INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES
WASHINGTON, D.C.

IN THE ARBITRATION PROCEEDING BETWEEN

CONOCOPHILLIPS PETROZUATA B.V.
CONOCOPHILLIPS HAMACA B.V.
CONOCOPHILLIPS GULF OF PARIA B.V.
and
CONOCOPHILLIPS COMPANY
THE CLAIMANTS

v.

BOLIVARIAN REPUBLIC OF VENEZUELA
THE RESPONDENT

ICSID Case No. ARB/07/30

AWARD

Members of the Tribunal

Mr. Eduardo Zuleta, President
Professor Andreas Bucher, Arbitrator
The Hon. L. Yves Fortier, QC, Arbitrator

SECRETARY OF THE TRIBUNAL
Messrs. Gonzalo Flores and Francisco Grob

Date of dispatch to the Parties: 8 March 2019

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I. Procedural Background

1. On 2 November 2007, the Claimants submitted to the International Centre for Settlement of Investment Disputes ("ICSID" or the "Centre") a Request for Arbitration against the Bolivarian Republic of Venezuela ("Venezuela" or "the Respondent") pursuant to Article 36 of the ICSID Convention. On 13 December 2007, the Secretary-General of ICSID registered the Request for Arbitration in accordance with Article 36(3) of the ICSID Convention.

2. The Tribunal was constituted on 23 July 2008. Its members were Judge Kenneth Keith, a national of New Zealand, President, appointed by the Chairman of the ICSID Administrative Council pursuant to Article 38 of the ICSID Convention; The Hon. L. Yves Fortier, QC, a Canadian national, appointed by the Claimants; and Sir Ian Brownlie, CBE, QC, a British national, appointed by the Respondent. On 1 February 2010, the Tribunal was reconstituted, with Professor Georges Abi-Saab, an Egyptian national, being appointed by the Respondent, following Sir Ian Brownlie's passing.

3. From 31 May to 12 June 2010 a hearing took place on jurisdiction and merits, followed by two days of pleadings on 21 and 23 July 2010. On 3 September 2013, the Tribunal issued a Decision on Jurisdiction and the Merits ("the 2013 Decision"), stating in its paragraph 404 the conclusions quoted below in Section II.

4. On 8 September 2013, Counsel for the Respondent submitted a letter requesting a clarification and further explanations from the Tribunal regarding certain findings in the Decision on Jurisdiction and the Merits relating in particular to the 2013 Decision's conclusion on the negotiation on compensation that took place between the Parties (the "First Application for Reconsideration"). In its letter, Counsel for the Respondent also requested "a limited and focused hearing" to address the specific issues raised.

5. Counsel for the Claimants replied to the Respondent's letter on 10 September 2013. The Claimants opposed the Respondent's requests and proposed instead a briefing schedule for submissions on quantum.

6. Between 11 and 23 September 2013, several further letters were submitted to the Tribunal by the Parties.

7. By letter of 1 October 2013, the Tribunal fixed a schedule for the Parties to file submissions on: (i) the Tribunal's power to reconsider the 2013 Decision; and (ii) a possible scheduling for quantum briefs. The Parties duly submitted two rounds of written pleadings.

8. In its Decision of 10 March 2014, the Tribunal stated that so far as the matter set out in the Respondent's Application for Reconsideration was concerned "this decision is limited to answering the question whether the Tribunal has the power which the Respondent would have it exercise. The decision does not address the grounds the Respondent invokes for reconsidering the part of the Decision which it challenges and the evidence which it sees as supporting those grounds. The power must be shown to exist before it can be exercised"[1].

9. The Tribunal concluded that it did not have the power to reconsider the Decision on Jurisdiction and the Merits, with Professor Georges Abi-Saab dissenting. In the absence of such power it implicitly followed in the Tribunal's Decision that the Respondent's Request was dismissed.

10. Professor Georges Abi-Saab resigned on 20 February 2015 with immediate effect. On 10 August 2015 the Tribunal was reconstituted, with Professor Andreas Bucher, a Swiss national, being appointed by the Chairman of the Administrative Council.

11. On that same day, 10 August 2015, the Respondent submitted a Second Application for Reconsideration directed at the Tribunal's Decision of 10 March 2014. It requested a hearing on the application. The Respondent recalled that it had, immediately following the 2013 Decision, applied for reconsideration, pointing out

> certain obvious factual, legal and logical errors the correction of any one of which would require a change in the majority's conclusions on the issue of good faith negotiations. Of particular relevance to this [Second] Application, Respondent pointed out that cables from the U.S. Embassy released after the hearing in this case in 2010, which reported on the briefings made by the chief ConocoPhillips negotiators to the U.S. Embassy in Caracas, left no doubt that the representations made by ConocoPhillips to the Tribunal regarding Respondent's supposed unwillingness to negotiate fair market value had been completely false, and that it was in fact ConocoPhillips which was seeking compensation 'on top of the fair market value of the assets.' Since the majority had relied on Claimants' misrepresentations in reaching its conclusion on bad faith negotiation, Respondent assumed that the Tribunal would want to reconsider the Majority Merits Decision to avoid an obvious gross miscarriage of justice. That assumption was based on the premise that every tribunal has the power to correct its own decision while the case is still pending before it and should exercise that power if its decision were indeed based on patently false representations[2]. (footnote omitted)

12. On 12 August 2015, the Claimants responded in these terms:

[1] Decision of 10 March 2014 on Respondent's First Request for Reconsideration, para. 9.

[2] Respondent's Second Application for Reconsideration, pp. 2-3.

> The application is frivolous and dilatory. Venezuela has not even attempted to articulate a legal basis for the admissibility of a request to reconsider a reconsideration decision – because there is none. The Tribunal's 10 March Decision considered and rejected the same arguments that Venezuela now raises. It has *res judicata* effect and may not be revisited or reviewed in any way prior to the rendering of the final Award[3].

The Claimants requested that the Tribunal dismiss the Respondent's application forthwith and promptly reschedule the final hearing.

13. Later that same day, the Respondent commented upon the Claimants' letter. On 13 August 2015 the Claimants stated that their letter of the previous day provided a complete answer to the Respondent's points in its later letter.

14. On 15 August 2015, the Parties were advised that the Tribunal "is currently considering the Respondent's application, including its request for a hearing, and will revert to the parties in due course. The Tribunal considers that no further submissions are needed at this point"[4].

15. On 9 November 2015, the Respondent submitted a proposal to disqualify L. Yves Fortier QC as arbitrator. In terms of Rule 9(6) of the Arbitration Rules, the proceeding was suspended until 15 December 2015 when the proposal was dismissed. Two further proposals were made by the Respondent on 26 February 2016 and 22 July 2016 (Respondent's Fifth and Sixth Proposals to disqualify L. Yves Fortier), both dismissed on 15 March 2016 and 26 July 2016, respectively.

16. The Tribunal rendered its Decision on the Respondent's Second Application for Reconsideration on 9 February 2016. It explained that it had approached the matter, as have the Parties, in terms of seeking the existence and source of the power the Respondent would have it exercise. It is not a matter of finding a rule prohibiting the existence or exercise of such a power. That power has to be found to exist. The Respondent has failed to make such demonstration.

17. Accordingly, the Tribunal, by a majority, dismissed the Second Application for Reconsideration made by the Respondent for the reconsideration of its Decision on Respondent's First Request for Reconsideration of 10 March 2014, with Professor Andreas Bucher dissenting.

18. On 24 February 2016, the Tribunal held an Organizational Hearing in Washington, D.C., where several outstanding matters of procedure were discussed, including the scheduling and the agenda of the forthcoming hearings on quantum. A number of procedural issues were recorded in the Minutes and further refined in ICSID's letter of 8 June 2016.

[3] The Claimants' letter of 12 August 2015, p. 1.

[4] ICSID's letter of 15 August 2015, p. 2.

19. On 21 March 2016, the President of the Tribunal, Judge Kenneth J. Keith resigned as arbitrator in this case with immediate effect. On 22 April 2016 the Tribunal was reconstituted, with Mr. Eduardo Zuleta, a Colombian national, being appointed as presiding arbitrator by the Chairman of the Administrative Council.

20. On 21 March 2016, the Respondent submitted the Updated Expert Report of Vladimir Brailovsky and Daniel Flores, dated 18 March 2016. On the same date, the Claimants submitted the March 2016 Update prepared by their Experts Manuel A. Abdala and Pablo T. Spiller (Compass Lexecon).

21. On 21 April 2016, the Claimants submitted the Rebuttal Expert Report prepared by Manuel A. Abdala and Pablo T. Spiller (Compass Lexecon) and the Second Expert Report of Richard Strickland, while, on the same date, the Respondent communicated the Valuation Update Reply prepared by Vladimir Brailovsky and Daniel Flores.

22. In accordance with the conclusions of the Organizational Hearing, the Claimants submitted on 15 April 2016 additional exhibits in the record (C-623 to C-671), as did the Respondent (R-603 to R-641).

23. By letter dated 20 April 2016, the Respondent filed with the Tribunal the Third Application for Reconsideration of the Majority's Decision of 9 February 2016, containing the same request and based on the same grounds as the Respondent's two earlier Applications. The Claimants responded by letter of 21 April 2016.

24. At the Organizational Hearing of 24 February 2016, the Claimants were ordered to produce a number of documents, which the Tribunal considered were not privileged. By letter of 11 May 2016, the Tribunal decided the last remaining issue in respect of the production of documents.

25. Another decision of the Tribunal at the Organizational Hearing was to invite the Parties to comment on the issues other than quantum that they considered were still outstanding, if any. The Tribunal received submissions from the Claimants on 2 March 2016 and from the Respondent on 11 March 2016. After due deliberation, the Tribunal considered it necessary to invite the Parties, by letter dated 17 March 2016, to file an additional round of submissions, which were received from the Claimants on 15 April 2016 and from the Respondent on 15 May 2016. The Parties were invited to specifically address the Claimants' request for a declaration of breach of Article 6 of the BIT (C-2, R-13).

26. The Tribunal held a first phase of the hearing on quantum on 15-19 August 2016 in respect of the following issues: (i) the scope of the Tribunal's finding on Article 6(c) of the BIT and the outcome of the Claimants' claim for a declaration that the Respondent breached Article 6 of the

BIT; (ii) the Respondent's Third Application for Reconsideration; (iii) the *misrepresentation* allegation; (iv) the relevance of the *compensation formulas* and (v) the impact of the ongoing ICC arbitration proceedings, if any[5].

27. At the end of the hearing on 19 August 2016 and after consultation with the Parties, the Tribunal issued Procedural Order No. 4, providing in particular as follows:

> 1. The Tribunal remains seized of the Respondent's Request for Reconsideration dated April 20, 2016, and of Respondent's misrepresentation claim. The Tribunal considers that it has been fully briefed on these matters, which therefore need not be addressed further.
> 2. Pursuant to the Tribunal's order of August 17, 2016, the parties shall file with the Tribunal all documents exchanged or presentations made between them in the course of their negotiations between November 27, 2007 and September 2008, by August 31, 2016.
> 3. By September 19, 2016, the parties shall submit post-hearing briefs addressing the evidence adduced in the course of the hearing. The parties may include in their post-hearing briefs comments with respect to the documents produced pursuant to paragraph No. 2 above.

28. Procedural Order No. 4 further provided that the Parties shall proceed through joint and expeditious cooperation in establishing new and consolidated expert reports (1) on the production capacities of the Petrozuata, Hamaca and Corocoro Projects (para. 4) and (2) on the amount of damages resulting from the expropriation of the three Projects (para. 5), in each case on the basis of a jointly agreed structure of issues. In both cases, it was determined that the parties shall proceed through an initial exchange of their reports between them without copying the Tribunal and then revise the reports as necessary in order that each party may submit its final version to the Tribunal by 17 October 2016 for the reports on production capacities and by 17 November 2016 for the reports on damages.

29. Further instructions were given to the Parties by the Tribunal in Procedural Order No. 4 in respect of the substance of the expert reports on the amount of damages. The reports shall contain determinations on whether the valuation was made at the date of the expropriation, *i.e.* 26 June 2007, or on 31 December 2016, in each case taking into account, or not taking into account, the compensation formulas contained in the Association Agreements (para. 6). The final briefs on

[5] The hearing was recorded and a transcript established (in English and Spanish), as this had been done for the 24 February 2016 Organizational Hearing and for the hearings held on 31 May to 12 June and 21 and 23 July 2010. The same has been done in respect of all other hearings following thereafter. The Tribunal uses the condensed version of the transcripts. All transcripts have been reviewed and amended by the Parties, either directly in the (corrected) transcript or on a separate list. The numbering of days used for the February and March 2017 hearing transcripts for the Spanish version has been aligned to the numbers used for the English version. The Tribunal makes reference to the transcripts, both in English and Spanish, as they are on its record and as approved by the Parties, abstaining from amending the language for improvement or for compliance of one language version with the other. On some points both versions have to be consulted in order to reach an optimal understanding of the transcripts' respective content.

quantum were scheduled for 30 December 2016 (para. 7). The Order fixed the dates for the hearing on the second quantum phase at 21-25 February 2017 (para. 8), to which a further hearing was added by ICSID's letter of 2 September 2016 for 27-31 March 2017.

30. On 31 August 2016, the Tribunal received from each party a set of presentations that had been used in the course of the negotiations between 27 November 2007 and 8 September 2008. Most of the documents submitted by each party were identical[6].

31. The Claimants' and the Respondent's Post-Hearing Briefs were filed with the Tribunal on 19 September 2016.

32. In compliance with the procedure provided in paragraph 4 of Procedural Order No. 4 and the adjustments noted by the Tribunal's letters of 5 September and 3 October 2016, the Parties submitted consolidated expert reports on the production capacities of the three Projects on 17 October 2016 as follows: the Claimants' Expert Reports prepared respectively by Richard Strickland and by Neil K. Earnest of Muse Stancil; the Respondent's Expert Report of Jesús Rafael Patiño Murillo.

33. Following the procedure provided in paragraph 5 of the Order, the Parties submitted consolidated expert reports on the amount of damages resulting from the expropriation of the three Projects on 17 November 2016 as follows: The Claimants' Consolidated Update Report on the Damages Assessment for the Taking of ConocoPhillips' Investments in Venezuela prepared by their Experts Manuel A. Abdala and Pablo T. Spiller (Compass Lexecon), and the Respondent's Consolidated Expert Report on Valuation prepared by Vladimir Brailovsky and Daniel Flores.

34. The Claimants submitted their Final Submission on Quantum, and the Respondent its Brief on Quantum, both on 30 December 2016.

35. Pursuant to the Tribunal's invitation in its 6 May 2016 letter, the Parties communicated their submissions and valuation reports they had filed until 20 May 2016 with the ICC Tribunal (Case No. 20549/ASM), where ConocoPhillips were the claimants and PDVSA and two if its subsidiaries were the respondents. These briefs were complementary to the two Requests for Arbitration dated 10 October 2014, copies of which were communicated at an earlier date to this Tribunal (R-494, R-495). Each Party provided explanatory comments related to these proceedings by letters both dated 20 May 2016. On 16 September 2016, the Respondent filed with the Tribunal its Rejoinder submitted in the ICC proceedings on 9 September 2016. Finally, with the Claimants' agreement and as agreed by the Tribunal, the Respondent submitted on 16 December 2016 the transcript of the hearing that took place from 28 November to 10 December 2016 in the ICC Arbitration (R-

[6] The Claimants' Exhibits C-688 to C-694; Annexes 1 to 10 to the Respondent's letter dated 31 August 2016.

654). By letter to the Parties dated 19 December 2016, the Tribunal recalled that pursuant to paragraph 3 of the Minutes of the Organizational Hearing of 24 February 2016, as reiterated in its directions of 6 May, 1 July and 12 September 2016, this material has been received for information purposes only and will not, accordingly, be accorded any evidentiary value in this case. The Tribunal also informed the Parties in its letter dated 23 December 2016 that it did not grant leave for the Parties to submit documents referred to during the ICC hearing or other documents not on the record in the ICC Arbitration, or to file additional legal authorities[7].

36. The ICC Arbitral Tribunal rendered its Final Award on 24 April 2018 (20549/ASM/JPA). It was submitted to this Tribunal as an enclosure to the Claimants' letter dated 25 April 2018, which was followed by the Respondent's letter dated 26 April 2018. The Tribunal acknowledged receipt of both letters by its letter dated 27 April 2018, further stating that it understands that the filing of the ICC Award had the purpose of informing the Tribunal of the closing of the ICC Arbitration and that it has no other purpose. A further letter of the Respondent dated 1 May 2018 recalled the critical significance that the ICC Award had for this Party. The Claimants expressed their disagreement in an email the following day, recalling their understanding that in light of the Tribunal's letter of 27 April 2018 and paragraph 9 of Procedural Order No. 4, further submissions were precluded without the Tribunal's consent. By email of 3 May 2018, the Tribunal reconfirmed that the ICC Award has been submitted for the purpose of informing the Tribunal only and that the unsolicited correspondence submitted thereafter did not go beyond what had been presented to and argued before this Tribunal. Through the Claimants' letter dated 20 August 2018 and the Respondent's letter dated a day later, both enclosing news releases, from ConocoPhillips, Houston, and PDVSA, respectively, the Parties informed the Tribunal that a settlement agreement had been reached between these parties in respect of the collection of the amounts awarded by the ICC tribunal.

[7] The Respondent complained at the 2017 September Hearing that it was prevented from updating its information and allegations as per 31 December 2016 because documents and evidence it had submitted to the ICC Arbitration had not been admitted into the proceeding of this Tribunal, in particular a more recent witness statement prepared by Mr. Figuera; cf. TR-E, 2017 September Hearing, Day 17, p. 4830:14-4832:11 (Preziosi), 4832:12-4833:17 (Kahale), 4901:3-4903:19 (Preziosi). The Tribunal recalls that it explained in its 23 December 2016 letter that such late introduction of new evidence would not have been allowed according to ICSID Arbitration Rules 34 and 35, in particular because no further cross-examination (not offered by the Respondent anyhow) would have been possible. The Tribunal also noted that their way of proceeding was not intended or even contemplated at the Organizational Hearing of 24 February 2016, and this with the Parties' agreement. No request for the production of further witness statements was made by the Respondent when the draft of Procedural Order No. 4 was submitted to the Parties for the purpose of receiving their comments (cf. TR-E, 2016 August Hearing, Day 5, p. 1523:2-1534:19). Nonetheless, the Respondent filed with the Tribunal Figuera Appendices 157, 161, 162, 164, 165, 169, 171, 172, 176 as attachments to its 2017 Post-Hearing Brief. Moreover, the Respondent let its valuation experts attach to their opinion material from the ICC Arbitration, which has no evidentiary value in the present case, *i.e.* Figuera Appendices 154-172 (Brailovsky&Flores, Valuation Update Reply, 21 April 2016) and excerpts of Figuera Witness Statements together with Appendices 176 and 178 (cf. Brailovsky&Flores, Consolidated Expert Report on Valuation, 17 November 2016, footnote 2). On 10 January 2019 the Tribunal rejected the Respondent's unsolicited request dated 8 January 2019 to consider a model on data relating to the Corocoro Project that had been submitted in an ICC arbitration instituted on 30 December 2016.

II. The 2013 Decision on Jurisdiction and the Merits

37. The conclusions reached by the Tribunal's 2013 Decision read as follows:

> 404. For the foregoing reasons, the Tribunal decides as follows:
>
> a. It does not have jurisdiction under Article 22 of the Investment Law and accordingly the claims by ConocoPhillips Company are dismissed; and
>
> b. It has jurisdiction under Article 9 of the Bilateral Investment Treaty over:
>
> i. the claims brought by ConocoPhillips Petrozuata BV, ConocoPhillips Hamaca BV and ConocoPhillips Gulf of Paria BV in respect of (1) the increase in the income tax rate which came into effect on 1 January 2007 and (2) the expropriation or migration; and
>
> ii. the claims brought by ConocoPhillips Petrozuata BV and ConocoPhillips Gulf of Paria BV in respect of the increase in the extraction tax in effect from 24 May 2006.
>
> c. All claims based on a breach of Article 3 of the BIT are rejected.
>
> d. The Respondent breached its obligation to negotiate in good faith for compensation for its taking of the ConocoPhillips assets in the three projects on the basis of market value as required by Article 6(c) of the BIT.
>
> e. The date of valuation of the ConocoPhillips assets is the date of the Award.
>
> f. All other claims based on a breach of Article 6(c) of the BIT are rejected.
>
> g. All other questions, including those concerning the costs and expenses of the Tribunal and the costs of the parties' determination are reserved for future determination.
>
> Items (a), (b)(i), (b)(ii), (c), (f) and (g) above have been decided unanimously by the Tribunal. Items (d) and (e) have been decided by majority, with Arbitrator Georges Abi-Saab dissenting.

38. This 2013 Decision on Jurisdiction and the Merits is hereby incorporated by reference into this Award.

39. Since 3 September 2013, when the ConocoPhillips Company's claims were dismissed (para. 404(a)), this Company no longer participated in this proceeding. However, this Decision was never incorporated in an award. It will be made in this Award, together with an assessment of the impact of such dismissal on the allocation of legal fees and costs (Section XV). Unless otherwise stated elsewhere in this Award, the "Claimants" means the three Dutch ConocoPhillips companies.

40. The Tribunal's Majority has decided twice that it had no power to examine the Respondent's Application for Reconsideration, each time with the third arbitrator dissenting.

41. Nonetheless, the true meaning and effects of the 2013 Decision's statement in respect of the Respondent's conduct of the negotiation on compensation in paragraph 404(d) remained a matter of debate. The Tribunal felt that further clarity would be useful in relation to the obligation prohibiting expropriation by the host State as contained in Article 6 of the BIT, and in relation to the assessment of the Claimants' claim for damages. Further procedural developments, and

particularly the August 2016 Hearing, had the effect of providing a broader view on the negotiations that actually took place between the Parties, including in the period between November 2007 and September 2008, which the Tribunal was not able to evaluate in the prior proceeding that was concluded with the 2013 Decision. Furthermore, the Respondent submitted a claim based on alleged misrepresentations made by the Claimants to the Tribunal. Therefore, the Tribunal decided that the Respondent's Third Application for Reconsideration and the misrepresentation allegation would both be addressed at the August 2016 Hearing. Both matters were dealt with in the Tribunal's Interim Decision dated 17 January 2017.

III. The 2017 Interim Decision

42. The conclusions reached by the Tribunal in its Interim Decision read as follows:

> 1. The Respondent's Third Application for Reconsideration is dismissed.
> 2. The Respondent's claim based on the Claimants' alleged misrepresentations to the Tribunal is dismissed.
> 3. The Tribunal declares that Venezuela has breached Article 6 of the BIT by unlawfully expropriating the Claimants' investments in the three Projects in the Orinoco Belt in Venezuela.

43. This Interim Decision is hereby incorporated by reference into this Award.

44. In sum, the Tribunal explained that the true meaning of the 2013 Decision's finding in respect of the negotiation on compensation was that the Respondent failed to be involved in negotiations leading to an offer complying with the requirements of "just compensation" and "market value". The Tribunal did not find a lack of good faith on the part of the Respondent for its breach of an obligation to negotiate on the basis of market value as required by Article 6(c) of the BIT (paras. 39-62). The Tribunal concluded that until the filing of the Claimants' Request for Arbitration and thereafter, the Respondent did not envisage, conduct or propose to ConocoPhillips a market valuation as required by Article 6(c) of the BIT (paras. 63-131). The Tribunal also decided that the Respondent's claim based on the Claimants' alleged misrepresentations must fail in light of the Respondent's failure to demonstrate that relevant information had been unduly retained by the Claimants or that they presented evidence that was either forged or otherwise misleading (paras. 67-69, 80, 93, 132-136).

45. In its 2017 Interim Decision (para. 137), the Tribunal recalled that it had concluded in its 2013 Decision that the Respondent committed a breach of Article 6(c) of the BIT by not respecting its obligation to negotiate in good faith on the basis of market value for the compensation to be provided to the Claimants for the taking of its assets (para. 404d). The Tribunal explained that the obligation implicitly referred to in Article 6(c) is one of the three pertinent requirements which

must be complied with by the host State if it proceeds to expropriate or nationalize the investor's investment. Beyond this function, it has no legal autonomy. Indeed, a breach of an obligation contained in Article 6(c), as stated in the 2013 Decision, does not have the effect of providing the aggrieved party with a claim for damages based on such breach. The legal effect of such breach appears exclusively in the overall context of Article 6, because the non-compliance with the requirements of letter (c) means that the measures taken by the host State do not comply with the conditions set out in this provision.

46. If and to the extent that the requirements of Article 6(c) have not been complied with, one of the three cumulative conditions set out in Article 6 has not been fulfilled, and the effect is that Article 6 has been breached. The Tribunal recalled in its 2017 Interim Decision (para. 147) that the 2013 Decision noted that the requirement of compensation was one of the necessary conditions for an expropriation to be "lawful" (paras. 334, 343, 401). Using the same logic, the finding that one of these conditions has not been met must be understood as having the effect of rendering the expropriation in June 2007 unlawful.

47. When rendering its Interim Decision, the Tribunal decided to rule explicitly on this matter (para. 148). It noted (para. 150) that the Tribunal's record reveals that the first two requirements of Article 6 have been met. An expropriation or nationalization requires a "taking" to be operated by the authorities of the host State. Such taking may cover rights other than rights *in rem*, as confirmed by Article 6 which refers to the broad concept of "investments". In the present case, such taking became effective on 26 June 2007, when ConocoPhillips' assets were definitively taken over by Venezuela and by PDVSA's or its subsidiaries' employees. This taking did not extend to the assets exclusively. It meant that Venezuela assumed directly the activities performed by the Associations and it extinguished ConocoPhillips' ownership interests[8]. It necessarily included the rights contained and held by ConocoPhillips through the Association Agreements and all other contractual undertakings relating to the three Projects. As Witness Mommer recalled, at that date, the Association Agreements were terminated[9].

48. There is no dispute about the fact that the measures enforced on 26 June 2007 have not been taken against "just compensation" as required by Article 6(c). In fact, no compensation has been paid at all. As the Interim Decision also explains (para. 153), the negotiations that took place before the taking over of ConocoPhillips's assets and interests were conducted by Venezuela on the basis of a model representing a migration into *empresas mixtas*, based on an amount of compensation that had nothing to do with a compensation representing market values covering the loss of profits that were to be earned by ConocoPhillips' companies until the end of the lifetime of the Projects.

[8] Witness Mommer, TR-E, 2016 August Hearing, Day 3, p. 993:8-994:17.

[9] The Witness used the term "disappear" (TR-E, 2010 Hearing, Day 7, p. 1838:16-17), further explaining that the assets were taken over (TR-E, 2010 Hearing, Day 7, p. 1716:14-15, 1854:12-13).

When the negotiations took place in parallel with the arbitration proceeding, Venezuela never made a concrete proposal. The evidence before the Tribunal demonstrates with stringent clarity that no offer was ever made by Venezuela in order to put a positive end to the negotiation.

49. All the reasons given in the 2017 Interim Decision (paras. 137-155) and briefly repeated here support the Tribunal's conclusion that the Respondent had breached Article 6 of the BIT.

IV. The Final Phase on Quantum

50. Shortly after rendering its Interim Decision on 17 January 2017, the Tribunal continued with the final phase of this proceeding, relating to quantum.

51. The Tribunal held its hearing on the second quantum phase in Washington, D.C. in two parts, the first from 21 to 25 February 2017, and the second from 27 to 31 March 2017. Present at these two sessions were (except where stated otherwise):

<u>Members of the Tribunal</u>

Dr. Eduardo Zuleta, President
The Hon. L. Yves Fortier, QC, Co-Arbitrator
Professor Andreas Bucher, Co-Arbitrator

<u>ICSID Secretariat</u>

Mr. Gonzalo Flores, Secretary of the Tribunal
Mr. Francisco Grob, Secretary of the Tribunal

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Ms. Jannet Carrig, ConocoPhillips
Ms. Laura Robertson, ConocoPhillips
Ms. Suzana Blades, ConocoPhillips
Mr. Alberto Ravell, ConocoPhillips
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Ms. Dori Yoldi, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Arianna Sánchez, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Simon Batifort, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Irene Petrelli, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Matilde Flores, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Farshad Zahedinia, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Sofia Herrera, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Steven Richardson, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Gloria Diaz-Bujan, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Herbert Tapia, Curtis, Mallet-Prevost, Colt & Mosle LLP

Dr. Reinaldo Muñoz, Attorney General, Bolivarian Republic of Venezuela (only March)
Dr. Bernard Mommer, Bolivarian Republic of Venezuela
Ms. Irama Mommer, Bolivarian Republic of Venezuela
Dr. Alvaro Silva Calderon, Bolivarian Republic of Venezuela
Dr. Joaquin Parra, Bolivarian Republic of Venezuela
Dr. A. Vanessa Gonzalez Anton, Bolivarian Republic of Venezuela
Dr. José Gabriel Oroño, Bolivarian Republic of Venezuela
Dr. Alejandro Schmilinsky, Bolivarian Republic of Venezuela
Dr. Edoardo Orsoni, Bolivarian Republic of Venezuela

52. At the February hearing, the following Witnesses and Experts were heard and cross-examined:

Dr. Manuel A. Abdala and Professor Pablo T. Spiller, presented by the Claimants
Mr. Vladimir Brailowsky and Dr. Daniel Flores, presented by the Respondent
Mr. Albert Roy Lyons, presented by the Claimants
Mr. Rubén Figuera, presented by the Respondent
Mr. Jesús Rafael Patiño Murillo, presented by the Respondent
Dr. Richard F. Strickland, presented by the Claimants
Mr. Neil K. Earnest, presented by the Claimants
Mr. David Andrew Brown, presented by the Claimants

Mr. Leonardo Marcano, presented by the Respondent

Following an exchange of views between the Parties, the Tribunal decided that Mr. Virgil Chamberlain, a witness presented by the Claimants, would not appear at the February hearing.

At the March hearing, Witnesses Lyons and Figuera were examined again, followed by the quantum Experts, Dr. Abdala and Professor Spiller for the Claimants, and Mr. Brailovsky and Dr. Flores for the Respondent.

53. Shortly before the March hearing, on 20 March, the Parties provided the Tribunal, upon its request, with tables for each of the Hamaca and Petrozuata Projects containing accumulated annual production figures, listed year by year, of Extra Heavy Crude Oil (EHCO), Commercial Crude Oil (CCO), and blends, for each of the following periods: (i) commencement of the corresponding Project until 26 June 2007; (ii) June 2007 until 31 December 2016; and (iii) 1 January 2017 until the expiration of term of the corresponding Association Agreement. A similar request related to the Corocoro Project, but without any division depending on the quality of the oil. For all three Projects, the tables also contained information in respect of the Operating Expenses (OPEX) and Capital Expenditures (CAPEX) affecting the aforesaid production figures for the same periods, as well as for taxes relating to the production. The Parties were further invited to explain the operation of a windfall tax and the impact, if any, of applying the compensation provisions, assuming that such tax had applied as from 15 April 2008, the rate that would have applied for each year. In parallel to the Respondent's Assessment of Production the Claimants also submitted a set of tables relating to oil production, costs and taxes in respect of each of the Projects.

54. At the end of the March hearing, upon the invitation of the Tribunal, the Respondent submitted a hardcopy of the invoices of CCO sold during the years 2009 to 2015, together with monthly lists of the quantities of oil sold and loaded on vessels for the purpose of exportation. Complementary tables summarizing the pertinent figures relating to production, costs and taxes were also provided. An exchange of views took place at the hearing in order to assist the Tribunal in understanding this voluminous documentation[10].

55. By letters dated 4 and 12 April 2017, the Tribunal directed the valuation experts to confer with the aim of narrowing the gaps between their respective positions related to discount rates, in general, and country risk, in particular. By letter dated 25 April 2017, the Claimants informed the Tribunal that the experts had conferred but were unable to narrow the gap between their respective views.

[10] Cf. TR-E, 2017 March Hearing, Day 14, p. 4258:8-4297:22.

56. By letters dated 27 April and 3 May 2017, the Tribunal requested the Parties to submit by 29 May 2017 a jointly prepared assessment, supported by their respective experts, of the actual production of the Projects (July 2007 to 31 December 2016), together with an assessment of the associated costs. The Tribunal also noted in its 27 April letter that the hearings held in February and March 2017 had clearly demonstrated that the experts had made various assumptions and assertions that were either wrong, not cross referenced to evidence on the record, or simply not supported by sufficient evidence. The Tribunal therefore requested the Parties in these two letters to continue instructing their experts to jointly work towards results elaborated on the basis of constructive cooperation. It also requested the Parties in its 27 April letter to provide the Tribunal by 19 May 2017 with an additional expert report by its respective experts on the country risk specifically associated with each Project. The deadline fixed on 19 May 2017 was subsequently extended at 26 May (letter dated 18 May 2017) and later to 2 June 2017 (letter dated 25 May 2017).

57. On 19 May 2017, the Claimants and the Respondent each submitted their Post-Hearing Briefs following the February and March hearings. The additional reports requested from the experts were provided on the same date.

58. On 2 June 2017, the Parties submitted two sets of documents containing (1) an Assessment of Production reported by the Respondent for the three Projects, commented by the Respondent and the Claimants, and (2) the Respondent's Estimated *Ex Post* Capital Expenditures (CAPEX) and Operating Expenses (OPEX) for each Project, also commented by the Respondent and the Claimants (referred to below as "Cost Estimations").

59. By letters dated 8 and 14 June 2017, the Tribunal submitted to the Parties a list of questions. The Parties' answers were received on 10 July 2017, followed by rebuttal comments from each side on 31 July 2017. Upon the Tribunal's request, the Respondent submitted an English translation of Annexes 8 to 10 filed in relation to Appendix 76 of Mr. Figuera's Testimony, on 11 September 2017. Thereafter, the Tribunal invited the Parties on 13 September 2017 to prepare responses to be submitted at the forthcoming hearing on a number of supplementary questions.

60. The Tribunal held its final hearing in Washington, D.C. on 19 to 21 September 2017. It dealt with the examination of the Parties' answers to the Tribunal's questions and with the submission of further clarifications. On the last day, the Parties made their closing statements. Present at this hearing were:

<u>Members of the Tribunal</u>

Dr. Eduardo Zuleta, President
The Hon. L. Yves Fortier, QC, Co-Arbitrator
Professor Andreas Bucher, Co-Arbitrator

ICSID Secretariat

Mr. Gonzalo Flores, Secretary of the Tribunal
Mr. Francisco Grob, Secretary of the Tribunal
For the Claimants

Mr. Jan Paulsson, Three Crowns LLP
Mr. Constantine Partasides, QC, Three Crowns LLP
Mr. Josh Simmons, Three Crowns LLP
Mr. Luke Sobota, Three Crowns LLP
Mr. Hugh Carlson, Three Crowns LLP
Mr. D. Brian King, Freshfields Bruckhaus Deringer US LLP
Mr. Elliot Friedman, Freshfields Bruckhaus Deringer US LLP
Mr. Sam Prevatt, Freshfields Bruckhaus Deringer US LLP
Mr. Lee Rovinescu, Freshfields Bruckhaus Deringer US LLP
Ms. Madeline Snider, Freshfields Bruckhaus Deringer US LLP
Mr. Cameron Russell, Freshfields Bruckhaus Deringer US LLP
Mr. Israel Guerrero, Freshfields Bruckhaus Deringer US LLP
Mr. Breanna Weber, Freshfields Bruckhaus Deringer US LLP
Ms. Cassia Cheung, Freshfields Bruckhaus Deringer US LLP
Mr. Iain McGrath, Freshfields Bruckhaus Deringer US LLP

Ms. Jannet Carrig, ConocoPhillips
Ms. Laura Robertson, ConocoPhillips
Ms. Suzana Blades, ConocoPhillips
Mr. Alberto Ravell, ConocoPhillips

For the Respondent

Mr. George Kahale, III, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Benard V. Preziosi, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Arianna Sánchez, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Simon Batifort, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Irene Petrelli, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Matilde Flores, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Farshad Zahedinia, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Sofia Herrera, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Steven Richardson, Curtis, Mallet-Prevost, Colt & Mosle LLP
Ms. Gloria Diaz-Bujan, Curtis, Mallet-Prevost, Colt & Mosle LLP
Mr. Joseph Giberti, Curtis, Mallet-Prevost, Colt & Mosle LLP

Dr. Reinaldo Muñoz, Attorney General, Bolivarian Republic of Venezuela
Dr. Bernard Mommer, Bolivarian Republic of Venezuela
Ms. Irama Mommer, Bolivarian Republic of Venezuela
Dr. Alvaro Silva Calderon, Bolivarian Republic of Venezuela
Dr. Joaquin Parra, Bolivarian Republic of Venezuela

Dr. José Gabriel Oroño, Bolivarian Republic of Venezuela
Dr. Alejandro Schmilinsky, Bolivarian Republic of Venezuela
Dra. Marianna Zerpa, Bolivarian Republic of Venezuela

61. On 19 September 2017, in response to a request made by the Tribunal, the Respondent submitted two lists, one for the Petrozuata and the other for the Hamaca Project, containing information about the actual CCO sales from 2009 through 2015 including the relevant quantities of barrels sold and also containing the corresponding prices in US$ as they were actually invoiced.

62. In the course of the debate before the Tribunal, the Parties prepared jointly lists of prices for CCO per year in relation to the Petrozuata and Hamaca Projects, indicating a number of figures shared in common and a number of other prices where the respective positions differ. The information thus provided will be used below in Section VIII on Prices.

63. In the course of this proceeding, the Parties have filed a myriad of submissions and a great number of exhibits. The Tribunal does not enumerate all of these submissions, sometimes presented in a letter format. It recalls the main memorials and briefs it has received, complemented, where appropriate, by their short-title.

<u>The Claimants</u>

Claimants' Memorial, 15 September 2008 – Claimants' Memorial
Claimants' Reply, 2 November 2009 – Claimants' Reply
Claimants' Memorial on Quantum, 19 May 2014 – Claimants' Memorial on Quantum
Claimants' Reply on Quantum, 13 October 2014 – Claimants' Reply on Quantum
Claimants' Post-Hearing Submission, 19 September 2016 – Claimants' 2016 Post-Hearing Brief
Claimants' Final Submission on Quantum, 30 December 2016
– Claimants' Final Submission on Quantum
Claimants' Post-Hearing Brief, 19 May 2017 – Claimants' 2017 Post-Hearing Brief
Claimants' Initial Replies to the Tribunal's Questions, 10 July 2017
– Claimants' Replies of 10 July 2017
Claimants' Supplemental Comments on the Tribunal's Questions, 31 July 2017
– Claimants' Comments of 31 July 2017

<u>The Respondent</u>

Counter-Memorial of the Bolivarian Republic of Venezuela, 27 July 2009
– Venezuela's Counter-Memorial
Rejoinder of the Bolivarian Republic of Venezuela, 1 February 2010
– Venezuela's Rejoinder
Respondent's Counter-Memorial on Quantum, 18 August 2014

– Respondent's Counter-Memorial on Quantum
Respondent's Rejoinder on Quantum, 7 January 2015 – Respondent's Rejoinder on Quantum
Respondent's Post-Hearing Brief, 19 September 2016 – Respondent's 2016 Post-Hearing Brief
Respondent's Brief on Quantum Pursuant to Procedural Order No. 4, 30 December 2016
– Respondent's Final Brief on Quantum
Respondent's Post-Hearing Brief, 19 May 2017 – Respondent's 2017 Post-Hearing Brief
Respondent's Answers and Observations to the Questions Posed by the Tribunal in its Letters of June 8 and 14, 2017, 10 July 2017 – Respondent's Answers of 10 July 2017
Respondent's Reply to Claimants' Responses to the Tribunal's Questions, 31 July 2017
– Respondent's Reply of 31 July 2017

64. The Tribunal has received a great number of witness statements, many of them prepared by Mr. Albert Roy Lyons, presented by the Claimants, and Mr. Rubén Figuera, presented by the Respondent. These statements may be listed as follows:

<u>Mr. Lyons</u>

Witness Statement – 10 September 2008
Second Witness Statement – 30 October 2009
Rebuttal [3rd] Witness Statement – 14 April 2010
Fourth Witness Statement – 16 May 2014
Fifth Witness Statement – 13 October 2014

<u>Mr. Figuera</u>

Direct Testimony – 20 July 2009
Supplemental Direct Testimony – 26 January 2010
Second Supplemental Direct Testimony – 17 May 2010
Third Supplemental Direct Testimony – 15 August 2014
Fourth Supplemental Direct Testimony – 7 January 2015
(For the purposes of this Award, the term "Direct" will not be used.)

All other witness statements will be mentioned where appropriate.

65. In respect of the contributions of Mr. Lyons and Mr. Figuera, which are of particular relevance to the quantum phase, the Tribunal notes at the outset that their views do not in all cases reflect direct personal knowledge relating to the conduct and operation of the Projects, given the fact that they were exercising responsibilities only during a part of the period when the facts relevant to the matter to be examined by the Tribunal occurred.

66. The Tribunal has also received a great number of reports prepared by the Parties' respective experts.

67. Some of these reports were focusing on issues related to production (upstream, on-stream, and downstream) and on a number of technical items. The main expertise in this category was authored by Mr. Jesús Rafael Patiño Murillo, presented by the Respondent; the reports submitted by this expert are the following:

Expert Report – 18 August 2014
Second Expert Report – 7 January 2015
Consolidated Expert Report – 17 October 2016

The reports provided by Mr. Patiño have been reviewed and addressed by two of the Claimants' experts. Dr. Richard F. Strickland submitted three reports:

Expert Report – 13 October 2014
Second Expert Report – 21 April 2016
Consolidated Expert Report – 17 October 2016

Mr. Neil K. Earnest (Muse, Stancil & Co.) provided the following reports:

Technical Assessment of the Hamaca and Petrozuata Upgrader Performance – 13 October 2014
Consolidated Expert Report – 17 October 2016

68. A second category of experts' reports relates to the calculation of oil production and of the damages in dispute, both items being covered by the term "valuation".

For the Claimants, a series of reports have been submitted by Dr. Manuel A. Abdala and Professor Pablo T. Spiller, Directors of former LECG, LLC, today Compass Lexecon. They are:

Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008
Second Valuation Report of ConocoPhillips' Investments in Venezuela, 2 November 2009
Rebuttal Report to Respondent's Experts' Second Reports, 15 April 2010[11]
Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014
Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014
March 2016 Update, 18 March 2016
Rebuttal Report, 21 April 2016

[11] The first three of these reports had also as author Mr. José Alberro.

Consolidated Update Report, 17 November 2016
Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017

For the Respondent, an equally important number of reports have been presented by Mr. Vladimir Brailovsky and Dr. Daniel Flores. They are:

Expert Report on the Discount Rate to be Applied to Projected Cashflows, 24 July 2009
Second Expert Report on the Discount Rate to be Applied to Projected Cash Flows, 1 February 2010
Reply to LECG's Rebuttal to Second Discount Rate Report, 17 May 2010[12]
Expert Report on Valuation, 18 August 2014
Expert Report on the Theoretical and Historical Foundations of the Compensation Provisions, 18 August 2014
Second Expert Report on Valuation, 7 January 2015
Valuation Update, 18 March 2016
Valuation Update Reply, 21 April 2016
Consolidated Expert Report on Valuation, 17 November 2016
Additional Expert Report on Country Risk in Discount Rate, 19 May 2017

All other expert reports filed with the Tribunal will be mentioned where appropriate.

69. Upon request, the Parties have filed their submissions on Costs on 16 April 2018, which were followed by the Claimants' rebuttal dated 3 May 2018 and two letters in reply from the Respondent, dated 18 April and 3 May 2018. The Claimants submitted an update by letter dated 17 September 2018.

70. The Tribunal declared the proceeding closed on 8 February 2019.

V. The Applicable Law Governing Remedy

71. The natural remedy for the Claimants' compensation of their damages suffered as a consequence of an expropriation of the three Projects is to be found in the BIT or in the applicable law to which this Treaty refers. Article 9 of the BIT is therefore the first source of law to be considered (A). In relation to the Petrozuata and Hamaca Projects, great emphasis has been put, since the beginning of this proceeding, on the alleged relevance of the compensation provisions contained in the respective Association Agreements. The potential impact of these provisions as remedies for

[12] These first three reports have been prepared by Mr. Brailovsky and Professor Louis T. Wells.

the Projects' expropriation needs to be clarified (B). Finally, the Tribunal must determine whether the standard of compensation is contained in the BIT, and in Article 6(c) in particular, or whether general or customary international law is to be applied (C).

A. Article 9 of the BIT

72. At the outset of this analysis, two provisions of Article 9 of the BIT have to be examined more closely. The first one is paragraph 3 on the possible scope *ratione materiae* of a Tribunal's award on the merits. This provision reads as follows:

> 3. The arbitral award shall be limited to determining whether there is a breach by the Contracting Party concerned of its obligations under this Agreement, whether such breach of obligations has caused damages to the national concerned, and, if such is the case, the amount of compensation.

73. The second one is the last part of Article 9, paragraph 5:

> 5. The arbitral award shall be based on:
> - the law of the Contracting Party concerned;
> - the provisions of this Agreement and other relevant Agreements between the Contracting Parties;
> - the provisions of special agreements relating to the investments;
> - the general principles of international law;
> - such rules of law as may be agreed by the parties to the dispute.

1. The Claimants' Position

74. The Claimants submit that under Article 9(5) of the BIT, only customary international law governs the consequences of Venezuela's illegal expropriation, requiring full reparation. On the other hand, Venezuela contends that any award in this case must take into account Venezuelan law, including the terms and conditions of the special agreements relating to the Projects and their compensation provisions. Venezuela so argues on the basis of Article 9(5) of the BIT. Venezuela avers that the Claimants have "simply ignored" Venezuelan law.

75. The Claimants explain that Article 9(5) does no more than confirm that the Tribunal must consider different sets of rules for different sets of issues in dispute. This provision is not an express choice-of-law clause; its reference to domestic law cannot be construed as requiring its application to the determination of every issue that arises before the Tribunal.

76. Venezuela's invocation of "the law of the Contracting Party concerned" is therefore misplaced, because the issue for determination in this quantum phase must be adjudicated solely in

accordance with international law. State responsibility entails a secondary obligation of full reparation. This principle was codified in Article 32 of the ILC Articles.

77. The authorities referred to by Venezuela in its Counter-Memorial on Quantum are of no moment here. The only relevant question is whether Venezuela may be allowed to rely on its own domestic law, to reduce its responsibility under international law. In sum, the authorities cited by Venezuela contradict its allegation that the consequences following Venezuela's Treaty breach should be determined by reference to domestic law instruments such as the Congressional Authorizations.

78. The *Mobil* Tribunal had no difficulty in rejecting the same argument on the basis of the same Treaty provision[13]. It stated that a party may not invoke its internal law as justification for its failure to perform a treaty. International obligations cannot be discarded on the grounds of national law. The *Mobil* Tribunal had no doubt that the Award must be governed by international law. Consequently, the Eighteenth and Twentieth Conditions cannot exempt or excuse the Respondent from its obligations under the Treaty or under customary international law. Bearing this in mind, the *Mobil* Tribunal considered the effect of the Eighteenth and Twentieth Conditions of the Cerro Negro Framework Conditions in the section on quantum.

79. In addition, the Association Agreements do not even come within the terms of Article 9(5). For a domestic law contract potentially to affect the international law rights of investors, it is axiomatic that the contract must be between those same investors and that same respondent State. It stands to reason that the contracts on which the Tribunal can "base" its award under Article 9(5) must also be between the State and the investor. In sum, customary international law governs quantum in this case, and Venezuela's invocation of Article 9(5) of the Treaty does nothing to change that.

2. The Respondent's Position

80. The Respondent submits that the Congressional Authorizations and the Association Agreements are to be taken into account and given effect in determining quantum under Article 9(5) of the BIT, which refers to the law of the Contracting Party concerned and the provisions of special agreements relating to the investment.

81. The Claimants argue that because the issue is full reparation, the only relevant law is international law. This argument is nothing more than an invitation to the Tribunal to ignore the

[13] *Venezuela Holdings, B.V., Mobil Cerro Negro Holdings, Ltd., et al. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award of 9 October 2014 (CL-348). On this point, the Claimants refer to paras. 224 and 225 of the Award (Claimants' Reply on Quantum, para. 39). These paragraphs, among others, have been annulled by the Decision on Annulment, dated 9 March 2017, para. 196(3) (R-658).

applicable law provisions of the Treaty. The Claimants seem to be under the mistaken impression that international law can be applied in the abstract without consideration of national law. The Treaty calls for compensation based on fair market value, but fair market value is not a concept divorced from the underlying rights being valued, which themselves cannot be separated from whatever limitations may be attached to them. The concept of reparation is not independent of the terms and conditions applicable to the specific investments at issue.

82. The Respondent also notes that Article 9(3) of the BIT prevents this Tribunal from awarding damages beyond those caused by a breach of the BIT. In the case of a failure to pay the required compensation, the only damage is the amount of compensation due as of the date of expropriation, plus interest.

83. In other words, giving effect to the governing law provisions of Article 9(5) of the Dutch Treaty and applying the compensation mechanisms is not only a requirement of the Dutch Treaty itself, but is consistent with, and an integral part of, the international law analysis that the Claimants want this Tribunal to apply pursuant to the *Chorzów* decision. It is worth noting that it is universally recognized that the nature and scope of property rights are defined by local law, not international law. The issue here is not whether the consequences of an internationally wrongful act should be determined by international or national law. It is the scope of rights that the Claimants had. That is determined by national law, in this case starting with the Congressional Authorizations. The Claimants cannot circumvent the terms and conditions upon which they were permitted to invest in Venezuela. They must be given effect and they determine the basis of compensation.

84. The Claimants further invoke the well-known principle that a State may not use its internal law to extricate itself from an international responsibility. It is one of the principles the Claimants invoke which has nothing to do with the facts of the case. This is not a case in which the Respondent is relying upon subsequently enacted legislation as a defense to an international law claim. Rather, the Respondent is relying upon the terms and conditions established at the outset of the upgrading Projects pursuant to the Congressional Authorizations, which set forth the terms and conditions under which the Claimants would be entitled to invest in Venezuela. The issue can be stated as follows: if the terms and conditions of an investment are that the State would be entitled to capture, for instance, windfall profits through taxation, can the principle that a State may not use its internal law to extricate itself from international responsibility apply to prevent the State from exercising that right when the windfall profits subsequently materialize? The answer must be “no”. Yet that is what the Claimants try to do. They have not been able to refute any part of the extensive documentary record establishing the State’s ability as owner of the resource to obtain the benefit of exceptional profits.

3. The Tribunal's Findings

85. The Tribunal notes that the wording and the list set out in paragraph 5 of Article 9 of the BIT do not establish any order of priority among the five sources of law that are mentioned. The provision contains an enumeration, without any hierarchy. When considered as a rule on the applicable law, or on conflicts of law, the rule has its own limitations: it determines the possible applicable sources of law, but it does not determine which one is applicable in a particular context that is relevant for rendering the award.

86. One of the effects of this characteristic of Article 9(5) of the BIT is that the potential scope of application of one or another of the enumerated sources of law, for itself or in comparison to the others, has to be determined by reference to the scope of application of each one of these sources. Article 9(5) does not provide an answer to this question.

87. Article 42(1) of the ICSID Convention is in harmony with such understanding. Pursuant to this provision, the Tribunal shall decide a dispute "in accordance with such rules of law as may be agreed by the parties". Article 9(5) of the BIT constitutes such an agreement. The BIT is also in harmony with the second part of Article 42(1) of the ICSID Convention, stating that in the absence of an agreement on the choice of applicable rules of law, the Tribunal shall apply the law of the host State "and such rules of international law as may be applicable." The ICSID Convention does not provide for any restriction in respect of these "applicable rules of international law"; they necessarily include all such rules which according to their self-determined scope of application cover the legal issue arising in a particular case.

88. One important factor of hierarchy is the principle that international law must prevail over domestic law, and that a State may not invoke its internal law to extract itself from an international law obligation. As a matter of principle, this is not disputed between the Parties, nor is there any controversy that such principle results from the international law itself and not from Article 9(5) of the BIT.

89. This principle of priority of international law over domestic law has its own limitations. International law does not prevail over national law in a matter not governed by international law, in which case national law may apply, in accordance with Article 9(5) of the BIT. The much-debated issue of the relevance of the compensation provisions of the Petrozuata and Hamaca Association Agreements goes to the heart of this question. Are these provisions capable of governing the effects of an expropriation of the participants' assets held in the Projects? Or are these provisions relevant to the determination of the assets subject to such an expropriation when considered in the framework of Article 6 of the BIT? These questions, together with others, will be examined more closely below.

90. The Tribunal also observes that Article 9(3) of the BIT does not support the Respondent's interpretation that no damages other than those provided by the Treaty can be awarded. This provision states that the Tribunal's award shall not determine breach beyond the "obligations under this Agreement". Thus, while the range of obligations to be taken into account is limited by the content of the BIT, such limitation is not attached to the terms of "damages" and "amount of compensation" contained in the same provision.

91. The Tribunal also notes that the BIT has to be interpreted in light of the rules set out in the Vienna Convention of the Law of Treaties of 23 May 1969. Article 31 § 3(c) of this Treaty indicates that account is to be taken of "any relevant rules of international law applicable in the relations between the parties". The Tribunal must certainly be mindful of the BIT's special purpose as a Treaty promoting foreign investments, but it cannot apply the BIT in a vacuum, without taking the relevant rules of international law into account. Article 9(5) of the BIT has to be construed in harmony with such rules.

B. The Compensation Provisions of the Association Agreements

92. Captured in very summary terms, the debate between the Parties centers on whether the Association Agreements, relating, respectively, to the Petrozuata (C-21) and the Hamaca (C-22) Projects, are based on the implicit but nevertheless fundamental principle that the host State's ability to capture extraordinary profits must be preserved and whether in this respect the investors do not have an assurance that their revenue will never be affected. The marked difference with older State contracts in the field of petroleum extraction is that these Agreements do not contain a so called "stabilization" clause whereby the State accepts not to interfere with the legal and economic characteristics of the contract.

93. The compensation provisions contained in each of the Association Agreements represent a substitute for the full preservation of the host State's rights and policies[14]. In sum, these provisions provide that in case a "Discriminatory Action" ("DA") is taken by the State that causes a significant loss to the foreign investors, compensation must be provided to them. This compensation, however, is not due by the State, but by PDVSA or its relevant subsidiary, a company under the State's control. The amount of the compensation is calculated on the basis of a complex formula, which under the prevailing oil prices resulted in a sum of approximately 25 US$ or 27 US$ per barrel, respectively. The payment was to be made through the regular terms of provision of dividends to the shareholders. The Hamaca Association Agreement contains an additional layer in providing for a "buy-out" in case the parties cannot agree on whether a discriminatory action has occurred or the amendments to be agreed upon (Art. 14.4). Since the very beginning of this proceeding, the Parties have been deeply divided in their respective understanding of the content and effects of these

[14] Articles 9.07 for Petrozuata (C-21, R-22) and 14 for Hamaca (C-22, R-26).

compensation provisions (also called “Discriminatory Action provisions” or “DA provisions”) in the present case, and this in particular in respect of their application to the consequences of an expropriation governed by the BIT.

1. The Claimants’ Position

94. The Claimants object to Venezuela’s main line of argument that the Discriminatory Action provisions in the Petrozuata and Hamaca Association Agreements somehow limit the compensation resulting from Venezuela’s liability under international law for its expropriation of these Projects, although Venezuela was not a party to these Agreements.

95. The Claimants submit that domestic law is irrelevant to the standard of compensation for a violation of international law. Article 9(5) of the BIT does not provide otherwise; it simply sets out the different sources of law that a tribunal might apply to different issues. The issues of State responsibility here attract the rules of international law. The Association Agreements do not affect Venezuela’s obligations under international law. There is nothing in these contracts showing any “cap” on the value of the Projects. On the contrary, the DA provisions serve as an additional form of protection that served to enhance the value of the Associations.

96. The Claimants are investors and therefore entitled to the benefit of the Treaty’s substantive protections. Thus, the Claimants’ claims must be assessed and valued under the Treaty and international law. Potential contractual causes of action are separate and distinct from Treaty claims. They cannot diminish the quantification of damages under international law. In the present case, Venezuela was not a party to the Agreements. A fortiori, these Agreements can neither remove nor limit the Venezuelan State’s liability under international law.

97. The Congressional Authorizations confirm the irrelevance of the discriminatory action provisions. These Authorizations provide that the Agreements will not restrict Venezuela’s sovereign rights. One of those rights was the right to grant binding protections to foreign investors by Treaty or by legislation (here the investment law).

98. The Claimants explain that the DA provisions include three basic propositions: (a) First, when a DA occurs, the Claimants must, to the extent practicable, pursue remedies against the governmental actor responsible for the DA, including actions for monetary damages against the State. (b) Second, the relevant PDVSA subsidiaries are contractually obliged to indemnify the Claimants for harm resulting from the DA, with the indemnity being limited under certain oil price scenarios. (c) Third, to avoid double recovery, if the Claimants obtain payment from the relevant governmental actor, they must provide an offset to the PDVSA subsidiaries through an appropriate credit or reimbursement.

99. The DA provisions evidence that they are irrelevant to the compensation owed by Venezuela under international law for the taking of the Claimants' investments. They are partial contractual indemnities payable by PDVSA affiliates. They do not purport to address Venezuela's obligations for its own wrongful conduct. They do not limit the profits of any Project participant, nor do they impose any limit on the fair market value of the Claimants' project interests.

100. Venezuela has avoided looking at the plain terms of the DA provisions and has instead relied on the negotiating history. The contractual text is the best evidence of the parties' agreement. The DA provisions expressly recognize the Claimants' rights and require the pursuit of those remedies that are available under the circumstances. Even if this Tribunal were to consider pre-contractual negotiating history, the DA provisions do not contain a value-cap on the State's liability under international law.

101. All of the Claimants' witnesses called at the August 2016 hearing confirmed their understanding of the three-pronged structure of the DA provisions as outlined above. Venezuela has failed to put forward a single witness who was involved in negotiating the Association Agreements. The sole witness appearing on behalf of Venezuela, Dr. Mommer, played no role in these negotiations.

102. The Claimants have never argued that Venezuela lacked the "sovereign power" to expropriate. The question is whether the DA provisions say anything about Venezuela's obligations under international law with respect to that power. They do not.

103. Moreover, the DA provisions of the Association Agreements provide for ICC arbitration. The ICC Arbitral Tribunal seized with the matter had to determine how the Discriminatory Action provisions have to be applied, and whether Venezuela's unlawful expropriation falls within the ambit of those clauses. Venezuela has denied that they cover the expropriation or other challenged measures. This ICSID Tribunal, however, has exclusive jurisdiction over Venezuela's breach of the Treaty.

104. The DA provisions add value to the Associations because they provide for an additional layer of protection, above and beyond the remedies against the State expressly envisaged in the DA provisions. Venezuela argues that a willing buyer of the Claimants' interests would value future cash flows under the assumption that the State would take all cash flows beyond the indemnity limits in the DA provisions. Accordingly, says the Respondent, the fair market value of the Claimants' project interests is limited by the DA provisions.

105. Even if one were to assume that the DA provisions somehow cap the value of the Associations, the only way such a cap could be imposed would be if the Claimants were deemed to have waived their rights to full reparation under international law. The fact is that the Claimants have

important international law rights against the State that were in no way waived, modified or limited by the Association Agreements, to which the State is not even a party. Those provisions did not purport to relieve the State of its own legal responsibility or to waive any otherwise applicable international law restrictions on the State's ability to take away an investment.

106. The Claimants also observe that Venezuela misconstrues the negotiation history of the Petrozuata and Hamaca Association Agreements. First, the *condiciones* in the Congressional Authorizations did not require a waiver of remedies against the State under international law. Each Authorization established only a non-exhaustive general framework for items to be addressed in each Association Agreement. Second, the ConocoPhillips parties were not negotiating with the State and hence were not agreeing to any limitations of the State's potential liability. Their access was limited to representatives of Maraven and Corpoven. Accordingly, those discussions can only have related to the rights and obligations between contractual parties. Third, there is no support for Venezuela's assertion that Conoco was seeking compensation "from the Government" via the Petrozuata Authorization, rather than from the PDVSA subsidiary Maraven. Mr. Griffith's reply letter of 17 September 1992 (R-97) addressed the proposed compensation that would be owed by Maraven. Fourth, the operative provisions of the Association Agreements were limited to the reciprocal rights and obligations of the parties to those Agreements. PDVSA and its subsidiaries were authorized to agree to take some degree of indemnity upon themselves. They could not and did not purport to agree to impose obligations on the State; that matter was outside the scope of the Agreements and was governed by other sources of State obligations, including international law. Fifth, the parties added provisions that were not dictated by the Congressional Authorizations, like the "sliding scale" compensation mechanism. The ConocoPhillips parties sought the most robust indemnities they could get, while their counterparts sought to narrow the indemnities. At the end, the Association Agreements provided for partial indemnification by the contracting PDVSA affiliate in the event of certain governmental actions whose damage exceeded specified thresholds. In sum, the terms of the Association Agreements do not purport to affect any obligations the State had, or might assume in the future, under international law, or in Venezuela's statutory or constitutional law. Nor is there any indication that the Discriminatory Action provisions were *in lieu* of otherwise applicable State liability. They were providing an additional layer of protection for the investors.

107. The Claimants submit that the Discriminatory Action provisions were intended to serve as limited insurance policies underwritten by the contracting PDVSA subsidiaries – not as a waiver of the ConocoPhillips Parties' rights in that regard. The Association Agreements provide for a contractual indemnity against the contracting PDVSA subsidiary for measures taken by the State. This indemnity is subordinated to whatever relief the Claimants may obtain in any other competent fora against the State. Venezuela is not a party to the Association Agreement. The Congressional Authorizations confirm it expressly when reserving the sovereign powers of the State. Venezuela cannot claim to be a third-party beneficiary. This is precisely how similar provisions have been interpreted by the ICSID Tribunal in *Mobil v. Venezuela* (CL-348). The Tribunal noted that the

Agreement limits the compensation due by PDVSA, a limitation reflected in the amount to be awarded by the ICC tribunal. No such limitation applies, however, to the State's responsibility under the BIT.

108. The Claimants also reject Venezuela's speculative claim that, in the absence of the expropriation, the Government would have "in all probability" taxed the Projects so as to capture all profits above the contractual price caps. This argument is illogical and without legal basis. It is no more than a recasting of Venezuela's main argument that the Association Agreements have the effect of a waiver of the Claimants' international law right to claim against the State, at least in respect of other than "normal" profits.

109. The Tribunal has held in its 2013 Decision and in its 2017 Interim Decision that Venezuela violated the Treaty by taking the Claimants' investments. It follows necessarily that they must be awarded full reparation for their losses – which is not what the Discriminatory Action provisions provide. Even if that were not so, those provisions do not afford any right to Venezuela or limit its liability for breaches of the Treaty.

110. The Claimants also object to Venezuela's assertion that even if the standard of full reparation applies, the Tribunal must take into account "the terms of the investment". The only cash flows that the Claimants could have expected to earn absent the expropriation would have been those below vague "exceptional" or "windfall" thresholds. The argument is circular. Only if Venezuela's argument was well founded – *i.e.* if the Association Agreements had allocated to the State all cash flows above an "exceptional" level – could one conclude that the Claimants' entitlement could be cut off at that level. If the Association Agreements do not extinguish the Claimants' right to full reparation under the standard of international law, then they cannot either affect the calculation of full reparation.

111. Finally, even if one were to assume that the DA provisions somehow serve as a cap on Venezuela's liability under the Treaty and international law, such limitation could not be operative here, because a party engaging in willful misconduct cannot claim the benefit of alleged contractual limitations on liability. Rather, under Venezuelan law, this party must pay all direct and consequential damages stemming from its conduct. Thus, even if Venezuela were hypothetically assumed to have stepped into the shoes of the parties to the Association Agreements, it would remain fully liable to the Claimants.

112. Venezuela cannot be allowed to benefit from any limitations on liability in the Association Agreements without also being subject to the laws that govern any such limitations. In all events, having willfully breached its international obligations, Venezuela cannot claim the benefit of any restriction of its liability under international law. For all these reasons, the Claimants are entitled

to full reparation for the takings in accordance with international law. The Association Agreements and the DA provisions do not undermine or limit that clear entitlement.

2. The Respondent's Position

113. The Respondent's analysis starts by affirming that the threshold question to be decided by this Tribunal is whether a State has the right to determine the terms and conditions upon which it will accept investments in its territory. The Respondent's basic position is that the investment in the Petrozuata and Hamaca Projects included the reservation by the State of its full sovereign powers[15] to take action affecting the Projects, and that compensation for such sovereign action would be provided by the State company partner in the Projects. Compensation for governmental action was to be on "equitable" terms and subject to a cap on "excess" or "exceptional" or "windfall" profits generated by high oil prices, which the State was entitled to take for itself as the "owner of the resource".

114. The Tribunal notes that it is faced with extremely lengthy and repeated explanations provided by the Respondent. For the purposes of this Award, the presentation of the Respondent's position must focus on those facts and arguments that are relevant for the Tribunal's understanding and its analysis of the pertinent questions requiring a solution. In order to remain faithful to the Respondent's presentation, the Tribunal retains the division based on each Project's historical evolution, referring as well to the summaries contained in the 2013 Decision.

a. The Petrozuata Project

115. The Respondent recalls that the Sixteenth Condition of the Congressional Authorization (R-21/92) addressed the precise manner in which the foreign partner would be "compensated" while at the same time reserving to the State its sovereign powers. The use of the word "compensate" in the Petrozuata Authorization is telling. This is the issue in this case, not "insurance" as the Claimants say. The Claimants understood full well that they were without any international recourse against the State (no BIT was applicable at that time) and they have admitted this point on several occasions during the course of this Arbitration. That is why during the negotiations they pressed Maraven for as much protection as possible.

116. The Claimants went into the Petrozuata Project understanding that they had no international remedy against the State and that their sole and exclusive remedy for adverse governmental action would be the compensation provisions. It would make no sense for the Government to insist on limited compensation from the State company but full compensation from the State itself.

[15] Based on Article 320 of the Constitution of the Bolivarian Republic of Venezuela (R-16) and Article 5 of the Organic Law that Reserves to the State the Industry and Trade of Hydrocarbons, dated 21 August 1975 (C-6, R-19).

117. The 17 September 1992 letter from Conoco's Mr. Griffith (R-97) commented on the draft of the conditions to be incorporated in the Petrozuata Authorization. The letter requested provisions of full compensation based on market value, an economic stability clause, and precisions on how Conoco's assets and interests will be valued and reimbursed in the event of nationalization. In response, only one change was made to the draft of Clause Sixteen, *i.e.* the inclusion of the language at the end, reserving the State's sovereign power[16]. Witness McKee testified that Conoco did not obtain anything it requested in the letter[17].

118. In its 16 September 1993 letter (R-100) Conoco wanted the key definition of Discriminatory Legislation (which ultimately became "Discriminatory Actions") to cover virtually all governmental action adversely affecting the Project. With respect to compensation, Conoco again sought full compensation, so as to restore the relevant Class B Shareholder's income to where it would have been had there been no Discriminatory Action. Conoco did not get it.

119. The Minutes of the Miami Negotiating Sessions which took place in November and December 1993 reveal that the question which was discussed was what would be the mechanism that would implement the notion of "equitable" compensation while allowing the State to capture what were considered to be windfall profits (R-395).

120. The January 1994 Conoco Venezuela Strategy Management Team Report (C-67) clearly expressed Conoco's understanding of the risks of the Petrozuata Project, of the fact that governmental measures were likely to be adopted in high price scenarios, and of the likelihood that the Government would place a ceiling on project economics. Witness McKee explained that they never expected that a country like Venezuela would not have the power to increase its take[18]; they believed in the sovereign rights of a country[19]. Thus, Mr. McKee not only acknowledged such expectation, he actually endorsed the concept[20].

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[16] Cf. Report of Bicameral Commission dated 12 August 1993 (R-167, C-8); and further a presentation to the Senate (R-393) and a letter of the President of Maraven to the Permanent Commission on Energy and Mines dated 13 February 1996 (R-394).

[17] TR-E, 2010 Hearing, Day 3, p. 712:6-16; 2016 August Hearing, Day 1, p. 282:5-285:13, 291:9-293:19.

[18] TR-E, 2010 Hearing, Day 3, p. 727:6-16.

[19] TR-E, 2010 Hearing, Day 3, p. 739:13-17.

[20] Mr. McKee also said that Conoco's "hurdle rate" for the project was 20% (*ibidem*, TR-E, 2010 Hearing, Day 3, p. 731:8-15, 732:8-17). Within this limit, it was recognized that the State would be expected to increase government take. To do that, it was necessary to assure that cash flows from the Project up to a certain level would be protected from governmental action.

121. In February 1994, Conoco presented a detailed "sliding scale" proposal setting forth a compensation mechanism tied to the average price of Brent crude oil (R-101). The proposal was a follow-up to the discussions two months earlier in Miami.

122. The April 1994 Steering Committee Presentation confirms that Conoco understood well that the State was entitled to take governmental action that would affect project economics, and that Conoco's protection had to be provided through provisions for the granting of compensation by Maraven and that Conoco would not receive the "full compensation" it had sought from the outset of the negotiations. Given the lack of an "economic stability clause", Conoco was exposed to changes in the law that could have an adverse impact on the economics of the Project. Slide 8 identified the issue as "Gov't can take away economics" (R-102).

123. The February 1995 internal communication to the Conoco Management Committee once again highlighted the risk that the "government may radically change taxes, exchange rules and rates, or other features of our basic terms which could render our venture uneconomic" (R-397). The document noted that the risk of governmental action was being addressed by "seeking contractual terms which will help protect non-Venezuelan investors".

124. The PDVSA March 1995 Strategic Business Committee Presentation (R-219) reported Conoco's position as follows: "the owner of the resource must be able to obtain the benefit of exceptional profits". It is noted that the current compensation scheme (sliding scale) allows a gradual recognition of exceptional profits to the owner of the resource. Conoco's internal documents confirmed the company's view that a "large portion of the taxation risk has been eliminated by contractual provisions that require Mareven to offset Conoco's losses from discriminatory treatment" (R-398/397).

125. The Petrozuata Offering Circular dated 17 June 1997 (C-75) that by its nature is presumed to be accurate, does not highlight that "full compensation" from the State was available; it describes in detail the compensation provisions. There is nothing to support the Claimants' interpretation of the mechanism as a "partial insurance policy".

126. The Claimants say nothing about Dr. Mommer's testimony concerning the compensation mechanisms established for the upgrading Projects. His testimony is consistent with the full record. In his second supplemental direct testimony he recalled that the essence of the concept they discussed within PDVSA was defining what constitutes "normal profit", and what was "excess" or "windfall" profit. The Claimants did not impeach Dr. Mommer on the subject of the compensation provisions at the 2010 hearing. Personally, Dr. Mommer considered such clauses as a circumvention of the condition that the Projects should not in any way restrict the sovereign power of the State. He resigned from PDVSA over this disagreement in January 1995. The well-recognized

feature for the delivery of compensation for adverse governmental action was also explained by Professor Sornarajah and Professor Wells[21].

b. The Hamaca Project

127. The basic legal terms were set forth in the Nineteenth Condition of the Hamaca Congressional Authorization (R-93, C-132), making clear that the Project would impose no restrictions on the exercise of the State's sovereign powers.

128. Compensation was provided in the Twenty-First Condition, providing that the foreign participants would be entitled to compensation from PDVSA's subsidiary, subject to the conditions and limitations established in the Agreement. This Condition was similar to the Sixteenth Condition of the Petrozuata Authorization (R-21/92), including the language reaffirming that the compensation mechanism would not in any way restrict the sovereign power of the Government to adopt any measure in the future.

129. The Twenty-First Condition also contained an additional provision relating to the buy-out option. It provided that in the event that the State company charged with the responsibility of providing the compensation for adverse governmental action did not agree with the amount of compensation determined, it would have the option to purchase the interest of the ConocoPhillips subsidiaries involved in the Hamaca Project at the formula price. The provision underscores that there would be an upper limit on compensation for adverse governmental action, ensuring that "excess" or "exceptional" or "windfall" profits resulting from high oil prices would inure to the benefit of the State.

130. In the present case, the material point is that the buy-out option required by the Twenty-First Condition of the Hamaca Authorization would undoubtedly be triggered by any finding of an arbitral tribunal that compensation was due for any of the governmental measures at issue in this case. Thus, PDVSA's subsidiary involved in the Hamaca Project would have the option to purchase the entirety of the ConocoPhillips subsidiaries' interests in the Project at the formula price, thereby precluding any possibility of recovery in excess of that amount.

131. The minutes of an early Corpoven-Arco Joint Study Agreement Steering Committee Meeting in February 1995 (R-107) confirm that the Congress has the power to enact new laws or to modify current laws. The minutes make clear that the State would be able to exercise its full sovereign powers. The investors were to be compensated for adverse governmental action by the State

[21] The Respondent also refers to Thomas W. Waelde/George Ndi, Stabilizing International Investment Commitments: International Law Versus Contract Interpretation, Texas International Law Journal 31 (1996) p. 215-267 (R-220).

company, with any compensation being subject to the price cap formula to ensure that the State would remain entitled to capture windfall profits generated by high prices.

132. The concept of "equitable" compensation limited to protecting cash flows that would result from ordinary prices, but not extraordinary prices, was later incorporated into preliminary term sheets for the Hamaca Project, such as the term sheet dated 2 May 1996 (R-402). As in the case of all other documents in the record, the operative word was "compensate". The term sheet also recognized the inclusion of a buy-out option under "equitable conditions".

133. A flow chart from a Corpoven April 1996 presentation entitled "Terms and Conditions of the Arco-Corpoven Association" (R-405) illustrates the operation of the compensation arrangements. The chart shows that the legal actions against the governmental measures, *i.e.* remedies to obtain the revocation of the measures, were only the first step in the chain that would lead ultimately either to the acceptance of the compensation determined by the arbitral tribunal or a buy-out at the formula price. In that manner, the State ensured that the limitation on compensation based on the price cap would be respected.

134. The Phillips' May 1996 internal presentation to its own senior management contained a slide confirming its understanding of the issue of fiscal stabilization (C-110, p. 43). Nothing could be clearer on the issue of fiscal stability than the words: "No stability clause". Witnesses Goff[22], Appel[23] and Sheets[24] confirmed that there was no such clause.

135. Since the Hamaca Project enjoyed no stability guarantees from the State, the parties focused on designing compensation provisions that would address the adverse economic consequences of State action. In a 29 May 1996 letter to Corpoven, Arco abandoned the idea of stabilization after Corpoven had stated that it would have problems getting such protections through the current Congressional approval process (R-403). The draft discrimination provision attached to the letter made clear that there would be no obligation to compensate in case a "windfall tax" was imposed at a time when the price of oil exceeded a certain threshold.

136. In a 17 June 1999 internal memorandum, Mr. Bowerman advised the Phillips' Management Committee that President Chávez was authorized to reform the Income Tax Law and impose taxes on banking transactions (LECG-65). He knew that there was "no stability clause" for the Hamaca Project and that the Government expressly retained all of its sovereign powers to adopt measures pursuant to the Constitution and applicable laws.

[22] TR-E, 2010 Hearing, Day 3, p. 619:1-12.

[23] TR-E, 2010 Hearing, Day 4, p. 925:1-6, 933:3-7; 2016 August Hearing, Day 1, p. 244:10-14.

[24] TR-E, 2010 Hearing, Day 6, p. 1568:8-1571:12.

137. A Hamaca Information Memorandum shows that the Hamaca partners were considering approaching the Government for a tax stabilization clause under the Investment Law of 1999 (C-101). No tax stabilization agreement was ever made or even sought.

138. As in the case of the Petrozuata Project, the record shows that the legal negotiation centered around the definition of "windfall" profits that the State would be entitled to capture. With the experience of that Project in mind, the discussions concentrated on the concept of a protected annual cash flow based on a price cap. The parties settled on a US$ 27 per barrel threshold (in 1996 dollars), to be escalated in accordance with inflation, as defining the border between "normal" and "windfall" profits, with no compensation being payable for governmental action capturing "windfall" profits resulting from price increases above that level. This point is illustrated in a summary of the parties' positions during the negotiation (R-392) and in a flow chart presented by Corpoven in 1996 (R-405).

139. The Respondent also notes that the U.S. Embassy reported in May 2006 that according to a partner in a Venezuelan law firm, the strategic associations do not have a legal basis to fight the income tax increases or the new extraction tax (R-350). For the protection from tax increases, each of the agreements has some form of indemnity clauses. However, in order to receive payment, a certain level of economic damage must occur. Unfortunately, the formulas that are used assume low oil prices. Due to current high oil prices, it is unlikely that the increases will result in enough damage to reach the threshold where PDVSA has to pay the partners. The Respondent assumes that the lawyer in question was Ms. Eljuri, ConocoPhillips' own lawyer in Venezuela. The cable demonstrates, first, that the Claimants always knew that the terms and conditions of their investments in the upgrading Projects included the sovereign right of the State to take measures affecting project economics, with compensation to be limited to "normal" profits defined by applying a price cap. Second, the cable explains the operation of the compensation mechanisms for the upgrading Projects; the Claimants have declined to comment on the substance of the cable, beyond arguing that the cable was "irrelevant", "hearsay" and "inadmissible". The Claimants seem to think that the cable is irrelevant because it is referring to the Mobil's contractual claim for damages in the ICC arbitration against PDVSA. However, the cable says nothing about that arbitration but explains the operation of the compensation provisions of all the extra-heavy crude oil ("EHCO") upgrading Projects in the Orinoco Oil Belt. Thus, none of the Claimants' non-substantive arguments relating to those cables has any merit.

c. The Claimants' legal arguments

140. In reply to a *first* argument raised by the Claimants, the Respondent admits that certain issues are governed by international law, but that does not mean that international law, including the Dutch Treaty, will not allow consideration of national law or the special agreements entered

into regarding the investment in question. Thus, expropriation affects property rights, and those rights are defined by the local law under which they were created.

141. The Respondent submits that the Congressional Authorizations and the Association Agreements are to be taken into account and given effect in determining quantum under Article 9(5) of the Dutch Treaty, which refers to the law of the Contracting Party concerned and the provisions of special agreements relating to the investment. The concept of fair market value is not a concept divorced from the underlying rights being valued, which themselves cannot be separated from whatever limitations may be attached to them. The notion of reparation is not independent of the terms and conditions applicable to the specific investments at issue. In other words, giving effect to the governing law provisions of Article 9(5) of the Dutch Treaty and applying the compensation mechanisms is not only a requirement of the Dutch Treaty itself, but is consistent with, and an integral part of, the international law analysis that the Claimants want this Tribunal to apply pursuant to the *Chorzów* decision.

142. The Respondent reiterates that the nature and scope of property rights are defined by local law, not international law. The scope of rights that the Claimants had is determined by national law, in this case starting with the Congressional Authorizations. The Claimants cannot circumvent the terms and conditions upon which they were permitted to invest in Venezuela. They must be given effect and they determine the basis of compensation.

143. The Claimants' *second* argument has nothing to do with the facts of the case. It may be true that a State cannot under international law eviscerate acquired rights through subsequent legislation and invoke its national law to such effect. But in this case, the rights acquired were from the outset subject to the State's ability to capture "excess" or "windfall" or "exceptional" profits. The Respondent is relying upon the terms and conditions established at the outset of the upgrading Projects pursuant to the Congressional Authorizations, which set forth the terms and conditions under which the Claimants would be entitled to invest in Venezuela.

144. As their *third* argument, the Claimants submit that they had never waived their international law rights. Therefore, the compensation provisions of the Association Agreements cannot deprive them from their entitlement to full compensation, even if this would include "windfall" or "exceptional" profits. For the Respondent, the concept of waiver is irrelevant in this case. One can only waive a right that one has. The rights the Claimants had were limited in nature. Article 2 of the Dutch Treaty contemplates that the State is entitled to establish the terms and conditions under which an investment would be admitted in its territory. The Claimants cannot resort to the concept of waiver to do away with those terms and conditions and expand the rights their affiliates acquired when they made the investment.

145. The notion that the Claimants were immune from governmental action capturing windfall profits cannot be based on any part of the record. The Claimants were only entitled to compensation in case the governmental measure encroached upon the level of protected cash flows measured by the formulas under the price caps. This is not a matter of waiver of an acquired right; it is one of defining the right that existed in the first place, as a party cannot waive a right it does not have.

146. The Respondent recalls that the Claimants (i) acknowledge that Venezuela had the right and discretion to define the terms and conditions upon which it admitted the investments and (ii) claim that the Respondent cannot "seek refuge" in those terms and conditions, which reserved for the State the right to take governmental action relating to the investments. One cannot acknowledge the right of the State to determine the conditions for the admission of an investment, and also invoke international law to take that same sovereign right away. None of the Claimants' cases refutes the fundamental point that the terms and conditions of an investment must be given effect. This is simply a matter of recognizing that a treaty claim is not divorced from the terms and conditions of an investment and that the property rights that are protected by a treaty are rights created and defined by national law. There is no basis either in national law or in international law for compensating a party for greater rights than it had or for ignoring limitations imposed on those rights as a condition for the admission of the investment. The Claimants have no answer to the evidence that the Petrozuata and Hamaca Projects were authorized by Venezuela under specific terms and conditions. Those terms included the State's reservation of its full sovereign powers, with compensation to be provided by the State company subject to limits established by price caps. Under Article 2 of the Treaty, the Claimants cannot override those terms and conditions by invoking general principles of international law having nothing to do with this case.

147. The Claimants' *fourth* argument is that the Respondent cannot benefit from any limitation on liability because it was not a party to the Association Agreements nor can it step into the shoes of the PDVSA subsidiaries that are actually parties to the Association Agreements. The Claimants add that as a matter of Venezuelan contract law, a party who has acted in bad faith cannot invoke a contract limitation. This is irrelevant to the State's position. The issue is the fundamental condition on which the Projects were authorized and without which there would be no Projects at all. The State's position here is that of a regulator and owner of the natural resource, not a contracting party. The principle of compensation was explicitly recognized in the Congressional Authorizations, but such compensation was to be on "equitable" terms and conditions, which included the State's entitlement to capture through governmental action any "excess" or "exceptional" or "windfall" profits resulting from high oil prices. The Respondent asks this Tribunal to respect the terms and conditions under which the Projects were authorized. To do otherwise would be to give the Claimants the windfall they seek and to run afoul of the elementary principle that a party cannot be compensated for rights it never had.

148. Claimants' also refer to the majority's decision on bad faith negotiation that somehow precludes the application of the terms and conditions on which the investments in the upgrading Projects were authorized. This is not a good point. In its 2013 Decision, the Tribunal expressly left open the issue of the relevance of the compensation provisions (para. 402). And the allegation of the Respondent's bad faith has been removed from the record by the Tribunal's conclusion in the 2017 Interim Decision.

149. The Claimants' *fifth* argument is that "in all probability" Venezuela would not have exercised its full right to tax profits generated by prices in excess of the price caps, and that, *sixth* point, they can disregard windfall profit taxes in their valuation. The Respondent observes that one can only wonder how anyone could truly believe that Venezuela would not have, if the nationalization had to be unwound, exercised its full sovereign authority to collect "excess" or "exceptional" or "windfall" profits through taxation. The exercise by Venezuela of its authority to enact measures to capture windfall profits was perfectly lawful. It would have been perfectly within its rights to tax all profits above those generated by the price caps in the case of the former Hamaca and Petrozuata Projects had those Projects continued in the "but-for" world the Claimants hypothesize. The *Chorzów* decision cannot be cited in support of insulating the concept of full reparation from any consideration which negatively affects value.

150. The Respondent affirms that any reasonable buyer of the Claimants' interests at the time of the expropriation would have done its due diligence on that issue and taken into account the State's power to capture windfall profits. Even when considered by reference to a later date, like the date of the award, the issue must naturally be raised of the probability that additional taxes would have been assessed at the earliest opportunity. It is obviously logical for a State to insist at the outset of a project that it wants to retain its full sovereign rights to capture windfall profits.

151. The Respondent refers to the testimony of Dr. Mommer and the entire history of the conduct of the Government starting in 2004, when there was a structural change in the international crude oil markets leading to an upward spiral in crude oil prices. In his first witness statement, Dr. Mommer made clear that the Government was reacting to the extraordinary increases in price. This explains why in October 2004, the royalty rate of 16⅔% was restored. It also appeared in 2005 and 2006 that the 34% income tax rate was no longer needed for the economic viability of the Projects. He argued for a 50% rate. Prices continued to increase. President Chávez then decided that an excess profit tax especially designed for very high prices should be introduced. If the decision to nationalize had not been made in 2006, additional taxes would have been adopted. It is thus clear that it was a virtual certainty, not just a probability, that the Government would have exercised its sovereign right to capture windfall profits from the Projects.

152. Virtually all relevant authority makes clear that a tribunal may not disregard post-nationalization events when calculating value as of the award date. In this case, preserving the ability to capture windfall profits was precisely the objective of the Congressional Authorizations.

153. In the end, the Claimants reiterate their argument that the Respondent's principal submission is that the Agreements effect a waiver of the Claimants' international law rights to claim against the State, at least in respect of other than "normal" profits. The basic problem with this argument, says the Respondent, is that the concept of waiver is completely irrelevant to this case. The Claimants want this Tribunal to analyze this case as if it involved the waiver of acquired rights, because they know well that the record shows that they did not have the rights they now claim. If the Claimants never had the right to retain windfall profits resulting from high prices free from governmental interference, then there is no place for the argument of waiver or any of the authorities relevant to the waiver concept.

154. The conclusion from the Congressional Authorizations and compensation provisions is that the State, acting rationally, would have exercised its sovereign power to capture excess profits resulting from oil prices above those price caps. The Respondent had exercised that sovereign power on several occasions as prices began to rise starting in 2004, and it had every reason to continue doing so, as Dr. Mommer testified it would have done[25].

155. The Claimants seek to insulate the post-nationalization changes from any negative post-nationalization changes. An illustration is their approach with regard to the Venezuelan windfall profit taxes. The Claimants have sought to avoid the relevant fiscal regime applicable to their Project in an effort to inflate their calculation of damages. In the first phase, the Claimants challenged the 50% income tax rate and the 33⅓% extraction tax/royalty that was in place at the time of the expropriation as violating their imaginary right to "stabilization" of the 1990s fiscal regime. That argument was rejected by the Tribunal. Now the Claimants seek to avoid the application of taxes on windfall profits that were enacted in the years following the expropriation.

156. The purpose of the analysis is to put the Claimants back into the position in which they would have been, in all probability, had the expropriation not occurred. That means that the Claimants would have continued engaging in the Projects under the terms of the Association Agreements and the Congressional Authorizations, subject to the State's express reservation of rights to enact measures, including taxes, affecting the Projects. The Claimants were thus entitled only to compensation for governmental measures up to the price caps specified in the Association Agreements. Thus, had the expropriation not occurred, the Claimants would have been subject to fiscal measures taken by the Government, including the windfall profits tax laws they now seek to disregard.

[25] Second Supplementary Testimony, para. 11.

3. *The Tribunal's Findings*

157. The Parties' submissions on the pertinence of the compensation provisions of the Petrozuata and Hamaca Association Agreements address at length the Discriminatory Actions affecting ongoing Projects in taking away part of the participants' revenues. However, the primary focus in the present case should be on the impact of the expropriation that became effective on 26 June 2007.

158. One of the preliminary steps to be made in the analysis of pertinent issues is to set aside expressions not associated with a meaning or a definition. The Claimants' contention that they were entitled to "full" compensation does not, by itself, remove from the debate the effects to be given to the compensation provisions; it depends on what "full" should mean. Similarly, on the Respondent's side, there are, indeed, many indications that the Parties were to expect that "Government will take away economics", but such statement is of little guidance as long as the "economics" referred to are not identified. More particularly, the Respondent's position fails when it argues that, in the present case, the Government's expropriation had taken away such "economics" by terminating the Association Agreements in such a way that compensation should be based on provisions of these same Agreements that the Government decided to end and to which it has never been a party.

159. The Tribunal will have to avoid being caught into ambiguities and polysemic wording. When the Respondent states that "[its] first conclusion is that the Compensation Provisions formed the basis for providing compensation for governmental action agreed at the outset of the Upgrading Projects"[26], what does it mean precisely? What is the thought behind an assertion that "this case involves the definition of the scope of the rights that were expropriated"[27]? Does this mean that these provisions govern exclusively the admissibility and the effects of the expropriation, to the exclusion of any other remedy, be it domestic (Investment Law – C-1, R-12) or international (BIT)? Or does it mean that the compensation provisions govern the valuation of the economic earnings of the investing shareholders in case they are hit by a Discriminatory Action, with the effect that the same fixing of profit must be applied when considering the Claimants' compensation for the nationalization effective on 26 June 2007?

a. The main elements and structure of the compensation provisions

160. As a first step, the Tribunal must determine the meaning of "Discriminatory Action" in the framework of the compensation provisions. The definition of this concept is complex and different

[26] Respondent's 2017 Post-Hearing Brief, para. 47. Similar or identical expressions are used frequently by the Respondent.

[27] Respondent's 2017 Post-Hearing Brief, para. 30.

for each of the two Association Agreements. The elements of the definition are, in relevant part, as follows:

161. The *Petrozuata* Agreement provides in Section 1.01 that a:

> "Discriminatory Action" means any actions, decisions, or changes in law, adopted by national, state, or municipal, administrative, or legislative authorities, after a Development Decision has been made, which singly or in combination, result in unjust discriminatory treatment to the Company, any of its Shareholders … which are not applicable to all enterprises in Venezuela and which produce Significant Economic Damage to the Shareholders of the Company other than the Class A Privileged Shareholders[28].

However, under the same Section 1.01:

> a treatment shall not be considered discriminatory if it "equally applies to the enterprises within the oil industry in Venezuela, except that (1) with respect to the application of income taxes and any valuations as a basis for income taxes (e.g. the Fiscal Export Value), treatment shall be considered discriminatory if it is not generally applicable to most enterprises in Venezuela".

162. "Significant Economic Damage" was defined as the result of Discriminatory Actions during any fiscal year, which amounts to at least US$ 6.5 million (inflated from 1994 onwards) for all Class B Shareholders[29]. Such damage shall be determined by calculating any loan repayments or dividends that a Class B Shareholder would have otherwise received had no Discriminatory Action occurred.

163. Section 9.07 then provides for the compensation that an "Injured Shareholder" will receive from the Class A Shareholder when it suffered in a given fiscal year significant economic damage as a result of any Discriminatory Action. The payment will be made from cash available to the company for the payment of dividends to the Class A Shareholder and the repayment of cash call loans (a). When the indexed price compared to the 1994 price of Brent crude oil was US$ 18.00 or less, 100% of the damages had to be compensated. If the yield was US$ 25.00 per barrel of Brent crude oil, no damage shall be compensated. For prices between these two amounts, damages were determined in proportion based on a formula also called "sliding scale" (b). In fact, the different ranges of the "sliding scale" are of no relevance for purposes of this Award given the fact that since the expropriation, prices were above US$25 per barrel, with the effect that an alternative price prevailed (on the hypothesis of damages greater than US$ 75 million in 1994 US$), providing for the payment of 25% of the actual damages suffered (c). It was further provided that the injured shareholder shall, to the fullest extent practicable, commence and exhaust all available legal and

[28] This was the PDVSA subsidiary Maraven in the case of the Petrozuata Project.

[29] Conoco Orinoco Inc.

administrative actions which may provide a remedy from the application of any Discriminatory Action (d). In case of controversy, payment shall be postponed until an agreement was reached or such occurrence has been finally determined through an arbitral proceeding (f).

164. While the policy behind the Hamaca compensation provision is the same as for the Petrozuata Project, the structure and the key elements of the legal framework are different. Section 14 of the Hamaca Association Agreement also takes as the starting point the occurrence of a Discriminatory Action (a). Such action may consist of a change of law, act of government or any other action or decision of a Venezuelan authority, which is (i) applicable to the Association, (ii) unjust and (iii) not generally applicable to entities engaged on their own behalf in the hydrocarbon industry in Venezuela (b).

165. The Hamaca Association Agreement further provides that in respect of tax rates, new taxes, financial burdens or charges for goods and services, foreign exchange controls "or the expropriation of the assets of, or a Party's interest in, the Association or Association Entities", such change of law or decision will be considered Discriminatory Actions if they are not generally applicable to corporations and other legal entities that are taxable in the same manner as corporations in Venezuela (b/1). Additionally, reductions or increases in the royalty rate applicable to the crude oil will not be considered as Discriminatory Actions "unless such changes result in a royalty rate for the Parties in their capacity as participants in the Association, in excess of the maximum rate specified by law for the hydrocarbon industry in general" (b/4).

166. To the extent that a foreign party suffers a reduction of more than five percent in any fiscal year in its reference net cash flow as the result of one or more Discriminatory Actions, the PDVSA subsidiary Corpoven Sub shall be required to compensate that party (Sec. 14.2(a)). The relevant factors are defined with great complexity. Referring to the Claimants' experts' presentation[30], taken in its most simple terms, the main information is that a reference net cash flow of US$ 27 or more has to be taken into account since 2008. A reduction of more than 5% (US$ 1.35) then triggers Corpoven Sub's obligation to compensate. The damages of the affected party shall be equal to the amount in US$ needed for this party to attain the full reference net cash flow that this party would have attained in the relevant fiscal years had the Discriminatory Action not occurred, plus interest thereon at LIBOR, and increased by an amount taking account of the applicable taxes (Sec. 14.3(d)).

167. Upon notification by the foreign party to Corpoven Sub, negotiations may take place, including discussions about legal remedies (Sec. 14.3(a-c)). In the absence of an agreement on amendments to be concluded, each party is entitled to commence arbitration (Sec. 14.4(a)). If it is admitted that Discriminatory Actions resulted in a material adverse effect to a foreign party, the

[30] Abdala/Spiller, Consolidated Update Report, 17 November 2016, paras. 38-42.

arbitral panel shall determine, in a second stage of the proceeding, the "buy-out price" (Sec. 14.4(b)), to be calculated either by reference to that party's net investment or to the commercial value of its project interest (Sec. 14.4(c)). If then the matter cannot be settled, one option would be that Corpoven Sub purchases the affected foreign party's project interest at the buy-out-price (Sec. 14.5(a-2)).

b. The compensation provisions do not set the standard of compensation for the State's expropriation

168. The Respondent's main position is that the expropriation of the Claimants' interests embodied in the Association Agreements implies that the compensation they are entitled to receive must be determined in light of and is limited by the compensation provisions contained in these Agreements. The Claimants shall not, when invoking the BIT or customary international law, do away with the compensation regime they agreed to when entering into the Association Agreements prior to the date when the BIT became effective.

169. The Tribunal notes that it is not seized with a claim for declaring that the provisions of the Association Agreements, applicable either to an expropriation or to its compensation, have been breached. The Claimants' request for relief is, in this respect, based on a claim for a declaration that the Respondent breached Article 6 of the BIT, and that the Tribunal must determine the damages resulting from such breach. The Claimants invoke international law and not the Association Agreements as the basis for their claim for damages.

170. Moreover, the Tribunal observes that the application of Article 6 of the BIT to the present dispute prevails over any Venezuelan domestic law on the same subject matter. A breach of Article 6 of the BIT is defined solely by this provision without any consideration of the domestic law of the host State. The same principle must necessarily apply to the compensation due as a consequence of an expropriation, notwithstanding what the applicable standard may be under domestic law. The standard of the BIT prevails over any standard the host State may claim to be applicable under its national law.

171. The Respondent's position that the compensation provisions of the Association Agreements govern the economic consequences of the expropriation enforced on 26 June 2007 is not persuasive on the basis of the very terms and purposes of these provisions. An expropriation of the Project cannot be a "Discriminatory Action" within the meaning such term has in the compensation provisions[31]. For Petrozuata, such Discriminatory Action should follow a "Development Decision" (Sec. 1.01); such a decision has nothing in common with an expropriation. For Hamaca, such Action

[31] The Respondent had explained that a change in operatorship and the restructuring caused by migration were not covered by the definition of Discriminatory Action; cf. Respondent's Counter-Memorial on Quantum, paras. 45, 278.

must be "applicable to the Association" (Sec. 14.1(b)) and affect net cash flow (Sec. 14.2(a)); the cash is no longer flowing when the Project ceases to exist. Similarly, the payment provisions make sense only in the case of the Projects' continued existence. In the case of Petrozuata, the compensation is paid through the provision of dividends, or out of general funds accumulating payments differed for later (Sec. 9.07). In the case of Hamaca, the notification by the foreign party of a material adverse effect caused by a Discriminatory Action is followed by negotiations directed toward the agreement of amendments to the parties' relation, which is therefore considered as being ongoing (Sec. 14.3(c)). If the affected party's claim is not withdrawn, its damages are to be paid out of Corpoven Sub's net cash flow from the Project (Sec. 14.5(a/1)) which therefore continues to exist. In case the parties were unable to agree upon modified terms of their agreement or to accept an arbitral decision, a by-out had to be triggered; however, in the case of an expropriation, the shares to be sold no longer exist.

172. The Respondent has relied on one sentence where the case of an expropriation is mentioned as an illustration of a Discriminatory Action. The Hamaca compensation provision refers, indeed, to "the expropriation of the assets of, or a Party's interest in, the Association or Association Entities" (Sec. 14.1(b/1)). However, these terms include only assets or interests as part of the Association. This expression, not contained in the Petrozuata Agreement, does not include the entire Project governed by the Association Agreement. Finally, the buy-out regime of the Association Agreement is based necessarily on the existence of an on-going Project, and completely incompatible with its taking by the Government through an expropriation.

173. The Tribunal has noted a debate between the Parties on whether the compensation provisions would govern an expropriation different from the one enforced through a single taking on 26 June 2007, consisting of an agglomerate of a number of Governmental actions, to be qualified together as Discriminatory Action, while certain of its components would, as such, not meet the conditions set in the pertinent definition. The Tribunal was told that the Parties had reached an agreement on the applicability of the compensation provisions in respect of an expropriation[32]. The Respondent further confirmed that this means that the compensation provisions apply to the expropriation "in this case"[33] – this meaning "exclusively". This position does not reflect the Claimants' claim in the present case[34]. It can only relate to the dispute brought before the ICC Arbitration Tribunal. It is of no concern in the present case, where the expropriation at the origin of the dispute

[32] TR-E, 2016 August Hearing, Day 2, p. 459:10-18 (Kahale, King); 2017 March Hearing, Day 15, p. 4518:5-4522:19 (Partasides); 2017 September Hearing, Day 18, p. 5264:1-10 (Kahale).

[33] Respondent's 2017 Post-Hearing Brief, paras. 23, 48, noting the difficulty of applying these provisions "when the contract is over" (para. 23).

[34] The Claimants' Counsel explained at the March 2017 Hearing that their expropriation claim was not governed by the Discriminatory Action mechanism, which defines the value that has been expropriated but does not define the right related to the expropriation, nor does it represent an exclusive remedy; cf. TR-E, 2017 March Hearing, Day 15, p. 4513:18-4516:22, 4521:9-4522:19 (Partasides).

is the single taking of 26 June 2007 which led the Claimants to claim for a breach of Article 6 of the BIT.

174. The Tribunal cannot agree with the Respondent when it argues that Mr. Griffith, in his 17 September 1992 letter (R-97), accepted that the compensation provisions specifically address how "assets and interest of Conoco will be valued and reimbursed in the event of nationalization"[35]. This is not what Mr. Griffith wrote. In fact, he wrote to Mr. Aliro Rojas, CEO of Maraven, that Conoco wanted to know how this matter would be addressed in their forthcoming negotiation, noting further that they would like full compensation and an economic stability clause. He also noted that the project required positive tax legislation. This is not what they obtained, but this is not the same as submitting that Mr. Griffith had accepted in 1992 that the only remedy available in case of nationalization would be what was provided in the clauses on discriminatory treatment (respectively in the Congressional Condition No. 16). The Law on the Effects of the Process of Migration into Mixed Companies of the Association Agreements of the Orinoco Oil Belt, approved by the National Assembly of 11 September 2007, declared that these Agreements "shall be extinguished" (C-35).

175. The Tribunal also notes that the Respondent's reliance on the compensation provisions as the rules governing the expropriation effective on 26 June 2007 is inconsistent with the terms and effects of the taking that did take place on that date, when Venezuela assumed directly the activities performed by the Associations and extinguished ConocoPhillips' ownership interests[36], thus necessarily including the rights held by ConocoPhillips through the Association Agreements including those contained in the compensation provisions. As mentioned earlier, Witness Mommer recalled that, at that date, the Association Agreements were terminated[37].

176. The Respondent has denied that the Venezuelan Law for the Promotion and Protection of Investments of 22 October 1999 (R-12, C-1) had any role to play in respect of the expropriation decreed on 26 June 2007. It appears correct that the Claimants in the present case were not subject to the Investment Law. However, the joint ventures conducting each of the three Projects were in the opposite position. It has been explained by the Respondent in the jurisdictional phase of this proceeding that pursuant to Article 5 of Decree No. 1.867 of 11 July 2002 on Investment Law Regulation[38] the three joint ventures heading each of the three Projects were to be considered as

[35] Respondent's 2017 Post-Hearing Brief, para. 53; TR-E, 2017 September Hearing, Day 18, p. 5264:12-21 (Kahale).

[36] Witness Mommer, TR-E, 2016 August Hearing, Day 3, p. 993:8-994:17.

[37] The Witness used the term "disappear" (TR-E, 2010 Hearing, Day 7, p. 1838:16-17), further explaining that the assets were taken over (TR-E, 2010 Hearing, Day 7, p. 1716:14-15, 1854:12-13).

[38] Regulation of the Decree with Rank and Force of Law on the Promotion and Protection of Investments (RL-2).

entities receiving the investment *(empresa receptora de la inversion)*[39]. These entities were therefore holding investments "owned by or actually controlled by a Venezuelan or foreign individual or legal entity" and thus subject to the Investment Law (Art. 3, last and sole paragraph – R-12). The Investment Law must prevail over the Association Agreements in the hypothesis that one would consider that these Agreements would govern the effects of their own expropriation.

177. In any event the Tribunal notes that if the Claimants' claim for compensation was governed by the compensation provisions of the Association Agreements, it would be covered by the arbitration clauses contained therein (Sec. 9.07(f) and Sec. 13.16 for Petrozuata, and Sec. 14.4 for Hamaca). No claim based on these provisions is before this ICSID Tribunal. This, however, does not mean that these provisions are irrelevant for this Tribunal's ruling on the consequences of the expropriation that breached Article 6(c) of the BIT.

178. The Tribunal notes the Respondent's statement that "the issue before this Tribunal is not to determine whether the Association Agreements have been breached, but whether the compensation mechanisms established pursuant to the Congressional Authorizations as conditions to entering into the upgrading Projects are relevant in determining quantum"[40]. The question is correctly framed and deserves further consideration. It implies necessarily that the expropriation enforced by the State on 26 June 2007 is not to be examined as part of a claim invoking a breach of the Association Agreements. The Respondent's statement, quoted above, is not different from the Claimants' opening submission at the 2016 August Hearing that the Association Agreements are the basis for determining quantum. It was pleaded that in asking the question "what is it that was taken from ConocoPhillips?" the Claimants recognized that you must look at the "bundle of rights" that were taken. The Claimants further stated that they also recognized that that "bundle of rights" centers on the Association Agreements and the value that they represented to ConocoPhillips[41].

c. The compensation provisions are part of the legal structure and the economic value of the Association Agreements

179. Irrespective of whether the standard of compensation is "just compensation" under Article 6(c) of the BIT or "full" reparation based on customary international law, both sources of law cannot govern exclusively the determination of the compensation and its amount. In one way or the other, compensation reflects a value corresponding to the loss suffered by those whose rights are affected by the expropriation. These rights are not determined and have not been acquired on

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[39] Memorial on Objections to Jurisdiction, dated 1 December 2008, para. 132, note 186, enumerating Petrolera Zuata, Petrozuata C.A., the Corocoro Development Consortium, and the Hamaca Association. Cf. also Legal Expert Opinion of Enrique Urdaneta Fontiveros, dated 28 November 28, 2008, para. 31.

[40] Respondent's Counter-Memorial on Quantum, 18 August 2014, para. 155.

[41] TR-E, 2016 August Hearing, Day 1, p. 78:2-9 (Partasides).

the basis of either Article 6 of the BIT or general or customary international law. These are rights, mostly rights *in rem* or based on contractual undertakings that have been created and are held under national law. In this respect, the Respondent submits correctly that Article 9(5) of the BIT has to be given full effect when it refers to "the law of the Contracting State concerned" and to "the provisions of special agreements relating to the investments", thus relying upon the provisions of the Association Agreements and related provisions of the laws of Venezuela. None of the other sources of law enumerated in Article 9(5) are pertinent or applicable in this respect.

180. In other words, "full compensation", as the term is frequently used by the Claimants, cannot represent more than compensation of the rights and assets held by the Claimants at the relevant time and including revenues deriving therefrom in the future to an extent yet to be determined. Those rights were based on the Association Agreements, which are governed by Venezuelan law.

181. Therefore, as the expropriation had the effect of depriving the Claimants from revenue they were entitled to receive under the Association Agreements, these Agreements apply fully, including their compensation provisions (as far as Petrozuata and Hamaca are concerned). To the extent that these provisions fixed a limitation on the Claimants' potential right to be paid the Project's dividends, such limitation has to be considered when determining the scope of the taking through the expropriation. Compensation represents a value corresponding to a loss. It cannot cover more than what the Claimants were entitled to if there had been no expropriation.

182. Faced with a similar question, the Tribunal in *Burlington* noted that "[it] must assume that Burlington holds the rights that made up the expropriated assets and that those rights are respected. This does not mean that the Tribunal is enforcing a contract claim. What the Tribunal does is to value an expropriated asset, which the Parties agree consists of a bundle of rights allowing Burlington to obtain future revenues"[42].

183. The Claimants state correctly, as a principle, that they had not waived their rights under international law. However, while the protection of their rights as investors was governed by the BIT, the content of these rights was determined by the Association Agreements governed by the laws of Venezuela. This is what Article 2 of the BIT mentions as a Contracting Party's "framework of its laws and regulations" governing the investment. When accepting their investment in Venezuela through the Association Agreements and the Congressional Authorizations on which these Agreements were based, the Claimants acquired the rights contained in these instruments and covered by the available investment protection, which was, at the beginning, based on domestic law, and became the BIT at a later stage only. The investors' rights are those they acquired when making their investment in a Contracting State of the BIT. These rights were those contained in the

[42] *Burlington Resources, Inc. v. Republic of Ecuador,* ICSID Case No. ARB/08/5, Award of 7 February 2017, para. 358, further noting that "the expropriated contracts included a mandatory tax absorption clause which cannot be ignored for valuation purposes" (para. 359).

Association Agreements; by definition, they cannot be subject to a waiver of international law rights. As well, the investors' participation in the Projects does not imply any waiver of rights contained in the BIT that governs the protection of the investment but not its substance.

d. The operation of the compensation provisions in the present case

184. The compensation provisions of the Association Agreements can be relevant in the present case to the extent only that a particular Government's measure meets all the requirements for their application.

185. In this respect, the raising of the income tax from 34% to 50% and the 33⅓% royalty/extraction tax that was in place at the time of the expropriation is no longer an issue. In its 2013 Decision, the Tribunal concluded that while the Claimants accepted to treat income tax and royalty rates as taxes, they constituted a fiscal regime that did not fall within the scope of Article 3 of the BIT, and that – as accepted by the Claimants – these measures (as they were at that time applicable) did not breach Article 4 of the BIT (para. 322). Moreover, these governmental measures are not invoked, in the present case, as discriminatory actions triggering the application of the compensation provisions. The Claimants rely on their experts' approach of including in their damages calculations all existing taxes at each valuation date, with the exception of the windfall profit tax[43].

186. This has the effect that the windfall profit tax introduced in April 2008 and amended several times is the only measure which may need to be considered for the application of the compensation provisions.

187. It has been argued by the Respondent, relying mostly on Dr. Mommer's statement and the policy he tried to implement when he was a member of the Government, and still supported later on, that Venezuela would persist in exercising its sovereign power to capture excess profits resulting from oil prices above the agreed price caps. It is thus submitted that "had the 2007 nationalization not taken place, the Government would have exercised its full taxing power to take such profit as it was entitled to do"[44]. There is no legal basis for the Claimants' assumption to take full profit of post-nationalization price increases while ignoring all factors negatively affecting project economics, in particular those, such as taxes, that were virtually certain to materialize. The Tribunal notes, however, that leaving aside the windfall profit tax, including its amendments, no evidence has been submitted that would demonstrate that such a policy was seriously envisaged or on its way to be implemented. The highest level of exorbitant prices that this legislation was taking into

[43] Claimants' 2017 Post-Hearing Brief, para. 186; TR-E, 2017 March Hearing, Day 15, p. 4379:5-8 (Friedman); Abdala/Spiller, March 2016 Update, 18 March 2016, para. 28.

[44] Respondent's Counter-Memorial on Quantum, 18 August 2014, para. 138; Respondent's Final Brief on Quantum, para. 263.

account was US$ 110 per barrel[45]; since 2007, such level was never reached. It appears therefore as simple speculation when the Respondent argues that the Government was prepared to raise windfall profit taxes. Thus, the Tribunal must conclude that the evidence does not demonstrate any probability that any measure capturing profits in excess of the actual windfall profit tax would affect the Claimants' interest in the future and until the end of the life of the Projects.

188. Therefore, the actual windfall profit tax is the only hypothesis where the compensation provisions may have played a role or may need to be considered when determining the value of the Projects and the revenues of its participants. However, prior to arriving at this stage, the question will have to be examined whether such tax was capable of being applied to the Projects, in full or in part. All these issues being closely interrelated, they will have to be examined all together in their proper context, in Sections IX and X of this Award.

C. The Standard of Compensation

189. The Parties' focus when addressing the structure of the claims for damages to be considered in the present case is closely related to the valuation date to be taken into account. The 2013 Decision determined that this date should be the date of the award (paras. 363, 404). Such date reflects the Claimants' position. The Respondent objects to this conclusion and strongly supports the date of the expropriation as the valuation date.

190. The debate about the relevant valuation date needs to be looked at from a larger perspective, which is the compensation the Claimants are entitled to claim as a consequence of the breach of Article 6 of the BIT.

191. The Respondent's position is, as a matter of principle, that the compensation should represent the value of what has been taken away, which are the Association Agreements, including their compensation provisions (not applicable to Corocoro), and this at the time when such taking was enforced, on 26 June 2007. The hypothetical that has often been used is that of a reasonable buyer considering taking over the Association Agreements at that date. Simply put, such a buyer would evaluate the assets of the Projects and add his estimation of the net revenues reasonably to be projected in the future. As the participants in the Projects can be compared to such a reasonable buyer, their estimation of the assets and their projections of the future (generally called "models") may serve as a most useful working tool to reach a result coming close to what would become the conclusion of a hypothetical reasonable buyer.

192. Such position and method does not operate in actual terms. It does not include production, costs and taxes as they accrue since the taking up to the time when the award is made, nor does it

[45] Article 6 of Decree No. 40.114 of 20 February 2013 (R-502, C-600), amending Article 9(3) of Decree No. 8.807 of 15 April 2008 (R-500, C-252/582).

determine the future economics of the Projects between the date of the award and the end of the Projects' lifetime.

193. The difference of approach is a matter of law. It is a matter of international law. As has been explained above, the expropriation enforced by Venezuela in breach of Article 6 of the BIT triggers effects under international law. The standard of compensation is not determined by the Association Agreements and their compensation provisions. Notwithstanding this, these provisions may have an impact on the value of the taking and thus on the amount of damages.

194. The Tribunal directed the Parties in Procedural Order No. 4 to determine their valuations for both situations, at the date of the expropriation, *i.e.* 26 June 2007, or on 31 December 2016, by taking into account, or not taking into account, the compensation formulas contained in the Association Agreements (para. 6). The Parties have basically complied with the Tribunal's direction. However, they only considered the hypothesis of the application of the compensation provisions, *i.e*. that the expropriation as such would have been governed by these provisions. Little consideration was thus left for the case where compensation for the expropriation is governed by international law, while including effects to be given to the compensation provisions of the Association Agreements in respect of those economic inputs that qualify as "Discriminatory Actions".

195. The matter of the standard of compensation applicable in the present case under international law needs to be clarified first, before the meaning of a specific valuation date can be determined.

1. The Claimants' Position

196. The Claimants' approach in support of their claims is repeatedly based on "full reparation". This results from settled principles of international law. Because Venezuela's expropriation was unlawful, the Claimants must receive the substantial cash flows produced by the Projects since the expropriation. The host State cannot receive the full benefit of the Claimants' investment and thus draw from the expropriation revenue exponentially increasing through higher oil prices, in a total amount many times higher than the compensation it would have accepted to pay if it would have been calculated at the time of the taking.

197. The Claimants submit that had Venezuela expropriated lawfully the Claimants' investments, then the standard of compensation set out in Article 6(c) of the BIT would have applied. Because Venezuela acted unlawfully, that Article does not apply to quantification. Instead, the applicable standard of compensation is fixed by customary international law. An "essential principle" of customary international law is that a State is under an obligation to make full reparation for the injury caused by its wrongful act.

198. An authoritative description of the applicable standard of compensation has been provided by the Permanent Court of International Justice (PCIJ) in the *Chorzów Factory* case[46]. "Reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed." (p. 47) The ILC Articles reflect the same customary international law rule (CL-85). They require that a State provides "full reparation for the injury caused by [its] internationally wrongful act". Accordingly, where an asset has been expropriated unlawfully, a tribunal's task is to place the investor in the economic position that the investor would have enjoyed had the wrongful act never occurred. This is often referred to as the "but-for" position. The preferred remedy is restitution. Where restitution is impossible or impracticable, as is the case here, the rule of full reparation requires an award of damages that accomplishes the same result. Compensation for an unlawful expropriation must correspond to the value which restitution in kind would produce, in addition to payment for any additional losses.

199. If the Claimants' interests in the three Projects had not been unlawfully expropriated, the Claimants would have remained in possession of them and profited from their operations for their full term. In particular, the Claimants would have received, from June 2007 onwards, dividends representing their share of the profits in accordance with their ownership interest. The most common method for calculating such value is to determine the fair market value on the date of valuation, as this is stated in the Commentary to the ILC Articles (CL-86). Such value reflects the lost earnings that an investor would have received but-for the expropriation. In cases involving revenue-producing assets, an assessment of fair market value must compensate their future profitability in order to provide full reparation.

200. Both the Petrozuata and Hamaca Projects were oil fields in full commercial production at the time of their confiscation, and they will continue to be producing oil through the date of the Award and for many years thereafter. The Corocoro Project became a producing oil field in January 2008 and will continue to be producing through at least 2021. The Projects' Reserves and production capacity are known, and their hydrocarbon products are commodities for which a broad market with international price benchmarks exists. The discount cash flow methodology used by the Claimants' experts properly calculates that substantial value.

201. In the present case, the standard of compensation requires that (a) the Claimants be awarded compensation equivalent to the cash flows that they would have received had the Projects not been expropriated; (b) favorable market changes since the taking accrue to the benefit of the Claimants; and (c) value depressing measures adopted or permitted by Venezuela after the taking must be excluded from the calculation.

[46] Permanent Court of International Justice, *The Factory At Chorzów (Claim for Indemnity) (The Merits), Germany v. Poland*, Judgment No. 13, 13 September 1928, 1928 P.C.I.J. (ser. A) No. 17 (CL-84).

202. The principle of full reparation requires an award to the Claimants of: (1) Historical losses up to the date of the Award, in the amount of at least US$ 16.010 billion; (2) Lost profits from the date of the Award through the expiration dates of the Association Agreements, in the amount of at least US$ 5.276 billion; (3) Post-award interest, calculated using the Projects' cost of equity; (4) A declaration that the amount awarded is net of taxes, and may not be taxed again by Venezuela; (5) All of the Claimants' costs of arbitration.

2. The Respondent's Position

203. The Respondent recalls that the expropriation was decreed under Venezuelan Law and that the Tribunal has concluded that the requirements set in Article 6(1) and (2) of the BIT have been fulfilled. Therefore, the expropriation was legal and fully effective. The Tribunal's conclusion that no compensation had been paid affects one of the modalities of the expropriation, but does not render this measure illegal. Therefore, the compensation the Claimants are entitled to is the compensation that they did not receive when they had been expropriated. Their compensation must thus be necessarily based on the value of the Projects at the time of their taking, including an amount representing the estimations of future profits and losses reasonably calculated at that same time.

204. The Respondent relies on Sir Ian Brownlie who defined the distinction between an expropriation unlawful only *sub modo* and one unlawful *per se* as follows:

> The practical distinctions between expropriation unlawful *sub modo*, i.e. only if no provision is made for compensation, and expropriation unlawful *per se* would seem to be these: the former involves a duty to pay compensation only for direct losses, i.e. the value of the property, the latter involves liability for consequential loss (*lucrum cessans*); the former confers a title which is recognized in foreign courts (and international tribunals), the latter produces no valid title[47].

205. The Respondent submits that under Article 9(3) of the BIT, this Tribunal in any event would have no authority to award damages beyond those "caused" by a breach of a Treaty provision. Even assuming that there is a breach due to a failure to pay or make a concrete offer of compensation, there are no damages resulting from a breach other than the compensation that should have been paid in 2007 plus interest.

206. Using the valuation date of 26 June 2007 and applying the compensation provisions of the Petrozuata and Hamaca Projects, the Respondent calculates a compensation in the total amount of 471 US$ million, which may, if the Tribunal so decides, be increased by the end of 2016 by simple interest to 515 US$ million, any such amount being reduced by the Respondent's costs.

[47] Ian Brownlie, Principles of Public International Law, 7th ed. Oxford 2008, p. 539 (R-124). The Respondent also refers to James Crawford, Brownlie's Principles of Public International Law, p. 625 (R-631).

3. The Tribunal's Findings

207. The Tribunal considers it unnecessary to provide lengthy quotations from the *Chorzów* Judgment. Nevertheless, the main *ratio decidendi* must be recalled, albeit as concisely as possible.

208. The Court's Judgment was based on "the rules of international law in force between the two States concerned". Rights or interests of an individual are "on a different plane". The damage suffered by an individual is "never therefore identical in kind with that which will be suffered by a State" (p. 28). It needs also to be added that when one refers to Article 31 of the ILC Articles (CL-85), the provisions on State responsibility are "without prejudice to any right, arising from the international responsibility of a State, which may accrue directly to any person or entity other than a State" (Art. 33(2)).

209. As to the applicable principle on damages, the Court stated that the damage suffered by one of the two companies involved (named "the Oberschlesische") is "equivalent to the total value – but to that total value only – of the property, rights and interests of this Company" (p. 31). The principle establishing the obligation to make reparation is the indispensable complement of a failure to apply a convention. It is "an element of positive international law" (p. 29)[48].

210. In the *Chorzów* case, the Court was not seized with a claim for compensation in relation to an expropriation, because under the applicable provisions of the Geneva Convention concerning Upper Silesia concluded on 13 May 1922 between Germany and Poland, an expropriation was not permitted even against compensation. Therefore, reparation was the consequence not of the application of Articles 6 to 22 of the Geneva Convention, "but of acts contrary to those articles", *i.e.* dispossession (p. 46).

211. The Court noted that the compensation due to the German Government is not necessarily limited to the value of the undertaking at the moment of dispossession, plus interest to the day of payment. If the Polish Government had the right to expropriate and its wrongful act therefore consisted merely in not having paid the just price for what was expropriated, compensation would be limited to such value. This would put Germany in a situation "more unfavourable" than that in which Germany would be placed if Poland had respected the Convention, *i.e.* if it had not acted as it did. This would be "unjust". Moreover, "it would be tantamount to rendering lawful liquidation and unlawful dispossession indistinguishable in so far as their financial results are concerned" (p. 47).

[48] The *Teinver* Tribunal sought to make it more precise: "The *Chorzów Factory* case is not the source of the customary international law principle of full reparation, but the tribunal in that case determined that that principle was one that had been established by international practice." *Teinver S.A.*, et al. *v. The Argentine Republic*, ICSID Case No. ARB/09/1, Award dated 21 July 2017, para. 1089.

212. The distinction made by the Court applies in other situations as well. An expropriation enforced legally except for not being compensated puts the aggrieved party in a situation more unfavourable than that in which it would be placed if such expropriation had not been made. In the latter case, that party would enjoy the full benefit of the property, rights and interests that have been taken away. In the former situation, it would have received a "just compensation" in an amount that is different and generally lower than the benefit of the on-going enjoyment of all that has been taken away.

213. However, the present case is different. While still following the Court's reasoning, an expropriation enforced legally except for not being compensated puts the aggrieved party in a situation more unfavourable than that in which it would be placed if such expropriation had been made in compliance with all legal requirements. Indeed, the difference between these two situations, which puts that party in a more unfavourable position, consists in the lack of payment of the compensation that the expropriating party was required to pay.

214. Such a difference cannot be reduced to a simple matter of interest to be paid. If the expropriation had to be compensated by reference to the market price at the date when it was enforced, the value of this compensation – if it has not been paid – does not increase merely by a factor based on a rate of interest. At a later date, the value of the expropriated property, rights and interests is different, usually by reference to a higher market price. Such difference has nothing to do with interest. The value of an investment in a business (not consisting merely of placing money in a bank account) is progressing on a line which cannot be compared to the rate of interest.

215. The *Chorzów* Court did not elaborate on such a hypothesis. It simply compared the actual case to the financial situation of Germany in a case where Poland would have been entitled to expropriate but merely omitted to pay a just price. The main point still stands: The investor or the otherwise aggrieved party should not be dealt with more unfavourably by the adjudicating tribunal through "just compensation", including interest, while it was entitled not to be expropriated without just compensation determined by reference to market value at the time of the taking. When such compensation was one of the legal requirements to operate an expropriation, the fact of not proceeding with such payment renders the expropriation unlawful and triggers the financial consequences of the loss of the property, rights and interests that have been taken.

216. The same line of arguments applies to the expropriating host State. If compensation was awarded a certain time after the taking as the "just price" for what was expropriated, together with interest, the host State would be treated more favourably than the situation it would face with an expropriation that should not have taken place without compensation. If there had been no expropriation, the investor would have enjoyed the revenues and the increase in the market value of the property, rights and interests. If no account was made of such increase in value, the financial result

would be indistinguishable from the situation where compensation had been paid on time in compliance with the legal requirements. The host State would thus take advantage of all financial accruals, to the extent they are higher than the interest rate it would have to pay on the "just price" settled at the time of the taking. In the words of the Court, such result would be "unjust".

217. In a number of awards and various writings, a distinction is made between unlawful and lawful expropriations. The latter expression is reserved for a case where the expropriation complies with the legal requirements except that no or insufficient compensation has been provided. The *Chorzów* Judgment is sometimes used to support such terminology. Such interpretation of the *Chorzów* Judgment goes too far. The Court did not use the term "legal" or "lawful" expropriation for a situation where the expropriator's "wrongful act" ("son tort") consisted merely in having not paid the just price of what was expropriated (p. 47)[49]. On another occurrence, the Court notes that if an expropriation were to be envisaged, the payment of fair compensation would have rendered it lawful[50] – thus including the requirement for compensation in the notion of lawful expropriation, and its omission as keeping the expropriation unlawful.

218. Sir Ian Brownlie's *dictum* relied upon by the Respondent, is not pertinent. The Respondent's own submission is not as severe as Sir Ian appears to be, because the Respondent accepts to take into account the projections of future profits *(lucrum cessans)* which are not included in Sir Ian's notion of an expropriation unlawful *sub modo*. The Respondent adds its own interpretation of Sir Ian's statement that it omits to quote fully and in context[51]. When reading the parts preceding the sentence quoted by the Respondent, it is easy to understand that Sir Ian did not address the factor of time. He did not say that an expropriation is lawful if only payment of effective compensation is missing, and that it remains so for the future. The learned author only addressed the situation at the time of the taking. Further, when referring to an expropriation not accompanied by compensation, he uses, indeed, the expression of "unlawful *sub modo*" (by contrast to an expropriation unlawful *per se*). Thus, even when considered *sub modo*, such expropriation is nevertheless, in Sir Ian's view, "unlawful". Sir Ian's "Compensation Rule" confirms the distinction:

> The expropriation of alien property is lawful if prompt, adequate, and effective compensation is provided for. In principle, therefore, expropriation, as an exercise of territorial competence, is lawful, but the compensation rule (in this version) makes the legality conditional[52].

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[49] In this connection, the Court uses the expression "lawful liquidation", « liquidation licite ».

[50] "to render which lawful only the payment of fair compensation would have been wanting" – « à laquelle n'aurait manqué, pour être légitime, que le paiement d'une indemnité équitable » (p. 46, No. 123).

[51] Ian Brownlie, Principles of Public International Law, p. 538/539 (R-124). The Respondent also refers to James Crawford, Brownlie's Principles of Public International Law, p. 625 (R-631), where no delayed payment of compensation is mentioned.

[52] Brownlie, *ibidem*, p. 533/4.

219. The correct terminology does not really matter, although it may be noted that the use of the expression "lawful expropriation" seems not to be the most appropriate when it implies that one of the key elements of an expropriation – compensation – is missing. In any event, the focus must be on the significance of such term as it is used in a number of awards. It should mean, indeed, that the investor that suffered an expropriation that was otherwise "lawful" (except for the non-payment of compensation), is not entitled to claim for more than the payment by the host State of such compensation reflecting the market value of the investment at the moment of the expropriation, plus interest to the day of payment.

220. Thus, the *Tidewater* Tribunal concluded "that compensation for a lawful expropriation is fair compensation represented by the value of the undertaking at the moment of dispossession and reparation in case of unlawful expropriation is restitution in kind or its monetary equivalent"[53]. The *Mobil* Tribunal stated that "the mere fact that an investor has not received compensation does not in itself render an expropriation unlawful"[54].

221. In a number of cases, the difference between the compensation as determined at the moment of the expropriation and the assessment of damages resulting from the omission to provide for such payment at that time is of limited or no impact. Indeed, the assessment of the just compensation to be paid by the host State is usually based on market value or similar concepts that include consideration of prospective revenues and costs. The result may thus often come close to an assessment of actual revenues and expenses accumulated at the time of the award. This explains why many awards do not entertain any debate about the proper time for assessing damages, simply stating that the investor is entitled to be paid the compensation it did not receive when the expropriation took place, plus interest. The proper distinctions to be made are sometimes further diluted when it is stated that the investor shall receive compensation as it should have been paid at the time of the expropriation, while a number of particular items of revenue and costs are then quantified by reference to more recent or actual values.

222. Other cases are different and so is the situation in the present case.

223. Article 6 of the BIT is structured in three parts, each part representing one of the three conditions to be fulfilled to render an expropriation admissible under the BIT. The allocation of a "just compensation" is one of those requirements. As the Tribunal has concluded and explained in

[53] *Tidewater Investment SRL, Tidewaterr Caribe, C.A. v. The Bolivarian Republic of Venezuela*, Award of 13 March 2015, para. 142, and further paras. 130-146, 159-163 (R-642). The Tribunal observes at one point that an expropriation only wanting fair compensation has to be considered as a "provisionally lawful expropriation" (para. 141). However, to take the quality as "provisional" away, the simple award of compensation is not sufficient. And the Tribunal has no power to state such a declaration that it was not requested to make by the claimants.

[54] *Mobil Corporation, Venezuela Holding, B.V. et al. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award of 9 October 2014, para. 301 (CL-348).

its 2017 Interim Decision, this requirement has not been fulfilled by the Respondent. Therefore, one of the three cumulatively applicable requirements has not been met, and Article 6 of the BIT has been breached. Such unlawful act calls for reparation of the Claimants' losses.

224. According to the well-known principle settled in the *Chorzów* Judgment, "reparation must, as far as possible, wipe-out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed." (p. 47). Assuming that restitution in kind is not possible, the amount of compensation should correspond to a sum reflecting the value which a restitution in kind would bear, and damages for loss sustained which would not otherwise be covered. The dispossession involves the obligation to restore the undertaking and, if this is not possible, to pay its value at the time of the indemnification. To this obligation must be added that of compensating loss sustained as the result of the seizure. Thus, the reparation is about substituting payment of the value of the undertaking for restitution (p. 48). The Court added that these principles do not apply as if "an expropriation properly so called was involved." (p. 48).

225. When instructing the experts on their enquiry on the valuation to be retained, the *Chorzów* Court asked for the value of the undertaking for the manufacture of nitrate products at the date of dispossession, and the financial results current at the present time (profits or losses). This question had to cover the monetary value, both of the object of the undertaking, together with any probable profit ("*lucrum cessans*") that would have accrued to it between the taking of possession and that of the expert opinion[55]. While the note of the Court that these principles are different from those applicable in the case of an expropriation must be kept in mind, it can be concluded that when considering "wiping-out" all the consequences of an unlawful expropriation, the situation of the investor has to be addressed as it would, in all probability, have existed if that unlawful taking had not taken place.

226. If this was not accepted and the right to compensation was limited to the amount of "just compensation" referred to in Article 6(c) of the BIT, there would be no reparation of the wrong committed by the Respondent. The resulting compensation would simply be deferred from July 2007 to the date of this Award, together with interest. There would be no sanction of a manifest breach of the provision of Article 6(c) of the BIT, which implies a breach of Article 6 as a whole when prohibiting expropriation as long as one of the three pertinent conditions is not fulfilled. In the meantime, in the period between the taking and the rendering of this Award, the Projects would operate as decided by the Venezuelan Government and with all the benefits accruing to them, in particular when taking into account the increase in oil prices. This is not what the BIT provides and international law allows.

[55] p. 51-53, No. 136, 141.

227. The consequence of the unlawful expropriation and the purpose of reparation are to make the Claimants whole. If reparation consisted only in providing compensation as it had to be paid at the time of taking, plus interest, the Claimants would be deprived of the difference between the market value estimated at that time and the benefit of the Projects actually accruing since the expropriation and the date of this Award and in the future until the end of the Projects' lifetime. The Respondent would thus acquire, through the expropriation, profits available to the Claimants through the Projects above the range of the market value that would serve as reference to the determination of the "just compensation" at the time of the taking. For this part of the expropriation, no compensation would ever be paid. Such a result is implied in a compensation scheme as provided by Article 6(c) of the BIT, provided payment occurs at the same time. If such compensation is not effectively made or differed, the expropriating State would take on both levels: no account is provided for the market value at the date of the taking, and the full actual and future value of the Projects as from that date accrues to the State. Making, under such circumstances, the Claimants' whole means that "just compensation" as valued at the time of the expropriation cannot be achieved.

228. The Tribunal adds that the proper identification of the remedy for a violation of the BIT should respect the object and purpose of the BIT as this must apply to the BIT's provisions on investment protection in general. If "just compensation" is determined as per the date of the expropriation, and taken forward through a simple rate of interest, the host State would draw a clear advantage from its taking, as it did in the present case. Thus, such interpretation would result in an incentive for host States to expropriate investments and to defer payment of compensation until an undetermined future date. Such an approach would defeat the purpose of "protection of investment" that is the object of the BIT as stated in its Preamble.

229. An approach taking account of the future economics of the Projects requires a further clarification in respect of the date when the pertinent values in relation to the Projects have to be determined. An expropriation consisting of a single taking is valued as of the date of such taking. This is true, however, only by reference to that particular date. When time goes on, values change. Revenues may go up, costs are developing differently, and taxes may increase. In the present case, the rising oil prices are the main factor which informs the debate on the fixing of the appropriate valuation date. It led this Tribunal to determine in its 2013 Decision that this date shall be the date of this Award.

D. Valuation Date and Method

230. In the context of the debate between the Parties, the question is whether the relevant elements for the assessment of damages (including revenues, costs, taxes and others) are those applied or known at the time of the expropriation, or those at the time when the judgment has to be made about the damages accrued until that day and those arising as of that day. This is why, the Parties

are at odds between an *ex ante* valuation and an *ex post* valuation. The matter is closely linked to the applicable standard of compensation. If the Claimants' compensation is what they did not receive when they had been expropriated, the value of their loss must be assessed *ex ante*, as of the day of the taking, including an estimation prevailing at that time in respect of profits, losses and costs and other relevant items, occurring in the future. If, on the other hand, the Claimants are entitled to receive compensation for all revenues and net profits they would have earned had the Projects not been expropriated, the valuation has to be made by including all available actual (historical) and future data, which results in a valuation focusing on the matter from an *ex post* viewpoint.

1. The Claimants' Position

231. Consistent with settled law, it follows for the Claimants that their right to full reparation has as its necessary consequence that the date of valuation must be the date of the Award.

232. As a result of the improving market conditions all three Projects have increased in value following their confiscation. The Claimants are entitled to the benefit of those market improvements; they would have benefited from them had the Projects not been illegally taken. The consequences of any mismanagement of the Projects by PDVSA cannot be considered in the valuation, since this would not have occurred in the "but-for" world.

233. The Tribunal has already determined that the valuation date is the date of the Award. Accordingly, the Tribunal's valuation should take account of market developments subsequent to the taking that have increased the value of the Projects. Therefore, what remains to be calculated in the Claimants view is (a) lost historical cash flows: Forgone cash flows from the Projects between the date of the taking (26 June 2007) and the date of the Tribunal's Award, with a capitalization factor applied to actualize the lost historical cash flows to present value. (b) The equity value of the investments at the valuation date: Lost cash flows from the date of the Award through the end date of the Agreements, calculated using a DCF method to reduce those future cash flows to present value. (c) Post-award interest on all sums awarded from the date of Award to the date of payment. (d) Arbitration costs.

2. The Respondent's Position

234. For the Respondent, there is no basis for departing from the Treaty valuation date. This date is defined by Article 6(c) which states that the market value to be referred to is either the date "immediately before the measures were taken or the impending measures became public knowledge, whichever is the earlier". But even if the Tribunal could depart from the Treaty standard and look to customary international law, the result would be exactly the same.

235. In this respect, the Respondent submits that the normal valuation date in expropriation cases is the date of dispossession and that the valuation date does not change if the expropriation is one "to render which lawful only the payment of fair compensation would have been wanting", as stated in *Chorzów Factory*[56]. The authorities, including this decision, are crystal clear that where the only basis for unlawfulness is failure to pay compensation, the valuation date remains the date of dispossession because the damages are calculated based on the amount of compensation that should have been paid at that date, plus interest until the date of payment.

236. Relying on Sir Ian Brownlie's statement, quoted above, the Respondent contends that the valuation date in the case of an expropriation that at worst is only unlawful *sub modo*, rather than *per se*, is the date of dispossession because damages for such an expropriation consist of the value of the property expropriated as of that date, plus interest to the date of payment.

237. The Respondent explains that the *ex ante* valuations takes into account production, cost and price information that are considered relevant as of the 2007 valuation date. The Claimants' approach to such a valuation is not different. The difference between the Parties' valuations results from their difference in the *ex ante* production projections, because the Claimants take a much more optimistic view of the condition of the Petrozuata field and the Hamaca upgrader than the Respondent does as of the 2007 valuation date. Although an *ex post* valuation is supposed to be based on what actually happened in the Projects after the 2007 nationalization, the Claimants avoid considering *ex post* data that negatively affects value, thus submitting a hybrid valuation that bears no relationship with actual facts. The Respondent notes than when this Tribunal examines what actually happened, it cannot ignore the negative developments in the Projects in terms of both production and costs.

3. The Tribunal's Findings

a. The Parties' positions

238. The Tribunal observes that while the Parties present their respective positions with strong arguments, they are not always consistent.

239. The Claimants' *ex post* valuation approach would require, in theory, taking into account all available data on production, costs and other relevant factors of economics at the actual date and in moving data forward up to the date of judgment. This is not what they have always done, and it is not what their experts have done. Thus, they have taken the pre-expropriation production forecasts as the appropriate source for determining oil production in the but-for world. The Respondent pointed to the Claimants' preference to identify costs on the basis of costs accrued and projected

[56] Quoting the *Chorzów* Judgment, p. 46.

costs before the date of expropriation, arguing that the costs listed by the Respondent were *in toto* not reliable and unpersuasive; here again, such approach is like turning suddenly to an *ex ante* valuation, while an *ex post* approach would have required a closer examination of the evidence presented by the Respondent in respect of costs incurred since June 2007.

240. The Respondent, on the other hand does not conduct consistently an *ex ante* valuation that it claims should be the only relevant for this Tribunal. Such valuation would require taking all facts as they existed at the date of the expropriation, including the projections of the future on the basis of the best knowledge then available. In other words, the approach would have to be the one adopted by a reasonable buyer at that very moment, and nothing else. A correct date-of-expropriation valuation would not use the figures for production in year 2008, nor the forecasts prepared by Mr. Figuera in 2009, which projects the recovery of 653 million barrels of EHCO – substantially less than expected by all Parties prior to the expropriation[57]. An *ex ante* valuation would require that costs and taxes that could not have been reasonably envisaged at the time of the taking are not taken into account. This was not always done, for reasons that one can understand quite easily, but this approach is nevertheless not consistent with an *ex ante* calculation. The same is true in respect of additional expenses for the lease of the Interim Processing Facility (IPF) in the period between 2007-2012 at Corocoro[58]. Finally, a factual event that occurred before the date pertinent for the *ex ante* observation (*i.e.* 26 June 2007) must be identical to the same fact evaluated from an *ex post* perspective. For instance, when an upgrader's capacity is estimated as above 90% OSF in the year 2006, as observed at the date of the expropriation, this figure cannot become 75% simply because different information was provided in later years and integrated in the *ex post* valuation[59]. The best evidence must be the same from both perspectives when relating to a fact prior to the *ex ante* point of time.

241. In fact, whether one takes a principled position of an *ex ante* or an *ex post* valuation, none of these approaches can be conducted according to its own logic. Two main factors explain this. (1) The pressure of actual data often prevails. There is often no point in relying on hypothetical facts that have proven to be wrong. (2) On the other hand, there are occurrences where actual data are either not available or not reliable, leaving no other choice but to turn to projections that have been prepared carefully and agreed upon by those involved at the relevant time before the expropriation became effective.

[57] Cf. Respondent's Final Brief on Quantum, paras. 113, using figures provided by Figuera, Testimony, 20 July 2009, paras. 26-30, which were in part based on actual information for the years 2008 and 2009. The same approach was followed for Hamaca. At the 2017 September Hearing, Counsel of the Respondent admitted that with the actual figures presented for the second part of 2007 and for year 2008, they were not presenting *ex ante* projections; TR-E, 2017 September Hearing, Day 17, p. 4891:3-14 (Preziosi).

[58] Cf. Respondent's Final Brief on Quantum, paras. 174, 182-188.

[59] Cf., *ibidem*, paras. 139, 345.

242. The Respondent's experts have presented an article that explains the operation of the two valuation methods and the bargain that divides them[60]. For the author, in an *ex ante* analysis, all damages projected after the date of the breach are present-value discounted back to the breach date to arrive at a damages amount as of that date; interest is then applied. In an *ex post* analysis, projected damages are present-valued to the date of trial. For the portion of damages between the breach date and the trial date (the interim period damages), a time-value of money factor is applied forward to the trial date; and the projected damages after the trial date (the post-interim period damages) are present-value discounted back to the date of trial. The challenge for an *ex ante* analysis is that ignoring subsequent information may artificially ignore actual impacts to the plaintiff that, if considered, would result in a more precise estimate of the plaintiff's loss. In contrast, an *ex post* approach effectively attempts to put the plaintiff in the position he or she would have been in on the date of trial but-for the actions of the defendant. In evaluating both approaches, the effect of the interim period events on the plaintiff should be considered. Depending on whether the predominant economic factors affected positively or negatively the performance of the plaintiff, the plaintiff would be in a better or a worse position based on an *ex post* option, and the reverse would be the case when considering facts *ex ante* only. The question is then whether the defendant should not bear the risk of uncertainty produced by the act. If the defendant has not gained as a result of the act, an argument that plaintiff may be overcompensated via an *ex post* analysis may not carry much weight[61]. However, a damages award that returns the plaintiff to its economic position at the date of the injury, but leaves the defendant with a gain as a result of his action may not be appropriate and not deter future unlawful acts.

243. The comparison between the two valuation methods that are at the centre of the Parties' debate shows that one or the other cannot be adopted without a number of adjustments. The legal components should be looked at more in depth.

b. The appropriate time factors

244. In its 2013 Decision, the Tribunal stated that it did not consider that the amount of the compensation payable in respect of an unlawful taking of an investment is to be determined under Article 6(c) of the BIT. This provision establishes a condition to be met if the expropriation is in

[60] Stephen L. Buffo, Readings from the Book of Wisdom: Ex Post versus Ex Ante Damages, Stout, Risius Ross 2014, Brailovsky/Flores, Appendix 392. The experts refer to this article for the purpose of explaining what an *ex post* valuation should be, but they do not elaborate on the definition of an *ex ante* valuation, nor on the author's comparison of the two methods. Cf. Valuation Update, 18 March 2016, para. 41; Valuation Update Reply, 21 April 2016, para. 19.

[61] In any event, in such a case, the loss must stay with the expropriating host State. The investor should not receive less than an investor who was hit by an expropriation fully complying with the BIT. Cf., for instance, in *Siemens A.G. v. The Argentine Republic*, ICSID Case No. ARB/02/8, the Award of 6 February 2007 (CL-43), concluding that the claimant was entitled not just to the value of its enterprise as of the date of the expropriation, but also to any greater value that enterprise has gained up to the date of the award, plus any consequential damages (para. 352).

all other respects in accordance with Article 6. The Tribunal concluded on the basis of principle and the authorities it had reviewed, that if the taking was unlawful, the date of valuation is the date of the award.

245. Article 6(c) of the BIT governs the compensation to be paid by the expropriating State at the time of the taking. It does not deal with the consequences of its breach. If one would submit that Article 6(c) continues to be applicable and governs the Claimants' claim for reparation, this would mean that this provision continues to govern compensation, with the simple addition of interest. This is not what the provision says. It refers exclusively to the market value at the time of the taking. No reference can be found in the text that Article 6(c) would remain applicable in the future and for years to come for the purpose of calculating the investor's compensation, to which only interest is added.

246. The expropriation has the effect of transferring the market value of the Projects to the host State. At the same time, pursuant to Article 6(c), just compensation is to be paid to the investors by reference to the same market value. Both sides are thus basically placed on equal terms. If no compensation is paid, the host State acquires the Projects at their market value, plus the forthcoming profit, while the investors are left with the market value the Projects had in the past.

247. If no payment was made, an *ex ante* valuation that assumes that payment was made on the date of expropriation and calculates interest thereafter would result in the State taking advantage of whatever difference between the real profit of the business and the interest. Indeed, Article 6(c) provides for payment to be made at the date of expropriation, without any further alternative or escape clause. If no compensation has been made at the required time, the loss must be determined independently from this provision and it is to be compensated by the host State. Nowhere is it provided that such loss consists simply of interest.

248. An *ex ante* valuation makes sense only if it results in an *ex ante* payment. The hypothetical of a reasonable buyer considering the acquisition of the Projects, as presented by the Respondent, is a buyer who acquires the Project the very day when it has been taken away from the Claimants, and who pays the relevant amount at that date. A reasonable buyer who defers its acquisition to a later point in time will reconsider the market value of the Projects at that moment and pay the amount then corresponding to the actual market value. As prices move, up and down, the buyer will not suggest fixing price on the basis of an *ex ante* analysis (plus interest), and no seller would accept to make a deal on such basis.

249. The World Bank's Guidelines on the Treatment of Foreign Direct Investment cannot be understood otherwise. In its Chapter IV, payment of appropriate compensation is mentioned as one of the factors which allows a State to expropriate a foreign private investment. When declaring that such compensation must be adequate, effective and prompt, the implication is always that such

payment takes place at the same time as the taking. In case a "going concern" is involved, future income that could be expected with reasonable certainty over the course of its economic life is to be included in the calculation; this must imply an assessment at the time of the expropriation. If compensation had to be evaluated at a later stage, actual or historical facts would certainly prevail over any earlier projection on the enterprise's economic life in the future. Similarly, when a willing buyer is supposed to consider specific characteristics of the investment, "including the period in which it has been in existence", this specific element will certainly have to be updated to present value if the purchase has not taken place when it was supposed to take place, *i.e.* at the date of the expropriation. There is no point in trying to read the Guidelines to assert that the valuation of the expropriated investment shall in all cases be settled at the date of expropriation.

250. If payment is not made on the day of the expropriation, and is differed to later, plus interest, the expropriator takes advantage on a day-to-day basis of the difference between the profit resulting from the operation of the Projects (representing the investment that had been taken) and the applicable interest. An *ex post* valuation corrects the unequal treatment resulting from such a calculation, because it supports payment including the profit resulting from an investment that the host State had taken without the burden of financing its value.

251. In so doing, the host State takes the benefit of the value of the investment above the legal terms when it should have paid the compensation. The purpose of the compensation provision is to make whole the investor, in terms of equitable market values, at the time of payment. If such payment is not done and deferred for later, it must necessarily be determined again by reference to the market value prevailing at that time. This is then equivalent to an *ex post* valuation.

252. Taking an example for the purpose of illustration, when an oil production industry has a market value of 10 US$ billion at the time of expropriation and yields 10% of net profit, the host State, when not paying compensation and waiting for a judgment to be awarded some years later on the basis of an *ex ante* valuation (*i.e.* 10 billion), would earn 1 US$ billion per year as a result of an investment it did not provide itself, leaving the investors with interest at 300 million (3%), and the State with a net profit of 700 million. In fact, the investors will make a loss, because their costs for financing an investment of 10 US$ billion (still in the hands of the host State) are markedly higher than the interest rate of 3%. Thus, the host State receives more than the market value the investment had when it was expropriated. Such an extended taking has no basis in the provisions of Article 6 of the BIT.

253. When taking account of facts that occurred after the expropriation, and before or after the Award, the pertinence of the available information may be questioned in its causal relation to the situation of the Projects as they existed at the time of the expropriation. The reparation must re-

establish the Claimants in the situation which would, "in all probability"[62], have existed if the expropriation had not taken place. In this respect, an *ex post* valuation is linked to the *ex ante* situation under which the Projects were conducted when they were expropriated. Such a link cannot be reduced to a simple condition of foreseeability. Facts may be relevant for the assessment of the but-for world even if not foreseeable at the time of the taking, as long as they can be assessed with reasonable certainty as the consequences of the initial situation at the time of the taking. Such facts must be capable of being placed in a chain of events that, albeit not foreseeable at an earlier point in time, nevertheless appear as an occurrence that under a reasonable perspective appears as potential consequence of the expropriation and the loss represented by the taking away of the Projects from the Claimants[63].

254. An *ex ante* approach calculates revenues accruing as from the date of the breach on the basis of projections. Such revenues are then discounted back to the date of the breach. This is Respondent's position, using a rate of 19.8%. Compared to actual facts, this has the effect of reducing compensation in two ways: (1) Revenues accruing in the future above the projected figures profit to the State, and (2) to the extent that the discount rate is higher than the interest rate, the positive difference accrues to the host State as well. Such approach ignores artificially any impact on the Claimants in the future, which, if considered, would result in a more precise estimate of the Claimants' losses. That is precisely what an *ex post* valuation does.

255. Contrary to what has been suggested, the view that an expropriation incompatible with the BIT for the only reason that no compensation has been paid calls for a valuation at the date of the expropriation is not as broadly shared as this is sometimes argued[64].

256. In some cases, this solution was retained but for reasons different from the so-called "legal" nature of an expropriation which only lacks compensation. In the case of the *Crystallex* Award[65], the parties agreed that the proper date of valuation should be the date of expropriation. This was also the basis for the same solution for the *Saint-Gobain* Tribunal[66], with the additional element

[62] *Chorzów* Judgment, p. 47, 53.

[63] Cf. also the Award of 7 February 2017 *Burlington Resources, Inc. v. Republic of Ecuador*, ICSID Case No. ARB/08/5, para. 333, using however the foreseeability as the prevailing factor, while correctly stating that the injury suffered must have been caused by the wrongful act. The same reasoning can be found in *Quiborax S.A. & Non Metallic Minerals S.A. v. Plurinational State of Bolivia*, ICSID Case No. ARB/06/2, Award of 16 September 2015 (R-577), paras. 382/383.

[64] For an overview of the case law, *see* Steven R. Ratner, Compensation for Expropriations in a World of Investment Treaties: Beyond the Lawful/Unlawful Distinction, American Journal of International Law 2017 p. 7 ff., 15-18.

[65] *Crystallex International Corporation v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB(AF) 11/2, Award of 4 April 2016, para. 854.

[66] *Saint-Gobain Performance Plastics Europe v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/12/13, Decision on Liability and the Principles of Quantum of 30 December 2016, paras. 611-614 (R-655).

that in the particular case such valuation date yielded a higher value than the date-of-the-award valuation.

257. In other awards, compensation was simply treated as one of the conditions for an expropriation not prohibited under the BIT, with the effect that if no compensation has been paid, one of the Treaty requirements has not been complied with, resulting in an unlawful expropriation as if any of the other requirements had not been met. Accordingly, the *Crystallex* Award states as follows

> When a treaty cumulatively requires several conditions for a lawful expropriation, arbitral tribunals seem uniformly to hold that failure of any one of those conditions entails a breach of the expropriation provision[67].

The Tribunal then concluded

> Under the circumstances, the Tribunal cannot but conclude that Venezuela breached Article VII(1) of the Treaty, as no "prompt, adequate and effective compensation" was either offered or provided to Crystallex[68].

The *Crystallex* Tribunal referred to seven other awards considering the lack of payment of just compensation as a breach of the pertinent provision of the applicable BIT on expropriation[69]. The

[67] *Cristallex International Corporation v. Bolivarian Republic of Venezuela*, Award of 4 April 2016, para. 716.

[68] *Ibidem*, para. 717.

[69] *Bernardus Henricus Funnekotter et al. v. Republic of Zimbabwe*, ICSID Case No. ARB/05/6, Award of 22 April 2009, para. 98 ("The Tribunal observes that the conditions enumerated in Article 6 are cumulative. In other terms, if any of those conditions is violated, there is a breach of Article 6."); *Saluka Investments BV v. Czech Republic*, PCA/UNCITRAL, Partial Award of 17 March 2006, para. 266 (non-compliance with one or more of the conditions set out in Article 5 of the treaty would lead to the conclusion that the respondent has breached Article 5 of the Treaty); *Kardassopoulos v. Georgia*, ICSID Case Nos. ARB/05/18 and ARB/07/15, Award of 28 February 2010, para. 390 (noting that absence of due process is sufficient to support a finding that the expropriation was wrongful); *Compañía de Aguas del Aconquija SA and Vivendi Universal SA v. The Argentine Republic*, ICSID Case No ARB/97/3, Award of 20 August 2007 (CL-42), para. 7.5.21 (lack of compensation makes an expropriation unlawful); *Siag and Vecchi v. Egypt*, ICSID Case No ARB/05/15, Award of 11 May 2009, para. 428; *Marion & Reinhard Unglaube v. The Republic of Costa Rica*, ICSID Case Nos. ARB/08/1 and ARB/09/20, Award of 16 May 2012, para. 305; *Gemplus, S.A. and Talsud, S.A. v. Mexico*, ICSID Case Nos. ARB(AF)/04/3 and ARB (AF)/04/4, Award of 16 June 2010, para. 8-25 ("The Tribunal concludes that these expropriations were unlawful under the BITs and international law, given the facts found by the Tribunal and the further fact that the Respondent did not meet the condition required by Article 5 of both treaties regarding the payment of adequate compensation").

Quiborax[70], *Tenaris*[71] and *Burlington*[72] Awards can be added to the list. This Tribunal has decided accordingly in its Interim Decision.

258. The *Tidewater* Tribunal took a strong stand on the need for an *ex ante* valuation operated at the time of expropriation in case of a so-called "lawful" expropriation only missing just compensation[73]. In such a case valuation and compensation should assess damages as identified at the time of the expropriation, including what the investor expected at that time in terms of future profits and expansion. The facts known at the date of the expropriation are taken as the reference, as they are the only ones objectively related to the dispute[74].

259. The reasons underlying such position are based on the concern that an arbitral tribunal should avoid considering events occurring after the expropriation, such as the evolution of prices, potential expansion of the business or other circumstances that may appear as hypothetical or even speculative. Such a concern must certainly be taken seriously. However, it does not allow a broad conclusion that events occurring after the expropriation shall have no bearing on the tribunal's assessment of the loss suffered by the expropriated party and of the damages to be awarded. The *Chorzów* Judgment does not support such an understanding. In this case, the plaintiff was Germany that had no claim to raise in respect of future revenues of the manufacture in which it had no operational impact.

260. The *Tidewater* Tribunal's approach appears correct when reference is made to the date of the expropriation in all respects including the determination and payment of the just compensation due to the investor. If no compensation has been paid, however, valuation moves forward, and so does the profit accruing to the host State as from the date of the taking, and the loss suffered by the investor who did not receive the market value of its investment in return, being left with an expectation for late payment together with interest. The *Tidewater* Award serves to understand that in

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[70] *Quiborax S.A. and Non Metallic Minerals S.A. v. Plurinational State of Bolivia,* ICSID Case No. ARB/06/2, Award dated 16 September 2015 (R-577), paras. 370-386.

[71] *Tenaris S.A. and Talta-Trading E Marketing Sociedade Unipessoal LDA v. Bolivarian Republic of Venezuela,* ICSID Case No. ARB/11/26, Award dated 29 January 2016, para. 481.

[72] *Burlington* Award, paras, 160, 176, 325-330, 409, 477, 531.

[73] *Tidewater Investment SRL and Tidewater Caribe, C.A. v. The Bolivarian Republic of Venezuela*, ICSID ARB/10/5, Award of 13 March 2015 (R-642), paras. 130-146, 159-163.

[74] The same position is shared by Arbitrator Brigitte Stern, who was a member of the *Tidewater* Tribunal, in her partially dissenting opinion to *Quiborax S.A. and Non Metallic Minerals S.A. v. Plurinational State of Bolivia,* ICSID Case No. ARB/06/2, Award dated 16 September 2015 (R-577). The dissenting arbitrator notes that an expropriation "which only lacks fair compensation to be lawful has to be treated as a potentially lawful expropriation (or a provisionally unlawful expropriation until the tribunal has awarded the compensation due for the expropriation to be legal)" (para. 17, emphasis omitted). However, the Tribunal's task in such a case is not to render an expropriation lawful that has not been lawful before, but to draw the legal consequences of an expropriation not complying with the law because not accompanied by the required compensation.

such cases, adjustments are needed. The Tribunal noted indeed, in further relying on the World Bank Guidelines, that an *ex ante* valuation does not mean that it would be unconcerned with future prospects. In the first place, the factors that a willing buyer would itself take into account when considering the purchase of an investment necessarily include "the circumstances in which it would operate in the future". In the second place, the Tribunal, when estimating values *ex ante*, is not required to shut its eyes to events subsequent to the date of injury, if these shed light in more concrete terms on the value applicable at the date of injury or validate the reasonableness of a valuation made at that date[75]. The Tribunal added, referring to the experts on both sides, that there may in particular cases be a real benefit in hindsight, because it allows for a reliable measurement of lost cash flows between the date of breach and a present date[76]. This is precisely what an *ex post* valuation allows: taking account of the actual facts that improve the assessment of those retained at the time before the expropriation when they represented mere projections towards a not yet known future. The focus must be on causation, meaning that *ex post* information should not introduce facts into the valuation that have no real connection with the expropriated assets[77]. However, if such risk exists which may materialize in certain situations, the proper solution has to be found through the correct application of the requirement of causation, including mitigating factors like intervening or concurrent causes, contributory negligence, or proportionality. This element is important and must be added as a factor of adjustment to what may appear extreme in an approach based on an *ex post* valuation. Such valuation, indeed, should not include facts and events that have no reasonable or adequate connection to the investment as it was implemented and conducted at the time of its expropriation. The question whether information or valuation must be determined *ex ante* or *ex post* is not adequately examined and answered without taking into account the interaction between both options through the necessary consideration of causation.

261. Therefore, an *ex* post valuation must be measured in relation to the content and the terms of the Association Agreement and the whole contractual environment on which the Projects were based. Production, costs, taxes, and all other components of an actual valuation are relevant to the extent only that they are caused or related to the Projects as they were created and conducted at the time when the expropriation occurred. This also means that new or additional production methods, equipments costs, etc. are not to be included in a valuation based on the framework pertinent in the present case when they have as their origin legal undertakings or operational choices that are unrelated to the original Projects.

262. This consideration represents the indispensable addition to a debate that simply opposes two different valuation dates. Indeed, if damages have to be evaluated as of a given date, they must be connected by a relation of causality to the injury, *e.g*. the expropriation. From the viewpoint of

[75] *Tidewater* Award, para. 160.

[76] *Ibidem*, para. 162.

[77] This is the main purpose of Arbitrator Stern in her dissenting opinion (cf. paras. 87-101).

the date of expropriation, impacts on damages occurring later are taken in consideration if they have a basis in the then existing projections and expectations, which means that they appear as the consequences of such factors. The *ex ante* information sets a bottom line from which the probability of the occurrence of events in the future can be assessed. Viewed from the other perspective, when evaluating damages as of the date of the decision, occurrences of a "but-for" nature that are not caused by the project or the legal setting that has been taken away through the expropriation are not included in the valuation. Looked at from one point or the other, the results will coincide in large parts, *i.e.* a valuation including all actual effects caused by the injury, together with all other related effects occurring in the future.

c. The evidence

263. The Tribunal notes that an *ex post* valuation places the focus on actual terms. However, it cannot be conducted without retaining approximate assumptions and projections. This is easy to understand in relation to future events, mostly relating to production, oil prices, costs and taxes. The situation is not clear cut in actual terms for the historical period since the expropriation and the date of this Award (also called the "Interim Period"). In this respect, it is true that theoretically all pertinent actual facts should be available to the Tribunal. This is not the case: Firstly, the Projects have been conducted differently than they would have moved forward had the Association Agreements remained applicable. Secondly, the evidence before this Tribunal is in many respects not representative of the real world or of the "but-for" world. The Tribunal must deal with the evidence present on its record, and it cannot rule by reference to evidence the Parties either could not or did not want to submit to the Tribunal.

264. The assessment of damages is not an exact science. It is a matter of law, and to the extent the pertinent factors of facts or economics are uncertain or associated with a margin of appreciation, the proper determination is one of the Tribunal's tasks. As stated in Arbitration Rule 34(1), the Tribunal shall be the judge of the admissibility of any evidence adduced and of its probative value. The Tribunal is thus granted full discretion in these matters. Such discretion applies also in respect of the weight to be assigned to the evidence proffered in respect of calculation of damages.

265. One of the characteristics of an *ex post* valuation is that for easily understandable practical reasons, the date of such valuation cannot be the precise date of the Award. The Tribunal has instructed the Parties in Procedural Order No. 4 to provide their *ex post* valuations on damages updated on 31 December 2016 (para. 6). The Parties have prepared their submissions accordingly. The Tribunal has decided not to ask for a subsequent update, being reluctant to engage in a further delay of the proceeding, and considering that the additional information then provided would not

have had a significant impact on the overall assessment of damages[78]. Therefore, the assessment of relevant evidence between early 2017 and the date of this Award is based on the information and projections available for the preceding period and the up-date requested for 31 December 2016.

266. The evidence in the present case is in large parts based on documents. A certain number of witnesses have submitted statements and have been heard. However, all of them have a limited personal knowledge of the life of the Projects, in particular, Mr. Lyons and Mr. Figuera, the main witnesses of fact presented by the Parties.

267. Mr. Lyons was General Manager of the Petrolera-Ameriven Joint Venture (Hamaca) from August 2003 to August 2005, when he became president of ConocoPhillips Venezuela and involved in Petrozuata as a Board Member and in Corocoro as an Executive, while he remained responsible for Hamaca as a Board Member. He left that function in April 2006 when he was appointed president of ConocoPhillips in Latin America. He served in that capacity until the end of 2008[79]. He retired from ConocoPhillips in 2012[80]. He was co-signatory of the Management Board Resolutions dated 22 May 2007 providing Power of Attorney to Counsel representing the Claimants in this proceeding (C-003).

268. Mr. Figuera was president of Petrozuata from January 2005 until December 2006. He was president of Hamaca from June 2006 until the expropriation and then of PetroPiar until December 2007. Since that date, he had no personal involvement in Hamaca or in Petrozuata since he left that company. In December 2007 he became president of PetroSucre until December 2008. In late 2011 he was appointed General Manager of the Junín Division, where he remained until late 2013. As he explained to the Tribunal, when he was General Manager, he had no direct oversight over the seven individual Projects that were part of the Division (including Petrozuata). He was not consulted nor did he review documents such as business plans for any project. Therefore, since he left the Projects, he had no personal knowledge and had to talk to people in order to be provided with information[81]. The actual data he used were given to him by the technical staff from PDVSA [82]. In his Testimony provided in 2009, Mr. Figuera stated that he was then General Manager of Offshore Joint Ventures of Corporación Venezolana del Petróleo S.A. ("CVP"), a 100% subsidiary of

[78] The Respondent has raised an objection at the 2017 September Hearing, claiming for a possibility to provide an updating of relevant facts after 31 December 2016 (TR-E, 2017 September Hearing, Day 17, p. 4831:15-4833:19, 4901:5-19 – Preziosi). The Tribunal is not convinced by the pertinence of the argument, further noting that the Respondent had not raised the argument earlier, while it had ample opportunity to do so since 19 August 2016 when Procedural Order No. 4 was issued. See above, two last paragraphs of Section I.

[79] He was the signatory of the formal Notice of Dispute submitted to the competent Venezuelan Governmental Authorities on 31 January 2007 (C-36).

[80] Cf. TR-E, 2017 February Hearing, Day 7, p. 1867-1869; 2017 March Hearing, Day 11, p. 3083/84, 3086.

[81] Cf. TR-E, 2017 February Hearing, Day 8, p. 2251-2265; 2017 March Hearing, Day 11, p. 3084-3086, 3236.

[82] TR-E, 2017 February Hearing, Day 9, p. 2755:12-2756:12.

PDVSA [83]; in this function, he had indirect involvement in the companies through the Board issues[84]. In 2014, he was Internal Director of this company, responsible among others of PetroSucre that operates the Corocoro field; he was then also Executive Director for new developments in the Orinoco Oil Belt[85]. In sum, Mr. Figuera did not have personal information to provide evidence as a Witness on facts relating to the operation of the Projects Petrozuata and Hamaca since early 2008.

269. None of the witnesses was able to testify on actual facts based on personal knowledge and covering the historical period between the expropriation up to 2015 or 2016, and in many cases, the information provided to the Tribunal is based on hearsay or documents gathered from other persons involved in the Projects who have not been asked to appear before this Tribunal. The evidentiary gaps had led some experts to take positions not reflecting the real situation of the Projects and to argue on the basis of assumptions not verified with actual facts, or not supplied with evidence on the Tribunal's record. The Tribunal also noted that the valuation experts on several occasions insisted that their analyses was limited by the instructions provided by their respective instructing Party. The experts' evidence, therefore, requires a close analysis as to its objectivity and reliability.

270. The Tribunal further notes that the remedy it will retain must be connected to actual facts and reflect the Tribunal's knowledge. The Award "shall state the reasons upon which it is based" (Art. 48(3) of the ICSID Convention, Arbitration Rule 47(1)(i)). Members of the Tribunal must be capable of exercising independent judgment (Art. 14(1), 40(2) ICSID Convention). When reading these provisions together, it means that the opinion of experts must be capable of being translated into reasons to be provided by the Tribunal. Such reasons cannot be based, for instance, on mathematical formulae not accompanied by explanations serving as evidence or reasons of law on which an award can be based. The Tribunal cannot reach conclusions based on simple excel-sheets not accompanied by explanations and incapable of being operated on an interactive mode. This is all the more difficult when the response of the experts is limited to stating that the reports have been prepared following a party's instruction. The Tribunal has on several occasions made the Parties aware of such deficiencies.

271. The burden of proof is based on two components. One is to determine the party required to submit to the Tribunal evidence relevant for the resolution of the dispute. The other is to identify the party bearing the burden of losing on a submission when the requested evidence has not been brought before this Tribunal. In many cases, but not in all cases, both components identify one and the same party.

[83] Testimony, 20 July 2009, para. 1.

[84] TR-E, 2017 March Hearing, Day 11, p. 3085:21-3086:2.

[85] Third Supplemental Testimony, 15 August 2014, para. 2.

272. The party making an allegation or an assertion is also the party who should supply the evidence in support of such a submission. It is in most cases also the party who suffers if its submission is not retained by the Tribunal because the required evidence was not presented. As a general matter, it is clear that the Claimants bear the burden of proof in relation to the fact and the amount of loss and damages.

273. In the exercise of the discretion granted to it in relation to issues of evidence, the Tribunal requires that the existence of such losses and damages be proven with certainty, together with the associated costs for production. However, a less stringent approach applies when it comes to determine the precise scope and exact quantification of damages, including the estimation of production and costs. In this respect, the Tribunal must take account of the inherent difficulties to prove precise amounts of oil provided through the process of extraction, upgrading and delivery for sale, and to identify all and every single item of costs associated with such process. When the occurrence of certain facts is demonstrated with certainty, their quantification may be assessed when the Tribunal has received information sufficient to show their reliability with reasonable certainty. Some discretion and approximation must be exercised to render possible such assessment of quantified data. When it comes to the valuation of future profits and costs, the Tribunal will focus on the existence of a stream of occurrences demonstrating that such future events will become actual facts with sufficient certainty, and will not award compensation for inherently speculative claims and costs or any other element affecting cash flow.

274. The Tribunal's record contains an unusually high number of situations where one or the other party was not able or claimed not to be in a position to get access to and to supply to the Tribunal information relevant to the resolution of the dispute. The Claimants argued that since they left the Projects they were faced with considerable difficulties in getting access to facts related to the on-going operation of oil production and its costs. The Respondent, on the other hand, did not provide information from individuals that have had, for a number of years in the past and will have in the near future, responsibilities in the conduct of the Projects. No witness with actual knowledge from the sites was called. The Tribunal also noted the absence of any witness representing foreign companies operating in the Orinoco Belt, and in particular from Chevron, a company closely associated with the oil production on site. These difficulties materialize in the present case in particular in relation to the actual operating mode of the Projects and the costs implied since June 2007 and for the rest of the Projects' lifetime.

275. In a number of occurrences, the Tribunal will have to simply dismiss allegations that are not supported by sufficient evidence. In other cases, the Tribunal may have to proceed with its own estimates, *e.g.* when future oil prices or costs of wells or turnarounds must be assessed. In certain instances, the inability of a party to provide sufficient evidence may have the effect of shifting the burden of proof, in full or in part, to the other party. This may happen when fairness and good faith require that a party not being able to provide full evidence of an assertion it makes should not stand

alone when it can demonstrate that the opposing party has access to or control over the missing evidence. Although the Claimants are correct in stating that they are no longer in an operational position since the expropriation, they retain nevertheless valuable information relating to the Projects as they were in 2007 and they have full professional skill to evaluate the on-going production process and the main categories of costs including their prices today.

276. The Respondent has on many occasions produced piles of invoices in exclusively electronic form without providing either any explanation nor any guidance on how to understand hundreds or thousands of documents not identified by consecutive numbering or dates, mostly not referring to the underlying contracts, and in general not completed by indicating whether the amount invoiced has effectively been paid. The Tribunal's role is not to search for evidence the Respondent or its witness or experts undertook without any effort to assist in being comprehensive. In such cases, more supportive demonstration must be required, like explanations about work to be done on particular items of equipment. Particular attention must be given to the risk of overlapping claims or payments, like associated costs claimed in addition to turnaround costs when it appears that what was "associated" was in fact included in the turnaround's budget. The Respondent sometimes took the position to offer only minimal information, while more evidence would manifestly have been available; such approach must in the end be detrimental to this Party. For example, the Tribunal also learned with some surprise that the Respondent thought appropriate to include in its Submission on Estimated Costs filed with the Tribunal on 2 June 2017 costs projected in an amount of US$ 512,913,000 for a turnaround to take place the preceding year 2016[86] that in fact has never been executed that year and that was still uncertain to be executed in September 2017[87]. Under such circumstances, the need for carefully proceeding in assessing data is particularly high.

277. When preferring an *ex post* approach to valuation based on actual figures over an *ex ante* valuation using figures, in full or in part, that have proven to be incorrect during the Projects' on-going operation, the Tribunal does not mean that *ex ante* information available at the time of expropriation or before is entirely irrelevant. It appears indeed on certain occasions that actual information on a particular item is neither available nor reliable. The Petrozuata and Hamaca Projects have been operated differently since 2009, with different outcomes in respect of quality and quantity of production and causing costs not always comparable to those incurred or projected when ConocoPhillips was still an acting partner. Under such circumstances, an assessment of evidence based on Projects as they would have been conducted had the expropriation not occurred, may prove difficult, hypothetical or simply impossible. When weighing the evidence, the Tribunal may in some cases share the view that assumptions made by the Projects' partners before the

[86] Page 42. Similarly, the Respondent's Experts Brailovsky/Flores, in their Consolidated Expert Report on Valuation dated 17 November 2016 (paras. 329, 335, 337), presented estimated costs for an "assumed turnaround in 2016" of US$ 456.5 million, when they must have known that such turnaround did not take place in 2016.

[87] TR-E, 2017 September Hearing, Day 17, p. 4868:10-4869:2 (Preziosi). It was explained that the information was indeed provided in mid-2017 but based on projections dating back in 2015 (*idem*, p. 4870:8-4872:19).

expropriation were reasonable to such an extent that they can still be used as a reference and as reliable evidence. Such an approach is particularly necessary when the evidence pre-dating the taking in June 2007 was based on common grounds, prepared through the cooperation between all partners and agreed upon by all those attending board meetings, which means in most cases unanimously, except where otherwise stated.

VI. Production

A. Preliminary Observations

278. The investment at the core of this dispute has been made in three parts, named the Petrozuata, the Hamaca, and the Corocoro Projects. The factual, economic and legal background is different for each of these Projects, while their common feature is that they were all hit by Venezuela's attempt to have them migrated into mixed companies (*empresas mixtas*), followed after the default of such process by the expropriation enforced on 26 June 2007[88]. The Tribunal does not need to repeat the basic features of these Projects, which have been presented in their key-elements in the 2013 Decision. The legal basis for the remedy available to the Claimants has been determined and explained above. The Tribunal turns now to the quantification of damages.

279. The Parties strongly disagree on the elements pertinent to the damage calculation. They follow in their presentations a common line of consecutive items to be retained as the key inputs of such calculation. These inputs will also provide guidance for this Award. They are as follows: production, oil prices, costs, taxes, discount rate, interest or update factor. The Parties refer to "DCF Methodology". They accept that this methodology uses the same input categories, and that its specificity relates to the discount rate.

280. The stream of production can be divided in oil extraction, treatment and upgrading. It is then followed by delivery and sale. The Corocoro Project is different from the two others because of its smaller size, the different quality of the oil and the fact that no upgrading is undertaken. This explains why the process of production of the Petrozuata and the Hamaca Projects is more complex and involves a greater number of issues and technical occurrences to be addressed. Each Project must be examined and evaluated by its own characteristics. The analysis is therefore divided in the three main sections of production (upstream, upgrading, downstream), addressing firstly the Petrozuata and Hamaca Projects and secondly the Corocoro Project.

281. There is common ground that the Petrozuata Project was designed to extract approximately 120,000 barrels per day (BPD) of extra-heavy crude oil (EHCO) and to upgrade it into 104,000

[88] Decree No. 5.200 dated 26 February 2007 (C-5, R-40); Law on the Effects of the Process of Migration into Mixed Companies of the Association Agreements of the Orinoco Oil Belt, dated 11 September 2007 (C-35).

BPD of synthetic crude (Syncrude or CCO). This syncrude was then sold to ConocoPhillips under an Off-Take Agreement for further refining at its Lake Charles refinery.

282. The Petrozuata Association Agreement was first concluded on 10 November 1995 (C-21, p. 277/pdf) between Maraven S.A., a PDVSA affiliate, and Conoco Orinoco, Inc. (which later had its interests transferred to ConocoPhillips Petrozuata B.V. – CPZ), and later amended on 18 June 1997 (C-21, p. 347/pdf). It provided for the establishment of a joint venture company, Petrozuata C.A., which would, by a majority of 50.1%, be owned by the Conoco affiliate. When the Petrozuata upgrader entered into service in April 2001, and the first syncrude sales were made on 12 April, the 35-year term of the Agreement was triggered, which would extend until 11 April 2036.

283. The Hamaca Project was designed to produce and upgrade 190,000 BPD of extra-heavy crude oil, and to sell the resulting 180,000 BPD of syncrude and other By-products to international markets.

284. The Hamaca Association Agreement was signed on 9 July 1997 (C-22, R-26) by Corpoguanipa S.A. (on behalf of Corpoven, a subsidiary of PDVSA), ARCO and Texaco affiliates, and Phillips Petroleum Company Venezuela Limited (which later had its ownership transferred to ConocoPhillips Hamaca B.V. – CPH). It provided for the Project to be structured as an unincorporated joint venture; the Phillips Company owned 40% of the Hamaca Project[89], while the subsidiaries of PDVSA and Chevron each owned a 30% interest. The exploitation of the field would extend until 8 July 2037.

285. The Corocoro Project operated on the basis of an amended Development Plan of 2005 (C-181) that projected production of 30,000 BPD of light and medium crude oil in the offshore New Areas in the Gulf of Paria beginning in the summer of 2007, with production rising close to 70,000 BPD when the Central Production Facility came online at a projected date in late 2008.

286. The Corocoro Association Agreement was concluded on 10 July 1996 providing a 39-year term and for Conoco Venezuela B.V. to be the operator (C-23, R-29). Conoco Venezuela B.V. (which later had its ownership interest transferred to ConocoPhillips Gulf of Paria B.V. – CGP) held 32.2075% in the Project, alongside with CVP, a PDVSA subsidiary (35%), Eni (25.8%) and two smaller investors, OPIC and Ineparia (7%).

287. A number of issues are of a general nature and suited to be examined independently from specifics of a particular Project (B). They will be addressed first, in respect of Petrozuata and Hamaca, before the focus will turn to each of these Projects separately (C and D), followed by an

[89] The initial participation of 20% was raised to 40% by means of Amendment No. 2 to the Hamaca Association Agreement, dated 28 June 1999 (C-22, p. 818/pdf).

examination of the operation of the upgraders (E) and a conclusion (F). As mentioned, Corocoro deserves a special section (G). A final point relates to By-products (H).

B. The Main Features of Production of Petrozuata and Hamaca

288. One of the main areas of dispute is the assessment of the production profiles to be retained for the post-expropriation period, both between July 2007 and end 2016, and from early 2017 until the end of the lifetime of each of the Projects (Petrozuata and Hamaca). The experts on each side presented analysis based on very different assumptions. Different operating objectives are a matter of debate, together with the migration companies' skill for running efficiently the sites and the business as a whole. When lower production volumes are discussed, the issue then coming up as a reflex relates to the quantities of oil remaining available in the future (the Reserves), either until the end of the Projects' operation or until the time of complete exhaustion of the fields.

1. The Claimants' Position

289. The Claimants explain that their valuation experts, Dr. Abdala and Prof. Spiller, have relied on the oil production profiles endorsed by all of the Project participants, including PDVSA, immediately prior to the expropriation. They reflect what the disputing parties both agreed upon what was likely to be achieved. That is particularly appropriate where, as here, the pre-expropriation profiles are confirmed by highly persuasive evidence – the Projects' Reserves figures. Those figures are a uniquely reliable measure of an oil field's value, because they reflect the best current knowledge about the geological and economic properties of a reservoir.

290. Venezuela offers in respect of the Petrozuata and Hamaca Projects only the made-for-arbitration assertions of its fact witness, Mr. Figuera, and the models of its technical expert, Mr. Patiño. Venezuela's quantum experts in turn rely on their reports for the production profiles they plug into their damages calculation. Venezuela's made-for-arbitration production profiles must be rejected.

291. First, the diminished production estimates put forward by Venezuela are contradicted by the most powerful evidence: the Proved Reserves figures. Such Reserves are, by definition, the volumes of oil that are nearly certain to be recovered under existing economic and operating conditions. Venezuela puts forward an extraordinary contradiction: according to its published Proved Reserves figures, the fields are now capable of producing much more oil than at the time of the taking, while according to the profiles presented in this arbitration, the Projects are capable of producing less and less. This makes no sense.

292. Second, to the extent that extra-heavy crude oil (EHCO) production at the Projects has actually declined since the expropriation, then the only explanation would be PDVSA's poor post-expropriation management of the Projects.

293. Third, Venezuela's production forecasts are unreliable. For the period from 2009 to the end of the Projects terms, Venezuela relies not on actual EHCO production data, but on theoretical models for Petrozuata and Hamaca created by Mr. Patiño. For the historical period (January 2009-December 2015), Mr. Patiño excludes tens of millions of barrels of EHCO that according to PDVSA's own documents were in fact produced during that period. Mr. Patiño's forecasts of future production rest on inadequate methodology, as the Claimants' expert, Dr. Strickland, has explained.

a. The oil production profiles

294. The damages awarded in this case must restore the Claimants to the position that they would have enjoyed in the but-for world, in which the expropriation did not occur. Consistent with this principle, the Claimants' experts have relied on conservative oil production profiles contained in each Project's pre-expropriation business planning documents. These profiles reflect the Project participants' shared expectations about the level of oil production that would be achieved in the future. International tribunals have routinely relied upon such forecasts.

295. The experts follow the approach described above, adopting forecasts as follows: (a) for Petrozuata, the remaining EHCO recovery between June 2007 and 2036 is 913.5 million barrels; (b) for Hamaca, the remaining EHCO recovery between June 2007 and 2037 is 1.894 billion barrels.

b. The expected oil production based on the Reserves figures

296. The Claimants submit that Reserves figures are uniformly used to quantify the volumes of oil that are expected to be recovered from specific oil reservoirs. Under the SEC regulations, Reserves are divided in three categories: Proved (1P), Proved plus Probable (2P), and Proved plus Probable plus Possible (3P). Proved Reserves (1P) represent the most cautious "low estimate scenario" for actual production from a given field. 2P Reserves represent the "best estimate scenario", while 3P Reserves represent the "high estimate scenario" (CL-343). International tribunals rely upon Reserves figures. The Organization of the Petroleum Exporting Countries (OPEC), Venezuela and PDVSA likewise use functionally identical definitions.

297. In the present case, Venezuela's own Proved Reserves figures put to rest any doubt that the Claimants' oil production profiles were, and remain, achievable. Those figures – which have been increasing since the expropriation – confirm to a "reasonable certainty" that there is more than enough recoverable EHCO, to an extent exceeding the pre-expropriation forecasts used by the Claimants. The Ministry of Energy and Oil reported Proved Reserves at Petrozuata to be 2.4 billion barrels of EHCO in 2006 (C-404). Its most recent published figure, in 2010, is 3.9 billion barrels

(C-623). Nothing has been published since then. In 2006, the figure for Hamaca was 3.6 billion (C-404), and for 2015 4.6 billion (CLEX-090).

298. The Respondent argues that these figures are not comparable to the oil production profiles in this arbitration. First, Venezuela argues that the Ministry's Proved Reserves are calculated for the life of the fields, rather than for the contractual terms of specific projects. However, the argument fails by the definition of Proved Reserves, also agreed to by Venezuela. Such Reserves refer to EHCO volumes that are virtually certain to be recovered under "prevailing conditions", which means that they are actually recoverable and certainly before the end of the Projects. Second, Venezuela argues that the Reserves figures published by the Ministry include additional volumes of oil recoverable when using enhanced oil recovery (EOR) techniques, such as steam injections. If such volumes of recoverable oil reserves have been included in the Ministry's counting, then the same techniques had been available to the Claimants in the but-for scenario as well. Third, Venezuela appears to suggest that Proved Reserves figures may be higher for the owner of the natural resource (the State), on the ground that it is not concerned with the payment of taxes and royalties. Venezuela had offered no evidence in this respect. In any event, PDVSA pays the same royalties and taxes as private oil companies in Venezuela.

299. Venezuela's post-expropriation Proved Reserves figures show that the Petrozuata and Hamaca fields remain more than capable of producing the volumes of EHCO used in Claimants' damages model. Furthermore, the Proved Reserves figures have been increasing since the expropriation, which contradicts Venezuela's position that the production volumes have decreased as time has passed by.

c. Venezuela's made-for-arbitration production forecasts

300. The Claimants note that the Respondent bases its case on production profiles prepared for the purposes of this arbitration by its technical expert, Mr. Patiño. They were then plugged into Brailovsky & Flores damages calculation. If applied, they would reduce the value of the Projects by nearly US$ 6.9 billion, compared to the production profiles used by the Claimants' experts.

301. The Respondent employs a two-step approach: (a) with respect to the historical period (2007-2015), Venezuela relies on what it says the "actual" performance has been. This is in two parts: (i) for the period 26 June 2007 through the end of 2008, Venezuela uses the actual volumes of EHCO produced by the Projects, as reported by PDVSA, while (ii) for the period from 1 January 2009 through 31 December 2015, Venezuela relies on Mr. Patiño's calculation of the volumes of EHCO that would have been required to produce the amounts of syncrude that were actually sold by the post-expropriation Projects. (b) With respect to the future period (from 1 January 2016 through the end of the Association Agreements), Venezuela relies upon the theoretical production forecasts created by Mr. Patiño.

302. The Claimants contend that the post-expropriation performance of the Projects, under PDVSA's stewardship, cannot be taken as reflecting the performance that would have been achieved had the expropriation not occurred. The Claimants have no means to test or verify that information. Even if the "actual" results reported by Venezuela would be accurate, they are not reflective of what would have been achieved had the expropriation not occurred. First, the alleged lower production volumes are not consistent with the Ministry's Proved Reserves figures. Those figures reflect the amounts of oil that a competent operator would extract under presently existing conditions, and they considerably exceed the oil volumes used in the Claimants' damages calculations. Second, since the expropriation, all three Projects have been majority-owned and controlled by PDVSA, which has different priorities and capabilities. According to the Claimants, beginning in the early 2000s, PDVSA has been transformed from a commercially-oriented company into an arm of the Venezuelan State. Its priorities have been shifted and its performance has suffered. The government has, for example, increasingly used PDVSA as a "cash cow" to fund its social programs. All Projects suffered from an exodus of experienced employees caused by the expropriation of the Orinoco Belt and New Areas Projects.

303. While the post-expropriation oil production alleged by the Respondent cannot be verified, the profiles for the remainder of the historical period – from 2009 to 2015 – are more egregious still. For this period, Venezuela does not refer to actual volumes of EHCO, but on hypothetical volumes of EHCO that would have been required to produce the volumes of syncrude that Venezuela says were sold by the Projects during that period. In fact, actual EHCO production has far outstripped the EHCO volumes retained for the Respondent's damages calculation. Venezuela thus ignores its own data, showing approximately 97 million barrels of "lost oil", worth approximately US$ 7.5 billion.

304. Venezuela attempts to justify its disregard of these lost oil volumes by claiming that as from 2009, PetroAnzoátegui and PetroPiar produced large amounts of EHCO that were not upgraded to syncrude, but rather sold in blended (not-upgraded) form (DCO and blended crude). Venezuela argues that the pre-expropriation Projects were not allowed to sell those products, and that therefore the Claimants can get no credit for those blended EHCO volumes in this arbitration. Even if this would be correct, Venezuela's assertion shows, firstly, that PDVSA's post-expropriation strategies and priorities differ from those agreed by all the Project participants prior to the expropriation. Indeed, in such a post-expropriation scenario, the incentive to maintain upgrader performance would have been reduced, because it was still possible to sell non-upgraded products. Secondly, the but-for scenario must be modeled on the basis of the pre-expropriation plans, as they had been endorsed by PDVSA.

305. In any event, Venezuela's claim that the pre-expropriation Projects were prohibited from selling non-upgraded products is false. Venezuela relies on a June 2005 letter from the Ministry

(Appendix 1 to Dr. Mommer's Testimony). On a closer look, the letter was in fact a demand that the Projects pay higher royalties on non-upgraded volumes of EHCO. The Projects were never prevented from producing blended crude: (a) both Projects produced and sold blended crude oil before the June 2005 letter; (b) the Ministry was fully aware of this; (c) both Projects continued to produce and sell blended products after June 2005; and (d) there were no occasions in the pre-expropriation period when either Project was prohibited or prevented from producing and selling blended crude. It cannot be suggested that the Projects would have been prevented from producing and selling blended crude oil in the but-for scenario. However, they would not have made such a choice: they would have upgraded those additional crude oil volumes, thereby maximizing the value obtained from them.

306. With respect to the future period, *i.e.* from 1 January 2016 onward, Venezuela relies on the production forecasts created by Mr. Patiño. He determined for each Project an annual decline rate, at which the wells in each field will produce less oil over time. The Claimants note in this regard that where the pre-expropriation Projects used more advanced tools, Mr. Patiño's decline curve methodology is inappropriate and ultimately irrelevant. It is also clear that Mr. Patiño's simple decline rate methodology could only be used to evaluate a small minority of the wells at both fields. Mr. Patiño did not undertake the most basic reality check. He did not attempt to (i) reconcile his pessimistic forecasts against the far larger Proved Reserves figures published by the Ministry and PDVSA; (ii) compare his model's results to the long-term production forecasts prepared by the Projects since the expropriation; or (iii) test his forecasts against the actual EHCO production from the fields for past periods covered by those forecasts. The reports of the Claimants' expert, Dr. Strickland, reveal these and other fundamental flaws in Mr. Patiño's analysis, including the erroneous conflation of different types of wells.

d. PDVSA's poor management

307. The Claimants observe that PDVSA's practices and competencies became substantially different from those of the Projects' prior management, before the takings. In 2003 already, the government fired thousands of PDVSA's most experienced engineers and managers, and replaced them with political loyalists. Another wave of losses of experienced senior employees occurred in 2007. PDVSA offered substantially lower salaries to the Venezuelan personnel. Mismanagement and corruption have been documented in Venezuela and the United States.

308. In support of PDVSA's post-expropriation performance at the Projects, the Respondent argues that Chevron remained a shareholder and is a competent commercial organization. Yet the suggestion ignores that since the takings, PDVSA owns the entirety of what was the Petrozuata Project, and 70% of what was Hamaca. The governance structure of the companies has changed. While the Respondent further argues that Chevron retains a significant role on maintenance

activities at Hamaca, it has produced no evidence to that effect, beyond Mr. Figuera's unsubstantiated assertions.

2. The Respondent's Position

309. The Respondent notes that the Claimants' starting points for the extra-heavy crude oil upgrading Projects are (i) for Petrozuata, the October 2006 ConocoPhillips (COP) Composite Economic Model (CEM, LECG-085, BF-412), and (ii) for Hamaca, the October 2006 Petrolera Ameriven Hamaca Economic Model (AEM or PAM, LECG-129, BF-411). Both Projects have produced less oil than Claimants have projected. The Petrozuata Project suffers due to a high decline rate, the lack of good well targets and the low initial production of the wells. The Hamaca Project has suffered due to enormous problems at the upgrader, resulting in an average OSF of only 71.37%. These issues are detailed in the Third Supplemental Direct Testimony of Rubén Figuera and the Expert Report of Jesus Patiño, which form the basis for the valuation carried out by Mr. Vladimir Brailovsky and Dr. Daniel Flores.

310. The Claimants use virtually the same production and costs in their *ex post* valuations as they do in their *ex ante* valuations. The only difference is the inflation index; the underlying costs are exactly the same. However, those *ex ante* data bear no relationship to what actually happened in the Projects after the nationalization. While such data may have been appropriate to account for information that a reasonably informed buyer would have known as of the date of the nationalization, in an *ex post* valuation as of 31 December 2016, what actually transpired in the historical period must be taken into account.

311. The Respondent also reacts to the Claimants when they argue that they do not have to take into account the performance of the Projects under the operatorship of companies in which they are not participants. They contend that post-expropriation is essentially irrelevant to the "but-for" analysis, because they were entitled to compensation based on the manner in which the fields would have been operated had the Claimants not been dispossessed.

312. The Respondent further highlights the confusion entertained by the Claimants when referring to the Ministry reserves in this context. EHCO production volumes for the term of a project with a finite life using cold production techniques are not comparable to the volumes that Venezuela expects to be achieved over the entirety of the life of the field, both under cold production and using EOR techniques.

a. The oil production profiles

313. The Respondent has demonstrated precisely what the production and sales of CCO achieved by the upgrading Projects Petrozuata (now PetroAnzoátegui) and Hamaca (now

PetroPiar) have been during the historical period[90]. What the Respondent did was to properly assess the performance those Projects would likely have achieved in the historical period had the associations remained in place. Thus, the Respondent started with the actual CCO sales as the basis for the calculations, since the oil product the Petrozuata and Hamaca associations were permitted to sell was upgraded crude oil. The Respondent has estimated (not "projected") the volumes of EHCO that would have been required to achieve the actual CCO sales volumes realized in the historical period. In short, the Respondent started with the relevant actual performance data, namely CCO sales, and estimated from there EHCO production volumes and related costs that would have been incurred in a world in which the associations had persisted. The only "projecting" that the Respondent did was in connection with the future EHCO and CCO production, where projections are required, since the actual facts are not known.

314. The Respondent has established what the actual sales of CCO at PetroAnzoátegui and PetroPiar have been during the historical period and that those are the results that would in all likelihood have prevailed in a world in which ConocoPhillips participated in the Projects. It is the Claimants' burden to establish that the Projects would have achieved better results than those obtained by the post-nationalization companies if the associations had remained in place. But the Claimants' *ex post* valuations, which are premised on long outdated models that were prepared in 2006, ignore the real world and the historical realities of the Projects.

315. The Respondent's presentation of the potential EHCO production from the fields is based on Mr. Patiño's expert study. He had proceeded with a detailed examination of a selection of representative wells with the aim of determining the overall production capabilities of the fields. Based on this analysis he determined an overall decline rate of the wells between 20 and 22%. He concluded that the fields would run out of targets for new drills much sooner than this was projected, and that therefore the total production of EHCO would be significantly lower than the volumes the Claimants contend to extract from the grounds. This will be demonstrated in respect of each Project separately.

b. The expected oil production based on the Reserves figures

316. The production profiles used by the parties necessarily assume production only for the terms of the Projects. Neither party has assumed that EOR techniques, with the associated costs, would be employed at either Petrozuata or Hamaca. The Ministry Reserves assume production over the entire life of the fields and the implementation of EOR techniques that would increase the recovery factor to an assumed 20% rate against the original oil in place (OOIP) calculated at the outset of the Projects.

[90] Cf. Invoices in Figuera Appendices 42, 81, 104, 105; Reports in Figuera Appendices 106, 107, 108, 109, Patiño Appendix 46.

317. The Claimants argue that both categories of Reserves are defined to mean volumes that are commercially recoverable under existing economic and operational conditions. They ignore the distinction between production volumes that can be expected over the course of a period of approximately 30 years using primary production methods alone and the production that can be expected over the life of the oil fields using all known methods that would available for Venezuela (as opposed to a Project company). Mr. Figuera explained that the Ministry-approved Reserves assume that the wells will continue to produce oil, even at a lower and lower rate. They also assume that additional wells that are economically attractive to the country will be drilled in due time, and that EOR techniques ultimately will be employed over the life of the field. Mr. Figuera's basic point is that reserves for a country, as the owner of the resources, will invariably be higher than the reserves for a particular project of a finite term. This is so, not only because the country can use recovery methods that may not be attractive to a project participant, but also because the resource owner, producing through its national oil company, benefits from the entirety of the revenues realized on the production.

318. The Respondent refers to a presentation from Petrolera Ameriven to CVP from November 2006 distinguishing between a recovery factor of 5.4% of the OOIP for the 35-year life of the Hamaca Project, while the same factor applied to the life of the Huyapari field through 2150 was estimated at 11.7%[91]. This means that this field would produce more than twice as much EHCO as was estimated for the life of the Hamaca Project using cold production techniques alone. The Respondent also recalls that each of PDVSA's yearly management reports stated that the Reserves set forth therein are for the life of the field and are based on ultimate production using EOR techniques, as for instance in the 2008 Report (CLEX 39).

319. The Respondent also notes that the Claimants would never have implemented EOR at the Projects had they remained participants. Even if certain areas of both of the Projects' fields could potentially be exploited using EOR techniques, such hypothesis is irrelevant, since such techniques were never seriously considered and, in any event, neither Party is assuming the implementation of such techniques in this arbitral proceeding. Witness Brown explained that ConocoPhillips had suggested the use of steam assisted gravity drainage (SAGD) when Petrozuata was designing its first EOR pilot study in 2005. Neither he nor the Claimants mention that the SAGD project under consideration at Petrozuata was to be implemented only in a particular portion of the Petrozuata field's reserve area with sands having a then-estimated thickness of at least 40 feet, and that it was to use only single-lateral wells. They do not address either Mt. Lyons' statement at the 2010 hearing that there was not a high degree of confidence that such a project would work at Petrozuata. Even if the SAGD project had been implemented, it would only have been expected to contribute 20,000

[91] Figuera Appendix 75.

BPD of EHCO starting in 2015, at the earliest, at a cost of more than US$ 1 billion[92]. EOR was rejected by ConocoPhillips as uneconomic (C-333). The Claimants have never addressed the costs associated with EOR Projects, which involve massive up-front capital expenditures.

320. In sum, the Respondent concludes that there is no connection between the Ministry Reserves and the production volumes that can be achieved under cold production during the terms of the Petrozuata and Hamaca Projects. The Claimants' reliance on Ministry Reserves is nothing more than a smokescreen. What is impossible to understand is that if there is more than enough oil for the Projects to produce, why does the Claimants' own production profile for Petrozuata drop off the cliff in 2023, and why does the Claimants' own production profile for Hamaca fall off starting in 2031. The Claimants obviously cut their own production profiles because the fields simply cannot produce more, and, in fact, will produce less under cold production.

c. The control over the Projects

321. The Respondent objects to the Claimants' assertion that their continuing involvement on the sites would have contributed to raise production and improve performance of the Projects. In the post-nationalization period, as before, the PDVSA subsidiary would have held the position of control. Article 5 of the 1975 Nationalization Law provided for the control through the State company and this was retained in both the Congressional Authorizations for Petrozuata and Hamaca. Thus, nothing of significance at either of the Projects could be accomplished unless and until the PDVSA subsidiary gave its approval, and this would have been true for the associations post-nationalization as before. Witness Lyons acknowledged the control held by the PDVSA subsidiaries in the Projects.

322. The Claimants have never been able to explain why it should be assumed that at a project like Hamaca, the presence of a handful of ConocoPhillips secondees would have dramatically changed the results achieved in the post-nationalization period. At PetroPiar, Chevron personnel have, since the nationalization, held key positions in upgrader projects and technical management, maintenance, engineering and construction and drilling; they have been responsible for all of the major maintenance activities, including the 2009 turnaround, the combined turnaround/PRAC (Restoration Plan for Critical Assets) in 2012, and the series of PREMs (Restoration Plans for Major Equipment) starting in 2012.

[92] Figuera Appendix 80.

3. The Tribunal's Findings

a. The relevance of actual production figures

323. The Tribunal will analyze the production for each Project separately. As this has been explained above, it will rely on actual figures as much as they are available and based on reliable evidence. However, such approach is possible to the extent only that the Project's operation since the expropriation remains close to the characteristics that would have been prevailing had the Association Agreements not been extinguished. The main concern in this respect relates to the actual figures and forecasts presented by the Respondent since the year 2009.

b. The production forecasts as from 2009

324. The Respondent submits that the Projects' production of oil was much lower than what had been projected. In support of its submission, the Respondent used actual performance data, namely CCO sales, and estimated EHCO production volumes and related costs that would have been incurred in a world in which the associations had persisted[93].

325. However, this presentation, further explained above, is not correct. Mr. Patiño's available EHCO production was based on a retro-calculation from what he understood as the maximum quantities of oil capable of being extracted by the wells actually in place and later to be drilled. The EHCO quantities he retained for this purpose were admittedly lower than what he considered as the quantities of EHCO that were accessible on the fields and capable of being extracted if the required wells would have been available, which, in his opinion, was not the case.

326. The Respondent provided little explanation about the split operated as from 2009 between the production of syncrude or CCO, and the selling of blended oil. Albeit not supported by comments and focused evidence, the Respondent's statement is clear:

> Mr. Patiño's production capacity programs at both Petrozuata and Hamaca begin on January 1, 2009 because in 2009, the post-nationalization companies began to operate in a manner that was inconsistent with the pre-nationalization association model in that they produced and sold (or exchanged with other mixed companies) blended products, activities in which the associations were not authorized to engage. In the post-nationalization period pre-dating January 1, 2009, the mixed companies produced and sold only CCO and,

[93] The contracts on migration provided that the upgrading of extra-heavy oil was not the exclusive production, the mixed company further selling other hydrocarbons (cf. Article 3 of the contract for Hamaca dated 5 December 2007, R-45, and the draft of 17 January 2007, C-31, respectively for Petrozuata dated 22 January 2007, C-32).

> accordingly, the actual performance in that period represents what the performance would most likely have been had the associations remained in place[94].

Mr. Patiño made a similar statement:

> My production capacity programs were based exclusively on EHCO volumes required to achieve actual CCO production and sales in the historical period (and, therefore, excluded EHCO volumes used to produce blended products that the Projects under the association model were not authorized to sell). Since those volumes are less than actual EHCO production volumes achieved in the historical period, I also adjusted the well-drilling programs at the Projects to match those reduced volumes of EHCO, thereby eliminating costs in the historical period that the associations would have been able to avoid by deferring EHCO production capacity from which they could not have benefitted. The EHCO that was produced in the historical period but which would have been of no use to the associations was therefore excluded from the historical period and, instead, moved to the future (projection) period, along with corresponding costs, when the EHCO could be used by the associations had they remained in place[95].

327. Mr. Patiño as an expert could not provide witness testimony in this respect. He has not been contradicted by the Respondent. Mr. Patiño's expertise was based on quantities of EHCO supplied to the upgraders substantially lower than what has been provided before 2009. He thus incorporated in his examination the decrease in EHCO available for the production of upgraded syncrude. In so proceeding, he did not rely on the quantities of EHCO that have been extracted and shifted to the upgraders before 2009 when the Projects were operated as designed by the participants acting under the Association Agreements. He further told the Tribunal that his study and his instructions were different from the methodology currently existing at the Projects[96].

328. The same reduced figures then served Mr. Figuera's presentation that he brought before this Tribunal for the first time with his Third Supplementary Testimony. However, his testimony is not based on personal knowledge, as he had left the Projects long before 2009. He further demonstrated that his information was provided to him from external sources (basically Mr. Patiño), because it was completely absent from the statements he had submitted to the Tribunal before. Furthermore, his new figures are inconsistent with those contained in his prior witness statements.

[94] Respondent's Final Brief on Quantum, para. 317.

[95] Mr. Patiño's Consolidated Report (footnote 31). When referring to this note, the Respondent understood that the EHCO produced and used in the period starting on 1 January 2009 for production of blended products "is assumed to remain in the ground until needed for CCO production" (Respondent's Final Brief on Quantum, para. 317 *in fine*). Such assumption is purely theoretical and has nothing to do with the actual life of the fields.

[96] Cf. TR-E, 2017 February Hearing, Day 9, p. 2575:1-2577:12.

329. Mr. Figuera's interpretation of the shift that occurred as from 2009 in the production volumes provided to the upgraders is different from Mr. Patiño's and the Respondent's statement. Indeed, for Mr. Figuera, when the Projects began using excess EHCO for the sale of DCO or other blended products, "this was due to the chronically low OSF at the Hamaca upgrader and to certain events at Petrozuata that also reduced upgrader throughput"[97]. Thus, Mr. Figuera reversed the chain of causality: reduction in EHCO quantities provided to the upgrader was not the consequence of the choice to sell blended oil, but the effect of access restrictions to the upgrader expressed by its low OSF. However, Mr. Figuera does not provide any element of information on actual facts in support of his assertion. The sudden shift he observed starting in 2009 has no explanation based on the timeline of events: in the second half of 2007 and the year 2008, the upgraders were operating correctly and complying with the parameters for EHCO to CCO throughputs as before. Witness Figuera testified that in the second half of 2007 and in 2008 no blended oil (DCO or Merey 16) was produced at Hamaca or Petrozuata[98]. The shift to sell blended oil occurred in 2009. An upgrader's quality assessment cannot show a sudden "jump" from 79% to 60% OSF from 2008 to 2009, without any operational explication other than the volume of EHCO provided to the upgrader. No change has been reported in relation to the performance of the upgrader. There is no evidence before the Tribunal that the volumes of incoming EHCO and outgoing CCO were reduced because of a limited availability of the upgraders that would have had equally materialized under the operation based on the Association Agreements[99]. Mr. Figuera adopted Mr. Patiño's figures and his approach based on decline rates. Mr. Patiño's conclusion in respect of the limited output of the upgraders was based on his understanding of the EHCO production from the fields and not on the examination of the upgraders' performance that he had not done. It is instructive to observe the figures he lists as conclusion of his analysis of the upgraders' performance[100]: First, the expert identifies the possible EHCO production to the upgrader as the result of his analysis of the available EHCO in the fields; and then, second, he calculates the out coming CCO by using the yield factor exclusively, as if the upgrader would operate at a 100% OSF[101]. The Respondent[102] and its valuation experts[103] have reproduced the same numbers.

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[97] Fourth Supplemental Testimony, 7 January 2015, para. 21.

[98] Fourth Supplemental Testimony, 7 January 2015, para. 21, footnote 46.

[99] Witness Sheets explained that it is more expensive to refine heavy crude than light sweet crude. "For this reason, if the differential between heavy and light crude drops sufficiently, at some point it becomes economically justified for refiners to convert heavy oil refining capacity back to regular light oil refining capacity (termed "loafing" the coking facility). This point may be reached when the differential falls to just a few dollars." (Witness Statement, 30 October 2009, para. 22).

[100] Consolidated Expert Report, 17 October 2016, paras. 116, 193.

[101] For instance, for Petrozuata and for 2017, an EHCO production to the upgrader is determined at 86,829 BPD, yielding 74,855 CCO, which is the result of the yield factor of 0.8621. For the same year, at Hamaca, 143,432 BPD of EHCO produce 135,256 CCO, a result obtained through the yield factor of 0.947. No impact of a reduced OSF has been measured in these calculations.

[102] Respondent's Final Brief on Quantum, paras. 325, 363.

[103] Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 246-249, 259.

330. These basic elements of the Respondent's production figures will be analyzed in more detail below.

331. The Respondent has not submitted testimony on this matter before this Tribunal. The Tribunal assumes that this could have been done easily by calling personnel responsible for the operation of the sites conducted by PDVSA and thus under the State's control. The evidence before the Tribunal is therefore based in significant parts on documents relating to sales of oil. These sales are in two parts. The greater part relates to invoices and sales of CCO. The smaller part is about the sale of blended oil, which means oil not upgraded and sold as quantities of EHCO combined with naphtha (DCO) or with Mesa (resulting in Merey 16), usually in a proportion of 76.67% to 23.33%.

332. The Respondent objected to the use of any figure relating to blended oil, arguing that the Projects were not permitted to deal with such oil, as they were under an obligation to produce syncrude exclusively[104]. The latter observation is correct, subject to an examination of the question whether the Projects were permitted to sell blended oil during turnovers. The main parts of the 23 June 2005 letter of the Ministry of Energy and Mines concerning Hamaca[105] read as follows:

> THIRD: The blending of extra-heavy hydrocarbons is only envisaged in the pre-operating phases, but not in subsequent exploitation phases. The blending of extra-heavy hydrocarbons during the periods which correspond to the plant shut-down is not authorized in the decision of the Congress of the Republic and in the Bicameral Commission's Report.
>
> FOURTH: The activities carried out or the situations created during the exploitation of extra-heavy crude in the Orinoco Oil Belt that exceed the limit of the decision of the Congress of the Republic, shall be considered outside the framework of that decision. Accordingly, it shall be understood that the aforementioned activities and situations are subject to the provisions of the law in force, especially to those [provisions] of the Decree with Force of Organic Law of Hydrocarbons, dated November 13, 2001.

The fifth paragraph further explains that the volumes of hydrocarbons that exceed the monthly average production of MBD that was approved by the Congress shall be subject to the 30% royalty rate set forth by the aforesaid law, and that this also applied in cases of volumes related to the blending of extra-heavy crudes. It was also stated that the payment of such royalties does not legitimize the excesses identified and does not imply an authorization for such activities.

[104] Cf. Hamaca Congressional Authorization, Tenth Condition (R-93); Hamaca Association Agreement (Sec. 6.2).

[105] Testimony of Dr. Mommer, Appendix 1, including a nearly identical letter send to Petrozuata the same day (also C-217, R-199).

333. The Tribunal understands this last paragraph as being directed essentially to the royalty rate, which shall be the regular rate of 30% in the case of any excess production running over the volume of 197 MBD of extra-heavy crude. Blending of extra-heavy oil was not prohibited during shut-downs, but tolerated. As stated in paragraph 4, such production was outside the activity governed by the Association Agreement. Article 1 of the Hamaca Agreement defines "Commercial Production" as "the upgraded oil produced by the upgrading of Extra-Heavy Oil", whereas Article 1 of the Petrozuata Agreement states that the "Project" relates to the production and upgrading of extra-heavy oil; blended oil is not included in these definitions[106]. Therefore, the quantities of blended oil that ConocoPhillips allegedly had produced and sold and later envisaged to provide in by-passing the upgrader during turnarounds were not covered by the scope of application of the Association Agreements. They were nonetheless part of the "taking", because they represented assets and interests that were included in the scope of the expropriation based on Article 2 of the Law on the Effects of the Process of Migration into Mixed Companies of the Association Agreements of the Orinoco Oil Belt of 11 September 2007 (C-35).

334. The main part of the Respondent's argument in respect of blending, however, is wrong. The Tribunal does not consider relevant the actual or future sales of blended oil. It only notes, and considers this important, that there were substantial quantities of EHCO available to allow selling considerable amounts of barrels of blended oil since 2009. The Respondent noted that at Petrozuata "a significant volume of blended products" was sold[107]. The situation was the same at Hamaca[108]. Had the Association Agreements remained in place, such EHCO would not have been used for the purpose of blending, but it would have been included in the process of upgrading and be added to the quantities of oil sold as CCO.

335. In light of the omission to take account of the EHCO available for blending, the quantities of EHCO referred to by Mr. Patiño and Mr. Figuera are not reliable for the determination of the CCO production as it would have been possible had the Projects remained as they were under the Association Agreements. It would seem that Mr. Patiño was aware of this difference in counting, because he also listed the amounts of EHCO potentially extractable. However, he did not use these figures, and Mr. Figuera and the Respondent and its experts ignored them. They will come back in the Tribunal's analysis below.

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[106] For the same reason, the Respondent's experts explained that the Hamaca compensation provision that is based on revenues from commercial production could not apply to an activity such as blending; TR-E, 2017 February Hearing, Day 6, p. 1669:20-1670:8 (Flores).

[107] Respondent's Cost Estimation for Petrozuata, p. 7, 72, 73; TR-E, 2017 March Hearing, Day 14, p. 4269:18-4270:3, 4290:9-13 (Preziosi).

[108] Respondent's Cost Estimation for Hamaca, p. 7, 76, 97.

336. The Tribunal finds, however, that the Claimants' presentation is not accurate either. The quantities of oil that have been reported on the Tables submitted on 20 March 2017 as "blended" are not accounted for in the Claimants' models and documentation as having such characteristic (composed of EHCO and naphtha or another diluent). The Claimants add in a comment to their Tables that the source for such "blended" oil has to be found under "ECHO by-pass"[109]. The Claimants' Replies of 10 July 2017 affirm that the production of blended oil has been reflected in pre-expropriation business plans[110], however without demonstrating convincingly that such production consisted of more than simple EHCO by-passing the upgrader. The models and the Claimants' experts' accounts determine quantities of "EHCO by-pass" during turnaround years. Contrary to the Claimants' assertion, the term "blended oil" is not used in this connection; "EHCO by-pass" is EHCO and not "blended oil". The Composite Economic Model (CEM) of 2006 records, for instance, 2,400,000 million barrels (MMB) as "EHCO By-pass" for each turnaround year at Petrozuata, whereas the line labeled "(Blend (Zuata 9 - Naphtha)" is completely empty[111]. For Hamaca, the main figure is 2,880,000, also under the heading "EHCO By-Pass" (there is no mention of blend)[112]. Consistently, there is, for Petrozuata, no cost item relating to the 23.33% naphtha component of blended oil[113]; for Hamaca, costs for "Naphtha-Make-up" are noted but such expense appears as projection and not relevant for oil sold as EHCO[114]. The Claimants' experts account for EHCO by-pass in turnaround years, combined with prices relating to EHCO sold (neither CCO, nor blended oil). On the other hand, the total volume of 913,5 million barrels claimed as the Claimants' loss for Petrozuata's post-expropriation period includes a volume of 9,044,000 MMB EHCO

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[109] Cf. Claimants' Tables submitted on 20 March 2017 for Petrozuata and Hamaca.

[110] Question 15, para. 36. However, the Petrozuata 2006 Business Plan simply mentions EHCO by-pass production (slide 2, LECG-082). The Hamaca 2006 Business Plan notes the use of EHCO for "blending and sales" independent of the upgrader during turnarounds (p. 20); it records prices for EHCO blend (p. 17) that are so low (compared to naphtha) that they rather support the assumption of simple EHCO production. When the Claimants quote their experts (*ibidem*, footnote 62), they refer to their reporting on "EHCO" and not "blending" (CLEX-086). Similarly, the Hamaca Board of Directors provided on 18 May 2006 for a 90 MBD by-pass production of EHCO during turnaround (C-344, Figuera Appendix 25, p. 3, 8), and, at its meeting of 12 September 2006, it assumed a production of 80 MBD EHCO during such an occasion (Figuera Appendix 75, p. 2). By-pass production during turnarounds and emergency shutdowns was also recognized at Petrozuata; cf. Financial Statements 2006/5, p. 14, noting that by-pass production consisted of EHCO not processed through the upgrader (LECG-009); and for 2004/3, p. 14/15, adding that by-pass produced oil was blended with Santa Barbara crude (LECG-094). The Respondent's Counsel mentioned an agreement of the Ministry with PDVSA "to provide the Mesa necessary for the blending process" during the 2006 turnaround at Hamaca; TR-E, 2017 September Hearing, Day 16, p. 4568:4-9 (Preziosi).

[111] CEM, p. 53-55/pdf.

[112] CEM, p. 244/245/pdf.

[113] CEM, p. 63-65/pdf.

[114] Cf. CEM, p. 245/246/pd, and CLEX-086, Hamaca, OPEX. Such costs are explained as projections for future sale of blended products on the Claimants' part (cf. Respondent's Cost Estimations for Hamaca, under Nos. 14 and 21). However, such production took never place and the Claimants' experts, while accounting for costs for naphtha, account in fact for the sale of by-pass EHCO that does not contain naphtha. In any event, the amount in US$ for the naphtha portions as mentioned do not comply with the quantities of EHCO by-passed if one would prefer understanding that such EHCO was used for the production of blended oil.

by-pass[115]. Such an accounting may be the source of errors due to the fact that prices for EHCO sold on the market are different (substantially lower) than those for CCO[116] and for oil blended with a diluent. For Hamaca, the total EHCO by-pass was 20,880,000 MMB[117]. On the other hand, EHCO by-passing the upgrader is covered by the expropriation of an asset or interest according to Article 2 of the 2007 Law, as it applies to blended oil.

337. At the outset, the Tribunal notes that there is no evidence on the production of blended oil during turnarounds in the Claimants' case. In addition, the wells' activity could be turned down but never stopped completely; there were quantities of EHCO to be disposed of when no upgrading capacities were available due to an ongoing turnaround. Part of such volumes of EHCO could be stored on the upgrader's site and disposed of as soon as the turnaround was terminated. Another part, exceeding such storage capacities, was sold as EHCO. These volumes of "EHCO by-pass" are not accounted for by the Respondent's experts[118], whereas they are included in the Claimant's experts' accounts together with prices in US$ that appear to represent amounts around 30% compared to the sales prices for heavy syncrude. They represent what the Claimants wrongly labeled as "blended oil".

338. The Tribunal has two ways to take account of this supplemental sale of EHCO that represents a loss when compared to the but-for scenario governed by the Association Agreements. One option would be to take account of the respective volumes of EHCO by-passed and sold during turnarounds separately, and to deduct the associated costs, royalties and taxes. The Tribunal does not adopt this method, because in the absence of reliable information on the latter items the result would be speculative[119]. The other option is based on the true function of the sale of EHCO by-pass, which is to compensate part of the loss in production of upgraded CCO during turnarounds. As will be explained below in part F, such compensation is made in the form of values additional to the total input of EHCO to the upgrader and the outgoing CCO.

[115] CEM, p. 52/pdf; Claimants' Final Submission on Quantum, para. 34, notes that during upgrader maintenance periods, the Petrozuata Project sold blended products. See also CEM, p. 15, recording a total of 934.9, an amount reduced by the Claimants' experts to 913.5 for the purpose of excluding the first half of year 2007; Abdala/Spiller, Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, footnote 37.

[116] In the valuation of the Claimants' experts, prices for EHCO sold are approximately 30% of the pricing of heavy syncrude; cf. CLEX-086, Revenues (Petrozuata and Hamaca).

[117] Cf. CEM, p. 244/245/pdf.

[118] Cf. Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, footnotes 129 and 152, where the reference to the sale of EHCO by-pass, respectively blended oil, during turnarounds by the Claimants' experts is noted.

[119] For instance, royalty would be fixed at 30% and not combined with the extraction tax to a total of 33⅓%.

c. The Reserves figures

339. The Tribunal recognizes the difference existing between the Reserves available for the Projects for their lifetime and the Reserves remaining in the fields after that until a later point in time when they will be completely exhausted after all available techniques for oil extraction have been used.

340. Nonetheless, the Tribunal notices a gap in the Respondent's reasoning. It is one thing to affirm that the full quantity of Reserves of the whole field will not be available for the Projects for the next 20 years, while it is a different matter to know the quantity of oil Reserves contained in the field that can be extracted by the Projects during their lifetime. In other words, while the Reserves of the field offer production of oil for a longer period than the term of the Projects, this does not state how much will be available for the Projects and how much will remain when they reach their term. In order to answer such question, one needs to assess either the Reserves available for the Projects or the difference between such Reserves and the Reserves of the field. The Respondent did not provide this information[120].

341. The information provided by the Ministry Reserves figures implies the use of techniques that are more developed and more productive than the cold production operated by the Projects. EOR techniques are mentioned in this respect. However, even when assuming that the Ministry Reserves cover Reserves contained in the field that are not accessible to the Projects as long as they do not change their operational mode, such information does not determine the quantity of Reserves available for the Projects.

342. What the Respondent calls Mr. Figuera's basic point, that the reserves available for the owner of the resources will always be higher than the Reserves for a particular project of a specific term, is of course correct. But it does not help to identify the quantity of Reserves available for the Projects. Mr. Figuera's formula would still be entirely correct if the Projects would leave one barrel of oil in the field when they leave the site. Further analysis is required.

343. One refinement of Mr. Figuera's basic point relates to the impact of costs. Contrary to the Projects' Reserves, that are accounted for only if recovery is certain or probable when using a technique that is known and proven, the Ministry's Reserves do not account for the impact of higher costs due to the use of new techniques and the difficulty to extract the field up to its point of exhaustion. There might come a point where the production based on the remaining Ministry's Reserves in the field becomes uneconomic, notably when compared to the costs of importing oil from abroad.

[120] The Respondent's valuation experts could have gathered such information when they visited the site, but they were instructed not to ask questions about the production of the reservoirs; TR-E, 2017 March Hearing, Day 12, p. 3613:3-9 (Flores).

344. The Respondent conducts its demonstration by reference to the Hamaca recovery factors of OOIP that differ from 5.4% to 11.7%, depending whether one looks at the 35-year life of the Project or at the life of the field. Again, even if correct, this does not show that the recovery of 5.4% would not be sufficient for the operation of the Project in accordance with its projections[121]. These figures do not explain either whether, or if so how, the potential recovery of the Project could not be increased, in order to capture quantities above 5.4% but still below 11.7%[122]. The same document identifies the crude recoverable until 2150 as 3,715 MMB[123], which is more than enough to allow the extraction of volumes envisaged by the Project. If the situation was as alarming as it is presented by the Respondent, one would expect to find at least a note in such a budget report. There is no such note.

345. It appears interesting to note that for the Huyapari field (that is part of Hamaca), the 2015 PDVSA Report records 4.5 billion Proved Reserves in 2015 (CLEX-090)[124] and compares this volume to an actual production of 151 MBD, which is stated to be in a relation of 1:83 to the Reserves. The reports relating to the years 2008 to 2013 note amounts of Reserves between 4.136 and 5.34 billion, with production numbers between 125 and 165 MBD per year (CLEX-039). The Report filed by PDVSA with the Security and Exchange Commission on 17 November 2006 reported 3.808 billion Proved Reserves for the Hamaca's Huyapari field, noting that at a production rate of 106 MBD, this would allow production for 98 years (C-258, p. 27, 42/pdf). Similarly, the Petrozuata figures had moved from 2.522 billion at the end of 2004 (same Report, p. 42/pdf) to 2.4 billion in 2006 (C-404) and 3.9 billion in 2010 (C-623)[125]. The Descriptive Report of 1996 had stated that a reserve of 2.7 billion was sufficient to guarantee the 1.5 billion to be produced by the Project during 35 years[126]. Any other position would run counter to the Association Agreement (C-21) where the parties accepted that 1.533 billion barrels could be currently planned as "Total Oil Required" (Art. I). It would seem far from reality to submit that the Project's reserves are pumped out in the near future.

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[121] Cf. Figuera Appendix 75, slide 15.

[122] The Tribunal notes that the General Business Plan attached as Exhibit B with the Hamaca Association Agreement (C-22, p. 518/pdf) forecasts "a primary depletion recovery factor of 10.5%", grounding this conclusion on an estimated OOIP of 33 billion barrels and the current drilling plan, based on the results of laboratory studies, review and extrapolation of Block B production history, and reservoir simulation" (comment to figure 3).

[123] Figuera Appendix 75, slide 10.

[124] Figure confirmed by Witness Figuera, TR-E, 2017 February Hearing, Day 8, p. 2439:13-18.

[125] Witness Figuera did not object to this assumption (TR-E, 2017 February Hearing, Day 8, p. 2369:10-2374:14), having accepted earlier that the figure of 2.477 billion barrels was correct (TR-E, 2010 Hearing, Day 8, p. 2119:8-2120:10).

[126] Joint Venture Project (Maraven-Conoco) Petrozuata C.A. Descriptive Report, p. 130/pdf (C-92); Revision of Descriptive Report dated January 2000 (C-323, p. 59/pdf). Witness Lyons confirmed the numbers (TR-E, 2017 February Hearing, Day 7, p. 1893:12-1894:10, 1932:20-22) and the figure of 2.434 retained in 2006 (TR-E, 2017 February Hearing, Day 7, p. 2017:3-2019:9, 2020:16-2023:14).

346. The Parties have not provided evidence that allow the Tribunal to draw precise conclusions about the potential impact of EOR or techniques other than cold production. It has been stated that such techniques were uneconomic; it must be stressed that this was in 2003 or later, but before 2007. For instance, the Tribunal considers too short the Respondent's statement that the Petrozuata Board of Directors concluded at its meeting of 6 October 2005 that Enhanced Recovery (EOR) using steam-assisted gravity drainage (SAGD) was uneconomic (C-333). In fact, as the Minutes explain, the Board wanted to submit the matter to the representatives of the shareholders. It was noted that the Ministry imposed a limit on Petrozuata of 120,000 BPD of EHCO per month; the Minutes then say:

> Consequences – if the limit continues for the life of the concession, there is no incentive to change the current cold production techniques until or after the year 2030. (p. 297)

The Respondent's Witness Mr. Figuera was involved in actively considering a shift to EOR techniques, as noted in the Minutes:

> Ruben Figuera proposed that the Enhanced Oil Recovery (EOR) Pilot Project be considered to be a technology investment and, as such, that it be carried out using resources reserved for the contributions required by the Science and Technology Law, which has been estimated for 2006 at approximately US$ 34 MM. The members of the Board of Directors believe that this is a possibility, if other technology investments or expenses are not identified which would add to the amount of the estimated contribution. The members of the Board of Directors agreed to discuss this point in the scheduled meeting of shareholders in order to reach an agreement. (p. 300)

Mr. Figuera explained that the Project recognized that there was the capability, through the use of steam injection technology, of extracting oil with higher viscosity from the thicker sands that had already been exploited, but that such technology would be difficult to implement given the Project's earlier decision to drill extensively multilateral wells[127]. Witness Lyons also confirmed that such techniques were available when they became necessary in order to fill up the upgrader[128]. A Petrozuata EOR Information Package of March 2005 contained a feasibility study promoting EOR as an option to utilize the excess gas production on site (C-332).

347. The Respondent's rejection of any access to such techniques in later years and for the second part of the life of the Projects is not convincing in light of its submission of an expert opinion prepared by Dr. Rafael Sandrea concluding that steam injection "was likely no longer uneconomic

[127] Figuera, Testimony, 20 July 2009, para. 22; Supplemental Testimony, 26 January 2010, paras. 20, 27; Third Supplemental Testimony, 15 August 2014, para. 72.

[128] TR-E, March 2017 Hearing, Day 11, p. 3216:4-12.

in 2004 and certainly was not uneconomic by 2006 and 2007, when oil prices rapidly increased"[129]. This report stays in line with the deliberations of the Petrozuata Board of Directors in 2005[130]. The actual interest for such enhanced technology is also shown by the Respondent reporting about an "EOR assessment" at Hamaca in 2015 for which it claims reimbursement of costs of US$ 5.6 million[131]. The Tribunal understands that there was certainly a potential for introducing new and more efficient extraction techniques that would have enlarged the Projects' Reserves and increased their production[132]. Witness Figuera reported that all wells drilled since 2015 at Petrozuata have been fitted for ultimate steam-enhanced oil recovery in the future, a strategy consistent with the Ministry's directives to prepare for the use of EOR techniques to achieve a higher ultimate recovery factor of the fields[133]. PDVSA reported for the year 2009 that the project for steam injection (SAGD) "was launched as the method for obtaining improved recovery of extra heavy crude oil in the Orinoco Belt area, in order to increase the oil reserve recovery factor up to 60%"[134]. However, the Tribunal's record does not contain information and evidence sufficient to allow taking into account an extension of oil extraction in quantitative terms. Nonetheless, the availability of such techniques, supported by the Respondent's expert Sandrea from a time prior to the expropriation in 2006, make it possible to accept that the Projects had a potential of development that may have compensated in large part the alleged decline of the Projects' ability for EHCO recovery as argued by the Respondent in this proceeding.

d. PDVSA's management

348. The Tribunal considers it plausible that a number higher than usual of employees left Venezuela in the aftermath of the migration to *empresas mixtas* and the expropriation of two important holders of association agreements in the Orinoco Belt. It notes, however, that it has not received detailed information of such a move, and literally nothing about its impact on the operation of the Projects.

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[129] Expert Testimony of Dr. Rafael Sandrea, 29 January 2010, p. 25.

[130] It was said that there were initiatives taken to introduce steam injection; TR-E, 2017 March Hearing, Day 11, p. 3188:4-3189:7 (Lyons), p. 3190:3-3191:7 (Figuera); TR-E, 2017 February Hearing, Day 9, p. 2702:15-21 (Patiño).

[131] Hamaca Project Cost Assessment, p. 49.

[132] The potential for the implementation of such future techniques had been recognized already in the General Business Plan attached as Exhibit B with the Hamaca Association Agreement (C-22, p. 518/pdf), noting that: "Secondary recovery using water, gas, steam or other methods is not planned at this time, but may be determined to be viable, as more is learned about the reservoir characteristics in the Specified Area" (comment to figure 3).

[133] Cf. Fourth Supplemental Testimony, 7 January 2015, para. 59; further Testimony, 20 July 2009, footnote 19; Supplemental Testimony, 26 January 2010, para. 27; Third Supplemental Testimony, 15 August 2014, footnote 207; Fourth Supplemental Testimony, 7 January 2015, para. 85.

[134] PDVSA Annual Report 2009, p. 716 (C-564).

349. The mere fact that PDVSA offered substantially lower salaries to the Venezuelan personnel does not demonstrate that the quality of their work was lower than the quality of the work performed by previous workers. It has been said that most experienced technical employees left the Projects when the expropriation occurred[135]. But what were the numbers and the concrete impact? No evidence has been provided. Similarly, the Claimants' suspicion that Chevron was no longer admitted to play a significant role in the operation and maintenance of the Projects, and the upgraders in particular is not supported by any evidence[136]. It is taken as a "key-assumption" of the Claimants' experts[137]. This is not the role of an expert. The Claimants could have provided witness testimony or could have expanded on the analysis of the agreements governing certain *empresas mixtas* where the foreign (minority) participants, like Chevron, had controlling functions as operators of important parts of the Projects[138].

350. The Tribunal noted that in certain respects, difficulties with the personnel have been observed and may have had the effect of lowering the progress of work, in particular during turnarounds on the upgraders[139]. This could have been a factor impacting on time and costs. It would have to be taken into account, if properly argued and supported by evidence. This will be considered later as a potential impact on costs.

C. Production at Petrozuata - Upstream

351. The Petrozuata Project was initially provided with a designated field comprised of a "Base Area" of 231 km^2 and a "Reserve Area" of 69 km^2 consisting of two areas, one to the south of the Base Area and the second to the east. The Project was supposed to be developed from the Base

[135] Lyons, Fourth Witness Statement, 16 May 2014, para. 22; TR-E, 2017 February Hearing, Day 6, p. 1573:3-11 (King).

[136] Witness Figuera stated that after the migration, engineers from Chevron became responsible for upstream planning and monitoring at Hamaca (cf. Testimony, 20 July 2009, para. 47). Chevron secondees occupied key positions (TR-E, 2017 March Hearing, Day 11, p. 3197:19-3199:4). Chevron was one of the most important partners in the country (TR-E, 2017 March Hearing, Day 11, p. 3199:12-14).

[137] Consolidated Update Report, 17 November 2016, paras. 8 (a, b), 46, 116, 214; TR-E, 2017 February Hearing, Day 6, p. 1696:21/22; 2017 March Hearing, Day 12, p. 3420:4-6, 3421:10-14, 3422:18-3423:2, 3426:15-3427:8, 3428:9-3428:20, 3437:16-19 (Abdala).

[138] The Contract for the conversion to the mixed company PetroPiar executed on 5 December 2007 (R-45) provided that the Technical and Operations Manager shall be nominated by Chevron Orinoco, and that the management structure shall be reviewed by the partners for the purpose of assuring that it responds to the objectives and purpose of the mixed company (Art. 4.2).

[139] The most explicit source constitutes the report on the PetroPiar turnaround of 2012, noting "deficient performance of contractors due to lack of experienced supervisors", "many decisions made without involving the planners", "lack of quality control and specialists by the contractor, to repair tanks", "insufficient personnel to cover the work shifts", "insufficient operational support personnel"; Figuera Appendix 46, PetroPiar 2012 Final Report on the PRAC, August 2013, p.87.

Area, and the Reserve Area was to be utilized only if the Project partners agreed that it was necessary and access was granted by the Ministry.

1. The Claimants' Position

352. The Claimants' experts took the most conservative oil production profile as it was contained in the ConocoPhillips Composite Economic Model that had been updated in late 2006 (LECG-085). This yields a projected recovery at Petrozuata of 913.5 million barrels of EHCO over the period between July 2007 and 2036[140].

353. A wealth of contemporaneous evidence confirms the reasonableness of the Claimants' production profile, in particular: (a) the Proved Reserves figures, as certified in August 2006 by the consulting firm D&M at 1.02 billion barrels of oil as of 31 December 2005 (LECG-078) and as at 31 December 2006 for SEC reporting purposes at 936.4 million barrels (LECG-006, 108); (b) the Petrozuata Economic Model from late 2006, showing a balance of 1.192 billion barrels (LECG-077, p. 468/pdf); (c) the Petrozuata Business Plan of 2006, forecasting total production of 1.235 billion barrels of EHCO from 2006 to 2036 (LECG-082)[141].

354. The Petrozuata Project would likely have achieved at least the level of production anticipated before the expropriation and used in the Claimants' damages model, which is conservative. Moreover, the Claimants would have promoted the use of EOR techniques, which would be expected to increase EHCO production by a factor of three times or more, and at a minimum would have enabled the Project to "keep the upgrader full" for the full contractual term (120,000 BPD).

355. PDVSA endorsed the production profile relied upon by the Claimants at the time. In June 2007, both the Respondent and Mr. Figuera affirmed that the Petrozuata Project would produce at least as much EHCO as required over its contractual term. From January 2005 until late 2006, Mr. Figuera was the President of Petrozuata. He approved oil recovery projections even greater than those assumed by the Claimants' experts. (a) The Petrozuata 2005 Annual Report projected that this Project would produce more than 1.6 billion barrels of EHCO over its operating life (LECG-106, p. 1). (b) In November 2006, Mr. Figuera delivered a presentation confirming that the Project was projecting the recovery of volumes of oil over 1.56 billion barrels of EHCO (C-324). In 2006, the Ministry announced that Proved Reserves at the Petrozuata field were 2.4 billion barrels, a figure certified by Mr. Figuera (C-471). The Ministry proposed almost doubling production at Petrozuata in August 2006, only 10 months before the taking (C-231). The Proved Reserves figures for Petrozuata that Venezuela has adopted and published after the expropriation remove any doubt

[140] Figure reduced from 934.9 covering late 2006 to 2036.

[141] This plan had not been approved by the Board, but for reasons unrelated to the productions, namely the proposed use of the Reserve Area (C-333).

about the field's ability to meet the Claimants' production profile, because they have been going up, from approximately 2.4 billion barrels as at the end of 2006 to 3.9 billion barrels now. 2010 is the latest year for which such figures were published.

356. Venezuela has chosen Mr. Patiño's pessimistic forecast, arguing that after the taking, the Petrozuata field has turned out to be far less productive than anticipated, and is now largely tapped out. Venezuela's date-of-award valuation assumes that the total EHCO production at Petrozuata from June 2007 to 2036 will be 522 million barrels. This hypothesis has to be compared to another, relating to the Ministry's Proved Reserves. Here the figures increased from 2.434 billion barrels in 2006 to 3.923 billion barrels in 2010 (C-404, C-623), while in parallel the Respondent's projections for production decreased from 653 million (Mr. Figuera) to 522 (Mr. Patiño).

357. Mr. Patiño adopts a decline rate for all wells in the field of 22% (corresponding to a 20% decline of the production rate). He uses this rate to suggest that a great number of new wells will need to be drilled each year. Further, he forecasts initial production rates for the new wells that will be drilled in the future. And he concludes that insufficient viable targets exist to supply the upgrader past 2021. The Claimants' expert Dr. Strickland explains that the core of Mr. Patiño's method – the use of simple decline curves – is inadequate, and the method itself fraught with mistakes.

358. Mr. Patiño calculates his decline rate by analyzing well test data for a total of 124 wells at Petrozuata, and he derives the median rate of decline for those wells, which he then applies to all existing and future wells in the field. Dr. Strickland shows that Mr. Patiño misapplies his own inadequate decline rate methodology. First, he uses well test data only providing for a brief "snap-shot" of a well's life, and do not account for routine operational changes that allow the prolongation of the lives of wells and the increase the amount of oil that they produce. Mr. Patiño should have used the fiscalized daily production. Second, Mr. Patiño wrongly conflates different types of wells. Some wells exhibit "exponential" decline (meaning they decline at a constant rate over time), while others are "hyperbolic" (meaning that the rate of decline constantly decreases over time). While two wells decline at an initial rate of 20%, the decline of the hyperbolic well subsequently reduces, with the effect that this well produces more barrels of oil over its life time than the exponentially declining well. Mr. Patiño acknowledges that about half of the 124 wells that he analyzed at Petrozuata exhibited hyperbolic decline. He nevertheless effectively did not make the distinction, thereby understating future production.

359. Mr. Patiño seems to have recognized his error when providing a revised decline rate in his Consolidated Report (paras. 42-45). His new analysis shows that when hyperbolic wells are properly taken into account, the field decline rate would drop from 20% to 14%, leading to a higher ultimate recovery. To avoid this result, Mr. Patiño reintroduced into his calculations wells that he had previously excluded, and he also calculated different decline rates for existing and new wells.

360. Dr. Strickland compared the production resulting from the decline rate determined for the 124 wells Mr. Patiño had chosen with what those wells actually produced during that same past period according to PDVSA's data. As Dr. Strickland showed, Mr. Patiño's analysis produces results that understate actual production during the historical period by a wide margin. Mr. Patiño's analysis results in an understatement of expected production at Petrozuata by approximately 367 million barrels of oil. Venezuela further refers to various Petrozuata documents that allegedly show decline rates similar to those claimed by Mr. Patiño. However, these documents generally comprise short-term assessments. They do not support Mr. Patiño's decline rate analysis.

361. For the Claimants, a further flaw is Mr. Patiño's conclusion that there were only 262 well targets remaining in the Petrozuata field as of 1 January 2009. Mr. Patiño applies an unrealistic standard to determine what oil sand bodies count as targets. Mr. Patiño's criteria are unreasonably restrictive. Had those criteria been applied in real life, a number of wells that the Petrozuata Project actually drilled would not have been drilled. Dr. Strickland shows that Mr. Patiño missed at least 22 additional viable well targets, even when applying his criteria. This mistake reduces the forecasted production by approximately 18 million barrels.

362. The Claimants also object that Mr. Patiño's production model exclusively assumes the drilling of single lateral, as opposed to multilateral wells. A single lateral well has only one horizontal bore, while multilateral wells have two or three horizontal bores at different depths. At the outset of the Petrozuata Project, the shareholders (including PDVSA) jointly decided to drill primarily multilateral wells. Multilateral wells proved themselves capable of producing significantly more oil at Petrozuata than single lateral wells. Once it took over operations at Petrozuata, PDVSA largely abandoned this strategy and reverted to drilling less productive (and also cheaper) single lateral wells. Prior to the taking, the Project projected drilling up to 250 multilateral wells from 2007 through 2036 (C-337, C-480). The Respondent claims that by November 2006, the Petrozuata Board of Directors lost confidence in the use of multilateral wells[142]. The documentary record is different. The Project continued to endorse the drilling of multilateral wells. In November 2006, Mr. Figuera gave a presentation favorable to such wells (C-324), followed by another presentation in February 2007 (C-374). Venezuela proceeds to argue that multilateral drilling is too risky. These criticisms are rebutted by the Claimants' witness, David Brown.

363. The Claimants conclude that when the necessary corrections to Mr. Patiño's forecasting model are made, as Dr. Strickland did, Mr. Patiño's model yields a production profile consistent with the one used by the Claimants' experts. This confirms the adequacy of these experts' pre-expropriation forecasts, whose achievability is confirmed by the Ministry's, PDVSA's and

[142] Cf. Respondent's Rejoinder on Quantum, 7 January 2015, para. 365; Figuera, Third Supplemental Testimony, 15 August 2014, para. 72.

ConocoPhillips' pre-expropriation Proved Reserves figures. The Claimants' documentation notes forecasted volumes of 118,200[143] and 118,000 BPD[144].

2. The Respondent's Position

364. The Respondent uses the data available in the business plans prior to the expropriation to show that the Petrozuata field simply could not produce the volumes that had been anticipated using cold production techniques over the term of the Project. This can be seen from a review of the production profiles and well-drilling programs reflected in the annual business plans and related documents since the year of the commissioning of the upgrader in 2001. An overview shows that the expected amount of total production varied between 1.76 billion barrels (2001), 1.59 (2002), 1.6 (2003), 1.58 (2004), 1.56 (2005), and 1.502 (2006). Production was set to fall off in 2027 (2001), 2033 (2004), 2029 (2005), and 2031 (2006). The total number of single-lateral horizontal wells required were initially 571, and then 745 (2002), increasing to 777 (2004). The 2002 business plan noted that 241 wells had been drilled. It was then noted the drilling of 21 wells in 2004 (2005), and a total of 56 new wells in the years 2005 to 2009, a number that increased in two steps from 83 to 116-119 the year thereafter (2006). In August 2003, the Project partners recognized that access to the Reserve Area would be necessary and that the Project would require more acreage beyond that Area in order to achieve EHCO feed rates to the upgrader of 120,000 BPD for the life of the Project. The Respondent further notes that ConocoPhillips projected that the production level of about 118,200 would last only until 2023, not 2031[145].

365. The Respondent further refers to a number of internal presentations of ConocoPhillips, noting a steep decline in production of multilateral wells between 2000 and 2007 and a further loss of 18% to be expected if no well-drilling program was conducted. A ConocoPhillips' summary is shown estimating a drop of ultimate recovery from 1.767 to 1.246 billion barrels. The steep downward trend for the period after year-end 2006 is further demonstrated by Project's documents estimating a decline rate of about 20% per annum, as shown by the weekly reports prepared by the reservoir personnel between 2004 and the first half of 2007, considering active wells, inactive wells and well repairs, the graph from a November 2006 presentation to the Petrozuata Board of Directors, reflecting an 18% annualized decline rate, a presentation to the Ministry in February 2007, and a June 2007 production capacity report reflecting a decline rate of 19.7%.

366. On this basis of information as per 26 June 2007, and relying in large parts on Mr. Figuera's evidence, the Respondent estimates that a total of 653.4 million barrels of EHCO would be

[143] Petrozuata 2006 Business Plan, p. 8/9/pdf (LECG-082); CEM 2006, p. 79/80 (LECG-085); Tables presented on 20 March 2017.

[144] Claimants' Memorial on Quantum, para. 120; Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 50.

[145] ConocoPhillips RCAT group, Building Production Capacity Reserves, October 2006 (C-474).

produced at Petrozuata using cold production techniques through 12 April 2036, and that those EHCO volumes would yield a total of 562.1 million barrels of CCO.

367. When looking forward into the period post-nationalization, decline rate becomes the key issue. It is at the core of Mr. Patiño's study. He relied on the periodic production (or well) test data for individual wells. He selected those wells that had six years of production data that did not present erratic behavior. Based on those wells, 145 in total, he determined that the appropriate decline rate for the wells at Petrozuata is 22% on an exponential basis. Mr. Patiño's analysis was aimed at deriving a decline rate that could be applied to all of the wells at the field over the entire term of the Petrozuata Project, not just the wells drilled in the best sands at the outset of the Project. Mr. Patiño explains that the wells that remained to be drilled at Petrozuata as of 1 January 2009 would be "in-fill" wells (*i.e.* wells drilled between existing wells in locations where field energy has already been substantially depleted) or that would be geologically and petrophysically less desirable. Such wells would tend to decline at steeper rates and almost invariably exponentially and not hyperbolically as this had been claimed by Dr. Strickland.

368. Mr. Patiño also determined that 262 new well targets remained to be drilled as of 1 January 2009. He assigned initial potential production rates to each of the new wells he identified. He estimated that the plateau period for the new wells at Petrozuata would last about six months for wells in the Base Area and 18 months for wells in the Reserve Area.

369. Mr. Patiño reached the following conclusions regarding Petrozuata: (1) As of 1 January 2009, the Project had drilled, completed and connected 373 production wells, 289 of which were active and 29 had minor problems requiring routine repairs. The potential production from those 318 wells totaled 112.1 MBD. In addition, 12 wells with a potential production of 6.1 MBD were assumed to be completed and connected to production by the end of 2008. This would result in a production capacity of the field of approximately 118.2 MBD as of 1 January 2009. (2) Mr. Patiño also assumed that during 2009, 29 new wells would be drilled and that 14 single-lateral wells would be drilled in replacing multilateral wells that failed. (3) Thereafter, Mr. Patiño added new wells year after year based upon the number of wells included in the drilling program assumed by the Claimants' experts. He also assumed that (a) additional single-lateral wells would be drilled to replace multilateral wells that failed, (b) 10% of the single-lateral wells would fail and be "re-drilled" and (c) wells would fail and be repaired at the annual rate of 16% of the active wells.

370. For the Respondent, Mr. Patiño's study shows that the field runs out of well targets in 2020. Production would start to fall off prior to that time, and it falls off dramatically thereafter, as there are no new wells to drill to partially offset the decline. In total, in taking account of the number of wells drilled and all those completed, re-drilled or completely new, Mr. Patiño's production capacity program assumes a total of 757 wells over the life of the Project. That figure is consistent with the number of wells that was assumed in the business plans prior to the expropriation.

371. Mr. Patiño concluded that for the period between 1 January 2009 through the term of the Petrozuata Project, a total of approximately 461 million barrels of EHCO would be produced and that EHCO production from inception of the Petrozuata Project through 12 April 2036 would total 848.4 million barrels. That figure is about 400 million barrels less than the volumes that the Claimants contend would be produced based on the outdated ConocoPhillips model that was prepared in 2006. Based on the substantial additional drilling activities that have taken place in the years since the ConocoPhillips model was prepared, it has become apparent that the field will not support either the production profile assumed in the Claimants' model on an annual basis in light of the well-drilling program set forth therein or the accumulated production volumes the Claimants and their experts assume.

3. The Tribunal's Findings

372. The Tribunal will not have to return to the figures tied to the Respondent's *ex ante* view of production as shown through its reading of the business plans for Petrozuata between 2002 and 2006. The minimal total production was estimated at 1.502 billion barrels in 2006. At that time, it was also admitted by all participants that a total of 745 (2002), respectively 777 (2004) wells were to be drilled, with a pace of about 10 to 24 new wells per year between 2005 and 2009, the total remaining still far below the expected total amount[146]. In light of the fact that the projected total of 777 wells has not been reached, the Respondent's submission that the Project lacked sufficient available targets is not convincing, and, in any event, not supported by evidence. Witness Lyons testified that at the end of 2006, 825 laterals remained to be drilled[147]. It also appears as common knowledge at that time that the lifetime of the Petrozuata Project will not end in 2036, but that a cliff will occur at the earliest in 2027. Although the Respondent claims that substantially lower production was observed before the expropriation, the figures presented do not support such a conclusion. None of the business plans between 2001 and 2006 showed daily production significantly lower than the maximum allowance of 120,000 BPD. The internal notes of ConocoPhillips on which the Respondent relies to show significant declines in production are not pertinent since the purpose of showing such declines was also to alert on the need for new wells. The weekly reports filed between 2004 and 2007 show many variations in the wells' productivity, and a decline in the years 2006 and 2007, but they do not provide any information on future drillings[148]. And how may it possibly be explained that the Ministry's proposed term sheet for migration, submitted in August 2006, suggested that Petrozuata will "no longer be subject to the production limit of 120 MBD",

[146] Cf. Figuera, Testimony, 20 July 2009, paras. 16-29; Patiño, Consolidated Expert Report, 17 October 2016, para. 20.

[147] Lyons, Rebuttal [3rd] Witness Statement, 14 April 2010, para. 11; TR-E, 2017 March Hearing, Day 11, p. 3210:17-3211:11. Mr. Lyons referred to the list provided in the Petrozuata Long-Range Plan of April 2006 (C-480).

[148] Cf. Figuera Appendix 102 (2004), 103 (2005), R-279 (2006), R-280 (January-June 2007).

and that the Mixed Company "is authorized to expand its capacity to 225 MBD, approximately" (C-231, C-232, C-236)?

373. For instance, the Respondent relies on a November 2006 presentation to the Petrozuata Board of Directors reflecting an 18% annualized decline rate, while it also adds that this applies "if no wells were to be drilled in 2007"[149]. The same decline is derived by the Respondent from a November 2007 presentation, however again subject to the proviso that such loss would occur "if the 2007 well-drilling program were not implemented in a timely fashion"[150]. As long as the total amount of wells that had been approved by all participants including the Respondent's company PDVSA had not been reached, there remains no convincing argument in support of a dramatic decrease or decline in production. Mr. Figuera exaggerates as well when pointing to a decrease of production capacity of the field to 108,000 BPD. The difference of 12,000 BPD up to the maximum is equal to the production of 15 wells at 800 BPD each, which corresponds approximately to the average number of wells drilled at that time per year. Moreover, a closer look to the document on which the Respondent[151] and Mr. Figuera[152] rely demonstrates that the purported decline in production was of a purely transitory nature in the year 2008, when the Claimants were no longer participants in the Project. Indeed, the report on the Production Capacity Petrozuata Oil Field of June 2007[153] simply notes that the current capacity in 2008 was 108,000 BPD and that a decline of the oil field was observed. The document then refers to an optimized drilling program for the implementation of new wells (p. 5) and notes that the construction of new well pads and wells had been severely impacted as a result of contractual delays, new ministerial regulations and restrictions on cash flow caused by OPEC reductions (p. 7)[154]. The report concludes that the negative impact

[149] Respondent's Final Brief on Quantum, paras. 100-104, 109.

[150] *Ibidem*, paras. 102/103.

[151] *Ibidem*, para. 102.

[152] Figuera Appendix 3: Production Capacity, Petrozuata Field, June 2007.

[153] Figuera Appendix 3, referred to in Figuera, Testimony, 20 July 2009, para. 23.

[154] See also the Petrozuata Preliminary Monthly Report of February 2007, p. 1 (LECG-156, p. 37/pdf), noting that in order to comply with the Ministry's restrictions, the monthly average EHCO production had to be reduced to 95MB per day. These restrictions were frequently a matter of debate. At the Board of Directors meeting of 7 June 2006, the limitations imposed above the 120 MBPD monthly average were mentioned as a handicap in view of raising the upgraders capacity to 145 MBPD or even 165 MBPD (C-347, p. 16/pdf). In the Minutes of the meeting of the Board of Directors of 13 September 2006 it was recorded that Mr. Figuera "stated that, since last year, Petrozuata has been proposing a modification in the production strategy in order to raise production capacity to the Maximum Demonstrated Capacity (MDR) of the Upgrader plant, instead of maintaining capacity at the 120 MBD authorized by the MENPET, and that the company requested a second drill which was not authorized at that time" (C-335, p. 19/pdf). This statement confirms that the maximum design capacity was based on instructions from the Ministry but could be increased in fact, and that further drilling was envisaged and feasible but not authorized at that time. At the next meeting on 15 November 2006, the "production cuts imposed by the MENPET" were again a matter for concern (C-336, p. 14/pdf). The Tribunal's record contains correspondence implementing these reductions as from September 2006 into the year 2007 (C-365-368, 370-372, 476). The Claimants alleged that these limitations on production had not been

in 2008 will not occur in 2009 (p. 8). It presents a time line providing for the addition of two wells per month starting within six months (so end 2008). The report adds as from 2009 onwards new well production of 10,560 BPD per year within four years (p. 10). Therefore, the decline that occurred was scheduled to be offset by new wells and none of the difficulties that had impacted the situation in 2008 bare any relation with the Project's characteristics as they existed when the Association Agreements came to an end.

374. Most of the Respondent's arguments in this respect are not only related to the *ex ante* situation but are presented to demonstrate a long-term decline of the Petrozuata field after 2009 and for the rest of its lifetime. Such a submission must fail because it leaves out of any perspective the consideration of events and projections pertinent for that future period.

375. The Claimants projected to recover at Petrozuata 913.5 million barrels of EHCO over the period from June 2007 to 2036. The overwhelming figures projected before the expropriation show numbers clearly above 1 billion barrels of EHCO Reserves. The latest available document shows 3.9 billion barrels for 2010[155]. The Tribunal finds that there is no argument left that the Project would not allow recovery of the quantity of EHCO required to meet the expected recovery of 913.5 million barrels (less the volumes of blended oil). Moreover, if the Respondent is of the view that this latter amount cannot be reached over the lifetime of the Project and that therefore the 2010 figure of 3.9 billion was not correct, it was its task to provide the pertinent evidence to which it has easy access. The Respondent has been asked several times to provide the pertinent business plans or other documents allowing an insight into the actual operation on site. It has not been willing to do what it was invited to do. It had not argued that this was an impossible task.

376. The Claimants have not provided annual numbers in their briefs. They were then submitted in their tables on production filed on 20 March 2017 where it was explained that the annual numbers were copied by their experts from the COP-Composite-Economic-Model of 2006 (CEM) (LECG-085), but expressed through more precise numbers in a December 2006 Full Valuation (CLEX-86). The numbers provided in these two documents mostly coincide and support an average production rate of 118,200 BPD from the beginning of the post-expropriation period, with the exceptions of turnaround years and without counting blended oil reported as sold during turnarounds.

377. While it appears plausible that wells exhibiting a "hyperbolic" decline produce a total of oil higher than wells showing "exponential" decline[156], the Tribunal need not entertain the debate

compensated by Maraven as this had been accepted in the Agreement dated 10 November 1995 (C-369; Claimants' Reply, footnote 255).

[155] People's Ministry of Energy and Petroleum, Petróleo y Otros Datos Estadisticos 2009-2010, p. 71.

[156] Mr. Patiño recognized that a shift from one approach to the other would cause a drop of his 22% decline rate to 17.3% for the wells already in production on 1 January 2009; cf. Consolidated Expert Report, 17 October 2016, paras. 42-44.

in this respect. First, the evidence presented does not allow the Tribunal to identify which well has to go into one or another category, nor would this – if it was possible – allow a reasonable extrapolation to the totality of the wells operating in the fields. Second, if this distinction was as important as this is argued, one should expect to find a respectable amount of traces in the Project's documentation submitted to the Tribunal. This is not the case. Therefore, the Tribunal must conclude that the Respondent did not find further support for this theory in the Project's archives or that it did not consider it relevant for the Tribunal anyhow.

378. In any event, the purpose of such demonstration and of the Respondent's arguments was to provide evidence for the actual decline of performance of the wells at the Petrozuata Project. This does not, however, demonstrate in itself that such decline has the effect of a corresponding decline of EHCO production. A decline in the wells' performance calls for the need to repair those wells that can be saved for better performance and to replace those that are definitely lost. Moreover, even if this was done and production was still declining, the Project would have to drill new wells.

379. Witness Lyons testified that wells' decline had a reason other than what results from a simple observation of wells' performance. He recalled that the Petrozuata Project had drilled predominantly multilateral wells that were much more productive than singular lateral wells. When the Claimants had left the Project, PDVSA decided to change strategy and to focus on drilling of singular lateral wells only. With these wells the ultimate recovery of oil was much lower (about 20 to 30 percent)[157].

380. Mr. Patiño does not go as far. His analysis is focused on observing a strong well's production, while he did not examine with any detail the potential for improvement in production through an increase in drilling new wells, re-drilling, replacing and repairing of wells. Without this other part of the overall view of net figures on production, the resulting conclusions are incomplete and cannot identify the recoverable EHCO quantities on the sites. When Mr. Patiño was asked at the February 2017 Hearing whether he did check his work with the target wells in the post-expropriation models with the new companies, he told the Tribunal that he did not verify it[158], adding that asking for them "wasn't part of my job"[159]. He further confirmed that the Projects ought or must have such lists[160]. On the other hand, no dynamic model of the reservoir did exist[161]. Witness

[157] TR-E, 2010 Hearing, Day 4, p. 1077:5-1078:17; Day 5, p. 1329:2-1332:13; Second Witness Statement, 30 October 2009, paras. 10, 11, 13, 24, 30; Fourth Witness Statement, 16 May 2014, para. 21; Fifth Witness Statement, 13 October 2014, paras. 43-48.

[158] TR-E, 2017 February Hearing, Day 9, p. 2681/1-5.

[159] TR-E, 2017 February Hearing, Day 9, p. 2679/10-12.

[160] TR-E, 2017 February Hearing, Day 9, p. 2678/14-2679/8.

[161] TR-E, 2017 February Hearing, Day 9, p. 2752:9-2756:5 (Patiño), p. 2842:21-2843:15, 2851:9-13 (Strickland). However, Mr. Patiño also said that before the expropriation the Hamaca Project used a Dynamic Reservoir Model for

Figuera mentioned the existence of a "Strategic Plan"[162]; however, such plan has never been presented to the Tribunal[163].

381. Mr. Patiño did not comply with a fundamental equation contained in a document he had submitted to the Tribunal:

> New development wells and/or recompletion of existing wells will occur in every year during the project in order to offset production decline[164].

This formula provided in a document relating to Hamaca does of course equally apply to Petrozuata[165]. Mr. Patiño did not determine the number of new wells required (staying instead with the maximum of 757 wells projected from the very beginning of the Petrozuata Project), and he retained the same number of new wells to be drilled in the years 2009 to 2020 as projected at the same time, without adding any new well as from 2021 for the remaining 15 years of the Project, although he must have been aware that the decline of wells he observed required necessarily more wells to be drilled and to be replaced than he had planned. In other words, Mr. Patiño missed the goal of offsetting production decline[166].

382. The inconsistency of Mr. Patiño's approach with the characteristics of the Project can also be shown when regarding the option taken at the very beginning of the Projects in respect of decline rate. Mr. Figuera testified that this rate was 20% for Petrozuata[167]. If this had been the starting rate for the Project's wells' decline, why did no one at the time consider closing the site soon after 2007

its production (TR-E, February 2017 Hearing, Day 9, p. 2569:2-16). He told that after the expropriation, PetroPiar used a geological model with which they were able to establish additional drilling targets to maintain their production potential (*ibidem*, p. 2574:6-11). Mr. Patiño also accepted that where an updated Dynamic Model did exist it was pointless to use simple decline curves to predict production (*ibidem*, p. 2569:2-11).

[162] TR-E, 2017 March Hearing, Day 11, p. 3126:18-3127:12.

[163] The Respondent's experts did not ask that the plan be provided to them; TR-E, 2017 March Hearing, Day 12, p. 3595:13-3596:2 (Flores).

[164] Patiño, Appendix 7, Petrolera Ameriven S.A., Hamaca Project, Upstream Plan of Development: 190,000 BOPD, Orinoco Extra Heavy Oil Belt, Venezuela, Draft, December 3, 1999, p. 125, further noting that in relation to risks and projects' parameters, it was always required to ensure that the number of wells were such that it was possible to make 190'000 BPD (p. 246) and that there may be a cushion to enable the field to produce over 190 MBOPSD in the event of a shortfall (p. 247).

[165] Mr. Figuera's Presentation on Petrozuata's Challenges of Exploitation in 2006 listed as one of the operational challenges: "Maintaining production capacity to feed the Upgrader Plant at Maximum Proven Capacity (MDR)." (C-324).

[166] Cf. Strickland, TR-E, 2017 February Hearing, Day 9, p. 2855:12-2857:1.

[167] Figuera, Testimony, 20 July 2009, para. 29.

when Mr. Patiño projected on the basis of the same or a similar rate an increasing shortfall of EHCO production beginning in 2009?[168]

383. Mr. Patiño's methodology shows that when considered on a larger scale of available data, including a more representative selection of wells and a realistic assumption of available targets, the conclusions to be drawn from his method are not capable of demonstrating a net decline of oil production to such an extent that the production projections prevailing at the time would not be reached. Such a demonstration would have to include both sides of the coin, the effective decline on one side, and the failure to provide for sufficient new, replaced and repaired wells on the other[169]. More important is Mr. Patiño's reliance on quantities of EHCO that were required for the more limited actual production and sales of CCO since 2009, while he admitted that a greater quantity of EHCO was in fact available and would have allowed supporting production of upgraded syncrude to the extent required by the projections adopted by the participants in the Association Agreements. A selection of figures retained by Mr. Patiño may illustrate his assessments:

[168] Cf. Patiño Appendix 81, Output.

[169] Cf. Witness Lyons, Second Witness Statement, 30 October 2009, para. 36; TR-E, 2017 March Hearing, Day 11, p. 3153:16-3158:2. He explained the interaction between decline and new wells drilling, adding that the actual drilling of new wells was sometimes delayed when the rig was engaged on another site and thus not available on short notice.

	Mr. Patiño's data						Actual data		
	Active Potential EHCO Production[170]		EHCO Production to Upgrader[171]		CCO for sale[172]		EHCO required for blending[173]		Total EHCO required for upgrading and blending (column 5 + 9)
	BPD[174]	MMB	BPD	MMB[175]	BPD	MMB	BPD	MMB	MMB
2009	120,723[176]	44,067,180	105,501	38,508,000	90,953	33,198,000	9,124	3,330,131	41,838,131
2010	120,984	44,159,160	69,021	25,192,000	59,503	21,718,000	35,526	12,966,954	38,158,954
2011	114,022	41,618,030	76,637	27,972,000	66,068	24,115,000	24,061	8,782,320	36,754,320
2012	110,907	40,481,055	107,674	39,409,000	92,826	33,974,000	0	0	39,409,000
2013	107,737	39,324,005	94,262	34,405,000	81,263	29,661,000	16,500	6,022,542	40,427,542
2014	103,313	37,709,245	82,351	30,058,000	70,995	25,913,000	28,759	10,497,121	40,555,121
2015	98,876	36,089,740	70,592	25,766,000	60,858	22,213,000	36,055	13,160,089	38,926,089
Sub-total	776,562	283,448,415	606,038	221,310,000	522,466	190,792,000	150,025	54,759,157	276,069,157
Ave. / year	110,937	40,492,631	86,577	31,615,714	74,638	27,256,000	21,432	7,822,680	39,438,451
1	2	3	4	5	6	7	8	9	10

384. From the year 2016, when he had no actual figures for CCO available, Mr. Patiño selected the figures for Potential EHCO Production less 10% to determine EHCO Production to Upgrader and from there (x0.8621) CCO. Four years are here selected for the purpose of illustration. As a matter of fact, looking at his table, it is only as from 2019 that the results of his decline study are impacting seriously EHCO production at Petrozuata, with a further kick-down in 2024.

[170] Patiño, Appendix 81, Output.

[171] Cf. Consolidated Expert Report, 17 October 2016, para. 116; Patiño, Appendix 81, Output. These numbers are re-calculated from the volumes of CCO mentioned in Mr. Patiño's Consolidated Expert Report, 17 October 2016, para. 116 (with a yield factor of 0.8621); for 2009-2013, the numbers for BPD have been copied from Mr. Figuera's Third Supplemental Testimony, 15 August 2014, table 4, para. 87, based on Appendix 81.

[172] The numbers for 2009-2015 are all copied from the Consolidated Expert Report, 17 October 2016, para. 116, where Mr. Patiño explains that he took them from Mr. Figuera's Third Supplemental Testimony of 15 August 2014, table 4 (para. 87), where reference is made to Appendix 81. This is correct for the years 2009-2013. However, Mr. Patiño did not observe that Mr. Figuera updated his documentation and submitted a new set of invoices in his Appendix 108, further noting the results in his Fourth Supplemental Testimony of 7 January 2015, table 2, para. 20, from where the numbers on EHCO production have been copied in the Respondent's Assessment of Production submitted on 2 June 2017.

[173] These quantities represent 76.67% of blended oil sold as per the information submitted by the Respondent at the 2017 March Hearing, and also contained in the Petrozuata Assessment of Production, p. 1 (for the quantities of MMB).

[174] Mr. Patiño also provides the figures for "Year Start", which are slightly different and less suitable for comparison purposes. Cf. Consolidated Expert Report, 17 October 2016, para. 116; Patiño, Appendix 81, Output.

[175] The numbers have been rounded by Mr. Patiño.

[176] The number of BPD for 1 January 2009 is 118,189. This figure has not been verified by Mr. Patiño, but has been derived from the production potential of 121,900 BPD as identified in Mr. Figuera's Testimony of 20 July 2009, para. 30. Mr. Patiño then proceeded with some minor adjustments, resulting in the figure of 118,200 BPD; cf. Consolidated Expert Report, 17 October 2016, para. 21; Expert Report, 18 August 2014, para. 141.

	Active Potential EHCO Production		EHCO Production to Upgrader		CCO for sale	
	BPD	MMB	BPD	MMB	BPD	MMB
2017	95,526	34,866,990	86,829	31,692,000	74,855	27,322,000
2021	66,070	24,115,550	60,036	21,913,000	51,757	18,891,000
2025	28,076	10,247,740	25,511	9,312,000	21,993	8,028,000
2029	11,472	4,187,280	10,423	3,804,000	8,986	3,280,000
Total 2009 to 2036				460,950,000		397,385,000
1	2	3	4	5	6	7

385. Since the new operational mode of production was set up in 2009, EHCO supply served two different sales products, *i.e.* either upgraded oil or blended oil (DCO or Merey 16). For the years 2009 to 2015, Mr. Patiño admits that more EHCO quantities were available (column 2/3) than the EHCO quantities supplied to the upgrader (cf. column 4/5). The extreme is shown for year 2010, where a production of EHCO of 120,984 BPD is reported, while the upgrader's availability was limited to 69,021 BPD, after it had been set at 105,501 BPD the year before.

386. When taking account of both lines of production, it appears from the total (column 10) that starting with year 2013 the quantity of EHCO actually used (for CCO and blending) was higher than the volume that Mr. Patiño accepted as available for potential EHCO production (column 2/3). From year 2016, the Tribunal has no evidence on the record for the amounts of blended oil produced and sold. When taking the average amount of about 21,000 BPD EHCO used for blending (column 8/9) per year as a guideline, it appears that from 2017 until 2036 this number is clearly above (in many years for an amount around 10,000 BPD) the difference between the quantities Mr. Patiño identifies as "total potential ECHO production" and "EHCO production to upgrader"[177]. This means that the actual and projected production numbers are higher than what Mr. Patiño determined as the maximum EHCO production at Petrozuata.

387. Mr. Patiño's volumes for total potential EHCO available on the sites (column 2/3) are always higher than the actual volumes extracted by the wells (column 4/5) for the purpose of producing upgraded CCO (column 6/7). This applies for two periods, the one between 2009 and 2015, and the other covering the years 2017 to 2036. Therefore, more EHCO was in fact available than what results from Mr. Patiño's conclusions.

388. The foregoing is also confirmed when considering the estimated quantities of EHCO used for blending. When added to the volumes used for upgrading, the resulting amounts (column 10) are telling from two perspectives: (1) the added amount is always higher than the EHCO supplied for upgrading – thus showing that the EHCO taken into the upgrader is below the EHCO available; and (2) more importantly, this amount comes close to the actual feeding capacity of the upgrader

[177] See Consolidated Expert Report, 17 October 2016, para. 116; Patiño, Appendix 81, Output.

as mentioned by the Claimants (118,000 BPD). The difference is about 10,000 BPD, which is hardly more than 12 new wells producing at a pace of 800 BPD.

389. For his definition of the available wells, Mr. Patiño adopts a personal approach when he identifies characteristics of wells and their potential decline, but he does not proceed in the same way when it comes to determining the available potential for new wells and new targets. Dr. Strickland has rightly observed that a comparison to the quantities of certified Proved Reserves would have provided a serious picture about the possibility for extending drilling of wells[178]. It is indeed beyond commercial efficiency to accept Mr. Patiño's view that in about a few years (2020), and fifteen years before the end of the Project, no new well will be drilled, and that the EHCO provided to the upgrader will be about 50% below its design capacity[179].

390. With a closer look at the key points of new wells to be drilled, the Tribunal notes that Mr. Patiño projected 372 additional wells from 1 January 2009 (composed of 262 new wells, 68 replaced wells and 42 re-drills), a number that differs by one single well from the 373 wells added to the Project as per Mr. Figuera's testimony[180] five years earlier. Furthermore, on the same table, Mr. Patiño adopted exactly the same numbers of new wells to be added, year by year from 2009 to 2019[181]. For year 2020, Mr. Patiño noted 31 new wells, while Mr. Figuera had 32. For Witness Lyons, wells were still to be drilled in year 2024[182].

391. More remarkably, Mr. Patiño does not provide for any new well as from year 2021, although the Respondent's Witness Mr. Figuera stated that the Project's planning included 37, 48 and 25 new wells to be added in the period between 2021 and 2023. Mr. Patiño's assumption is equally surprising in comparison to the Petrozuata Economic Model for late 2006 that forecasted drilling between 18 and 31 wells per year from 2022 to 2028, and then 41 in 2029 and 19 in 2030, ending with 3 in each year 2031 and 2032[183]. Mr. Patiño opposed Dr. Strickland's assessment that 22 additional targets were available, stating that this would not have a significant impact[184]. Dr. Strickland's opinion[185] would have deserved more attention, all the more since he asserted a corresponding increase of 18 million barrels for the lifetime of the Project, which results in approximately half a million barrels per year. In any event, the maximum numbers of projected wells in the future

[178] Cf. Consolidated Expert Report, 17 October 2016, paras. 39-44.

[179] Cf. *ibidem*, para. 116.

[180] Figuera, Testimony, 20 July 2009, para. 29.

[181] *Ibidem*, para. 30.

[182] TR-E, 2017 February Hearing, Day 8, p. 2205:2-4.

[183] LECG-077, p. 469/pdf.

[184] Cf. Consolidated Expert Report, 17 October 2016, paras. 111, 115, Appendix 85.

[185] Cf. *ibidem*, paras 108-110. Also TR-E, 2017 February Hearing, Day 9, p. 2768:8-2771:1.

serve the purpose of planning work and budget; they do not set limits in such a way that no more wells above such figures could be drilled in the future in order to keep the upgrader full, if the economics allow[186].

392. In sum, Mr. Patiño stays very close to the original assessment of production and drilling activities, using numbers that are close of being identical to those presented through the testimony of Mr. Figuera. As he explained to the Tribunal, he was instructed to use the volumes of CCO for sale up to 2015 and to calculate the amount of EHCO required on this basis[187]; therefore, he identified the EHCO production needed on the basis of the historical CCO that had been sold year after year[188]. Such an approach does not include considering whether the upgrader would not be able to produce more CCO as this had been done before 2009. The Tribunal finds that Mr. Patiño's assessment of the decline rate of the wells does not include sufficient consideration of the potential of compensation through new wells and increasing work on maintenance and repair (and the associated increase in costs). This item is only marginally addressed in Mr. Patiño's decline analysis[189].

393. This gap in Mr. Patiño's analysis also appears when a comparison is made with the estimations that Mr. Figuera had presented in his first testimony, where the starting production capacity of the Petrozuata Project was set at 121.9 MMB[190], a figure on which Mr. Patiño also relies as a bottom reference to his own projections[191]. Mr. Figuera used a declination rate of 20%, while Mr. Patiño used the same or a similar rate (with some variations that are not pertinent for the comparison as it follows). However, their figures for EHCO production to the upgrader retained at the year-end are markedly different:

BPD	EHCO Production to upgrader (Mr. Figuera)	Active EHCO Potential Production (Mr. Patiño)	EHCO Production Mr. Figuera v. Mr. Patiño
2009	121,900	120,723	- 1,177
2015	89,000	98,876	- 9,876
2017	88,700	95,526	- 6,826
2019	80,600	81,989	- 1,389
2020	77,100	74,603	+ 2,497
2021	75,800	66,070	+ 9,730
2025	52,100	28,076	+ 23,924
2029	30,200	11,472	+ 18,728

186 Cf. Witness Lyons, TR-E, 2017 March Hearing, Day 11, p. 3204:2-3207:7.

187 TR-E, 2017 February Hearing, Day 9, p. 2666:9-15.

188 TR-E, 2017 February Hearing, Day 9, p. 2744:4-7.

189 Consolidated Expert Report, 17 October 2016, paras. 106/107.

190 Testimony, 20 July 2009, para. 30, p. 19.

191 Consolidated Expert Report, 17 October 2016, para. 21, note 33.

Starting in year 2020, the last year when Mr. Patiño provides for new drills, the EHCO production figures of Mr. Figuera get higher and higher compared to those of Mr. Patiño although Mr. Figuera's decline rate is close to the rate used by Mr. Patiño. The main explanation must be Mr. Patiño's assessment of EHCO production on the fields, which includes his method of determining declining wells and a restrained consideration for the drilling of new wells.

394. The Respondent[192] and its valuation experts[193] adopt the approach and the results of Mr. Patiño's method and report, and they include in their presentation the figures relating to the historical period between 26 June 2007 and the end of 2008. Their conclusions are as follows:

	EHCO Production to Upgrader		CCO for sale	
	BPD	MMB	BPD	MMB
Mr. Figuera[194]				
End 2007	106,132	19,531,383	84,505	15,568,593
2008	113,111	41,398,549	97,543	35,700,904
subtotal	111,288	60,929,932	93,643	51,269,497
Mr. Patiño				
2009-2036		460,950,000[195]		397,385,000[196]
Total		521,879,932		448,654,497

395. To conclude, the Respondent's presentation, resting on Mr. Patiño's analysis exclusively focused on decline rates, cannot be retained by the Tribunal. There has been brought no evidence before the Tribunal that the production at Petrozuata may be limited to quantities significantly lower than the upgrader's design capacity of 120,000 BPD, which corresponds to 43,800,000 MMB. For the period between 2009 and 2015, the figures provided by Mr. Figuera, combined with the EHCO required for the sale of blended oil, confirm this assessment:

[192] Respondent's Final Brief on Quantum, para. 325. The numbers for 2007 and 2008 are contained in the *ex ante* table, para. 113.

[193] Cf. Brailowsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 246-249. The numbers for 2007 and 2008 are contained in the *ex ante* table, para. 74.

[194] Testimony, 20 July 2009, paras. 11/12. The amounts quoted by the Respondent and its experts are slightly different for 2007.

[195] This number became 474,753,000 in Mr. Patiño's last update under Appendix 90. However, he stated that the difference was negligible and he did not use it in his Consolidated Expert Report, 17 October 2016, cf. paras. 44, 116, nor did he use the figures composing this final amount. The Respondent and its valuation experts have also not adapted their figures to this last version.

[196] As this has been noted above in respect of Mr. Patiño's numbers on CCO sold between 2009 and 2015 (column 6/7) they were copied from Mr. Figuera's Third Supplemental Statement, 15 August 2014, para. 87, table 4 and the attached Appendix 81, not noting that Mr. Figuera had updated his information in his Fourth Supplemental Testimony and the attached Appendix 108. The Respondent and its valuation experts have relied on Mr. Patiño's numbers, with the effect that their numbers are equally incorrect, and, as a consequence, any subsequent calculation based on them.

2009-2015	EHCO Produced	CCO Produced[197]	EHCO required for CCO invoiced	CCO Invoiced	Blended Oil Sold[198]	EHCO required for blending	Total EHCO used for upgrading and blending (column 4 and 7)
2009	38,745,784	31,173,844	38,507,947	33,197,701	4,343,460	3,330,131	41,838,078
2010	34,221,901	19,511,360	25,192,499	21,718,453	16,912,683	12,966,954	38,159,453
2011	32,092,161	23,205,820	27,972,368	24,114,978	11,454,702	8,782,320	36,754,688
2012	37,809,627	32,692,940	39,408,584	33,974,140	0	0	39,408,584
2013	40,884,534	28,447,930	34,405,492	29,660,975	7,855,148	6,022,542	40,428,034
2014	40,253,749	26,300,630	30,058,054	25,913,252	13,691,302	10,497,121	40,555,175
2015	38,760,178	23,498,940	25,766,208	22,213,048	17,164,587	13,160,089	38,926,297
total	262,767,934	184,831,464	221,311,152	190,792,547	71,421,882	54,759,157	276,070,309
p/year	37,538,276	26,404,495	31,615,879	27,256,078	10,203,126	7,822,737	39,438,616
p/day, BPD	102,845	72,341	86,619	74,674	27,954	21,432	108,051
1	2	3	4	5	6	7	8

This data shows that the amount of EHCO required to produce the EHCO needed for the upgrading and the sale of blended oil (in a proportion of 76,67%) are close to the maximum of 43,800,000 MMB design capacity for EHCO supply to the upgrader. The key figure to be considered by the Tribunal is 43,070,000 MMB, which corresponds to the 118,000 BPD the Claimants affirm as the feeding capacity of the Petrozuata field.

396. At this juncture, the figures to be retained are those relating to the EHCO Production Capacity. As mentioned above, the EHCO Production required for CCO Production is noted for informational purposes, because these quantities reflect the operational choices made as from 2009, with the effect that the CCO production was significantly reduced compared to the situation prior to that change, albeit complemented by the sale of blended oil[199].

[197] Petrozuata Assessment of Production, p. 1; Figuera, App. 109. The EHCO required for the production of the quantities of CCO mentioned in the table represents numbers lower than those mentioned above under EHCO Produced (column 2). As explained by Mr. Figuera, the Project produced more EHCO than the quantities of EHCO required for the CCO that was produced, according to his figures. The required EHCO quantities are provided in Mr. Figuera's Fourth Supplemental Testimony, 7 January 2015, and they can be calculated by dividing the figures of CCO Produced by the yield factor of 0.8621 (*e.g.* 26,404,495 CCO p/year: 0.8621 = 30,628,112 EHCO).

[198] Submitted by the Respondent at the March 2017 Hearing; Petrozuata Assessment of Production, p. 1, referring to Figuera Appendices 110, 112. Blended oil is composed of 76.67% EHCO and 23.33% diluent (Naphtha or Mesa).

[199] The operational choice mentioned above is accepted by the Respondent also in its impact on costs. As stated in the Respondent's Cost Estimation for Petrozuata filed with the Tribunal on 2 June 2017, in the "but-for" scenario, EHCO production would have been lower than it was in actuality, since only the EHCO that could be upgraded would have been produced. Therefore, the Respondent has deferred costs relating to drilling new wells so that the production capacity would be commensurate with the capacity required for EHCO production needed for actual CCO sales (p. 14). In other words, more new wells were actually drilled for the purpose of extracting sufficient EHCO to meet the need for upgrading to CCO and providing the 76.67% portion of the blended oil. This also means that more volumes of EHCO have been and still were available when further drilling new wells, more than what has been affirmed by Mr. Patiño in this proceeding.

397. To obtain the approximate volumes of EHCO that would have been available when no blending was permitted, the amount of EHCO required for the production of the relevant corresponding CCO sold (taking account of the yield factor) has to be added to the EHCO portion of 76.67% in the blended oil[200]. As shown in the table above, the amounts thus reached (column 8) are comparable to those reported as overall "EHCO Produced" by Mr. Figuera (column 2). Approximate amounts of 39,500,000 MMB and 108,000 BPD can thus be retained as actual EHCO production figures experienced per year between 2009 and 2015[201].

398. These amounts become a little higher when also including the results of the EHCO production following the 18 months since the expropriation up to the end of 2008, when a total of 60,929,932 MMB has been produced, corresponding to an average of 111,288 BPD. In appropriate proportions, this allows the conclusion that in the period since the expropriation until the end of 2015, an actual average amount of 40,000,000 MMB per year has been produced, corresponding to 110,000 BPD.

399. Mr. Patiño's assumptions on decline rates for the years starting in 2016 cannot serve as projection for the Tribunal's assessment of the most probable development of the Project had the expropriation not taken place. The Tribunal has no evidence on the record addressing the specific question of the available volumes for EHCO production from the fields for the period running up to the end of the Project's lifetime. The Reserves figures do not, as stated, impact negatively the prospects for sufficient production corresponding to the volumes projected on the basis of the Association Agreements. The actual EHCO production for the years 2009 to 2015 of 39,500,000 MMB and the numbers above this figure representing sales made before 2009 when the CCO production was combined with the sale of blended oil, indicate targets, however subject to improvements through increases in drilling and maintenance efforts that the evidence on the Tribunal's record has not shown to be out of reach.

400. The EHCO production of 118,000 BPD alleged by the Claimants[202] corresponds to 43,070,000 MMB. These volumes are slightly above the actual figures for the period between 2009 and 2015 (39,500,000 MMB) and the actual average amount of 40,000,000 MMB for post-

[200] The resulting figures are comparable to the numbers shown by Mr. Figuera as "EHCO Produced". However, they are far below the EHCO Production Capacity reported by Mr. Patiño.

[201] The Tribunal notes that the Respondent also argued that based on Mr. Patiño's program the quantity of EHCO used for blending as from 1 January 2009 "is assumed to remain in the ground until needed for CCO production" and that therefore "the larger number of wells actually drilled in the historical period is reduced (thereby reducing historical costs), since the excess EHCO production would not have been necessary" (Respondent's Final Brief on Quantum, para. 317 *in fine*). The whole theory on EHCO stored underground for the purpose of later CCO production has no real basis, but if it would be admitted, as suggested by the Respondent, there would be more wells available than actually drilled, thus offsetting any decline even without drilling new wells. Mr. Patiño's conclusions would then be irrelevant even for the Respondent.

[202] Claimants' Memorial on Quantum, para. 120; Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 50.

expropriation time in the years 2007 to 2015. The Tribunal finds no evidence and no convincing argument that would prevent it from retaining these figures for EHCO production at Petrozuata if the Association Agreements and the operation having the Claimants as partners had remained in place. These are standard figures based on the production capacity of the fields. They will have to be reviewed in light of the production capacity of the upgrader.

D. Production at Hamaca – Upstream

401. The Hamaca Project was planned for a designated production field from which to produce EHCO. The field was comprised of a main area (called "H" for Huyapari Block), and a reserve area to the south (known as "M" for Maquiritare Block), which was relinquished prior to the nationalization. The major constraint at Hamaca – and the main source of difference between the Parties – is the ability of the upgrader to process EHCO in the production of CCO. This issue will be examined further below (E).

1. The Claimants' Position

402. The Claimants submit that the production profile used by their experts for Hamaca Projects results in the recovery of approximately 1.864 billion barrels of EHCO from June 2007 to 2037, which corresponds to an average EHCO production level of approximately 175,000 BPD. That profile is taken from the Hamaca's Project's own Economic Model (prepared by Petrolera Ameriven), as last updated in October 2006 (LECG-129).

403. This oil production profile is consistent with other data showing expected production from the Hamaca field. (1) In February 2007, a ConocoPhillips team calculated Reserves for 1.96 billion barrels (LECG-111, p. 9/pdf). Recently, PDVSA reported the Proved Reserves to be 4.6 billion barrels (CLEX-090, p. 39). (2) The 2005 Hamaca Business Plan contains future oil production projections that are consistent with the figures used by the Claimants' experts (LECG-122/112). (3) ConocoPhillips Economic Model, in its last version produced in late 2006, projected the recovery of 1.894 billion barrels of EHCO over the life of the Project (LECG-085), an amount later adjusted to 1.864 billion barrels[203].

404. The Claimants recall that in the first phase of this case, Venezuela relied on a production forecast for Hamaca that estimated the recovery of 1.672 billion barrels of EHCO from the date of the expropriation through the end of the Project's term[204]. This forecast rested largely on the same EHCO profile used by the Claimants' experts, but with a reduction to the Hamaca upgrader's OSF.

[203] Claimants' 2017 Post-Hearing Brief, para. 35.

[204] Consolidated Expert Report on Valuation, 17 November 2016, para. 83.

In the later quantum phase, Venezuela used a more pessimistic forecast that foresees the recovery of only 1.051 billion barrels of EHCO from June 2007 until the end of the Project[205]. This forecast is premised on an even more desultory OSF for the Hamaca upgrader now predicted by Mr. Figuera.

405. Venezuela's future EHCO production forecast in the quantum phase is again derived from Mr. Patiño's theoretical model. Mr. Patiño introduced into his model Mr. Figuera's assertion that the Hamaca upgrader will achieve an OSF of only 72.85% for the remainder of the Project's term. As a result, Mr. Patiño artificially constrains EHCO production, so that the model can never yield a production figure of more than 143,432 BPD of EHCO[206]. The limit Mr. Patiño introduced into his model prevents the upgrader from ever operating beyond Mr. Figuera's OSF forecast. Thus, the production figures under his model will always be wrong. Mr. Patiño's EHCO production volumes for the historical period (2009-2015) substantially deviate not only from the Claimants' but-for scenario, but also from the actual post-expropriation production. Again, Mr. Patiño ignores what has actually happened at the Project. This can be demonstrated by comparing Mr. Patiño's ceiling on syncrude production with the actual syncrude production reported in past years, according to PDVSA. Mr. Patiño's approach stands in stark contrast to the Claimants' experts' reliance on the Project's agreed business plans, as confirmed by both the Project's pre- and post-expropriation Proved Reserves figures. Further, Mr. Patiño's production profile for Hamaca suffers from the same fatal flaws as his Petrozuata analysis, to the exception of multilateral wells that have not been used extensively at Hamaca.

406. Mr. Patiño's forecast of expected production is again based on a field decline rate. Dr. Strickland submits that the wrong data were used and that again wells that have an exponential (constant) and hyperbolic (ever-decreasing) rates are conflated. Mr. Patiño uses a total of only 55 wells. He derives a single exponential decline rate of 24% per year, which he then mechanically applies to all of the more than 800 existing and future wells in the field for the period between 2009 and 2037. Mr. Patiño has partially conceded his error and provided a new analysis in his Consolidated Report, adopting a hybrid approach resulting in an inflated decline rate of 18.7%[207]. Mr. Strickland demonstrates that Mr. Patiño's decline rate is contradicted by the Project's actual production history. Mr. Patiño understates expected production at Hamaca by approximately 695 million barrels over its remaining term. Once again, Mr. Patiño attempts to justify his flawed analysis by referring to a few Project documents, which, however, do not reflect long-term production projections for the field.

[205] Consolidated Expert Report on Valuation, 17 November 2016, para. 259.

[206] Patiño, Appendix 84, Field Metrics.

[207] Consolidated Expert Report, 17 October 2016, paras. 136/137.

407. Mr. Patiño also reduces artificially production by adopting unrealistically restrictive criteria for well targets. Mr. Patiño misses viable well targets, thereby depriving the Project of millions more barrels of production. As Mr. Patiño conceded, the post-expropriation Project has actually drilled wells that he failed to include in his production forecast. Dr. Strickland explained that Mr. Patiño's errors collectively serve to understate production at Hamaca by more than 706 million barrels of EHCO. When those errors were corrected, his model yields production volumes consistent with those used by the Claimants' experts.

408. To conclude, on upstream issues, the Claimants submit that (a) their experts rely on the most conservative of the Project's pre-expropriation forecasts, whose achievability is confirmed by the Ministry's, PDVSA's and ConocoPhillips' pre-expropriation Proved Reserves figures; (b) Venezuela's arguments that the productivity of the fields is declining are contradicted by these Proved Reserves figures, which have been going up since the expropriation; and (c) Mr. Patiño's uses an inadequate methodology. When the various errors are corrected, his model produces results for future oil production at Hamaca that are consistent with the Claimants' case.

2. The Respondent's Position

409. The Respondent notes that there were some signs at Hamaca leaving doubts about the ability of the field to meet the EHCO requirements at the upgrader during the entire term of the Project. The total number of wells required at the field increased in the business plans from 739 in 2004 to 1047 in 2005 and to 1389 in 2006; and 635 wells were anticipated through 2015, as per the 2006 business plan, as compared with 527 wells for the same period in the 2005 business plan. The 2006 business plan made clear that the Project would run out of well targets in 2031 and that starting then, production would fall off (LECG-122/112).

410. The wells at the Hamaca Project suffered from a high decline rate. When Mr. Figuera took office as President of Petrolera Ameriven in June 2006, he was informed by Mr. Steinar Vaage, a ConocoPhillips secondee and General Manager of the Project that the Project was running with a 2% decline per month, corresponding to a 50 to 60,000 BPD decline of production capacity per year[208]. In sum, on an *ex ante* basis as of 26 June 2007, the Respondent estimates that a total of 1.671 billion barrels of EHCO[209] would have been produced using cold production techniques and those EHCO volumes would have been processed to yield 1.576 billion barrels of CCO.

411. In the *ex ante* valuation at Hamaca, the Respondent assumed that EHCO production would be constrained by the performance at the upgrader, which RAM IV said could be expected to

[208] Figuera Appendix 74.

[209] Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 83.

operate at an OSF of approximately 84%. The Respondent relied on Mr. Figuera in explaining that "despite the growing concerns regarding the production field, there was every expectation that the field could produce sufficient EHCO to feed the upgrader at the reduced OSF expectations reflected in the RAM reports"[210]. The Respondent and its experts also assumed that even so the field was showing signs of having reduced capabilities under cold production. In the *ex post* valuation, the actual performance of the upgrader and the more severe limitations at the field must be taken into account.

412. In this respect, the Respondent relies on Mr. Patiño's study. The expert's conclusions regarding the Huyapari field are as follows: (1) As of 1 January 2009, the Hamaca Project had drilled, completed and connected 325 wells, of which 266 were active and 43 were inactive and required minor repairs, while the other 16 wells were not reparable. The potential production from those 309 wells totaled 169.4 MBD. In addition, there were 32 wells drilled in 2008 but not yet connected to production in early 2009. When they are added, the production capacity program would total 201.2 MBD. (2) Assuming that these 201.2 MBD would have dropped by the end of 2009 to 177.7 MBD in light of the EHCO volumes that were required for the CCO sales achieved during the year, no new wells would have been needed. (3) Thereafter, Mr. Patiño added new wells to assure that the overall production capacity of the field would be around 110% of the EHCO required for (a) CCO sales that were actually achieved in the historical period and (b) CCO sales that would be achieved in the projection period assuming a long-term OSF of 72.85%. After 2024, there were no new well targets, and from then on, production capacity will be insufficient to support the EHCO requirements for CCO production even at an OSF of 72.85%.

413. Mr. Patiño's production capacity program at Hamaca assumes an aggregate of 1,218 wells. This is 171 wells more than the number set forth in the 2005 Business Plan, and 171-197 wells fewer than the number set forth in the draft 2006 business plan (1,389) or in the model on which the Claimants rely (1,415). Mr. Patiño has concluded that over the whole duration of the Project, a total of 1,269 billion barrels of EHCO would be produced using cold production techniques, about 800 million barrels less than the production volumes the Claimants contend will be produced.

3. The Tribunal's Findings

414. The Tribunal will address here the production of EHCO independently from the disputed availability of the Hamaca upgrader to treat the required quantities of EHCO. If it was demonstrated that the upgrader cannot deal with EHCO above a certain quantity, this will have to be added to the analysis. At this juncture, the question is focused on the amount of EHCO potentially capable of being extracted from the grounds and sent to the upgrader. The Tribunal notes that apart from

[210] Cf. Respondent's Final Brief on Quantum, para. 120.

repeating Mr. Patiño's and Mr. Figuera's assertions, the Respondent has little to add for its position voicing doubts about Hamaca's field performance. Witness Figuera has nothing to report in this respect except the need to study enhanced oil recovery ("EOR")[211]. Reductions in production ordered by the Ministry in November and December 2006 are not mentioned[212]. As it does in respect of Petrozuata, the Respondent omits to consider the potential of new wells to be added to the site. For instance, when reporting about the message send by Mr. Vaage on 23 October 2006, alerting a 2% decline rate per month, the Respondent[213] omits to add that this information meant "without well additions", as this was stated in the message send on 20 October 2006 by Mr. Steven Haile to Mr. Vaage, who then reported to Mr. Figuera[214]. This information has to be considered together with the Hamaca Board of Director's decision of 18 May 2006 to restart drilling in January 2007[215]. As explained by Mr. Figuera, field decline had as a consequence an increase in the numbers of wells to be drilled[216]. Conversely, if one does not drill wells, a drop-off in production of all wells will follow[217]. Witness Lyons explained that everybody understood that the overarching assumption for both Petrozuata and Hamaca was to keep the upgrader full[218]. Witness Figuera agreed with this requirement[219]; it was the key-assumption[220]. Mr. Patiño failed to include this important objective into his methodology.

415. The Tribunal cannot follow Mr. Patiño's reliance on Mr. Figuera's allegation of a very low OSF factor (72.85%) of the upgrader with the effect that a reduced quantity of EHCO only can be fed into the upgrader and extracted from the fields[221]. Mr. Patiño did not examine from any perspective the actual recovery factor applicable to the Hamaca upgrader.

416. The Tribunal cannot rely either on Mr. Patiño's projections on EHCO supplied from the fields to the extent he assumes that the EHCO volumes required for the CCO sales since 2009

[211] Fourth Supplemental Testimony, 7 January 2015, para. 9.

[212] They were a matter for concern at the Meeting of the Board of Directors of 16 November 2006 (C-343, p. 2).

[213] Respondent's Final Brief on Quantum, para. 119.

[214] Figuera Appendix 74.

[215] C-344, Figuera Appendix 25, p. 5. The Board further noted a current output rate of 185,000 BPD EHCO which is close to the design maximum.

[216] Cf. TR-E, 2017 February Hearing, Day 8, p. 2535:1-2536:15.

[217] Witness Lyons, TR-E, 2017 February Hearing, Day 7, p. 1986:19-22.

[218] TR-E, 2017 March Hearing, Day 11, p. 3114:5-7.

[219] TR-E, 2017 March Hearing, Day 11, p. 3115:15-18.

[220] TR-E, 2017 March Hearing, Day 11, p. 3123:15/16.

[221] Consolidated Expert Report, 17 October 2016, paras. 121/122, noting that Mr. Figuera's projected long-term OSF of 72.85% was "based on the historical performance of the upgrader from the time it was commissioned through 2015" (note 199). Mr. Patiño did not investigate whether this was correct.

would have dropped, with the effect that no new wells would have been needed. Indeed, this reduction in the production of EHCO suitable for upgrading to CCO has nothing in common with the designed operation under the Association Agreement, which did not allow for regular production of blended oil. The Tribunal has also difficulties in understanding the Respondent's assumption of a decline on the Hamaca field, when Mr. Patiño's program scheduled a total of 1,218 wells, more than 170 wells less than the 1,389 wells provided as early as in the 2006 business plan[222]. In any event, Mr. Patiño has been called as an expert and not as a witness.

417. In light of the influence of external factors like the OSF or the reduced production of CCO on his own methodology, Mr. Patiño's assumptions cannot assist the Tribunal's decision. Mr. Patiño's decline rate is again based on a small sample of wells that he then corrected in reaction to Dr. Strickland's criticism. He also failed to compare his results with the actual production history of the Project.

418. The Tribunal can draw similar conclusions when considering the downstream production at the Hamaca site. Indeed, the Tribunal has been provided with the invoices for syncrude and blended oil sold between mid 2007 and 2015. The figures resulting from this documentation allow the determination of the quantities of EHCO that must have been available for such purpose. These figures can also be compared to those retained by Mr. Patiño in respect of the field's EHCO production capacity calculated independently from the EHCO production required for the upgrading to CCO only. The results are as follows:

[222] See also the Board's Budget 2007 Presentation, Figuera Appendix 75.

	Mr. Patiño's data						Actual data	
	Active Potential EHCO Production[223]		EHCO Production to Upgrader[224]		CCO for sale[225]		EHCO required for blending[226]	Total EHCO used for upgrading and blending (column 5+8)
	BPD[227]	MMB	BPD	MMB[228]	BPD	MMB	MMB	MMB
2009	188,906[229]	68,950,690	115,385	42,116,000	109,270	39,884,000	6,192,793	48,308,793
2010	165,869	60,542,185	144,706	52,818,000	137,036	50,018,000	0	52,818,000
2011	161,570	58,973,050	137,275	50,105,000	130,000	47,450,000	2,373,606	52,478,606
2012	160,305	58,511,325	72,747	26,625,000	68,891	25,214,000	26,277,368	52,902,368
2013	159,599	58,253,635	136,353	49,769,000	129,127	47,131,000	14,609,112	64,378,112
2014	158,897	57,997,405	153,203	55,919,000	145,084	52,955,000	3,578,852	59,497,852
2015	159,866	58,351,090	148,377	54,158,000	140,513	51,287,000	2,159,519	56,317,519
Sub-total	1,155,012	421,579,380	908,046	331,510,000	859,921	313,939,000	55,191,250	386,701,250
Ave./year	165,002	60,225,626	129,721	47,358,571	122,846	44,848,429	7,884,464	55,242,998
1	2	3	4	5	6	7	8	9

419. From 2016 onwards, when he had no actual figures for CCO available, Mr. Patiño selected the figures for Potential EHCO Production less 10% to determine EHCO Production to Upgrader and from there (x0.947) CCO. Four years are here selected for the purpose of illustration. As a matter of fact, looking at his table, it is only as from 2025 that the results of his decline study are impacting seriously EHCO production at Hamaca, with a further kick-down in 2027.

[223] Patiño Appendix 84, Output.

[224] Cf. Consolidated Expert Report, 17 October 2016, para. 193; Patiño, Appendix 84, Output. These numbers are re-calculated from the volumes of CCO mentioned in Mr. Patiño's Consolidated Expert Report, 17 October 2016, para. 193 (with a yield factor of 0.947); the numbers for CCO have been copied for 2009 to 2013 from Mr. Figuera's Third Supplemental Testimony, 15 August 2014, para. 8, based on Appendix 42.

[225] The numbers for 2009-2015 are all copied from Consolidated Expert Report, 17 October 2016, para. 193, where Mr. Patiño explains that he took them from Mr. Figuera's Third Supplemental Testimony of 15 August 2014, table 1 (para. 8), further referring to his Appendix 84. This is correct for the years 2009-2013. However, Mr. Patiño did not observe that Mr. Figuera updated his documentation and submitted a new set of invoices in his Appendix 106, further noting the results in his Fourth Supplemental Testimony of 7 January 2015, table 1, para. 19, from where the numbers on EHCO production have been copied into the Respondent's assessment of Production submitted on 2 June 2017.

[226] These quantities represent 76.67% of blended oil sold as per the information submitted by the Respondent at the March 2017 Hearing, and also contained in the Hamaca Assessment of Production, p. 15.

[227] Mr. Patiño also provides the figures for "Year Start", which are slightly different and less suitable for comparison purposes. Cf. Consolidated Expert Report, 17 October 2016, para. 193; Patiño, Appendix 84, Output.

[228] The numbers have been rounded by Mr. Patiño.

[229] This figure has not been verified by Mr. Patiño. He noted that on 1 January 2009, when he started his production capacity program, this capacity of the field totaled 201.2 MBPD; cf. Consolidated Expert Report, 17 October 2016, para. 124; Expert Report, 18 August 2014, para. 141.

	Active Potential EHCO Production		EHCO Production to Upgrader		CCO for sale	
	BPD	MMB	BPD	MMB	BPD	MMB
2017	159,766	58,314,590	143,432	52,353,000	74,855	49,368,000
2021	159,008	58,037,920	143,432	52,353,000	51,757	49,368,000
2025	130,384	47,590,160	118,473	43,243,000	21,993	40,778,000
2029	53,825	19,646,125	48,907	17,851,000	8,986	16,833,000
Total 2009 to 2037				961,622,000		908,136,000
1	2	3	4	5	6	7

420. As this has been done for Petrozuata, but avoiding lengthy repetitions, the figures resulting from Mr. Patiño's study and the comparison with the figures relating to the production of blended oil require the following comments.

421. Mr. Patiño's volumes for total potential EHCO available on the sites (column 2/3) are always higher than the actual volumes extracted by the wells for the purpose of producing upgraded CCO (column 4/5). This applies for two periods, the one between 2009 and 2015, and the other covering the years 2017 to 2036. Therefore, more EHCO was in fact available than what results from Mr. Patiño's conclusions.

422. When the estimated quantities of EHCO to be used for blending are also considered and added to the volumes used for upgrading, the resulting amounts are interesting from two perspectives: (1) the added amount is always higher than the EHCO supplied for upgrading – thus showing that the EHCO taken into the upgrader is below the EHCO available; and (2), there is a difference of about 38,650 BPD compared to the feeding capacity of the upgrader (190,000 BPD). In order to compensate the difference, an extended drilling activity (corresponding to about 45 wells proceeding at a pace of 800 BPD) would be required. Witness Figuera noted that it was possible to bring up the rate of production per well to an initial production of 1400 to 1600 BPD in the short-term[230].

423. For his definition of the available wells, Mr. Patiño again identifies the characteristics of wells and their potential decline, but he does not proceed to determine the available potential for new wells and new targets. He examined only 17% of the wells operating on site, arguably because so-called "erratic" wells could not be used for such testing[231]. He also chose a requirement of 20-foot thick sands[232] that has been considered as much too rigid[233]. Witness Lyons commented that if one removes anything less than 20 feet, that is a lot of oil left behind, thus eliminating oil that

[230] TR-E, 2017 March Hearing, Day 11, p. 3213:20-3214:11. He added that they had not to care about the long-term, which was Venezuela's task.

[231] Cf. TR-E, 2017 February Hearing, Day 9, p. 2583:4-2586:6, 2747:3-2750:19.

[232] Cf. Patiño, Consolidated Expert Report, 17 October 2016, paras. 62, 112-114.

[233] Strickland, Consolidated Expert Report, 17 October 2016, paras. 99-107.

can be obtained[234]. PDVSA's decision to require 20-feet thick sands was one of the reasons why it has been argued that the Projects were lacking targets[235]. A comparison to the quantities of certified Proved Reserves is missing. It is striking that upon Mr. Patiño's advice, no further well will be drilled as from 2024, although time is left until 2037 to increase EHCO production.

424. At a closer look at the key points of new wells to be drilled, the Tribunal notes that Mr. Patiño projected 754 new wells as from 1 January 2009[236], a number that is in the range of the business projections prior to the expropriation. In this regard, Mr. Patiño stays very close to the original assessment of production. Here again, the Tribunal finds that the assessment of the decline rate of the wells does not include sufficient consideration of the potential of compensation through new wells and increasing work on maintenance and repair (and the associated increase in costs). This item is only marginally addressed in Mr. Patiño's decline analysis[237]. It has also been noted that the decline of wells productivity had as one of its main causes PDVSA's policy to give priority to single lateral wells. For Witness Lyons, this change of strategy had a most negative effect on productivity[238]. This circumstance also renders uncertain Mr. Patiño's study based on wells decline. He explains, indeed, that in respect of multilateral wells, the information on the remaining reserves and the level of depletion per lateral cannot be managed and ascertained with anything close to precision[239]. How is it then possible to determine multilateral wells' decline?

425. Mr. Patiño's approach is not forward looking. In his First Report, he concluded that "with a target potential production capacity of 154.6 MPD, the Huyapari field runs out of targets in 2024"[240]. Assuming this is correct, why did he not suggest searching for targets above 2024? Was this because he was focusing on a "target potential production capacity of 154.6 MBD"? He identified 1,100 wells to be drilled over the life of the field. But he also noted that higher numbers were projected, up to 1,265 producing wells[241]. This number can be found in a ConocoPhillips's Engineering Report of 2007, identifying "new producers" and adding 124 re-drills, providing for a total

[234] TR-E, 2017 March Hearing, Day 11, p. 3211:1-3212:2.

[235] Cf. TR-E, 2017 March Hearing, Day 11, p. 3208:18-21 (Figuera), p. 3211:1-11 (Lyons).

[236] Consolidated Expert Report, 17 October 2016, para. 155.

[237] *Ibidem*, paras. 106/107.

[238] Second Witness Statement, 30 October 2009, paras. 10, 11, 13, 24, 30; Fourth Witness Statement, 16 May 2014, para. 21; Fifth Witness Statement, 13 October 2014, paras. 43-48; TR-E, 2010 Hearing, Day 4, p. 1077:5-1078:17; Day 5, p. 1329:2-1332:13.

[239] Consolidated Expert Report, 17 October 2016, para. 88. Expert Brown objected to Mr. Patiño's assumption (Second Witness Statement, 13 October 2014, paras. 11-13).

[240] Expert Report, 18 August 2014, para. 82. The understanding of Dr. Strickland was that Mr. Patiño took the actual CCO production and then back calculated what the EHCO volumes would have been in order to produce that (TR-E, 2017 February Hearing, Day 9, p. 2762:8-2763:6).

[241] Expert Report, 18 August 2014, para. 49.

number of wells drilled of 1389[242]. Why did he not go this far in light of a production capacity significantly below the Project's target since Mr. Figuera reported that, at the time of migration, ConocoPhillips had projected a capacity of 200 MBD that he considered as having dropped in reality to 186 MBD[243]? The same report listed more than 50 new producers drilled per year still as from 2024 until 2030. It appears to the Tribunal that Mr. Patiño refrained from heading above the number of 154.6 MBD because he was asked

> … to estimate the target potential production of the field based on the consideration presented in the Third Supplemental Figuera Direct Testimony relating to the requirements of the upgrader for the period from January 1, 2009 to December 31, 2013 and Mr. Figuera's estimate of those requirements thereafter. This results in target potential production of approximately 154.6 MBD[244].

426. Another rigid limitation is adopted by Mr. Patiño when he blocks the daily input of EHCO from 2016 until the end of the project at 143,432 BPD and, respectively retains a target of 157,775 BPD which includes a cushion of 10%[245]. These numbers represent a maximum availability. As the Claimants contend, the figure of 143,432 BPD is obtained when applying an OSF of 72.85% from the design capacity of 190,000 BPD. And Mr. Patiño's target of 157,775 BPD is close to 154.6 MBD he quotes as the target taken at the beginning of his study. This observation is in line with Mr. Patiño's introduction to his methodology where he notes that Mr. Figuera's estimate of an OSF of 72.85% was part of the information on which his study was based[246]. Although this is not expressly stated by Mr. Patiño, the review of his opinion suggests that in fact he started his study in taking the hypothesis of a maximum rate of 72.85% OSF and then back-calculated the numbers of wells needed to ensure the required EHCO production that was more than 27% behind design capacity[247].

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[242] ConocoPhillips, Hamaca RCAT Review, Engineering, 7 May 2007, p. 14/pdf (LECG-111). The same number has been retained in the Board of Directors' Presentation of 12 September 2006 (Figuera Appendix 75). Both documents noted that such drilling was being done until about 2032.

[243] Figuera, Testimony, 20 July 2009, para. 47.

[244] Expert Report, 18 August 2014, para. 67. In fact, the number of 154.6 MPD is not mentioned in the Testimony to which Mr. Patiño refers.

[245] Cf. Patiño, Appendix 84, Output, Upgrader, Field Metrics.

[246] Cf. Patiño, Consolidated Expert Report, 17 October 2016, para. 121, further noting that "OSF is an important consideration in the Hamaca production capacity program" (footnote 199). This OSF was thus used by Mr. Patiño to determine volumes of EHCO projected for the upgrader (para. 122). The Respondent, Final Brief on Quantum, para. 362, confirms that a 72.85% OSF was an assumption on which Mr. Patiño's conclusions were based. It was part of Mr. Patiño's instructions: cf. Expert Report, 18 August 2014, para. 8; TR-E, 2017 February Hearing, Day 9, p. 2665:10-2666:21 (Patiño), p. 2763:7-19 (Strickland).

[247] This percentage can be compared to the 30% that the Respondent estimates as variable portion of operational costs (OPEX) and therefore subject to the variation in EHCO production. Cf. Cost Estimation for Petrozuata, p. 14, 43/44, 48, 52/53, 56/57, and Hamaca, p. 15, 55, 59/60, 64/65, 69/70, 74; Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 308, 315.

427. The Respondent[248] and its valuation experts[249] adopt the approach and the results of Mr. Patiño's method and report, further including in their presentations on the *ex ante* profile the figures relating to the historical period between 26 June 2007 and the end of 2008[250]. Their conclusions are as follows:

	EHCO Production to Upgrader		CCO for sale	
	BPD	MMB	BPD	MMB
Mr. Figuera				
End 2007	171,629	31,570,422	157,341	28,939,154
2008	158,777	58,112,475	143,253	52,430,724
subtotal	163,061	89,682,897	147,949	81,369,878
Mr. Patiño				
2009-2037		961,622,000[251]		908,136,000[252]
Total		1,051,304,897		989,505,878

428. To conclude, the Respondent's presentation, tied to Mr. Patiño's analysis exclusively focused on decline rates, cannot be retained by the Tribunal. No evidence has been brought before the Tribunal that the production at Hamaca may be limited to quantities significantly lower than the upgrader's design capacity of 190,000 BPD, which corresponds to 69,350,000 MMB. For the period between 2009 and 2015, the figures provided by Mr. Figuera, combined with the EHCO required for the sale of blended oil, confirm this assessment:

[248] Cf. Respondent's Final Brief on Quantum, para. 363; the numbers for 2007 and 2008 are contained in the *ex ante* table, para. 157.

[249] Cf. Brailowsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 259; the numbers for 2007 and 2008 are contained in the *ex ante* table, para. 74.

[250] They were taken from Figuera, Testimony, 20 July 2009, paras. 37-39; TR-E, 2017 March 2016, Day 14, p. 4267:13-15, 4269:13-15, 4271:13-15, 4273:15-19 (Preziosi).

[251] This number became 959,823 in Mr. Patiño's last update under Appendix 89. However, he stated that the difference was negligible and he did not use it in his Consolidated Expert Report, 17 October 2016, paras. 137, 193, nor did he use the figures composing this final amount. The Respondent and its valuation experts have equally not adapted their figures to this last version.

[252] As this has been observed above in relation to Mr. Patiño's numbers on CCO sold between 2009 and 2015 (column 6/7) they were copied from Mr. Figuera' Third Supplemental Statement, 15 August 2014, para. 8, table 1 and the attached Appendix 42, not noting that Mr. Figuera had updated his information in his Fourth Supplemental Testimony, 7 January 2015, para. 19, table 1 and the attached Appendix 106. The Respondent and its valuation experts have relied on Mr. Patiño's numbers, with the effect that their numbers are equally incorrect, and, as a consequence, any subsequent calculation based on them.

2009-2015	EHCO Produced[253]	CCO Produced[254]	EHCO required for CCO invoiced	CCO Invoices[255]	Blended Oil Sold[256]	EHCO required for blending (76.67%)	Total EHCO used for upgrading and blending (column 4 and 7)
2009	45,723,407	39,675,000	42,075,382	39,845,387	8,077,205	6,192,794	48,268,176
2010	53,540,415	49,459,910	52,236,706	49,468,161	0	0	52,236,706
2011	57,523,545	46,783,000	50,105,448	47,449,859	3,095,873	2,373,606	52,479,054
2012	60,903,301	26,782,000	26,625,256	25,214,117	34,208,123	26,227,368	52,852,624
2013	58,430,039	47,602,000	49,768,987	47,131,231	19,054,535	14,609,112	64,378,099
2014	56,553,345	53,190,000	55,919,208	52,955,490	4,667,865	3,578,852	59,498,060
2015	54,927,758	50,946,000	54,157,769	51,287,407	2,816,642	2,159,519	56,317,288
2016							
total	387,601,810	314,437,910	330,888,756	313,351,652	71,920,243	55,141,251	386,030,007
Av. p/year	55,371,687	44,919,701	47,269,822	44,764,522	10,274,320	7,877,322	55,147,144
p/day, BPD	151,703	123,068	122,506	122,643	28,149	21,582	151,088
1	2	3	4	5	6	7	8

429. At this juncture, the figures to be retained are those relating to the EHCO Production Capacity. As mentioned above, the EHCO Production required for CCO Production is noted for informational purposes, because these quantities reflect the operational choices made as from 2009, with the effect that the CCO production was significantly reduced, albeit complemented by the sale of blended oil. None of the numbers for EHCO required for CCO invoiced (column 4) comes close to the quantities fed to the upgrader in the second half of 2007 (31,570,422 MMB) and 2008 (58,112,475 MMB). The drop that occurred in 2009 was therefore based on reasons other than the performance of the upgrader, which was under the control of PDVSA in that period of 2007/2008 and since 2009.

430. To obtain the approximate volumes of EHCO that would have been available when no blending had been permitted, the amount of EHCO required for the production of the relevant corresponding CCO sold has to be added to the EHCO portion of 76.67% in the blended oil[257]. As shown in the table above, the amounts thus reached (column 8) are similar or very close to those

[253] Hamaca Assessment of Production, p. 15; Figuera, 4th Supplemental Testimony, para. 19. Comparable figures, translated into BPD, can be found in the PetroPiar Financial Statement for the years 2009 to 2012 (CLEX-094, p. 210, 259/pdf).

[254] Hamaca Assessment of Production, p. 15; Figuera, Appendix 107. The EHCO required for the production of the quantities of CCO mentioned in the table (column 4) represents numbers lower than those mentioned above under EHCO Produced (column 2). As explained by Mr. Figuera, the Project produced more EHCO than the quantities of EHCO required for the CCO that was produced, according to his figures. The EHCO quantities required for the upgrading to CCO are provided in Mr. Figuera's Fourth Supplemental Testimony, and they can be calculated by dividing the figures of CCO Produced (column 3) by the yield factor of 0.947 (*e.g.* 44,919,701 CCO p/year: 0.947 = 47,433,686 EHCO).

[255] Submitted by Respondent at the 2017 March Hearing, with corrections for years 2009 and 2010 in Annex 7 of Respondent's Answers of 10 July 2017.

[256] Submitted by the Respondent at the 2017 March Hearing; Hamaca Assessment of Production, p. 15, referring to Figuera Appendices 110, 111. Blended oil is composed of 76.67% EHCO and 23.33% diluent, mostly naphtha.

[257] The resulting figures are comparable to the numbers shown by Mr. Figuera as "EHCO Produced". However, they are far below the EHCO Production Capacity reported by Mr. Patiño.

reported as overall "EHCO Production" by Mr. Figuera (column 2). Approximate amounts of 55,200,000 MMB and 151,200 BPD can thus be retained as actual EHCO production figures experienced per year between 2009 and 2015.

431. These amounts increase slightly if one also includes the results of the EHCO production following the 18 months since the expropriation up to the end of 2008, when a total of 89,682,897 MMB has been produced, at an average of 163,061 BPD. In appropriate proportions, this allows the conclusion that in the period since the expropriation until the end of 2015, an actual average amount of 56,000,000 MMB per year has been produced, corresponding to 153,500 BPD.

432. When considering the EHCO production capacity reported by Mr. Patiño, it appears that his figures are above those required to produce the CCO that was actually sold in the years 2009 to 2015[258]. Indeed, he determined numbers for actual potential EHCO production between 57,977,405 MMB (corresponding to 159,866 BPD in 2015) and 68,950,690 MMB (188,906 BPD in 2009), at an average per year of 60,225,626 MMB, which is clearly above the figures quoted above and derived from Mr. Figuera's presentations.

433. Mr. Patiño is not a fact witness providing evidence relating to these figures. However, the Respondent and its valuation experts rely on them. Mr. Figuera's numbers are derived from actual numbers he retrieved when looking at thousands of invoices and reports to the Ministry on EHCO production. The difference is in a range of 4%, which is negligible when considering the many other factors that may have an impact (positive or negative) on the operation of such machinery as an upgrader.

434. The Claimants have not provided annual numbers in their briefs. They were then submitted in their tables on production filed on 20 March 2017 where it was explained that the annual numbers were copied by their experts from the COP-Composite-Economic-Model of 2006 (CEM) (LECG-085), but expressed through more precise numbers in a December 2006 Full Valuation (CLEX-86). The numbers provided in these two documents mostly coincide and support an average production rate of 175,000 BPD (corresponding to a yearly total of 63,875,000 MMB) that is adopted by the Claimants and its experts[259] from the beginning of the post-expropriation period, with the exceptions of turnaround years and without counting blended oil reported as sold during turnaround.

435. The EHCO production of 175,000 BPD initially alleged by the Claimants must be reduced on the basis of the Claimants' own observations. This number was based on an OSF of 92% as it

[258] As a matter of fact, looking at his table, it is only as from 2024 that the results of his decline study are impacting seriously EHCO production at Hamaca.

[259] Consolidated Update Report, 17 November 2016, para. 54.

had been submitted by the Claimants. In light of the 91% OSF adopted later in the proceeding, this figure would become 172,900 BPD and per year 63,108,500 MMB.

436. These quantities are above the actual figures for the period between 2009 and 2015 (55,200,000 MMB, 151,200 BPD), but closer to the actual average amount for the post-expropriation period in the years 2007 to 2015 (56,000,000 MMB, 153,500 BPD). The Tribunal finds no evidence and no convincing argument that would prevent it from retaining these figures for EHCO production at Hamaca if the Association Agreements with the Claimants as partners had remained in place. These are standard figures based on the production capacity of the fields. They will have to be reviewed in light of the production capacity of the upgrader.

437. A further observation must be added: Mr. Patiño notes a sharp decline for Hamaca for the last ten years of the Project's lifetime. Production of EHCO drops from 2025 and three years later it reaches the level of half of the quantities recovered between 2012 and 2024. The Claimants' experts note a drop in 2031[260]. This needs to be further considered below (F).

438. Before that, the next question is to determine whether the available EHCO production is capable of being upgraded.

E. The Processing Capacity of the Upgraders

1. Basic elements

439. According to the constraints accepted in the Association Agreements, the Petrozuata and Hamaca Projects were focused on the production of syncrude (CCO) through a process of upgrading of extra-heavy crude oil (EHCO), to the exclusion of blended oil that is mixed with other oils and not processed through an upgrader. Each Project had one upgrader available for such purpose, each being constructed so as to be able to process a certain maximum quantity of oil per day over the life-time of the Projects. In terms of EHCO, this quantity was, approximately, for Petrozuata 120,000, and for Hamaca 190,000 barrels per day (BPD).

440. EHCO was not delivered to the upgrader in that quality. Given its very high viscosity, it had to be diluted with naphtha in order to be capable of being processed as DCO from the wells through a pipeline to the upgrader. It is not disputed that the respective quantities of such mixed or diluted EHCO were 76.67% undiluted EHCO and 23.33% naphtha. Once arrived at the upgrader, the original EHCO was separated from the naphtha; while the latter was sent back to the fields, the remaining EHCO entered into the upgrading process.

[260] Consolidated Update Report, 17 November 2016, para. 54.

441. In order to take the measure of the quantity of CCO available for sale, the capacity of the upgrader is determined in relation to the quantity of EHCO that can be introduced. The relation between the resulting CCO and the incoming EHCO is determined by a "yield factor" that expresses the quantity of EHCO in relation to the resulting CCO. If this factor is 94.7% or 0.947 (as it is at Hamaca), one barrel of EHCO becomes 0.947 barrel of CCO. Thus, the upgrader of Hamaca was designed to produce 179,600 BPD[261] of CCO, and the upgrader of Petrozuata 104,000 BPD (the yield factor being 0.8621).

442. Given the relation between EHCO and naphtha when mixed together as DCO, the amount of EHCO required to fill up the upgrader at maximum capacity is in a proportion of 76.67% compared to the quantity of DCO provided from the fields. Thus, one barrel of DCO includes 0.7667 barrel of EHCO that yields 0.7261 barrel of CCO at a yield factor of 94.7% (in the case of Hamaca). Therefore, when the upgrader had a capacity of 190,000 BPD of EHCO, it had an initial throughput of 247,800 BPD of DCO (comprising 57,800 BPD of diluent).

443. The maximum capacity for the production of CCO was not defined in real terms but as a designed quantity of EHCO that each upgrader was actually capable of processing. The relation between this designed optimal capacity of CCO and the quantity of CCO actually treated at a certain point of time, or rather over a certain period, is expressed as the "on-stream factor" (OSF). The OSF is a metric that describes the operational efficiency of an upgrader or refinery[262]. It is a measure of actual CCO production against the design rate for CCO production[263]. It reflects the ratio of actual syncrude production (CCO) to the upgrader's design capacity. In fact, the OSF is the key number or percentage that identifies the availability and capacity of treatment of the upgrader, and, ultimately, the resulting quantities of CCO that can possibly be put on the market for sale. Thus, in the case of Hamaca, the OSF is a measure of actual CCO production against the design rate for CCO production of 179,600 BPD. If the upgrader operates at a 91% OSF (as alleged by the Claimants), it can be expected to produce 163,400 BPD of CCO (when receiving 189,600 BPD of EHCO, the yield factor being 0.947). If it runs at a 84.26% OSF or at a 73% OSF (both figures used by the Respondent), it will produce 151,331, respectively 131,100 BPD of CCO. From another perspective but again for the Hamaca upgrader, it can be determined that whereas an OSF of 100% represents 179,600 BPD of CCO, 1% OSF equals 1796 BPD. This also means that a shutdown of the whole upgrader can be measured by days but also by its effects on the OSF. A loss of 1796 BPD

[261] The precise figures for EHCO and CCO capacity of the Hamaca upgrader are uncertain. 179,600 BPD is frequently quoted for CCO and used here. Given the yield factor of 0.947, it would correspond to 189,600 BPD of EHCO (cf. Earnest, Consolidated Expert Report of October 17, 2016, paras. 10, 34, 56). However, the capacity for EHCO is in general given as 190,000 BPD.

[262] Claimants' Final Submission on Quantum, para. 214.

[263] Respondent's Final Brief on Quantum, para. 117, note 229.

equals a 1% OSF reduction. This also explains that the OSF is used as expressing a percentage of time that a refinery is running at its design capacity[264].

444. Sometimes the OSF is used differently, as a factor based on the actual volume of incoming EHCO. It has been noted, indeed, that the OSF can in principle be calculated using either EHCO or CCO production figures[265]. When referring to EHCO, the OSF can be used as expressing the quantity of EHCO delivered to the upgrader. Thus, again in the case of Hamaca, assuming the upgrader operates at an OSF of 91% (as submitted by the Claimants), this can have the meaning that it receives an EHCO production of 172,900 that is then upgraded to 163,736 CCO (using the yield factor of 0.947). In the hypothesis of a 84.26% or a 73% OSF (both figures used by the Respondent), the upgrader will produce 151,331, respectively 131,100 BPD of CCO, which can mean that the supply of EHCO is limited to 159,800 or 138,437 BPD (using again the yield factor of 0.947).

445. In sum, the OSF can be understood in two ways: (1) Either it expresses a decrease in the performance capacities of the upgrader, which produces CCO below its design capacity[266]; or (2) the OSF goes downwards because of a reduction in the EHCO quantities provided from the fields, which has also the effect of lowering CCO volumes below the design capacity. An additional factor for which no evidence on quantities was provided relates to the processing of EHCO delivered to the upgraders of Petrozuata and Hamaca from other sites in the Orinoco fields[267].

2. *The Claimants' Position*

446. The Claimants explain that by its third year of commercial operation in 2004, the Petrozuata upgrader achieved an OSF of roughly 97%, which the Claimants represent as "world-class". The upgrader was still "best in class" until 2007, subject to a cut in EHCO production based on an OPEC limitation applicable in 2007[268]. At that time, the upgrader was operated by the Petrozuata joint venture company. Since the expropriation, it has been operated and maintained exclusively by PDVSA.

[264] Cf. Claimants' Memorial on Quantum, 19 May 2014, para.143.

[265] Claimants' Final Submission on Quantum, para. 246, note 391.

[266] This option is expressed by Mr. Earnest when he refers to a loss of operating proficiency at the Hamaca upgrader; cf. Technical Assessment of the Hamaca and Petrozuata Upgrader Performance, 13 October 2014, para. 11; Consolidated Expert Report, 17 October 2016, para. 55. However, this does not, by itself, dispose of the other option that understands the downward trend in OSF performance as a decrease in the volume of EHCO supplied.

[267] Cf. Figuera, Fourth Supplemental Testimony, 7 January 2015, para. 22; Earnest, Consolidated Expert Report, 17 October 2016, para. 66.

[268] Cf. Lyons, Second Supplemental Testimony, 17 May 2010, para. 17; TR-E, 2017 February Hearing, Day 8, p. 2222:15-2224:3, 2233:14-2235:5.

447. The Claimants note that Venezuela alleges that subsequent to the expropriation, PDVSA has encountered operational problems that have reduced the OSF of the Petrozuata upgrader. With one exception, all of these problems are said to have arisen in 2009, long after the Claimants had left Venezuela. Mr. Earnest concludes that the problems on which Venezuela seeks to rely in fact result from PDVSA's own technically poor operation of the upgrader. Such deficiencies cannot be attributed to the Claimants.

448. Venezuela tacitly acknowledges that the reduced performance of the upgrader results, at least in part, from PDVSA's own technical failings. The Claimants have noted that Mr. Figuera attributes upgrader downtime in 2014 and 2015 to "equipment failures and operational errors"[269]. An outage of the delayed coker unit in 2013 occurred "due to operator error" and Mr. Figuera explained that this incident led to a shutdown of the entire upgrader for 45 days, and a consequent 12.3% reduction in the upgrader's OSF for 2013[270]. Mr. Earnest noted that one would not expect a 45-days shutdown for this reason from a competently run organization[271]. The government inspectors reported in 2015 on a serious deterioration of upgrading facilities under PDVSA's management, further noting PDVSA's negligence in its operation of the Orinoco Belt Projects (C-649). PDVSA's deficiencies cannot be properly imputed to the Claimants in the but-for scenario.

449. In respect of the more controversial production capacity of the Hamaca upgrader, the Claimants recall once again that their experts have used a conservative approach. They relied upon the average production figure for Hamaca of 175,000 BPD of EHCO through the terminal years of the contractual period. This level of production implies an OSF for the Hamaca Upgrader of approximately 91%[272]. That OSF figure matches the expectation of all Project participants (including PDVSA) prior to the expropriation, as reflected in the 2005 Hamaca Business Plan (C-341, p. 39) and the 2006 Project's Economic Model (LECG-129). Mr. Earnest concludes that this OSF projection is both reasonable and attainable[273].

450. The RAM ("Reliability, Availability and Maintainability") Studies that have been commissioned by the Project partners predicted an average long-term OSF of between 84% and 93%. The Hamaca Project's Board of Directors evaluated RAM IV and its predecessor reports and concluded that there was a range between 85% and 95% (C-344, 470).

[269] Claimants' Final Submission on Quantum, para. 219, referring to a statement of Mr. Figuera before the ICC Arbitral Tribunal.

[270] Third Supplemental Testimony, 15 August 2014, para. 95.

[271] Consolidated Expert Report, 17 October 2016, para. 136.

[272] In the Claimants' Memorial on Quantum, 19 May 2014, para. 144, this production figure implies an OSF of approximately 92%.

[273] Consolidated Expert Report, 17 October 2016, paras. 68-79.

451. Actual upgrader performance in the pre-expropriation period confirms the Project partners conclusion that a long-term OSF of 91% would reasonably be achieved. In 2005, the first full year of commercial operation, a 89% OSF was achieved. In 2006, the OSF averaged over 91% in the first five months of that year[274]. The Project partners accordingly concluded that the upgrader's OSF would continue to rise in later years, as reflected in the Project's successive Business Plans for 2005 and 2006[275]. The 2005 Plan, the last approved by the Hamaca Board[276], prior to the expropriation, shows that the parties expected the OSF to rise to 94.8% in 2007, and remain at rates above 90%, except in turnaround years[277].

452. To insure this result, the Project partners agreed on a detailed capital investment program to enhance and sustain the upgrader's OSF, as reflected in the extracts from the Project's 2007-2008 Capital Expenditure (CAPEX) budget (C-473). Additional expenditures were also contemplated for later years. The Project partners' expectations were reasonable and achievable. Mr. Earnest concluded that the budgeted improvement measures would be expected to yield a long-term OSF of approximately 91% – consistent with the figure adopted in the Project's Economic Model, and the Claimants' damages model.

453. The Claimants note that Venezuela insists that the long-term OSF should be fixed at 72.85% for the remaining 21-year duration of the Project's term. This figure is the latest advanced figure by Mr. Figuera and it is said to be based on PDVSA's own post-expropriation performance at Hamaca. First, there is strong evidence that PDVSA's post-expropriation operation of the Projects has suffered from profound deficiencies that must be imputed to PDVSA, and not to the Claimants in the but-for scenario. Second, Mr. Figuera refers to wrong figures. He reports an OSF of 87.63% for 2005, while the minutes of a Hamaca Board meeting report a year-end OSF of 89% (C-344, C-561, C-614). Third, Venezuela acknowledges that Hamaca has been bypassing the upgrader and selling large quantities of non-upgraded products since 2009, with the effect that the OSF is artificially reduced. In this respect, Venezuela has not shown that the upgrader was not capable of processing those extra volumes. Fourth, Venezuela's proposed long-term OSF of 72.85% is not credible. If correct, it would mean that the upgrader would be off-line nearly 30% of the time, for each of the coming 20 years. For the same period, Venezuela claims that PetroPiar will spend billions of dollars on upgrader turnarounds, maintenance and improvements; such activities had the purpose

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[274] The Board of Directors noted in May 2006 a current OSF of 91-92%; C-344, Figuera Appendix 25.

[275] C-341, C-346. Witness Figuera expressed doubts whether the members of the Board understood the challenge they were accepting in the 2006 Plan, but he was not present at the meeting; TR-E, 2017 March Hearing, Day 11, p. 3263:5-14, 3264:14-16, 3265:12-19.

[276] It was said that this Plan had not been formally approved because of some uncertainties in 2007, relating to access to the Reserve Area and the question how long the OPEC cuts will last. Cf. Witness Lyons, TR-E, 2017 February Hearing, Day 7, p. 2008:20-2009:12; 2017 March Hearing, Day 11, p. 3284:1-3287:22.

[277] Cf. also Witness Lyons, TR-E, 2017 March Hearing, Day 11, p. 3265:22-3267:17, 3270:19-3271:15, noting an actual OSF of 91.4% in 2005.

of improving the integrity of the upgrader, which was meant to achieve a higher OSF (C-341, C-346). This is confirmed in a Report of the company on the 2009 turnaround (C-584). In sum, the evidence supports the expectations of the Hamaca partners that a long-term OSF of 91% would be attained. Venezuela's figure of 72.85% is unreliable and unrealistic.

454. The Claimants also object to Venezuela's main argument about the upgrader's deficiencies, which relate to the coker and the vibration levels experienced there. The coker is the part of the upgrader that strips out the heavier elements in the EHCO to yield lighter, more valuable hydrocarbons. The Project partners made the resolution of this problem a priority. A list of corrective measures was set up (C-340, C-346). Mr. Figuera conceded that the coker vibration has not impacted syncrude production at Hamaca. However, Venezuela asserts that the coker vibration poses a "risk of catastrophic failure"[278]. Venezuela's quantum experts adopt a 10% annually compounded probability of upgrader destruction[279]. This reduces the value of the Project by US$ 2 billion (16%). Venezuela offers no technical justification for the 10% figure. No responsible company would continue operating a coker that actually posed a significant risk to the surrounding facility and its workers. Nine years after the expropriation, the problem has not been corrected. Only in 2012 a third party was commissioned to proceed with an assessment of the vibration issue (Chevron Energy Technology Company, CETC). The CETC report[280] proposed a correction to the coker structure with the effect of reducing structural drum vibrations. Mr. Earnest agrees and considers that the measure as proposed will almost certainly resolve the coker vibration issue. Nevertheless, PetroPiar has not completed the implementation of the CETC solution.

455. The economic consequences of the coker issue suggested by Venezuela are absurd. Venezuela claims that PetroPiar will make multi-billion-dollar investments to maintain and improve the upgrader. If this was true, it would be cheaper to replace the coker, at US$ 600 million costs as estimated by Mr. Figuera[281]. The losses incurred during the replacement could be bypassed by selling blended products. At the ICC hearing, the Respondent's experts conceded that the probability of a coker failure has no technical basis.

456. The Respondent alleges other operational problems that, in its view, diminish the efficiency of PetroPiar's operations and should be reflected in the valuation related to the Hamaca Project and its upgrader. None of these problems has any specific impact on the valuation. Thus, naphthenic acid corrosion is a common problem at refineries and can be remedied; the record shows that this was a recognized issue prior to the expropriation and was being resolved (C-379). There is no

[278] Respondent's Rejoinder on Quantum, 7 January 2015, para. 441.

[279] Consolidated Expert Report on Valuation, 17 November 2016, para 261.

[280] Figuera Appendix 72.

[281] Testimony, 20 July 2009, para. 52; Fourth Supplemental Testimony, 7 January 2015, para. 43.

evidence that the alleged quality issues Mr. Figuera raises in respect of EHCO (in particular a lower gravity) have had any effect on the syncrude production; Mr. Earnest explains that Venezuela has vastly overstated the potential impact of EHCO quality on production levels[282]. The alleged collapse of storage tank 12 in 2011 was due to a fire caused by an operator error; that is PDVSA's responsibility, and any resulting losses would have been covered by PetroPiar's insurance policy.

3. The Respondent's Position

457. The Respondent recalls that the Hamaca upgrader was commissioned in October 2004, with a design throughput of 247,000 BPD of diluted crude oil (DCO), comprised of approximately 190,000 BPD of EHCO and 57,000 BPD of diluent, and a design output of about 179,600 BPD of CCO. The Project had a term through August 2037. The performance of the upgrader was the main concern at Hamaca. A number of Reliability, Availability and Maintainability ("RAM") studies were made, ultimately showing that the upgrader would have a long-term OSF of about 84%, a figure far below the OSF in excess of 91% plus included in the business plan.

458. The Respondent has established that the CCO production profile for the Hamaca Project used by the Claimants is unfounded because of the serious limitations at the Project's upgrader. The evolution of the OSF at Hamaca indicates that as more information became available, the prospects for the upgrader's long-term performance diminished. The estimated long-term OSF for the Hamaca upgrader dropped at each of the four RAM studies that have been commissioned between 1999 and 2006.

459. RAM I[283] was issued in June 1999 and it concluded, based on the limited information available at the time, that the upgrader could achieve the original target of 93% OSF. RAM II[284] was prepared in 2002 (after the detailed engineering for the upgrader was nearly completed) and noted increased failure frequency of heat exchangers, columns and electrical supply, as well as failures of other components not considered in the RAM I study. The long-term OSF predicted by RAM II was 86.4% and it noted that there was no chance of achieving the targeted 93% availability level. RAM III[285] was issued in November 2003, after the construction of the upgrader was about 60% completed. It was conducted by a different company than RAM II, using however a similar methodology. It concluded that the long-term OSF was 85.37% and also confirmed that there was no chance to achieve the 93% OSF that had been envisaged. RAM IV[286] was undertaken in 2006 after the upgrader had been constructed and had been operating for more than a year. It considered a

[282] Consolidated Expert Report, 17 October 2016, para. 140.

[283] Figuera Appendix 19.

[284] Figuera Appendix 20.

[285] Figuera Appendix 21.

[286] Figuera Appendix 9.

total of 1,354 components and was based on real data from the Petrolera Ameriven databases. It took into account the modifications that have been made during the construction, and was also based on reliability studies that were then made available. RAM IV concluded that the long-term OSF would be 84.38%, but depending upon the nature of further improvements being undertaken, the mean OSF could be increased either to 86.32% or 87.87%. Thus, there was a potential for improvement of 3.4%. RAM IV also explained that upstream failures could have the effect of reducing the OSF down to 82.35%. The range of possible OSF was therefore between a "most representative" 84.38% and a "best practices" of 87.87%.

460. The key conclusions to be drawn from the RAM studies are that (a) the projected OSF steadily declined as more information became available; (b) RAM II, III and IV all indicate no chance of achieving either the 93% long-term OSF target established at the beginning of the Project or the 91% OSF that forms the basis of the Claimants' projections as of 26 June 2007; and (c) the OSFs for the most representative scenario established in RAM IV were 84.38% and 86.32 following metallurgy improvements, reduced to 82.28% and 84.22% when potential upstream failures are taken into account. All of the information and conclusions contained in the RAM reports supports the use of an OSF of 84.26% in the *ex ante* analysis.

461. The Claimants have attempted to diminish the significance of the trend exposed by the RAM reports. Mr. Earnest noted a change in methodology between RAM I and II, and RAM III, which was operated by a different company. For the Respondent, what is clear is that RAM III and RAM IV were performed by the same company. These reports were made within a period of two years and the estimated OSF dropped again. The company that conducted both RAM I and RAM II was the same company that was in charge of the design and construction of the Hamaca upgrader. Thus, the drop in the OSF is even more telling. The only possible conclusion that can be drawn from the RAM reports is that the projected long-term OSF dropped further away from the 93% OSF that was deemed achievable at the outset.

462. The Claimants argued that the Project expected an OSF of 91% or greater, relying on an incomplete version of the minutes of the November 17, 2005 meeting of the Board of Directors, whereas the full version of the minutes (based on the Spanish original) shows that in order to reach such result it "would be a challenge for Ameriven during the next years". Together with this proviso, the Board of Directors permitted the Project to proceed on the basis of a "Best in World" OSF assumption of 91.4% in the 2005 business plan. At the same meeting, the members of the Petrolera Hamaca Operating Committee (OPCOM) recognized that the "best in world scenario" included in the 2005 business plan was a "target". They stated that the actual OSF was 84%.

463. The RAM IV study constitutes the best evidence of what could reasonably be expected from the Hamaca upgrader over the long term. The results of that study – 82.35% until metallurgy improvements could be implemented during the upcoming turnaround in 2009 and 84.26%

thereafter – reflect the reality that the Hamaca upgrader suffered from severe problems. The 91% OSF used by Claimants is nothing more than an aspiration.

464. As a matter of fact, at the Hamaca upgrader, with the exception of 2005, the OSF has never reached even the level predicted by RAM IV, much less the 91% plus OSF used by the Claimants. The OSF from 2005 through 2015, calculated as from either CCO production or CCO sales, result in an average of 73.06%, respectively 72.85% OSF.

465. The Claimants ignore actual performance in their *ex post* valuation and point to a number of "publicly available reports", affirming that the upgrader actually operated at a much higher OSF than reflected in the Respondent's presentation. The OPEC Annual Statistical Bulletin for 2013 reported that the Hamaca upgrader was operating at a higher output rate that what had been expected in 2006. But the figures used in the Bulletin relate to the DCO feed rate, not the EHCO content of the DCO feed. The figures that should be compared to the Claimants' 175,000 BPD of EHCO feed are around 146,000 BPD for 2010 and 141,000 BPD for 2011, as those figures represent the EHCO in the DCO feed when the capacity of the upgrader is 190,800 BPD of DCO and 184,200 BPD of DCO, respectively. The Claimants' reference to the output of the upgrader is a further confusing distortion. The output is CCO, not DCO or EHCO. Given the figures in the OPEC Bulletin, the CCO output was approximately 138,532 BPD in 2010 and 133,741 BPD in 2011.

466. Mr. Lyons referred to a September 2012 article (C-560) where it was stated that the facility will produce 243,000 BPD, compared with 180,000 BPD before the shutdown. These figures relate to the DCO throughput, not EHCO, nor CCO. After the extensive turnaround/PRAC in 2012, the OSF of the upgrader in 2013 was only 71.90%, which was slightly lower than the OSF in 2011 (72.38%).

467. The Respondent notes that the Claimants are wrong when they contend that the purpose of the turnarounds is to achieve a higher OSF over time. That is another of the Claimants' mystifying arguments. The OSF was 72.85% for the eleven-year period from 2005 through 2015. The hopes that turnarounds and other major maintenance activity will improve the OSF, including the enormous expenditures required, have not yielded the sustained results. Among others, the Hamaca Project has engaged in major maintenance and improvement activities post-nationalization. An extensive turnaround in 2009 lasted 65 days and cost US$ 223.7 million; the OSF did not improve. As result of the poor performance of the upgrader notwithstanding the 2009 turnaround, a multidisciplinary team was set up that determined that the processing capacity at the upgrader was limited in 2010 to approximately 145,000 BPD of EHCO. Two plans were then prepared, the PRAC (Restoration Plan for Critical Assets) and the PREM (Restoration Plan for Major Equipment), the latter of which was expected to be carried out annually from 2012 through 2022. The PRAC was carried out in 2012 together with the turnaround, for a total cost of US$ 313.2 million. The first PREM was conducted in 2012, and the second in 2013. But the OSF in 2013 was only about 72%.

468. In sum, the upgrader at the Hamaca Project has never come close to achieving an OSF of 91% on a long-term basis, and even following major maintenance activity, OSF improvements have been short-lived. There is no basis to conclude that in a "but-for" world, the OSF would have been higher than it has been in the historical period. There is nothing that would support the notion that the Hamaca upgrader would have performed at a better OSF had a ConocoPhillips subsidiary remained in the Project.

469. The Respondent further notes that the focus of the RAM studies was on mechanical limitations, but other important factors had an adverse impact on CCO production. RAM IV did not take into account the fact that the EHCO feedstock could vary significantly from what was expected. Shortly before the nationalization, the Hamaca Project realized that the EHCO that was being fed to the upgrader had an approximate API gravity of 7.7 degrees, lower than the 8.6 degree API gravity on which the design feed was based. Lower API gravity correlates to a lower concentration of the lighter petroleum constituents, and also to higher viscosity. This in turn results in (i) a lower percentage of EHCO in the DCO and (ii) a lower inherent EHCO-to-CCO conversion (yield) rate for the EHCO component of the DCO. The result is that less CCO could be produced compared to the design specifications. At the time of nationalization, it was anticipated that the API gravity of the EHCO would drop further over time, to about 7.0 degrees API.

470. The Respondent also notes that the EHCO at Hamaca had a less favorable chemical composition than had been expected, which can have a significant impact on upgrader performance and the quality of the CCO produced, with a corresponding impact on value. For example, metals content poisons the catalysts that are critical to the upgrading process. The increase in the metals caused increasing costs for more frequent catalyst replacements. High metals content tends to reduce the OSF because shutdowns of significant duration are required in order to replace the catalysts.

471. Conradson Carbon Residue (CCR) measures the coke-forming propensities of a crude oil. Higher CCR numbers tend to correlate to reduced volumes of "on-spec" CCO, because less of the lighter, higher value CCO will be produced. Similarly, the Total Acid Number ("TAN") is an important indicator of the corrosive characteristics of the material in question. This causes corrosion problems for the ultimate refining customers and affects the price of the Hamaca CCO. The Claimants and Mr. Earnest have attempted to diminish the impact of the serious corrosion problem, claiming that the Project was properly addressing it through metallurgy upgrades. At a meeting of the Petrolera Hamaca Operating Committee on 8 February 2006, it was noted that an appropriate corrosion inspection could not be conducted at the upgrader prior to the first turnaround, because of the difficulty to locate the corrosion problems. The Claimants referred to the 22 February 2007 meeting of the Hamaca Board of Directors for the proposition that the corrosion problem was "being addressed". In fact, the only thing that had been done was to place a purchase order for heat exchangers with upgraded metallurgy, equipment that had been identified much earlier. What was clear is that there was a substantial risk that both the scope and estimated expenditures would not

improve upgrader performance dramatically. Indeed, the RAM IV OSF following major metallurgy upgrades was projected to be only 84.26%

472. Finally, the sulfur level associated with the feedstock processed at the upgrader is an important issue in determining crude quality and pricing. Sulfur in crude is undesirable because of issues related to corrosion, environmental pollution and human toxicity. Upgrading equipment that comes in contact with sulfur-containing crude oil and petroleum fractions will degrade more quickly, increasing maintenance costs and upgrader unavailability. The sulfur issue can be addressed by means of upgraded metallurgy, but this increases capital costs and has therefore an influence on the price of CCO. Sulfur will be converted to various sulfur oxides during the combustion process, and then becomes an air problem. In sum, the quality of the EHCO feed to the upgrader was identified as a potential problem early in the life of the Hamaca Project.

473. An important item that deserves special attention is the significant risks associated with the vibrations at the coker structure and the impact those risks would have on the prospects of the Hamaca Project. The issue resulted in the formation of a special Vibration Mitigation Project Team in 2005. The vibrations could cause a failure of the coke drum overhead vapor lines that carry the entire content of the high-temperature, highly combustible effluent of the delayed coking reaction process. A leak or failure in these lines could have catastrophic consequences for the continued viability of the upgrader. At a meeting in November 2005, the Project's Operations Committee categorized a "Catastrophic Piping Collapse" as a risk having "high consequences with high probability". Foster Wheeler, a leading U.S. Licensor of delayed coking technology stated that the problem represented "a high potential threat"[287]. A request for funds was made in April 2007, justified by an abnormal level of vibration, representing a high potential threat on personal safety, mechanical integrity of piping and major impact on production. It was noted that there were no industrial standards and guidelines available to follow; therefore, it was very difficult to diagnose the problem and identify the possible solutions. For purposes of its *ex ante* valuation, the Respondent did not lower the OSF or its projections of CCO production as a result of the vibrations, because the impact of the risk was not a current reduction in productivity given the lower OSF achieved by the Project.

474. The Claimants contend that after the nationalization, the Project did nothing to address the risk associated with the vibrations. But the issue has always been recognized as a very complex one. Foster Wheeler described the problem as representing a high potential threat on personal safety. The vibration problem at the coker unit has always been tackled with diligence, but the difficulty lies in its uniqueness and the lack of a known solution. The Vibration Mitigation Project Team created in 2005 was led by the Chevron Energy Technology Company (CETC). The 2013 CETC Report details the efforts that had been made prior to 2012. This Report is the latest in a

[287] Figuera Appendix 71.

series of proposals to remedy a situation for which no known solution exists. The CETC Report states that it is not enough to modify the existing structure only, but that it would be necessary to enforce strict control on feed rates. CETC included in its proposed solution the construction of shear walls following the installation of braces. The 2014 approval to proceed with the most recent solution proposed by CETC was justified by the risk to personal safety and contamination by toxic releases. The Respondent's experts have attempted to quantify the reduction in value. They adopted a 10% cessation risk, reducing the value of Claimants' interest in the Hamaca Project from US$ 315 million to US$ 270 million. The Claimants' experts have not suggested any alternative valuation, denying any solution in arguing that the coker vibration is not presently impacting syncrude production at PetroPiar and thus that there could not be an impact on valuation.

4. *The Tribunal's Findings*

475. There is no dispute about the fact that the Petrozuata upgrader was designed for a capacity of 120,000 BPD EHCO, resulting in 104,000 BPD CCO (or, more precisely, 103,450 BPD), at a yield factor of 0.8621, and expected to operate at a 97% OSF[288]. The Respondent reported about deficiencies and operational problems occurring during the historical period since Mr. Figuera mentions "equipment failures" and "operational errors". It does not identify the cause of such occurrences nor does it deduct from such events any impact on future production. The evidence before the Tribunal shows that this upgrader was capable of operating at an OSF rate of 97%. It may of course become a characteristic of such a complex structure that in order to keep such high-level throughput and to improve performance, maintenance activities may increase. However, as long as this is effectively done, the effect will be on costs, while the capacity of the upgrader is kept close to the design-level.

476. The Claimants note, however, that the average volume of EHCO supplied to the upgrader was 118,000 BPD[289], corresponding to 43,070,000 MMB per year. When an OSF of 97% (of 120,000 BPD) is applied, the volumes to be retained are lower, *i.e.* for EHCO 116,400 BPD[290] (42,486,000 MMB) and for CCO 100,348 BPD and 36,627,181 MMB. These amounts do not account for the impact of shutdowns required for turnarounds that were scheduled to be done every five years. However, this sequence was subject to technical, economical or other practical incidents and can therefore not be retained for a production reduction (and cost attribution) for precisely each

[288] Witness Figuera noted that it was 95.9% in 2006; TR-E, 2010 Hearing, Day 8, p. 2107:11-2108:7. The 2006 Business Plan mentioned an adjusted reliability rate of 97.5%. The Report made in March 2012 after the 2011 turnaround showed a resulting DCO processing capacity close to the design top; Figuera Appendix 82, p. 39. The Petrozuata Annual Report to the Lenders of 1 April 2007 observed that the upgrader operated at an average uptime of 98% during 2006 (C-376, p. 3/pdf).

[289] This was the quantity of EHCO field production recorded in the Petrozuata 2006 Business Plan (LECG-082).

[290] Claimants' 2017 Post-Hearing Brief, para. 104, notes a number of 116,600, further referring to the CEM, p. 41-43, that does not provide such result.

year. Its impact on the OSF of the actual year is about 8%, resulting in a 1.6% discount to be operated per year for the purpose of calculating the upgrader capacity. Any additional shutdown period is absorbed by the overall OSF. Therefore, in respect of EHCO, the volumes to be noted are 114,480 BPD and 41,785,200 MMB, further yielding to 98,693 BPD and 36,023,021 MMB CCO.

477. The overwhelming part of the documentary record relating to the Hamaca upgrader in the years 2005 to 2007 shows OSF between the upper 80s and the lower 90s. It is not disputed that PDVSA shared all of these statements made prior to the expropriation. The Hamaca Business Plan 2006 for the ten following years reports an average 89.65% OSF for that period (C-346, p. 32), with the highest numbers in 2011 and 2013 (94.53%) and the lowest in 2008 (77.58% – a turnaround year), noting that this was in the range of the RAM IV study (p. 34). Witness Lyons affirmed that in 2006 the Project partner endorsed using 91-92% as the projected long-term OSF of the Hamaca upgrader[291]. In light of the evidence on the record, the Respondent's assertion that the upgrader OSF was not more than 73% since 2005 is unsupported. At least for the early years prior to the expropriation, such allegation is clearly contradicted by the available documentary evidence of that time. The Tribunal further notes that when the Respondent bases his allegation about an average 73% OFS over the years 2005 to 2015 on Mr. Figuera's statement[292], it is clearly contradicted by its own witness noting OSF in the range between 74.90% and 86.25% for the years 2005 to 2008 (with an average of 80.65%) and informing the Tribunal that the OSF in 2005 was 87.6%[293]. In September 2010, PDVSA and its partners reported that they undertook the 2009 turnaround with the aim of restoring a "World-Class Upgrader"[294].

a. The OSF allegedly based on reality

478. The Tribunal finds that the documentation on its record in relation to turnarounds that were in general scheduled every four years shows that one of the main purposes of a turnaround was to ensure maintenance and improve performance of the upgrader, an object which is generally expressed through the OSF measured before and reached at the end of a turnaround. The Parties do not share a common view about whether the turnarounds actually conducted were successful in this

[291] Rebuttal [3rd] Witness Statement, 14 April 2010, para. 5; Fourth Witness Statement, 16 May 2014, para. 28; Fifth Witness Statement, 13 October 2014, para. 19. The design OSF had been set at 91% in the Hamaca's Project's Business Plan (Construction Plan) of 14 October 1998, including biannual shutdown (30 days) and unscheduled outages (18 days annually), p. 222, 234/235. The goal to be achieved was 95% (p. 224, 237). The Minutes of the Operation Committee Meeting of Hamaca of 30 November 2004 assumed an OSF of 88.4% in 2005 and a 91.5% - 92.9% in 2006 forward, except for a 87.3% OSF in turnaround years (C-201); the same numbers are shown in a Board of Directors Presentation on 2 December 2004 (C-202, p. 14/pdf). At the Hamaca Board of Directors' Meeting of 17 November 2005, it was stated that the duty cycle of the upgrader plant for the next 10 years was 91.4% (LECG-130, p. 11/pdf).

[292] Third Supplemental Testimony, 15 August 2014, table 1, para. 8.

[293] TR-E, 2017 February Hearing, Day 8, p. 2386:3-7.

[294] Final Report on PetroPiar's 2009 Turnaround, 21 September 2010, Figuera Appendix 76, p. 3.

respect, but this does not have the effect of removing the object relating to the improvement of the OSF.

479. The Respondent insisted in the final phase of this proceeding on playing down the OSF figures retained in the few documents on turnaround it made available to the Tribunal, stating many times that in reality the OSF figures actually obtained were much lower, around 72 or 73%. Whatever may be the origin of these figures that will be discussed below, the Tribunal notes from the outset that they contradict manifestly the documentation relating to the turnarounds that had been prepared and approved by all participants, including the Respondent's company PDVSA. The Respondent submits that turnarounds have been executed and it claims the costs incurred. If the OSF in reality went down to a level of 73%, the turnaround preceding the measurement of such OSF would have been a complete failure and the costs claimed in this respect without justification. The Respondent does not make any such submission. Furthermore, it did not provide any actual testimony or further evidence of such low level OSF. On the other hand, the Claimants' usual line of argument based on PDVSA's profound deficiencies in operating the upgrader and its poor mismanagement is not more convincing, as it is not supported by actual facts and evidence.

480. Turnarounds serve to improve the OSF[295]. The Respondent reported that after the extensive turnaround/PRAC in 2012, the OSF of the upgrader in 2013 was only 71.90%, which was slightly lower than the OSF in 2011 (72.38%)[296]. This assertion is most confusing in light of the 2012 Report relating to the turnaround, which has had as its main authors the representatives of PDVSA together with those of Chevron. It is hard to believe that under the direction of a high ranking director of PDVSA a Report was written indicating that the purpose of the exercise was to reach "the goal of reliably restoring processing capacity to 247 MPD"[297], further noting that the upgrader was "World-Class"[298], whereas the Venezuelan Government now represents before this Tribunal that this was all wrong and the correct figure had been below 72%.

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[295] Witness Lyons, TR-E, 2017 February Hearing, Day 7, p. 2088:16-2089:10.

[296] Respondent's Final Brief on Quantum, para. 346, p. 259.

[297] Figuera Appendix 46, 2012 Final Closing Report on the PRAC, August 2013, p. 5, 113; cf. TR-E, 2017 February Hearing, Day 10, p. 2917/4-16 (Earnest). The volume of 247 MPB was the maximum capacity for DCO. The Respondent argued that this volume was the target, whereas the actual capacity was 190 MPB, which is noted in the PRAC Report; cf. Respondent's Final Brief on Quantum, p. 259; TR-E, 2017 September Hearing, Day 16, p. 4752:6-4753:19 (Preziosi). However, the Respondent did not provide evidence on the result of this PRAC; several important chapters are missing, most probably including the section reporting about the OSF obtained at the end of the restoration. The Tribunal also notes that the number of 190 MPB did not represent a low capacity or OSF of certain duration, but that the upgrader was experiencing a period of particular difficulties that called for appropriate remedy. The Report explains explicitly that the processing capacity of the complex was limited to 190 MPB "due to mechanical damages to some critical equipment" that are then enumerated. It is thus clear that the 190 MPB figure was of a transitory nature.

[298] A quality expressly confirmed by the Respondent's Counsel as being PDVSA's position; TR-E, 2017 September Hearing, Day 16, p. 4602:21-4603:3 (Preziosi).

481. A similar argument has been raised by the Respondent in respect of the 2009 turnaround, which allegedly did not improve the OSF. The evidence expected to be supplied by the Respondent is missing. The Respondent simply refers to a table prepared by Mr. Figuera that does not rely on pertinent facts, as will be explained below. The Report of the 2009 turnaround has been submitted in parts only[299]; the missing sections must have contained the relevant information on the verified actual OSF as this is a key information to be recorded in any such report. When questioned about the OSF resulting from the 2012 PRAC, Counsel of the Respondent admitted that this information was not contained in the parts of the concluding Report submitted to the Tribunal[300], and that it may have been reported in the missing parts that they were not able to produce[301]. They were not able to explain the omission of this information[302].

482. On the same line, when the Respondent affirms that the first PREM was conducted in 2012 and the second in 2013, but that both did not improve the OSF above approximately 72%, no evidence other than a list of numbers provided by Mr. Figuera is submitted. If the matter had been taken seriously, the Respondent would have presented the necessary documentary evidence retained by PDVSA in respect of these PREMs.

483. A further contradiction in the Respondent's submissions appears in relation to the OSF figures retained by the RAM studies that the Respondent presented as being overall reliable, at least during the first phase of this proceeding. The Respondent contradicts itself when it affirms on the one hand that the RAM IV Report supports an OSF of 84.26%, a percentage that is repeated many times in its submissions[303], whereas the same Party then asserts that since 2005 (thus already before RAM IV had been prepared in 2006) through 2015 has been about 73%[304]. The RAM IV study also conflicts totally with the Respondent's allegation that the OSF usually went down after turnarounds. The study's graphs show that the reverse is correct: while the OSF is down in turnaround years, it jumps up to its peek the year thereafter, before steadily declining again when approaching the next turnaround four years later (p. 70, 77).

[299] Figuera Appendix 76, Final Report on PetroPiar's 2009 Turnaround, 21 September 2010.

[300] Figuera Appendix 46.

[301] TR-E, 2017 September Hearing, Day 16, p. 4604:11-4606:18 (Preziosi).

[302] Cf. TR-E, 2017 September Hearing, Day 16, p. 4578:19-4580:20, 4600:3-4601:6, 4604:3-4606:18 (Preziosi). In reply to the Tribunal's query, three annexes have been supplied that relate to the preparation of the turnaround and not to its results.

[303] Cf. Consolidated Brief, paras. 130, 136, 138, 140, 157, 344; Post-Hearing Brief, para. 124 (where the figure is 84.38%). It may be recalled that the RAM IV study has been introduced into this proceeding by Mr. Figuera (Appendix 9) and that it is declared therein that it's "objective is to determine the On Stream Factor (OSF)" (p. 10).

[304] Cf. Consolidated Brief, paras. 139, 305, 345-347, 362; Post-Hearing Brief, paras. 123, 126.

484. The same inconsistency is contained in Mr. Figuera's statements, however with the aggravating element that Mr. Figuera was presented to this Tribunal as a fact witness making statements based on his personal knowledge. The Tribunal noted that in his first Testimony, read together with his Appendix 31, Mr. Figuera fully supported the RAM IV study and concluded that a 84.26% OSF had to be retained as an average[305]. He praised this study as the most relevant of the RAM studies as it was grounded in fact and actual plant data and was designed to derive a realistic OSF upon which the Project could rely[306]. It was only in his Third Supplemental Testimony that Mr. Figuera started testifying that the actual OSF was as from 2009 to be recognized at an average level of 72.85% or 73% OSF. Mr. Figuera did not supply any source other than Mr. Patiño for his statement. He told the Tribunal that he merely reported what he was told on the yearly OSF; his input was limited to calculating the averages[307].

485. The Respondent continued copying Mr. Figuera's figures all along[308], while still maintaining reliance on the results of the RAM IV study. While it may be a party's choice to present alternative factual settings, despite their inconsistency, the same behavior is highly problematic when adopted by a witness pretending to address the Tribunal on the basis of his personal knowledge and to tell the Tribunal the truth. Manifestly, between a 84.26% OSF and a 73% OSF, a choice must be made, because one of these figures must be wrong, if they are not both wrong.

b. The OSF based on EHCO upgraded since 2009

486. Mr. Figuera has demonstrated that the figures of EHCO he used for calculating his new OSF numbers are those related to the production of the CCO in the quantities required since 2009 when the Project started to produce and sell significant volumes of non-upgraded products, thus using the upgrader below its design capacity[309]. The year-by-year OSF he retained can then be

[305] The OSF in normal years would be 87.67%, while it would become 73.50% in 45-days turnaround years and 83.83% when a catalyst change had to be operated. The First Supplemental Testimony supported a mean of 84.26% (para. 81). It further stated that the maximum potential production of CCO would be reduced from the original design of 179.6 MBD over the life of the Project to 176 MBD (para. 82). This would result in a 98% OSF.

[306] Supplemental Testimony, 26 January 2010, paras. 51, 56. Witness Figuera submitted an ABB Study explaining that "a RAM study is an excellent quantative tool that provides the project team with numerically tanked indices and important values for a system of components". (Appendix 23, p. 8/pdf).

[307] TR-E, February 2017 Hearing, Day 8, p. 2384:22-2385:6.

[308] This was done, however, only for the years 2008 to 2015 that were addressed by Mr. Figuera. The Respondent has no supporting evidence for its hypothetical numbers of OSF of around 70% for the years 2005 to 2007. To the contrary, it presented a list of lost opportunity events for the years 2006 and the first half of 2007 that results (when operating appropriate calculations) in OSFs clearly above 80% (R-308).

[309] Cf. Figuera Testimony, 20 July 2009, para. 8; Respondent's Final Brief on Quantum, para. 345; Respondent's 2017 Post-Hearing Brief, para. 126.

compared to the corresponding quantities of CCO that had been produced and sold during the years 2009-2015:

Year	OSF (Based on CCO Production)	CCO Produced[310]	OSF (Based on CCO Sales)	CCO Invoices[311]
2005	87.63		86.25	
2006	74.96		74.90	
2007	82.79		81.68	
2008	78.77		79.76	
2009	60.52	39,675,000	60.84	39,845,387
2010	75.45	49,459,910	76.30	49,468,161
2011	71.37	46,783,000	72.38	47,449,859
2012	40.74	26,782,000	38.36	25,214,117
2013	72.61	47,602,000	71.90	47,131,231
2014	81.14	53,190,000	80.78	52,955,490
2015	77.72	50,948,525	78.24	51,287,407
Average	73		72.85	

The OSF is calculated taking the design capacity of 179,600 BPD CCO, respectively 65,554,000 MMB, as 100% reference. Compared to the actual EHCO and CCO figures reported by Mr. Figuera, the percentages obtained are in the 60 to 70% range. However, this calculation has nothing to do with the efficiency of the upgrader. Mr. Figuera in fact simply compared the decrease in EHCO and resulting CCO production that occurred in the years 2009 to 2015 in relation to the design levels. His figures cannot be understood but as a consequence of the shift in production that occurred in 2009, when upgraded oil production was reduced while blended oil was sold in parallel. These figures do not demonstrate that the upgrader was no longer capable of performing a throughput in the quantities close to the design level. No evidence has been provided to the Tribunal that would address such a deficiency. Mr. Figuera does not address the question.

487. In fact, Mr. Figuera modified the parameters applicable to the OSF metric actually applicable when the Association Agreements were still in force. He compared the quantity of CCO produced in 2009-2015 to the initial design capacity for CCO, although this capacity was no longer actual since the upgrader was operating under the new conditions with quantities of EHCO and CCO volumes far below the maximum of 190,000 BPD EHCO[312]. Of course, the OSF metric compares the CCO produced with the EHCO fed to the upgrader for such purpose. But when such a metric should serve to identify performance of upgrading, it makes sense exclusively when the EHCO volume remains constant: under this condition, one can compare the efficiency of the upgrader at different points in time by reference to the outgoing CCO in relation to the EHCO

[310] Based on Figuera, Appendix 107; Hamaca Assessment of Production, p. 15; Figuera, Fourth Supplemental Testimony, 7 January 2015, table 1, para. 19.

[311] Submitted by Respondent at the March 2017 Hearing, with corrections for years 2009 and 2010 in Annex 7 of Respondent's Answers of July 10, 2017.

[312] Referring to Mr. Figuera's percentages of OSF, Mr. Earnest observed that there has been a marked fall off in the operating proficiencies post-expropriation; TR-E, 2017 February Hearing, Day 10, p. 2921:13-2922:4.

supplied. Therefore, when Mr. Figuera listed a 60% OSF for year 2009, he compared the actual production of CCO with the Project's initial design capacity of 190,000 BPD (69,350,000 MMB), while the proper method would have required comparing with the actual volume of EHCO used to produce such actual quantity of CCO (108,699 BPD; 39,675,000 MMB) the same year.

488. The confusion can also be shown when observing that Mr. Figuera's presentation does not allow the taking into account of the conclusions of the RAM IV study, which he approved, in a range around 85% OSF. This percentage is exclusively based on the capacity of the upgrader to produce CCO when provided with the design EHCO quantity. Mr. Figuera (as well as Mr. Patiño before him) does not take account of this key element in determining the upgrader's capacity. He refers exclusively to a reduced volume of EHCO and calculates its impact on OSF, and then accounts for an out coming quantity of CCO as if the upgrader would work on a 100% OSF.

c. The OSF based on the RAM IV study

489. The Tribunal finds that the RAM I, II and III studies are of very limited relevance in light of the fact that they were prepared when the Hamaca upgrader was not yet in operation. The RAM IV study – dated June 2006 – was made on the basis of full knowledge of the operational terms of the upgrader and covers a period of 20 years. It made extensive reference to the RAM III report that it revised and updated. As RAM IV is the more recent of all four studies and the broadest in scope, its conclusions must prevail over those made previously.

490. The RAM IV study presented <u>three scenarios</u>, each of them being divided into <u>two variants</u> (A and B). <u>Scenario 1A</u> represents "the most representative of the upgrader current condition". It includes the heat exchanger failure rate and the failure rates of all pumps set to 4 years (No. 3.3.2.1). The resulting OSF is a distributed value with a mean of 84.386%, with a standard deviation of 0.63%. <u>Scenario 2A</u> includes improvement opportunities, based on available failure and repair data taken from the best practices considered at world-wide level (No. 3.3.2.2). The resultant OSF is 87.872% with a standard deviation of 0.493%. Compared to Scenario 1A, the OSF for Scenario 2A is higher by 3.486%. <u>Scenario 3A</u> includes a metallurgic change of exchangers (No. 3.3.2.3) and results in an OSF of 86.316%, together with a standard deviation of 0.583%.

491. The Tribunal notes that the OSF used by the authors of the RAM IV study includes consideration of the impact of the maintenance plan of all process units, including turnarounds undertaken every four years (p. 67, 71, 77, 120). The figures resulting for each scenario incorporate the turnarounds in the annual percentages and in the cumulative average at the end of the 20-year period.

492. All of these variants A have been combined with a <u>variant B</u>, representing a correction for upstream failures (described as "external factors" and "support facilities" [page 79]) in an approximate percentage of 2.1% to be added to each of the three scenarios. The Respondent applies this

B-reduction and advocates in its main presentation an OSF of 84.26%, which represents Scenario 3B, including changes in metallurgy, but reducing the OSF in light of upstream failures counting for approximately 2.1%.

493. The Tribunal finds that this latter reduction is not correct when considering the OSF as strictly related to the upgrader's production capacity. As the OSF serves to determine the capacity of producing CCO compared to the quantity of EHCO separated from DCO, such a factor based on failures occurring in the supply chain of DCO delivered at the upgrader (pipelines, wells) must not be included. The OSF has always be defined and understood as a metric related specifically to the operational efficiency of the upgrader[313]. The RAM IV study further noted that these external factors were not under Ameriven personnel control (p. 96)[314]. Therefore, it cannot be suddenly used as a factor for upstream production. In any event, the Respondent does not explain its choice in any way.

494. When this upstream portion of 2.1% is set aside, the Respondent's choice is Scenario 3A, resulting in an OSF of 86.316% and a standard deviation of 0.583%. This choice does not include any improvement based on "best-practice" standards (Scenario 2A). The Respondent does not supply reasons for this choice. If Scenario 2A is added (+3.486%) to the base scenario, the resulting OSF becomes 87.872%, with a deviation margin of approximately 1%.

495. The Respondent has not argued directly that such improvements had not been made. It simply relied on Mr. Figuera's assertions that the OSF of the Hamaca upgrader was in constant decline, even after turnarounds. It notes that an OSF of 84.26% demonstrates that the upgrader suffered from severe problems, to such extent that the 91% OSF the Claimants use appears nothing more than an aspiration[315], but it also notes that this OSF corresponds to the "most representative" scenario, without improvements[316]. The question whether such improvements were actually decided and implemented has not been addressed explicitly by the Respondent.

496. This issue has to be examined more closely. The Hamaca Board of Directors meeting of 18 May 2006 recorded a current OSF of 91-92%[317]. The Hamaca Economic Model of 30 October 2006 shows an OSF over 93% for the whole duration of the Project (LECG-129). The Hamaca 2005 General Business Plan had as one of its premises an average OSF of 91% (C-341, p. 39).

[313] This was also Mr. Figuera's understanding in his first Testimony (20 July 2009), note 39: "The RAM IV Study also relates only to the upgrader, and does not address issues that could impact production at the oil field or the pipeline."

[314] Mr. Earnest shared this view; TR-E, 2017 February Hearing, Day 10, p. 2893:10-2894:6.

[315] Respondent's Final Brief on Quantum, para. 140.

[316] *Ibidem*, para. 136.

[317] Figuera Appendix 25, p. 3.

When considering the conclusions of the RAM IV Report, the Board of Directors submitting the Petrolera Ameriven 2006 business plan noted an OSF of 93.2% in 2009 under normal operations and OSFs over 91% as from 2009 except in turnaround years[318]. A number of improvements were made in the budget[319]; according to Mr. Earnest, they had the effect of raising the OSF to 92.93%[320]. This expert assumed that all the items that had been budgeted were ultimately made[321]. Witness Lyons explained that the list of corrective actions had been translated in the budgets for 2007 and 2008[322]. The long-term planning was based on a 91.4% OSF, while the actual operation was better than this[323].

497. When asked by the Tribunal in question 12, submitted on 8 June 2017 to explain whether the best practice improvements (RAM IV, Scenario 2) and the metallurgic changes (Scenario 3) had been made, the Respondent noted in its Answer of 10 July 2017 that the metallurgic changes were made during the 2009 turnaround and subsequent maintenance, with the effect that Scenario 3B would prevail, corresponding to an OSF of 84.26%. The Respondent further added that "any possible improvements targeted to improve the OSF based on international practices have in fact been implemented". It noted that even if "best practices" reference figures were available[324], the maximum OSF estimated and after accounting for upstream failures (Scenario 2B) would be 85.78% (p. 20). This last figure does not include the metallurgic improvements that were part of Scenario 3. Nonetheless, the Respondent did not affirm that such improvements had not been made. If they are taken into account, the resulting OSF would become higher than 85.78% (*i.e.* +1.93% under variant A).

498. RAM IV identifies the OSF portion that each scenario 2 and 3 would add to the basic level represented by scenario 1. The study shows that when considering the lists of equipment items to

[318] Cf. LECG-112, C-346, p. 15, 18, 31.

[319] Witness Lyons, Rebuttal [3rd] Witness Statement, 14 April 2010, paras 22/23.

[320] Earnest, Consolidated Expert Report, 17 October 2016, table 2, paras. 71, 73; TR-E, 2017 February Hearing, Day 10, p. 2900:1-2904:22.

[321] TR-E, 2017 February Hearing, Day 10, p. 2963:18-2964:9. Cf. further the Petrolera Ameriven Operating Committee Presentation of 26 January 2007 (C-378); Petrolera Hamaca Board of Directors Presentation of 22 February 2007 (C-379); Hamaca Tender Committee Presentation of 19 September 2006 (C-472); CAPEX Projects Summary 2007-2009 (C-473).

[322] Second Witness Statement, 30 October 2009, para. 41; TR-E, 2017 February Hearing, Day 8, p. 2231:12-19.

[323] Lyons, Rebuttal [3rd] Witness Statement, 14 April 2010, paras. 21, 25,29; TR-E, 2017 February Hearing, Day 7, p. 2066:10-2067:18, 2068:18-2069:6, 2077:17-2081:22; 2017 March Hearing, Day 11, p. 3262:13-18; 2010 Hearing, Day 5, p. 1250:10-1253:8, 1379:9-1380:12.

[324] The RAM IV study explains that its Best Practices data came from the documents supplied by Ameriven, and for the equipment with no data of Best Practices, the most optimistic available data was taken from the existent databases (p. 58). This shows that the relevant information was available to the Project's governance.

be subject for improvement, there appears a very small overlap between scenario 2 and 3[325]. Scenario 3 seems to address metallurgic items exclusively, while scenario 2 has a much broader scope and may not include metallurgic improvements already covered by scenario 3. Therefore, one reading of the RAM IV study would be to combine Scenario 3A (86.316%) and 2A (improvement potential of 3.486%), resulting in an OSF of 89.8%. However, there is another, possible reading[326]. The Study states that when the projected Scenario 3A is chosen (86.316%), including a metallurgic change of exchangers, the OSF is increased by about 2% (1.93%); it also notes that this reduces the improvement opportunities margin to 1.556% (p. 96). The Tribunal considers that since each scenario is adjusted by a deviation margin and given the improvement capacities of the Project's upgrader, which includes a metallurgic change of exchangers, an OSF of 88.5% will be retained.

d. The impact of shutdowns and maintenance

499. The Tribunal acknowledges that a number of reports, minutes, contracts and invoices show that the coker caused a serious concern because of the vibration of its structure. The Tribunal is troubled, however, by unsupported assertions such as the Respondent's experts claiming a risk of explosion of 10% that increases in the same percentage year by year, as if a responsible operator of an upgrader would let such coker running, despite the manifest life-threatening risk for its workers and the ongoing operation of the upgrader as a whole.

500. The Tribunal notes at this juncture that the risk of failure of the coker did not materialize in a reduction of the upgrader's throughput. The issue is not part of a submission for a reduced capacity of production of the upgrader. It is a factor of costs to be considered as a potential for reduced cash flow and will have to be dealt with in this connection below.

501. Any other operational handicap highlighted by the Respondent does not appear as extraordinary to the effect that it would impact on the valuation above the usual operational elements and the required maintenance, including turnarounds. This is the case of acid corrosion that is mentioned as part of the items to be revisited during turnarounds[327].

502. The EHCO extracted at the fields and transferred to the upgrader apparently was not of identical quality in regular terms. Lower than the expected gravity was observed. However, the

[325] Cf. RAM IV, p. 130 and 133. On both lists one can find two elements of the coker unit, and two items of the flare system. All other items appear on one list only.

[326] Cf. Witness Figuera, Supplemental Testimony, 26 January 2010, para. 58, p. 45; Respondent's Counsel Preziosi, TR-E, 2017 September Hearing, Day 16, p. 4768:15-4769:13.

[327] Cf., for instance, Minutes of Hamaca Operations Committee Meeting of 8 February 2006, p. 8 (Figuera, Appendix 50); Hamaca Board of Directors Presentation of 22 February 2007, p. 7/pdf (C-379); Witness Lyons, TR-E, 2017 February Hearing, Day 8, p. 2232:19-2233:11.

Respondent does not demonstrate that this had any effect on the syncrude production. It did not observe that the contractual minimum was 8° API[328], close to the actual 7.7° and below the alleged 8.6° design API. It also omitted to note that the technical report on which it relied[329] explains that a lower API degree of EHCO can be compensated by a higher API of the diluent naphtha and that such a measure had the effect of increasing the production level of EHCO at 2.9 MBD and of CCO at 2.7 MBD[330]. Witness Figuera equally omitted to consider this information[331]. One effect of under graded API may be on price. However, the Tribunal notes that it has not been provided with evidence on an alleged impact of variations in API gravity on the CCO production through the upgrader. The differences in API gravity that appear on the Hamaca invoices from 2009 through 2015 relate to the down-stream part of the Project and their impact on prices cannot be recognized. Moreover, the Respondent does not draw any specific conclusion from such occurrences, either in terms of production volumes or as a loss of revenue. The Tribunal also observes that the Respondent confuses API degree of the EHCO from upstream with the API degree of the syncrude (mentioned on the invoices), which are different[332]. In terms of valuation, the issue is moot.

503. The collapse of storage tank 12 is not an issue, and has not been presented by the Respondent as an issue impacting on the efficient production of the upgrader. The operator has dealt with the problem (one solution providing for by-pass), and the matter remaining in dispute in this respect relates to costs and not to the valuation of the capacity for production of the upgrader.

504. The Respondent complained about a number of factors having allegedly an impact on the performance of the upgrader and the quality of the CCO produced, like a less favorable chemical composition of the EHCO and corrosion problems. However, the Respondent does not take these into account when assessing the valuation and production capacity of the upgrader. The problems that are mentioned may have a potential impact on the performance of the upgrader and are to be treated through appropriate maintenance; this has been done, as this can be easily observed when consulting the reports made on turnarounds. The costs have thus been absorbed by the budget allocation for turnarounds and other maintenance activities. The Respondent does not allege specific shutdowns caused by such problems, nor did it show that such shutdowns would have had the effect

[328] Annex A to Exhibit K of the Hamaca Association Agreement (C-22, p. 786/pdf).

[329] Respondent's Final Brief on Quantum, footnote 283.

[330] Petrolera Ameriven Technical Note (Processing of Extra Heavy Crude Oil (EHCO) of Low API Gravity, 11 July 2007 (C-405), p. 9, 15.

[331] Cf. Supplemental Testimony, 26 January 2010, paras. 66-72; Third Supplemental Testimony, 15 August 2014, para. 22.

[332] Cf. the Respondent's Answers of 10 July 2017 and its Reply of 31 July 2017 (Question 10), where numerous documents containing piles of invoices are mentioned (like Figuera Appendices 42, 104), without any indication where excessively low API could be found. The Claimants noted correctly in their comments of 31 July 2017 (para. 33) that the Respondent had not cited evidence of a causal connection between alleged EHCO quality issues and the supposed decline in syncrude quality (and thus the price).

of reducing the OSF below 90%. The same is true in respect of the sulfur issue that the Respondent admittedly considers as to be addressed by means of upgraded metallurgy, thus increasing costs. Metallurgy has been a permanent item on turnarounds and has been highlighted already by the RAM studies as a maintenance issue typical for upgraders[333].

505. Mr. Figuera provided the Respondent inspiration for a much broader allegation, extending the effects of all sorts of maintenance activities during the upgrader's shutdowns for a yearly duration of several months. Mr. Figuera affirmed that the upgrader had suffered shutdowns of an average duration of 85 days each year from 2009 to 2012[334]. He did not refer to any personal experience in this respect, nor did he present any other evidence[335]. The Respondent reproduced Mr. Figuera's testimony and, when questioned, supplied it with a long list of documents filed by Mr. Figuera that he did not use himself in support of his assertion[336]. This was for good reasons, because none of the documents cited by the Respondent offers evidence for shutdowns of such duration as alleged. Out of 22 documents, only two of them mention the occurrence of shutdowns of short duration[337]. The Respondent did not compare these documents and its allegation with the results of the RAM IV study that had as one of its specific objectives to "predict most of the scenarios of shutdowns" (p. 11, 14).

506. For Mr. Figuera's statement on the long duration of shutdowns, his Appendix 73 serves as the sole and exclusive basis of evidence. It has to be remembered that the designed maximum CCO capacity was 179,600 BPD, corresponding to 100% OSF. Therefore, 1% OSF is 1796 BPD. The same way, negative OSF can be calculated: a loss of 1796 BPD equals a loss of 1% OSF. This defines the unavailability of the upgrader in terms of OSF (column 5) and the corresponding percentage of availability (column 6).

[333] Cf. Witness Lyons, Fifth Witness Statement, 13 October 2014, paras. 34-36.

[334] Figuera, Third Supplemental Testimony, 15 August 2014, para. 11.

[335] The Development Production Supply Agreement (Exhibit K to the Hamaca Association Agreement) provided, among others, that any participant shall promptly give to the other a notice of any unscheduled shutdown (Art. 5.3). No such notice has been included into the Tribunal's record.

[336] Respondent's Reply of 31 July 2017, Question 13, p. 31/32.

[337] The overwhelming majority of the documents referred to do not contain any indication relating to a shutdown (cf. Figuera Appendix Nos 24, 33, 46, 49, 53-55, 58, 60, 62, 65-67, 119, 120, 123). Appendix No. 25 expressly stated that an "unplanned shutdown has been avoided" (p. 5-6). In one document, a shutdown of short duration was noted (Appendix No. 32), while in another report it was mentioned that a shutdown occurred three times, however without indicating its duration (Appendix No. 131), while in another Appendix it was observed that reparation on the same item (tank 12) was made when it was out of service (Appendix No. 61).

	Mr. Figuera's additions[338]	MBls per day (divide by 365)	BPD	Unavailability (divide by 1796) (= loss of OSF)	OSF
2008	7,997	21.910	21.910	12.199	87.801
2009	2,755	7.548	7.548	4.203	95.797
2010	5,148	14.104	14.104	7.853	92.147
2011	8,642	23.677	23.677	13.183	86.817
2012	11,333	31.049	31.049	17.288	82.712
2013	6,505	17.822	17.822	9.923	90.077
Average					89.225
1	2	3	4	5	6

507. The resulting average OSF of 89.2% has nothing in common with the average of the 73% determined by Mr. Figuera and emphasized by the Respondent. The 89,2% OSF confirms that the actual range of OSF based on production was around 90%.

508. Therefore, all of Mr. Figuera's OSF indications as from 2009 and the numbers copied from him by the Respondent and its valuation experts are not correct. The Respondent's alternative position relying on the RAM IV study is more convincing, however only when adding the correction relating to best practice improvements that have been implemented and after subtraction of 2.1% related to upstream failure items that are not caused by the upgrader, together with an adjustment based on the deviation factors, resulting in an OSF of 88.5%.

509. The Tribunal noted that each scenario presented in the RAM IV study included consideration of the impact of turnarounds and other maintenance causing shutdowns on the OSF. The OSF figures retained by the Study include those shutdowns in the annual accounts and in the cumulative average OSF determined at the end of a 20-year period. Therefore, the OSF retained as a result of the combination of Scenario 2A and 3A is 88.5 %. The Tribunal adopts this OSF and the resulting quantities of 168,150 BPD and 61,374,750 MMB EHCO that yield to 159,238 BPD and 58,121,888 MMB CCO.

e. The pre-expropriation OSF of 91%

510. The Tribunal has mentioned above an impressive number of documents, mostly prior to the expropriation, that allow the conclusion that the Claimants' focus on an 91% OSF finds strong support in the Project's history[339].

[338] Third Supplemental Testimony, para. 47.

[339] Cf. also ConocoPhillips, Hamaca RCAT Review, Engineering, 7 May 2007, p. 31/pdf, projecting full capacity rate for Hamaca's upgrader until 2033.

511. However, the 91% OSF figure has the handicap of having never been tested as such. The Claimants further rely on the opinion of their valuation experts, who have limited experience in the technicalities of oil upgraders and did not refer to actual measuring. The Tribunal also notes that the Claimants adopt correctly a significantly lower OSF in turnaround years and they further reduce the OSF when the catalyst has to be changed[340].

512. Therefore, the Claimants' figure of 91% OSF (with the reductions mentioned) includes more hypothetical elements than the 88.5% OSF resulting in the Tribunal's view from the correct understanding of the RAM IV study, which includes the impact of turnarounds. The Tribunal has not been provided with any evidence that would allow an assumption that the Project, when conducted under the operational parameters based on the Association Agreement, would have deviated significantly from such an OSF, when it were to be adjusted and may be corrected within a reasonable timeframe through professional and appropriate improvements by way of maintenance and increased quality of equipment.

F. Overall Production and Sales at Petrozuata and Hamaca

513. In conclusion, the Tribunal assembles the information for the assessment of the quantities of EHCO and CCO production, either in actual terms or on the basis of the evidence that allows determining production as it would have occurred if the Association Agreements had remained in place. The first period with actual results covers mid-2007 and 2008. The Tribunal is of the view that the quantities of EHCO produced at that time on the fields and supplied to the upgrader, together with the outgoing CCO, confirm basically the efficiency of the upgraders when operated under the control of PDVSA but before the cut in supply adopted for the years starting in 2009. As the Respondent confirms, this relatively short period under PDVSA' direction comes close to what the Claimants experienced prior to the expropriation:

> In the post-nationalization period pre-dating January 1, 2009, the mixed companies produced and sold only CCO and, accordingly, the actual performance in that period represents what the performance would most likely have been had the associations remained in place[341].

514. As from 2009, due to the change in the operational mode of the Projects and the production and sale of blended oil, the actual figures are not representative for the production and sales that would have been made had the Claimants remained partners in the Projects. Therefore, as from that date, the relevant figures are collected on the basis of the available quantities of EHCO for both

[340] In fact, the Claimants demonstrative provided at the 19-21 September 2007 Hearing ("Claimants' Position on CCO Production and OSF at Hamaca In But-For Scenario") confirms this assessment. TR-E, 2017 September Hearing, Day 16, p. 4737:18-4738:8 (King).

[341] Respondent's Final Brief on Quantum, para. 317.

the production of CCO and blended oil, combined with the production parameters of the upgraders. This applies to the historical period between 2009 and 2016 and for the following years. As this has been explained above, the Tribunal applies to the mean OSF retained for the Petrozuata Project a reduction of an average 1.6% corresponding to the impact of turnarounds undertaken approximately every five years (resulting in 95,4% OSF).

515. In this respect, the Tribunal retains, for Petrozuata, a EHCO production capacity of 41,785,200 MMB per year (equal to 114,480 BPD), and for Hamaca 61,374,750 MMB (168,150 BPD). In combination with the respective yields for Petrozuata (0.8621) and Hamaca (0.947), the resulting quantities of CCO are 36,023,021 MMB (98,693 BPD) for Petrozuata and 58,121,888 MMB (159,238 BPD) for Hamaca. The Tribunal further finds that these amounts also apply for the following years of the future lifetime of the Projects, as long as they would have been operating under the conditions provided for in the Association Agreements.

516. As this has been explained above (part B), the volume of CCO production must be slightly adjusted in order to take account of the volume of EHCO by-pass during turnarounds. Such volume represents a loss of upgraded oil and revenue for these periods of limited duration. The quantities of EHCO to be considered are relatively small, in an extent that does not allow useful results if the volumes involved would be attributed to years when turnarounds took place, assuming that these years could be determined with some precision – which is not the case. Therefore, the Tribunal retains the total amount of EHCO by-pass of 9,044,000 MMB for Petrozuata and of 20,880,000 MMB for Hamaca over the life-time of the respective Projects. For the purpose of adequate accounting of the values involved, these figures are to be taken into account in their proportion of 30% compared to the price of CCO counted at 100%, leaving 2,713,200 MMB for Petrozuata and 6,264,000 MMB for Hamaca. Instead of distributing these numbers over years when turnarounds took place, the Tribunal retains an average over the lifetime of each of the Projects since 2009, resulting in 193,800 MMB for Petrozuata and 261,000 MMB for Hamaca. The Tribunal also recognizes a small margin of discretion that allows rounding and retains a total production of heavy syncrude per year for Petrozuata of 36,200,000 MMB CCO, and 58,400,000 MMB CCO for Hamaca.

517. In relation to the period approaching the term of the lifetime of each of the Projects, the Tribunal observes that the Parties are not as explicit as they are in respect of many other items. For Petrozuata, the Claimants stated claims for production until the end of the Association Agreement's term in 2036[342], but they also accept, based on their experts' assessment[343] and on Witness

[342] Claimants' Final Submission on Quantum, paras. 179, 180, 224. No blended oil was produced during that period; cf. Figuera, Fourth Supplemental Testimony, 7 January 2015, para. 21, footnote 46.

[343] Cf. Claimants' Tables on Production at Petrozuata submitted on 20 March 2017; Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 50; TR-E, 2017 March Hearing, Day 12, p. 3455:13-3456:18 (Abdala). See also

Lyons[344], that the productivity of the field will dramatically decline at the end of year 2023. This turndown point also appears in the models that have been used[345]. The Tribunal finds therefore that operation at design capacity will no longer be the Project's target beyond 2023. For Hamaca, the Claimants also include in their claim the terminal year 2037[346]. The drop-off term is closer to the end of the lifetime of the Project, when in 2034 the curve of production turns definitively downwards[347].

518. After the drop-off years 2024 and 2034 respectively, production may still continue, albeit with much lower quantities. The available volumes until the end of the concessions' lifetime are difficult to ascertain on a reasonably certain basis. The numbers provided by the experts are not supported by testimony or actual documentary evidence. Further, the ratio between the revenue resulting from such end-term production and the costs that will be still involved at a more or less similar level than before will run out of proportion at a certain point in time for reasons of economics and financing. Drilling will no longer be an option when the costs cannot be recovered[348]. The Tribunal finds that for Hamaca, the drop in productivity was substantial in 2034, close to the contractual end of the Project. However, this is not a sufficient reason to stop the accounting completely while the production is still above 50% of the average determined by the Tribunal (61,374,750 MMB). The Tribunal retains therefore for Hamaca, keeping the calculation simple, the amounts of 51,000,000 (2034), 47,000,000 (2035) and 43,000,000 (2036). For Petrozuata, the main cliff occurs as early as in 2024, more than 10 years before the definitive end; during this residual period, the production as projected is not negligible[349]. The Tribunal finds that this situation has also to be adequately considered and valued. It thus concludes that the production in the years 2024, 2025 and 2026 has to be included in the account for Petrozuata, as the respective amounts of EHCO are still above 50% of the average determined by the Tribunal (41,785,200

ConocoPhillips RCAT group, Building Production Capacity Reserves, October 2006 (C-474). The Petrozuata Annual Management Report to Lenders of 1 April 2007 (C-376) noted under "Further Risks Associated with Long-Range Plan Key Assumptions" that "with access to the Reserve Area, the production falls below 120,000 BPCD in 2023".

[344] Rebuttal [3rd] Witness Statement, 14 April 2010, paras. 3, 12; TR-E, 2010 Hearing, Day 4, p. 1102:12-20. At the February 2017 Hearing, Witness Lyons noted that decline was expected in the 2006 Business Plan in year 2027 (TR-E, Day 8, p. 2209:12-21), but he also accepted a reference to 2023 (TR-E, Day 7, p. 1955:5-9). Witness Figuera also referred to year 2023 (Supplemental Testimony, 26 January 2010, para. 30).

[345] Cf. Composite Economic Model (CEM; LECG-085), p. 15, 42/pdf.

[346] Claimants' Final Submission on Quantum, paras. 226, 271, 309.

[347] The Claimants' experts (Consolidated Update Report, 17 November 2016, para. 54) note a decline starting in 2031. The 2006 Business Plan noted a decline in 2032, when well targets will run out in 2031 (C-346, LECG-112, p. 20); cf. Witness Lyons, TR-E, 2017 February Hearing, Day 7, p. 2012:20-2013:17. The Tribunal observes that while it is correct that the curve shows downwards from that year, the clear trend is manifest as from 2034 only. Cf. Claimants' Tables on Production at Hamaca, filed on 20 March 2017; ConocoPhillips, Hamaca RCAT Review, Engineering, 7 May 2007, p. 15, 27, 31/pdf.

[348] Cf. Witness Lyons, TR-E, 2017 February Hearing, Day 7, p. 1905:20-1907:10.

[349] The pertinent figures are provided by the CEM, p. 42/pdf, and the Claimants' Tables submitted on 20 March 2017.

MMB). The Tribunal retains therefore the amounts of 26,600,000, 22,100,000, and 19,000,000 MMB CCO for the years 2024, 2025 and 2026, respectively.

519. On the basis of the reasons provided above, the overall figures for production at Petrozuata and Hamaca are as follows:

	Capacity	EHCO to upgrader		CCO		Total CCO	
		BPD	MMB	BPD	MMB	years	MMB
Petrozuata 2007/2008			60,929,932		51,269,497	1½	51,269,497
Petrozuata 2009-2023	Design	120,000	43,800,000	103,450	37,759,980		
	Tribunal	114,480	41,785,200	98,693	36,200,000	14	506,800,000
2024-2026						3	67,700,000
Hamaca 2007/2008			89,682,897		81,369,878	1½	81,369,878
Hamaca 2009-2033	Design	190,000	69,350,000	179,600	65,554,000		
	Tribunal	168,150	61,374,750	159,238	58,400,000	24	1,401,160,000
2034-2036							141,000,000
Total							2,249,229,375
1	2	3	4	5	6	7	8

G. Corocoro

520. It has been mentioned above that Corocoro deserves a special section, due to the specificities of its nature and operation, different from Petrozuata and Hamaca. Corocoro did not produce upgraded oil. It also relied on an Association Agreement, concluded on 10 July 1996, but this document did not include compensation provisions (C-23, R-29). This Project is also different in the sense that Conoco Venezuela B.V. was designated as the operator for the whole 39-year duration of the Project[350]. Conoco Venezuela B.V. later had its ownership interest transferred to ConocoPhillips Gulf of Paria B.V. (CGP). It held 32.2075% in the Project, alongside with CVP, a PDVSA subsidiary (35%), Eni (25.8%) and two smaller investors, OPIC and Ineparia (7%).

521. The Project was at the beginning of its operation in the summer of 2007 based on an amended Development Plan issued on 3 March 2005 (C-181) that projected production of 30,000 BPD of light and medium crude oil in the offshore New Areas in the Gulf of Paria. Production was estimated to rise to 70,000 BPD when the Central Production Facility (CPF) came online at an expected date in late 2008. Production did not take place prior to ConocoPhillips' handover of the operatorship of the Project to PDVSA on 1 May 2007[351], followed by the formal expropriation on 26 June 2007.

[350] Cf. C-17, C-17A, R-29.

[351] Decision on Jurisdiction and the Merits ("the 2013 Decision"), para. 167.

1. The Claimants' Position

522. On 8 April 2003, the Development Plan for Corocoro (C-184) was approved by CVP and the other members of the Project's Control Committee, which included representatives of the Ministry. Over the course of the next two years, substantial investments were made by the project participants, including (a) a wellhead platform; (b) an Interim Production Facility (IPF); (c) a floating storage and offloading vessel; and (d) a series of underwater pipelines connecting these facilities. By the time the Project was expropriated, the Corocoro Project was close to enter into profitable, commercial production.

523. The Claimants assert that their case on Corocoro production volumes is overwhelmingly confirmed by the contemporaneous evidence. Their experts project the recovery of 205 million barrels of oil over the period 2007 to 2021. They started with the production profile contained in ConocoPhillips's Composite Economic Model (CEM; LECG-085) for Corocoro, as updated in late 2006 and endorsed by PDVSA at that time; they then revised that profile to be consistent with ConocoPhillips's slightly lower Reserves figure for the Project (at 205 million barrels).

524. The pre-expropriation business planning documents support the Claimants' experts' production profile. The Project participants agreed to the Corocoro Development Plan Addendum (DPA) in March 2005 (C-181). It was approved by the Ministry that same month (C-210). The Claimants and PDVSA anticipated the recovery of 231 million barrels of oil during Phase I of the Project. The Claimants' experts have nevertheless relied on the more conservative production figure of 205 million barrels derived from the Claimants' assumption of the available Reserves that did comply with the SEC requirements. According to the Development Plan Addendum, a further 215 million barrels of oil would be recovered during Phase II of the Projects, plus another 200 million barrels thereafter based on an expected extension to Phase II. The Claimants' experts have excluded these additional volumes.

525. The Claimants and Venezuela do not differ widely on the ultimate volume of oil to be produced at Corocoro. The Respondent's experts project a total recovery of approximately 181 million barrels that is nearly 10% less than the Claimants. The Claimants' profile is supported by PDVSA's Proved Reserves figure for the Project and therefore must be preferred.

526. The most substantial dispute between the Parties relates to the rate at which Corocoro's wells will produce that oil. Based on the Development Plan Addendum, Abdala&Spiller assume a maximum production output of nearly 70,000 BPD by 2013, with production then decreasing until 2021. Brailovsky&Flores assume a maximum production level of only about 37,000 BPD, but over a longer period of time, ending in 2032. Venezuela assumes a slower extraction of crude based on the alleged post-expropriation performance of the Project. However, this is the result of the implementation of a different oil extraction strategy by the post-expropriation Project, known as PetroSucre.

527. The Respondent's expert Mr. Patiño argues that the production plan set out in the Development Plan Addendum is premised on a misunderstanding of the geology of the Corocoro field, which has turned out to be less favorable than all of the Project participants had understood prior to the expropriation. Eni's models show that the production profile adopted in the Development Plan Addendum is unachievable. However, Dr. Strickland explains that the differences are not as substantial. The geological models produced by ConocoPhillips and by Eni have many similarities; their differences cannot explain the difference in production levels argued between the parties. In any event, Eni's understanding of the fields suggests rather a more recoverable oil field than the participants had thought in 2007.

528. Dr. Strickland explains that the new *empresa mixta*, PetroSucre, has deviated from the pre-expropriation Project participants' plan to use significant volumes of water injection to increase the productivity of the wells. PetroSucre is injecting far lesser quantities of water into the reservoir. Water injection is a means of ensuring sufficient pressure in a reservoir to achieve desired production levels. PetroSucre's reduced water injection program and corresponding oil production rates can be compared to the pre-expropriation plan for Corocoro that the Claimants, as the operator of the Project, would have applied. In a departure from what had been agreed in the Development Plan Addendum, the amount of water actually injected has been less than the volume of oil extracted, meaning that the new operator is not fully replacing the lost pressure caused by the extraction of oil. This operational decision by PetroSucre represents a substantial deviation from the course that ConocoPhillips would have pursued at Corocoro. The lower production levels achieved with the reduced levels of water injection cannot be attributed to the Claimants.

529. The Corocoro Project was to begin processing its oil production at an Interim Production Facility (IPF), which would have the capacity to process 30,000-35,000 BPD. The IPF would operate pending the construction of the Central Production Facility (CPF), which would have the capacity to process 70,000-75,000 BPD of crude. While the original plan was to de-commission the IPF once the CPF was operational, the PDVSA shareholder, CVP, believed that the volume of production from the field would justify keeping them both online. At the time of the taking, the Corocoro Project was on the verge of commencing production. The IPF was scheduled to be operational in the summer of 2007, with the CPF following in late 2008. Venezuela states that the IPF in fact entered into service only in January 2008, and the CPF in February 2012, and that these delays were attributable to the Claimants.

530. The Claimants also explain that the Nationalization Decree was announced in February 2007, less than six months prior to Corocoro's expected production start, when ConocoPhillips had already dedicated nearly five years to developing the Project. The Decree required that the control of the Project be assumed by a PDVSA-controlled Transition Committee within one month's time, and that PDVSA assume full operational control by 1 May 2007. The evidence shows that Venezuela paid little heed to managing the Corocoro transition. PDVSA rarely called Transition

Committee meetings and showed disorganization. PDVSA's mismanagement delayed the Project's progress, but Venezuela now seeks to attribute the delays to ConocoPhillips. While it is true that ConocoPhillips recommended additional safety measures to ensure that the IPF could withstand a "100 year storm", this would not have added time to the completion date or, at most, four months.

531. ConocoPhillips placed various options for modifying the IPF before the Transition Committee in April 2007, but to no avail. No action was taken. The IPF was completed by the manufacturer in August 2007 and, if diligently handled, would have started production three weeks later. In fact, production started in January 2008 only. All delivery delays to which Venezuela's Witness, Mr. Marcano, now points, relate to contractual deadlines falling after the 1 May transfer, when PDVSA was responsible for contract management. Relying on Mr. Marcano, Venezuela submits that the Project was significantly behind schedule in May 2007. The presentation slides referred to do not discuss details, and Mr. Marcano was not present at those meetings.

532. Venezuela relies upon hearsay testimony taken from the unrelated *Universal Compression v. Venezuela* arbitration[352], arguing that the CPF would have been delayed regardless of the unlawful taking. No weight can be given to such material. The Tribunal should trust the testimony of Witness Chamberlain, to the effect that, at the time of the taking, the construction of the CPF was on schedule, and that it should have been delivered by the end of 2008[353]. Venezuela disregards its own delays. The CPF was delayed by more than three years under PDVSA's post-expropriation management of the Project. The CPF was on track for first production by late August 2008. In sum, the alleged delays to the Corocoro production facilities cannot be attributed to the Claimants and must be disregarded for purposes of the but-for quantum calculation. The CPF was on schedule as of the expropriation date. Likewise, the alleged delays to the CPF arose after the expropriation and under PDVSA's management, to which they are properly attributable.

533. The Claimants use again the same production forecast for its date-of-expropriation valuation for Corocoro. That forecast foresees the recovery of 205 million barrels of oil over the period 2007 to 2021. The Respondent's experts rely in this regard on the forecasts contained in Mr. Figuera's July 2009 witness statement. On this basis, the total volume in the forecast is 182.8 million barrels; Mr. Figuera projects lower production rates. While the Claimants' experts, relying on the Development Plan Addendum, project daily production rising to approximately 70,000 BPD, the Respondent's experts limit production to a maximum of 52,800 barrels per day, and, in most years, less than 45,000 BPD. There is no dispute that as of the time of the taking, all Project participants had agreed to pursue the oil production plan in the Development Plan Addendum. They collectively endorsed a strategy of injecting significantly more water than the oil produced. Any

[352] *Universal Compression International Holdings, S.L.U. v. The Bolivarian Republic of Venezuela Respondent*, ICSID Case No. ARB/10/9, Order Suspending the Proceeding (R-553).

[353] Witness Statement, 30 October 2009, para. 23.

valuation made as of 2007 should take care of this. Venezuela assumes in its 2007 valuations for Corocoro that production would begin at the IPF in January 2008, at a rate of 19,800 BPD in 2008 and 32,300 BPD in 2009, and that full production with the CPF would not be underway until January 2010. However, at the time of the taking, the IPF was scheduled to start production in July or August 2007, and the CPF was scheduled to begin production in late 2008. Any delays to the completion of the IPF and CPF are attributable to Venezuela's and PDVSA's own shortcomings.

2. The Respondent's Position

534. The Respondent offers an extensive historical overview about the origin of the Corocoro Project that is, in its view, useful to understand the delays that have been characteristic for this site and the low production profile. Unlike at Petrozuata and Hamaca, ConocoPhillips was the operator of the Corocoro Project prior to the nationalization and therefore had a larger degree of responsibility for what happened during that period.

535. In the first phase of the development of the Corocoro Project, ConocoPhillips proposed a total of 24 wells, for a production estimated at 250 million barrels of oil. The 2002 Corocoro Development Plan contemplated infrastructure including a single 24-well wellhead platform in the eastern part of the field, a floating production unit (FPU) and a floating storage and offloading system (FSO), at a total cost of US$ 557 million (in 2002 US dollars). Oil production was expected to commence in late 2004 or early 2005. The Plan also provided that Conoco would undertake additional exploratory drilling in the western part of the field so that the Project would be prepared to implement Phase II in 2006.

536. Within months of the approval of the 2002 Development Plan, ConocoPhillips determined that it had underestimated the costs. Following a reassessment of the situation, a first series of delays occurred. ConocoPhillips decided to replace the floating production unit, a large vessel, with the CPF. ConocoPhillips also moved away from an engineering, procurement and construction strategy (EPC) to a new contracting strategy, whereby ConocoPhillips undertook the engineering in-house and provided that (a) the multiple components of the CPF, called "skids", would be farmed out to numerous contractors, including Venezuelan firms, and (b) the components would be integrated pursuant to a separate contract. This new contracting strategy was spelled out in the 2005 Corocoro Development Plan Addendum (C-181).

537. This Addendum was approved in early 2005. Phase I infrastructure costs were estimated at US$ 810.3 million (in 2003 US dollars). Phase I was sub-divided in two sub-phases, IA and IB, having different well configuration. In Phase IA, 14 wells were to be drilled, and in Phase IB 10 additional wells. The Addendum contemplated a total of 14 production wells, and 10 water injection wells. The Addendum contemplated first oil in early 2007, more than two years later than had been originally projected. It was also stated that there would be an opportunity to install an Interim Production Unit in early 2006 and accelerate the first oil date. This did not happen.

538. None of the wells contemplated in Phase IA were drilled. Thus, there was no possibility of commencing production with an IPF in early 2006. This delay did not make any difference, as the delivery of the floating storage and offloading system (FSO) was delayed and no efforts had been made to contract for an IPF for delivery in early 2006. Thereafter, the schedule for the drilling of wells continued to slip; the starting date for drilling did not occur until May 2006. ConocoPhillips did not engage in any additional exploratory drilling in the western part of the field.

539. With respect to the IPF, it was projected in October 2005 that a contract would be in place by December 2005, so that the unit could be installed at the site by October 2006, and operations commence in January 2007. Further slipping of dates occurred and no contract for the IPF was ready on 26 April 2006. ConocoPhillips contracted with Hanover on 29 September 2006, and it was envisaged that early production with the IPF would begin in May 2007, when seven wells were projected to be ready for production. In March 2007, a project schedule reflected a start-up of the IPF in May 2007 (C-383). This March 2007 schedule was the last document including an "Overall Project Schedule" prepared by ConocoPhillips. At the same time, ConocoPhillips requested changes to the IPF, increasing costs by US$ 5.2 million[354]. ConocoPhillips also advised the Corocoro Transition Committee that there would be additional delays associated with the installation of gas metering equipment not included in the IPF's design.

540. In the first phase of this case, the Claimants assumed production at Corocoro of 30,000 BPD for the entire second half of 2007, even though they knew that the IPF would not be ready at that time. They claim in this phase that the IPF was scheduled to start production in July or August 2007, although the IPF was nowhere in sight at the time ConocoPhillips left the Project at the end of June 2007. The Claimants submit that the construction of the IPF was completed in August 2007, but they have no other evidence than an attachment to the IPF contract dated 25 September 2006. In fact, the IPF was delivered to the site in October 2007.

541. In sum, the Claimants have ignored the entire history of the IPF, leaving the impression that everything was proceeding exactly as planned when ConocoPhillips decided against migration. The IPF was behind schedule and ConocoPhillips was introducing design changes as late as April 2007. The IPF commenced operation in January 2008. There is no basis for projecting any production prior to that date.

542. The 2005 Corocoro Development Plan Addendum projected completion of the CPF by early 2007, further providing for a short delay. That schedule was fantasy compared to ConocoPhillips' "Overall Project Schedule" presented in October 2005. This presentation revealed that the skids that were to comprise the CPF were scheduled to be delivered by October 2006, with production with the CPF starting in August 2008. In a 26 April 2006 presentation, ConocoPhillips

[354] Figuera Appendix 92.

exhibited a new “Overall Project Schedule”. The new delivery date for the skids was November 2006, rather than October 2006, the slipping to the site occurring in March/April 2008. The same presentation showed that 21 of the skids were procured in seven locations in the United States, while 13 were procured from fabricators at five locations in Venezuela. ConocoPhillips was managing the engineering from its offices in Houston, until mid-2006. This appeared to be a big mistake that resulted in enormous delays. Each skid contractor was treated separately and provided with basic engineering drawings only. Detailed engineering had to be done in cooperation between each contractor and ConocoPhillips until the drawings were considered appropriate. By October 2006, ConocoPhillips reported that the skids from Venezuela were completed on an average of 64% only.

543. A new presentation of the “Overall Project Schedule” was submitted in March 2007. Therein, ConocoPhillips separately set forth schedules for the National (Venezuelan) skids and the “International” (mostly US) skids. For the latter, delivery was fixed at December 2006, but it was clear in March 2007 that not all of the international skids had been delivered. For the Venezuelan skids, a delivery date by March 2007 was set forth. However, when visiting the integration yard, it was obvious that many of those skids had not been delivered by then and that there would be further substantial delay. The delays in the skid deliveries were far worse than what was reflected in the ConocoPhillips “Overall Project Schedule”. Many of the Venezuelan skids were far behind schedule. There were also serious issues with one of the US fabricators, Williams Production Services (WPS) in Louisiana. The first skid from this fabric had been delivered in November 2006, and the others in May 2008 only.

544. In the first phase of this case, the Respondent referred to the problems presented by the poor performance of this US contractor. After the 2010 Hearing, a company called Universal Compression, having taken over the IPF contract following a merger with Hanover, brought a case against Venezuela under the Venezuela-Spain BIT seeking compensation for the 2009 nationalization of its gas compression equipment. One of the issues in the case was compensation for the expropriation of the IPF, which remained in service as of June 2009 due to delays for the CPF. One of Universal’s counsels, Mr. Price, reported about the CPF being substantially behind schedule, and said that he was told by ConocoPhillips that the delay in the completion of the CPF would be for many years. The Claimants contend that Mr. Price’s testimony was not reliable. They assert that the testimony of Mr. Chamberlain should be credited, recalling that the CPF was on schedule. The Respondent submits that Mr. Price had no interest in blaming anyone for the delay in the CPF. The Respondent also recalls that the Claimants insisted in having Mr. Chamberlain submit a second witness statement, which he never did.

545. In sum, it was already well known prior to the nationalization that the scheduled start-up date for the CPF would be long delayed, and there can be no doubt that the CPF was actually delayed until 2012. In light of the delays associated with both the IPF and the CPF, the production profile that the Claimants and their experts used in their *ex ante* analysis for Corocoro is untenable.

546. Wholly apart from this issue on delays in delivery of the IPF and the CPF, the fact is that the Corocoro Project in any event could never achieve the production levels projected by ConocoPhillips. The geology at Corocoro would never have permitted rates of 10,000-11,000 BPD per well, as ConocoPhillips originally projected in 2005. ConocoPhillips mischaracterized the field as a system of incised valleys, when in reality the field is appropriately characterized as one with fluvial channels. Consequently, the production rates were far lower than those ConocoPhillips projected, with average rates at the outset of 1,500 BPD, 4,000 BPD and 900 BPD for reservoirs 70A, 70B and 70E, respectively.

547. The Claimants have contended that higher production levels could have been expected and would have been achieved had the Project injected more water to support the pressure in the field. But ConocoPhillips always recognized that there were substantial uncertainties regarding this method. The 2002 Development Plan (LECG-139) included as one of those uncertainties the effect of "reservoir heterogeneity on waterflooding", where water breaks through the reservoir creating channels to the producing wells. This was considered serious by ConocoPhillips when it stated in an internal document of August 2007 that water injection should not be used as long as its benefits are not demonstrated[355]. In an *ex ante* context, the effects of waterflooding were at best speculative.

548. Thus, the information that was available as of the date of the nationalization revealed that the production profile for Corocoro in the ConocoPhillips Composite Economic Model (CEM) could not be achieved. It would have been apparent that the start-up of the IPF, with a processing capacity of about 30,000 BPD, would have been delayed until at least the end of 2007, meaning that there would be no production in 2007; that the start-up of the CPF, with its greater level of processing capacity would be delayed for a number of years; and that in any event, the field could not achieve the levels of production contemplated by the 2005 Corocoro Development Plan Addendum with the infrastructure that was in place in light of the quality of the field. A reasonable buyer taking into account all of the available information as of 26 June 2007, would have projected far lower production volumes, consistent with the volumes set forth by Mr. Figuera's testimony.

549. The Respondent further submits that the crude oil production at Corocoro during the post-nationalization period has been far lower than both the volumes that had been projected in the pre-nationalization models upon which the Claimants rely and the volumes assumed by the Respondent in its *ex ante* assessment.

550. In their *ex post* analysis of production volumes at Corocoro, the Claimants assume again that the pre-nationalization planning document was correct in all respects. So, they make no adjustments to production volumes or costs (other than in respect of inflation). The Claimants' continued reliance on the 2005 Corocoro Development Plan Addendum as a basis for their *ex post*

[355] Corocoro RCAT Review, August 2007 (LECG-50).

production profile is entirely unwarranted, as actual production has revealed that even the production volumes that Mr. Figuera projected in the first phase of this case were overly optimistic.

551. The Claimants contend that the differences in geological interpretations of the field by ConocoPhillips and Eni are not that significant because the ultimate production under both interpretations is about the same. As shown by Mr. Patiño, the difference is of critical importance to the production levels actually achieved in the historical period as well as the overall production profile. There is a significant difference in value between (a) a project capable of producing oil at a rate of approximately 70,000 BPD that recovers 205 million barrels in a 15-year period, and (b) a project capable of achieving peak production of only about 40,000 BPD that recovers 184 million barrels over a 25-year period.

552. The fact that PetroSucre had injected lesser volumes of water than what was provided for in the development plans has had minimal impact. It has been the result of geological factors and the limitations of the surface facilities planned by ConocoPhillips. In many parts of the field, large volumes of water did not in fact have the pressure that had been required, waterflooding was much more difficult to manage and the surface facilities had limited capacities to treat the produced water. Seven years of production history at Corocoro have revealed that ConocoPhillips was wrong about most things in the field, including the appropriateness and effectiveness of a massive water injection program. In sum, in the *ex post* analysis, taking into account not only actual production in the historical period, but also what has been learned about the field, the Respondent's experts have relied on the production estimates based on PetroSucre's 2013 Reservoir Model.

3. The Tribunal's Findings

553. The Tribunal notes the explanations provided in respect of the pre-expropriation history of the Corocoro Project. Witness Lyons blamed the PDVSA-lead Transition Committee for not having acted expeditiously in order to have the IPF in place in August 2007[356]. However, the Tribunal understands that this information is of limited relevance for its task to determine the consequences of the expropriation that took effect on 26 June 2007. At that time, the Project had already accumulated delays that do not have to be analyzed here. The Parties may debate a number of contractual dysfunctions that certainly occurred but that are not for this Tribunal to decide. While the dates recorded for the entry into operation of the IPF are not always identical, January 2008 seems to be correct, as this date can be found in the statements of both Parties[357]. Therefore, no production has to be accounted for in 2007.

[356] Fifth Witness Statement, 13 October 2014, paras. 58-64.

[357] Claimants' Final Submission on Quantum, para. 295, 304; Respondent's Final Brief on Quantum, para. 174. Witness Figuera, Testimony, 20 July 2009, para. 58; Third Supplemental Testimony, 15 August 2014, para. 110. Witness Chamberlain, Statement, 30 October 2009, para. 23.

554. The start-up of the CPF was seriously delayed. While the precise date of its availability is disputed, oil production between January 2008 and this availability was based exclusively on the output of the IPF. Albeit submitted together with different lines of argument, both Parties take the daily production of 30,000 BPD as the bottom level[358], at least as from the year 2009. In order to achieve significantly higher production, the operation of the CPF was required. In other words, such higher production levels were initially scheduled starting at the end of 2008, but in fact deferred to February 2012 when the CPF was finally put in place[359].

555. The Claimants blame the Respondent for the delays in the delivery of the CPF and draws as a consequence that higher than actual production levels should be assumed as from the end of 2008 when the CPF was scheduled to start operation. The Respondent with Witness Marcano[360] complains about deficient handling by ConocoPhillips of the construction and delivery of the CPF. The Tribunal's task is not to explain the contractual liabilities to be assumed by one side or the other, but to determine whether it was reasonably certain that the delay in the delivery of the CPF would occur and therefore as well the point when higher volumes of oil production could be expected. The answer results from the Project's partners experiences made already in the years 2006 and 2007 when delays in the deliveries of parts ("skids") to be assembled in the CPF had occurred at various times. Witness Chamberlain reported about disappointing experiences with the PDVSA's lead Transition Committee[361]. Further difficulties were to be expected in the near future. The ConocoPhillips partner could not be reasonably certain that the CPF would be in place at the end of 2008. Further delay was to be expected362, although the actual delivery as late as in early 2012 was not in the range of what the operator had to be aware of in 2007. However, the Tribunal cannot speculate what would have been a reasonable target at that time. It will retain the year 2012 as the beginning of the period when the operation of the CPF allowed reaching production levels above the volume that could be handled by the IPF.

556. The CPF had a maximum design capacity of about 70,000 BPD. The respective positions of the Parties concentrate on the question of whether this production target could be reached and, in the negative, what would be the reasonable volume to be retained on a yearly basis until the available Reserve had been extracted. Witness Figuera noted a target of 65,000 BPD[363].The Respondent's experts take as their main parameter about 40,000 BPD, resulting in a recovery of 184

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[358] See also Witness Figuera, TR-E, 2010 Hearing, Day 8, p. 2157:9-2158:16, 2279:10-22; TR-E, 2017 February Hearing, Day 8, p. 2446:12-15, 2506:11-14.

[359] Date confirmed by Witness Marcano, Direct Testimony, 6 January 2015, para. 38; TR-E, 2017 February Hearing, Day 10, p. 3047:15-19.

[360] Direct Testimony, 6 January 2015, paras. 26-38.

[361] Witness Statement, 30 October 2009, paras. 27-40, 43-45.

[362] Witness Figuera, Supplemental Testimony, 26 January 2010, para. 120, set 90% completed delivery in January 2010.

[363] Testimony, 20 July 2009, para. 57.

million barrels between 2008 and 2032 (25 years), whereas on the basis of 70,000 BPD the Claimants' experts envisage recovering 205 million barrels between 2008 and 2023 (15 years). The profile to be retained by this Tribunal is thus placed in between a double margin, depending on the overall duration of the recovery (between 15 and 25 years) and the peak volume between the two extremes of 40,000 BPD and 70,000 BPD. The third factor is then the total recovery, but it seems less important given the fact that the experts' disagreement is in a range of 10% only. In order to determine whether these figures are compliant with the actual production of the field, the Tribunal will take account, as it has done for Petrozuata and Hamaca, of the data available on its record in respect of the sales of Corocoro oil and the corresponding volumes of production. The relevant figures will be analyzed and considered below.

557. One of the main arguments against a target of 70,000 BPD is based on Mr. Patiño's assumption that the geology of the Corocoro site would never permit rates above 10,000 or 11,000 BPD per well. However, Mr. Patiño argues that during the first 12 months when the wells were active, the average production per well of the three reservoirs 70A, 70B and 70E was approximately 1,500, 4,000 and 900 BPD, respectively[364]. Mr. Patiño explains in this respect that injecting higher water quantities would not have the effect of increasing production; such a program would not add more oil to the ground, but it will increase the pressure on the oil and extend it for a longer time. This does not offer an adequate answer to the lower availability of oil than initially expected. Witness Marcano explains that reduced levels of water injection were caused by the lower initial production of the wells; less water was thus needed to replenish the reservoirs[365].

558. The Tribunal concludes that it cannot resolve the controversy between the experts on the basis of geological and physical characteristics of the field that are not translated into actual oil production volumes. Its task consists of determining such volumes and to draw the appropriate consequences in respect of the Project's participant's loss.

559. The Claimants and their experts insist on the maximum production output of nearly 70,000 BPD referred to in the Development Plan Addendum (C-181, LECG-003). In fact, this plan identifies this number as a target, whereas the actual maximum figures varied between 64,000 and 66,500 BPD to be reached between 2007 and 2011, eventually 2013 (p. 50, 56-58). From then on, recovery would decline on a regular pace until 2026 (ending with about 10,000 BPD). The Project's Reserve for Phase I was estimated at 231 MMB; this was a mean of several probability estimates ranging between 89 and 163 MMB (p. 49/50). Production was estimated at 208 MMB over a period of 20 years (p. 8). The Claimants' experts submitted that they had reduced the figure of 231 MMB to 205 MMB[366], not noting that this adjustment was already made by the Development Plan (to

[364] Consolidated Expert Report, 17 October 2016, para. 247.

[365] Direct Testimony, 6 January 2015, paras. 45-52.

[366] Consolidated Update Report, 17 November 2016, para. 57.

208 MMB). The same experts rely on ConocoPhillips Corocoro RCAT Review of 7 August 2007 (LECG-050), where it is noted that the Phase I Recovery represents 205 MMB (p. 13, 48, 49/pdf), without explanation. The same Review notes that the daily production will vary between approximately 20,000 and 26,000 MMB in the years 2008 to 2013, before the average declines more seriously.

560. Mr. Patiño's production schedule is based on the PetroSucre Reservoir Model 2013 that has been prepared by this PDVSA affiliate and the other partner Eni[367]. The model includes all available data as of 2012. Mr. Patiño's conclusions have not been elaborated by him but represent the production forecasts presented by the model for various scenarios[368]. The accumulated production of the field through 2032 was 183.8 MMB[369]. The Claimants' experts did not examine this Model nor Mr. Patiño's presentation. This Model is extremely detailed and not limited to a simple assembly of slides as the RCAT Review. More important is the fact that this Model is six years more recent and includes actual production figures in the years 2008 and 2013, showing that the RCAT Review overestimated yearly production by a little bit less than half. The same production volumes are represented by the tables collecting the results derived from the collection of invoices for the period between 2008 and 2015[370]. Dr. Strickland's conclusions do not lead to another result, except for the correction that he thinks achievable if higher water and/or gas injection rates was used[371]. In the absence of supportive evidence for a production total of 205 MMB that goes above simple presentations based on slides, the Tribunal retains the figure of 183.8 MMB as the prospective total production until the end of Phase I.

561. The next question is then how to determine the year-by-year rate of production until the end. The rate at which Corocoro's wells will produce oil is uncertain. The PetroSucre Reservoir Model shows a peak period between 2009 and 2015 and a downward slope since 2016 that becomes regular as from about 2020, until the last year, 2032[372]. For the RCAT Review, the peak period is between 2009 and 2013, when the downward trend starts running until 2021. On the basis of these two documents, the Tribunal recognizes that while the peak periods are similar in their duration, the PetroSucre Model shows clearly lower volumes per year thereafter. This Model seems therefore more suitable for the purpose of assessing production over the whole duration of Phase I. In one respect, however, a correction has to be made. Mr. Patiño and the PetroSucre Model provide for a

[367] Patiño Appendix 36.

[368] Cf. Consolidated Expert Report, 17 October 2016, paras. 226-236.

[369] Cf. the Model (p. 136/S, 77/E) and Patiño, Consolidated Expert Report, 17 October 2016, para. 236.

[370] Tables submitted by the Respondent on 20 March 2017, based on Figuera Appendices 84-89, R-527, Brailovsky/Flores Appendices 359/360; TR-E, 2017 March Hearing, Day 14, p. 4292:14-4293:12 (Preziosi). See also Figuera, Testimony, 20 July 2009, para. 60; Third Supplemental Testimony, 15 August 2014, para. 104.

[371] Cf. Consolidated Expert Report, 17 October 2016, paras. 18-20, 143-158.

[372] Cf. p. 176/S, 76/E; Consolidated Expert Report, 17 October 2016, para. 236; Respondent's Final Brief on Quantum, para. 379.

term of production in 2032. The Composite Economic Model (CEM) determined the end of production in 2026 (p. 125, 128/pdf). This projection should prevail in a but-for scenario. The difference accumulates the volumes for the years 2027 to 2032 in PetroSucre's Model (*i.e.* 17,726 MMB). The Tribunal finds that the most suitable adjustment is to add a volume of 1,772 MMB to the production for each year between 2017 and 2026. Contrary to the findings in respect of the end of production to be accounted for the Petrozuata and Hamaca Projects, the reduced production at Corocoro reflects real terms that can be compared to the Respondent's figures; moreover, the term in year 2026 does represent simply the end of phase I, when continuing extraction will be on schedule for phases II and III (not to be considered in this proceeding).

562. Finally, the Tribunal observes that the actual monthly peak production varied between 39,792 BPD (2011), 42,476 BPD (2012) and 39,170 BPD (2013), and will most probably become lower in the following years, in parallel to the field decline. Witness Figuera notes that in light of the production capability of the Corocoro field[373], it turned out that the CPF was unnecessary[374]. This is, however, not a matter to be considered by this Tribunal.

563. The figures submitted by the Parties together with the adjustment for the overall production duration retained by the CEM are therefore as follows:

[373] The capacity of the IPF had been increased from 30,000 BPD to 42,000 BPD to accommodate production as additional wells came on line; Marcano, Direct Testimony, 6 January 2015, footnote 70; TR-E, 2017 February Hearing, Day 10, p. 2997:9-12. The Witness added that they thus increased the production level to what had been planned through the IPF; the CPF was not a problem for the production of the field because they had the IPF (TR-E, 2017 February Hearing, Day 10, p. 3039:13-3040:9).

[374] Third Supplemental Testimony, 15 August 2014, para. 107.

Corocoro – Production								
	Claimants[375]		Mr. Patiño, based on PetroSucre Model[376]		Respondent[377]		Adjusted to duration as per CEM	
	BPD	MMB	BPD	MMB	BPD	MMB	BPD	MMB
2007 ½	29,589	5,400	0	0	0	0	0	0
2008	21,408	7,814			19,624	7,182	19,624	7,182
2009	64,954	23,708			31,461	11,483	31,461	11,483
2010	66,263	24,186			36,033	13,152	36,033	13,152
2011	66,485	24,267			36,204	13,214	36,204	13,214
2012	66,546	24,356			36,829	13,479	36,829	13,479
2013	57,745	21,077			36,537	13,336	36,537	13,336
2014	42,126	15,376	35,176	13,052	35,176	12,839	35,176	12,839
2015	31,833	11,619	33,066	12,134	33,066	12,069	33,066	12,069
2016	27,476	10,056	30,128	11,027	30,128	11,027	30,128	11,027
2017	25,163	9,184	25,838	9,431	25,838	9,431	30,693	11,204
2018	22,163	8,080	20,925	7,638	20,925	7,638	25,781	9,411
2019	19,412	7,085	18,276	6,671	18,276	6,671	23,132	8,444
2020	17,164	6,392	16,321	5,974	16,321	5,974	21,222	7,747
2021	15,836	5,780	14,883	5,432	14,883	5,432	19,737	7,205
2022			13,677	4,992	13,677	4,992	18,532	6,765
2023			12,317	4,496	12,317	4,496	17,173	6,268
2024			10,843	3,969	10,843	3,969	15,729	5,741
2025			10,237	3,736	10,237	3,736	15,090	5,508
2026			9,659	3,525	9,659	3,525	14,512	5,297
2027			9,136	3,335	9,136	3,335		
2028			8,645	3,164	8,645	3,164		
2029			8,236	3,006	8,236	3,006		
2030			7,849	2,865	7,849	2,865		
2031			7,496	2,736	7,496	2,736		
2032			7,158	2,620	7,158	2,620		
Total		204,380				181,371		181,371
1	2	3	4	5	6	7	8	9

H. By-Products

564. The Projects were of course producing oil in very large quantities representing the bulk of the extraction work undertaken. Nevertheless, this operation also produced so-called By-products, like coke, sulfur, natural gas and LPG (liquefied petroleum gas). Such products are listed in the models, mainly the Composite Economic Model (CEM, LECG-085) and the Ameriven Economic

[375] MMB from CLEX-086, mostly based on CEM (LECG-085), p. 127/128/pdf, and further aligned to the Claimants' Tables of 20 March 2017.

[376] The numbers for MMB are taken from Patiño, Consolidated Expert Report, 17 October 2016, para. 236. The numbers for BPD are calculated on this basis. The Respondent uses the same numbers as from year 2016.

[377] For the years 2008 to 2015, the Respondent uses the figures resulting from the actual sales in that period (cf. Tables submitted on 20 March 2017), and it offers the conversions into BPD. Witness Figuera, Testimony, 20 July 2009, para. 60; Third Supplemental Testimony, 15 August 2014, para. 104; Figuera, Appendices 84-89, Brailovsky/Flores, Appendices 359, 360.

Model (Hamaca, LECG-129). They represent approximately 2 to 5% of the overall quantity of products extracted from the fields.

565. In large parts, such By-products were sold on the respective markets and produced revenues. The Claimants therefore may have submitted that they had suffered a loss comparable to the loss of the revenue from the sale of oil, albeit in much smaller proportion.

566. As regards By-products the Claimants' initial request for relief did not determine the nature of the loss they suffered or request for compensation. Expressly or implicitly, the Claimants connected the damages claimed "to their interest in the Projects". Such a broad designation, neither exclude nor include the By-products. When explaining the fair market value of the Projects, the Claimants Memorial of 15 September 2008 relied on forecast oil prices (para. 449), but no mention is made of the pricing of By-products. The same results from the Claimants' Reply of 2 November 2009.

567. Some elements can be found in the description of the loss of each Project and the ensuing calculation of damages. When the Claimants' Memorial on Quantum of 19 May 2014 determines the volume of production, the subject is oil production exclusively. The By-products are not mentioned. In order to quantify their losses, the Claimants relied on their experts who assessed as first component "the volumes of crude oil and upgraded syncrude produced by the Projects"[378], which are based on the "Reserves figures"[379], which are composed of oil exclusively. The Petrozuata production profile was based on oil (para. 120). Turning to Hamaca, the same submission noted the volume of extracted crude and of upgraded syncrude, adding to this "as well as saleable By-products such as sulphur and coke" (para. 139), but without further elaboration on this point. The price data referred to oil and not to the By-products (paras. 168-176)[380]. The amounts claimed by the Claimants in their request for relief reflected damages for the lost cash flows that would have accrued "from their interests". The Reply on Quantum of 13 October 2014 uses the same terms. By-products are not mentioned. Again, in the Final Consolidated Brief of 30 December 2016, the By-products do not appear; the Claimants request this Tribunal to adopt production profiles based on oil[381].

568. When the Tribunal raised the question at the final hearing in September 2017, Counsel for the Claimants affirmed that the By-products had always been part of their case and that their sale

[378] Claimants' Memorial on Quantum, para. 105.

[379] *Ibidem*, para. 113.

[380] In respect of the production profile under the Hamaca Discriminatory Action provision the Claimants' experts excluded By-products; TR-E, 2017 February Hearing, Day 6, p. 1770:14-17 (Abdala). The Respondent's experts shared this opinion; Consolidated Expert Report on Valuation, 17 November 2016, footnote 295.

[381] Claimants' Final Submission on Quantum, paras. 14(a), 113, 130, 305, 499.

was counted in the models. The sale of these products was part of what had been taken away from them through the expropriation. He submitted that these products are included in their claim as they were in the models[382]. Faced with the observation that the By-products do not appear in the Claimants' briefs, Counsel undertook to provide the references[383]. They never did, although there was ample time left to include such information in their closing statement.

569. Counsel for the Claimants also submitted that in any event, both Parties agree that there is value in the By-products and that this should be part of the compensation owed by the Respondent[384]. He thought that the matter should be decided by the Tribunal's decision on the production levels. The By-products are thus part of the claim for the full value of what was taken from the Claimants.

570. Nonetheless, despite the Claimants' declaration, their claim must show that the loss of revenue related to these By-products has been included therein. The reference to the models may serve as a starting point to demonstrate the projections prevailing at that time. However, the models do not report on actual prices and do not offer a basis for an *ex post* valuation at the time of the Award. The Claimants have not presented sales figures that could serve as a basis for the estimation of revenues obtained. The By-products were sold under long-term contracts that included price formulas tied to market conditions[385]; they are not on the Tribunal's record. There is more: The Claimants' submissions do not contain a statement that their claim includes By-products, not even through an implicit reference to the models. When they introduced their respective production profile for Petrozuata and Hamaca, the Claimants referred to oil exclusively[386]. Their experts' Consolidated Update Report of 17 November 2016 does not address By-products. The experts' key valuation inputs were crude oil volumes and prices[387] and their discounted cash flow was based on crude oil production[388]. Their Report of 19 May 2014 does so very shortly, and in relation to royalty prices only and without explaining how they used their sources of information and made their

[382] TR-E, 2017 September Hearing, Day 17, p. 4893:11-4894:15, 4896:21-4897:4, 4899:1-3 (Friedman). Figures on production and sale of By-products are contained in the CEM (LECG-085) in respect of Petrozuata and Hamaca, not for Corocoro. The CEM is a document of 411 pages; the Claimants did not refer to any precise page(s) where the relevant information could be found. This document is not numbered consecutively nor indexed.

[383] TR-E, 2017 September Hearing, Day 17, p. 4894:17-22, 4896:18-21, 4899:4-11 (Friedman).

[384] TR-E, 2017 September Hearing, Day 17, p. 4895:12-4896:5 (Friedman).

[385] Petrozuata Annual Management Report to Lenders, 1 April 2007 (C-376, p. 4/pdf).

[386] Cf. Claimants' Final Submission on Quantum, paras. 179, 226.

[387] Consolidated Update Report, 17 November 2016, para. 5(a)(c).

[388] *Ibidem*, paras. 45, 49, 54.

calculations[389]. The figures noted in the experts' valuations' (CLEX-086) are not referenced to their sources and not provided with any comment.

571. The document entitled "Phillips Petroleum Company Justification and Premises" dated 9 October 1996 (C-122) had been presented by the Claimants as the basis for the Phillips' CEO Wayne Allen decision of 10 October 1996 to enter into the joint study agreement and to move forward with the Hamaca Project[390]. The document noted that there "is no positive cash flow anticipated from the sales of the sulfur or coke byproducts", and that "gas sales were not included in the economics"[391]. The Claimants' present view is that the models prevail over such a document; they represent the reality that is very different from the expectation in the 1990s[392]. Nonetheless, the explanation is a bit short and unsatisfactory when observing that the By-products, while certainly mentioned in the models, were not included in the Claimants' submissions.

572. The Respondent did not address the matter in its Consolidated Brief of 30 December 2016. Its experts have reproduced the sales figures provided by Witness Figuera for 2007 and 2008[393], and for the later years, they projected the volumes they found in the Composite Economic Model (CEM), as the Claimants' experts did, and then multiplied EHCO production by the proportions found in the CEM for each of the different By-products [394]. This seems to imply that the pricing follows the prices for EHCO – a position that would require further explanation and evidence.

573. The Tribunal concludes that the very few elements provided in the Claimants' documentation and expert reports do not permit an assessment of what would represent the loss of revenue resulting from an expropriation that included the By-products.

574. The Tribunal has the power to make a ruling on any "question submitted" (Art. 45(2) and 48(3) of the ICSID Convention). When the proceeding is on the merits, this requires a "claim" (as this results from Art. 46 of the ICSID Convention, providing for "additional claims") and a "dispute" (Art. 41(2), 43(b), 46 of the ICSID Convention). The Claimants in this proceeding have not presented a claim for compensation in respect of alleged losses of revenues accruing from the sale of By-products. Therefore, the Tribunal has no power to render a decision in this respect.

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[389] Cf. page 59. The experts refer to their own collection of price forecast (CLEX-011), without providing any explanation. No documentary evidence was supplied.

[390] Cf. Claimants' Memorial, para. 109.

[391] C-122, p. 7/pdf. The Hamaca Confidential Preliminary Information Memorandum prepared by Morgan Stanley Dean Witter in August 2000 notes that the sale of By-products is expected, but that the Base Case Projections assume zero net profits from the sale of By-products. (p. 61/pdf).

[392] TR-E, 2017 September Hearing, Day 17, p. 4897:8-4898:22 (Friedman).

[393] Testimony, 20 July 2009, paras. 13 (Petrozuata), 39 (Hamaca).

[394] Cf. Consolidated Expert Report on Valuation, 17 November 2016, paras. 75, 249 (Petrozuata), 84, 260 (Hamaca), 140 (royalties).

VII. Costs

A. Petrozuata and Hamaca

1. The Claimants' Position

a. Overview

575. The Claimants explain that for the next input to the DCF computation in order to determine the Project's expected capital and operating expenses their experts rely on the same pre-expropriation business planning documents they use for production, *i.e.* the Composite Economic Model (CEM, LECG-085) for Petrozuata, and the Ameriven Economic Model (AEM or PAM, LECG-129) for Hamaca. They then adjust those costs to account for inflation in the industry[395]. International tribunals have established that contemporaneous business planning documents are preferred sources of evidence, as the *ADC v. Hungary* Tribunal held[396]. Both the ICC[397] and the ICSID[398] Tribunals in the *Mobil* case applied this principle, noting that the Parties agreed the budget on costs before the dispute arose. Venezuela had acknowledged that this was the correct approach[399].

576. However, since its Counter-Memorial on Quantum, and with the support of its new experts Brailovsky and Flores, the Respondent has taken a different view. While still using the Project's pre-expropriation models as the baseline on costs, Venezuela asserts that billions of dollars in "additional costs" have been or will be incurred by the post-expropriation projects, resulting in nearly doubling the expected operating expenses and quadrupling the expected capital expenses. The effects on the cost projections are considerable. While the Claimants' overall cost projection is US$ 36.8 billion, Brailovsky and Flores have US$ 50 billion.

577. Venezuela claims that oil production at Petrozuata and Hamaca is diminishing. It thus argues that more costs will be spent for substantially less oil. According to Brailovsky and Flores' model, cash flow became negative in 2015 and the Projects will suffer substantial losses in the future, to such an extent that the Projects should already have been shut down. This is not what happened. The post-expropriation documents show that PetroAnzoátegui and PetroPiar generated US$ 8.8 billion to their shareholders over the 7½ years from June 2007 to 2014.

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395 Cf. Abdala/Spiller, Consolidated Update Report, 17 November 2016, paras. 5(b), 60, 144-146.

396 *ADC Affiliate Limited and ADC & ADMC Management Limited v. The Republic of Hungary*, ICSID Case No. ARB/03/16, Award of 2 October 2006 (CL-15).

397 *Mobil Cerro Negro, Ltd. v. Petroleos de Venezuela S.A. and PDVSA Cerro Negro, S.A.*, ICC Case No.15416/JRF/CA, Final Award of 23 December 2011 (R-462).

398 *Venezuela Holdings, B.V., Mobil Cerro Negro Holding, Ltd.,* et al. *v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award of 9 October 2014 (CL-348).

399 Venezuela's Counter-Memorial, paras. 312, 341.

578. The Claimants submit that the alleged "additional cost" components are (i) unreasonable and/or unnecessary; (ii) unsupported by the evidence; (iii) ever changing, thus unreliable. Venezuela has not demonstrated that such costs had been incurred, and, even if so, that they would have been incurred by the Claimants. Venezuela's claims as to costs are addressed in Mr. Earnest's Consolidated Report.

b. The Respondent's claimed "Additional Costs" are unreasonable and/or unnecessary

579. The Claimants submit that this assertion is true for both the additional capital and operating expenses alleged. Furthermore, Brailovsky and Flores use the lowest possible exchange rate to Bolivar-denominated costs.

580. According to Venezuela, Petrozuata and Hamaca will incur turnaround costs in multiples greater than those projected prior to the expropriation. The alleged future costs are also greater than the actual costs incurred in 2005 and 2006. Venezuela argues that refinery maintenance costs are increasing worldwide. A brochure from Salomon Associates refers to a 15% annual increase[400]. This is not a reliable data source, but essentially a marketing document. For Hamaca, Venezuela adds maintenance costs that were called "PRAC" (Restoration Plan for Critical Assets) and "PREM" (Restoration Plan for Major Equipment), totaling approximately US$ 1 billion, that were never contemplated in the Project's Economic Model. Such massive expenditures have been useless. Venezuela asks the Tribunal to accept that despite huge claimed expenditures, the Hamaca upgrader will not operate on an OSF higher than 72.85% and be subject to increasing annual probability of catastrophic collapse.

581. The Claimants recall that Venezuela asserts operational costs allegedly spent on trucks to collect and deliver the coke and sulphur by the two upgraders to the Petrozuata Project's solids and handling facility. Mr. Figuera submits that the costs incurred between 2009 and 2014 are in the range of a quarter of a billion dollars. He argues that these costs became necessary because Petrozuata's new management failed to repair that facility after it was damaged by a fire in 2009. For the Claimants, a prudent operator would never spend US$ 250 million for such transport since the cost of repairing the facility was in the range of US$ 37.5 million[401]. The answer appears to be given by a governmental report finding that PDVSA had entered into improper contracts with CUFERCA, the trucking company (C-649). The Claimants mentions as another example the electricity generators purchased in 2010.

[400] Figuera Appendix 124.

[401] Claimants' Final Submission on Quantum, para. 336; in the Claimants' Reply on Quantum, para. 314, the corresponding amount was US$ 47 million.

582. The Respondent's experts rely on an incoherent mix of alleged historical and projected capital and operating expenses, many multiples greater than those agreed by the Project participants prior to the expropriation. Many of these costs are unverifiable, contradictory or subject to double-counting. For instance, its valuation experts add new well repair costs forecast by Mr. Figuera but they do not take out those costs which are already included in the Project plans.

583. Venezuela's costs figures are compounded by its inflation of those costs through exchange rate manipulations. The Respondent's experts assume that most operating expenses, half of all turnaround costs, and 30% of capital expenditures are incurred by the Projects in local currency, *i.e.* Bolivars. They apply to these costs Venezuelan inflation rates, and then convert them back into US$ at the lowest official exchange rate, thereby maximizing their negative impact on the Project's valuations.

584. The Claimants' experts explain that multiple legal exchange rates were available in Venezuela. A rational private operator would have had available numerous methods to access more favorable legal exchange rates or make payments directly in U.S. dollars. Experts Brailovsky and Flores do not meaningfully contest the options the experts Abdala and Spiller propose, like: (i) The Projects could have financed their operations through intercompany loans, which would allow access to more favorable, legal exchange rates. (ii) The Projects could have outsourced certain functions to third-party service providers and pay them in U.S. dollars. (iii) The Projects could have hired international suppliers and pay them in U.S. dollars.

585. For the period 2007 through early 2016, experts Brailovsky and Flores ignore these realistic options and apply the lowest possible exchange rate in their damages model. But even PDVSA does not do that. The financial statements confirm that the post-expropriation projects have in fact obtained Bolivars using more favorable foreign exchange rate regimes than those assumed by the Respondent's experts. These experts have accepted this fact. They maintain, however, that those preferable rates are allegedly available only to mixed companies, and not to projects operating under Association Agreements. This suggestion must fail. Exchange Agreement No. 9[402] does not make such a distinction, both before and since the expropriation. Further, the suggestion that Venezuela would discriminate against the two Projects in the but-for world is unsustainable. The forced migration is not a valid argument in support of the application of less favorable exchange rates to the Claimants.

586. For the period 10 March 2016 to 31 December 2016, Venezuela's experts adopt a different approach, assuming that the Projects would have had access to the more favorable, floating DICOM rate, but only 50% of the time. The experts have no explanation for this split. When realistic exchange rates are applied to the "additional costs", their impact is substantially reduced. When more

[402] Brailovsky/Flores Appendix 240.

favorable rates are applied, the Respondent's experts' cost projections become similar to the costs used in the Claimants' experts' model.

c. The Respondent's claimed "Additional Costs" are unsupported

587. Venezuela's "additional costs" claims should be rejected for a second reason: absence of proof. The Respondent's experts rely on alleged cost information provided by Mr. Figuera. Most of Mr. Figuera's "actual" information is either unsupported or prepared for this arbitration. The documents provided are insufficient. Notable is a quarter-page document in support of the alleged 2015 turnaround costs at Petrozuata, in the amount of US$ 1.1 billion. Mr. Figuera later admitted that the US$ 1.1 billion figure should be divided by three to account for future devaluations of the Bolivar. It has not been explained why this split applies to the Petrozuata 2015 turnaround only, and how this document can support such costs for a turnaround that finally did not take place.

588. The ever-changing nature of Venezuela's "additional cost" allegations renders them unreliable. In 2014 Venezuela told this Tribunal that the Projects would incur over one billion dollars for certain works in 2015, while Mr. Figuera has since admitted that those amounts have not been spent, and with respect to some, never will: (a) Solids Handling Facility Modernization. Venezuela initially claimed for 2015 US$ 200 million in costs to expand and modernize the facility. Two years later, Mr. Figuera withdrew the claim, submitting that no additional costs were needed. (b) Barge costs. Mr. Figuera also claimed that Petrozuata and Hamaca would each incur US$ 25.2 million to haul coke between 2015 and 2017. But he also admitted that such costs have never been incurred, and may never be incurred. (c) Trucking costs. Mr. Figuera submitted that Petrozuata would incur such annual costs for US$ 67 million per year from 2015 to 2017, but then withdrew the suggestion, such costs having never been incurred. In light of these most striking examples, one can conclude that other claims for "additional costs" are phantoms as well, as further explained by Mr. Earnest's Consolidated Report.

d. Comments on the Respondent's Cost Estimations

589. When addressing the Costs Estimations submitted by the Respondent on 2 June 2017, the Claimants underscore in their Introductory Notes that neither they nor the Respondent base their case on actual costs in the post-expropriation period. For the Claimants, the Projects' pre-expropriation business planning documents are the best reflection of the expected costs in the but-for scenario, combined with annual industry inflation rates as their experts have done. The Respondent uses the same sources, but then (i) increases the figures by applying inappropriate inflation and exchange rate assumptions, and (ii) adds "additional" costs categories that do not appear in the pre-expropriation models. The Claimants observe an evidentiary deficiency in the Respondent's approach, because only about 11.5% of the costs in Venezuela's valuation are supported by documents reflecting alleged actual expenses that the post-expropriation Projects have incurred.

590. The Claimants recall that the cost projections in the CEM included the following categories: CAPEX: G&A, Upstream Facilities, Upgrader Facilities; OPEX: Upstream, Upgrader, G&A, Third Party. The Respondent has changed the figures relating to these categories. First, the Respondent inflates all costs in assuming that certain percentages will be incurred in Bolivars and then inflates these costs using domestic consumer inflation rates in Venezuela, before converting them back into US$ using the lowest existing official exchange rate. However, the Respondent does not indicate the exchange rate used or obtained for any particular cost item. Additionally, the Respondent ignores that more favorable exchange rates had existed in Venezuela over the period since the expropriation in 2007 and were accessible if only reasonable management techniques had been used.

591. Moreover, the Claimants object that the Respondent replaced certain costs included in the CEM with much higher figures based largely on Mr. Figuera's unsupported testimony, specifically drilling costs, turnaround costs, well repair costs (and coker repair costs at Hamaca). Above these estimations of its own making, the Respondent added massive "additional" cost categories, like: CAPEX: Drilling, Turnarounds, Others; OPEX: Well Repairs, PREMs, Catalysts Unit 16, Tank 12 Repairs, Solids Handling Facility Trucking; Others. These purported additional costs remain largely unsupported, although the Projects must still have available detailed records of any specific expenditure in the post-expropriation period. In any event, these costs are unreasonable, hugely inflated and indicative of operational deficiencies. The purpose of the Respondent's option to rely on financial statements is unclear. They have not been part of and are inconsistent with the Respondent's pleaded case, they do not represent the but-for scenario and are incomplete and insufficiently detailed to be useful. When taking the example of costs for electricity generation at PetroPiar and the costs for hiring third parties to truck coke to the coke pile, the Respondent ends up with double counting because it does not subtract related costs already included in the AEM (also PAM).

592. In conclusion, the operating costs and capital expenditures shown in the Claimants' 20 March 2017 tables and based on the Composite Economic Model (CEM) for Petrozuata, and on the Ameriven Economic Model (AEM) for Hamaca remain the only principled and reliable assessment of costs in the but-for scenario.

2. *The Respondent's Position*

a. Overview

593. In line with its preference for an *ex ante* valuation, the Respondent submits that based on its experts' analysis, costs related to the Petrozuata Project are reflected in the ConocoPhillips Composite Economic Model (CEM) in 2006 U.S. dollars, escalated (i) to the date of valuation, 26 June 2007, using the oil field and gas field machinery PPI index, and (ii) from the valuation date forward, using a composite inflation index calculated as the weighted average of long-term US

inflation projections (85%) and the rate of change of their 2007 WTI price forecast (15%). Two exceptions are the inclusion of well costs consistent with the Project's experience and a US$ 20 million cost for an EOR pilot project in the Reserve Area. As with Petrozuata, in an *ex ante* valuation of Hamaca as of 26 June 2007, the Respondent's experts have proceeded in following the same method, however taking as the basis of their projections the estimates set forth in the contemporaneous model used by Petrolera Ameriven (PAM), in 2006 U.S. dollars, escalated to 26 June 2007. The Respondent further notes that lower volumes of EHCO and CCO production had been projected; therefore, its costs in the *ex ante* valuation are actually lower than the costs projected by the Claimants.

594. The Respondent objects to the Claimants' reliance on the *Mobil* cases for the proposition that pre-nationalization budgets should be used for projecting future costs. In both cases, the tribunals derived the value of cash flows in using *ex ante* information as of June 2007. There is no basis for doing so in an *ex post* valuation. The Claimants also argue that in the first phase of this arbitration, the Respondent's experts accepted the LECG projections regarding costs, noting that the Parties were not differing substantially with respect to costs. This was so because in the first phase of this case, the Respondent and its experts were conducting *ex ante* valuations, based on information available as of June 2007, thus using the same base of information as the Claimants did. In an *ex post* valuation, estimates for the future are no longer necessary, since the categories of costs and the actual costs incurred both are now known. Under those circumstances, it is wholly inappropriate to substitute projections made ten years ago for the figures resulting from actual experience. For example, as of June 2007, the costs associated with the periodic turnarounds had to be estimated on what was known at the time. Now, in 2016, not only the numbers but also the scope and the costs of those turnarounds are known.

595. Further, the Claimants seem to forget the undisputed fact that as oil prices rose, so did costs, as reflected in the HIS CERA Upstream Operating Cost Index (UOCI) and the HIS CERA Upstream Capital Cost Index (UCCI) upon which the Respondent's experts rely. The Claimants also do not take account of the fact that Venezuela has suffered high rates of inflation since the nationalization, with limited offsetting devaluations of the Bolivar. During the period from mid-2007 to January 2010, inflation ran at the rate of 30.3% per annum, meaning an overall increase in prices of 89.4%. At the official exchange rate, which remained at Bs. 2.15 per US dollar during that entire period, the US dollar equivalent of those costs incurred in Bolivars rose by the same percentage.

596. The Claimants do not seem to understand that while they should benefit from higher revenues resulting from oil price increases in the historical period, they should not remain immune from higher costs. They also object to the *post hoc* nature of the Respondent's current claims. Contrary to their allegations, these costs were reasonable and necessary and supported by evidence. The Claimants have failed to show that these costs would have been avoided if only a ConocoPhillips subsidiary had remained a project participant.

597. The Respondent does not believe the Claimants when they contend that the cost for the 2011 turnaround at Petrozuata (US$ 236 million in 2011 US dollars) was significantly higher than that incurred in the 2005 turnaround, which cost about US$ 23 million (in 2005 US dollars). Mr. Earnest, the Claimants' expert, fails to grasp the fact that all of the upgraders at the Jose Complex have experienced much higher costs for the post-nationalization turnarounds than those experienced prior to the nationalization, while they have been managed by the foreign partners (with the exception of those at PetroAnzoátegui). At the PetroCedeño (Sincor) project, the maintenance activities during the first turnaround in 2004 cost US$ 71.6 million and involved interventions at 287 equipment items, while the maintenance activities during the 2008 turnaround (managed by Total) cost US$ 266 million and entailed intervention at 913 equipment items. Similarly, at the PetroMonagas (Cerro Negro) project, the costs went up from US$ 27.4 million in 2006 to US$ 393 million in 2012, while the number of equipment items concerned was 84 in 2006 and 1,215 in 2012. At Petrozuata, the first turnaround in 2005 involved the intervention at 385 equipment items, while the second turnaround in 2011 entailed the intervention at 752 equipment items. In short, the post-nationalization turnarounds have been more extensive and more expensive at all of the upgraders.

598. The Respondent also disagrees with the Claimants with respect to the solids handling facility, when they argue that the costs associated with (a) the 2009 fire and repairs and (b) transporting coke to, and handling of the coke at a new storage location following the fire were unreasonable, contending that the facility could be repaired for US$ 47 million. This is based on confusion, as the Respondent was referring not to the full costs, but to the uninsured amount of US$ 45,263,789. After repair, the facility operated at less than full capacity, resulting in higher costs. The Claimants acknowledge the costs that have been incurred by PetroAnzoátegui, as well as PetroPiar, in trucking the coke to the alternative storage locations and managing the huge coke pile, but they claim that a prudent and efficient operator would not have engaged in such conduct. This argument ignores that upgraders produce large volumes of coke in the coker units, which needs to be removed from the pits quickly; when the solids handling facility was not available, additional costs were incurred for trucking the coke away. The Claimants assert that the costs were fabricated by the Respondent. They were not. The Respondent established that (a) the costs for the fire repairs in 2009, net of insurance proceeds, were US$ 37,531,649, and (b) the trucking and handling costs, net of insurance proceeds, through 2014, have been US$ 273 million.

599. The Respondent further notes that the Claimants also appear to challenge the costs for wells and well pads. In the first phase of this case, Mr. Figuera stated that the experience at Petrozuata was that single-lateral wells in 2009 cost approximately US$ 2.9 million, and multilateral wells about US$ 3.5 million. The Claimants did not cross-examine him on this point. At the 2010 Hearing, Mr. Lyons also confirmed that in its own presentation in October 2006, ConocoPhillips was estimating a cost for US$ 3.5 million per well for drilling costs. The Claimants have no basis for disputing the costs associated with upstream activities, which are in line with historical costs. Dr. Strickland did not comment on the costs associated with wells or well pads.

600. The Respondent recalls that at Petrozuata, additional firefighting systems have been installed. Through 2014, US$ 10,732,625 have been spent. As Mr. Figuera explained, the remainder of the US$ 100 million in estimated costs associated with the upgraders will be spent in the coming years. The upgrader at Petrozuata, like the other upgraders in the fields, are required to install electricity generating equipment in order to free up the grid for the population. That project, with an estimated cost of US$ 142 million (in 2010 US dollars) has been deferred pending the completion of the gas line to the José Complex. The Claimants object that these costs were not included in the pre-nationalization business plans or models. This underscores the absurdity of relying on those plans in an *ex post* valuation.

601. Turning to Hamaca, the Respondent begins by noting that the Claimants argue that the turnaround costs at PetroPiar are significantly higher than those projected as of June 2007. They further claim that the Respondent adds so-called PREM maintenance costs of US$ 1 billion that were never contemplated in the Project's Economic Model. But the fact that such costs have not been contemplated in 2006 does not disqualify those costs from inclusion in the *ex post* valuation analysis. To the contrary, the fact that those costs were and are considered necessary by the Project partners underscores the folly of relying on outdated plans and models as a basis for an *ex post* valuation.

602. Mr. Earnest's comparison between the costs for turnarounds before and those which occurred since is misleading, even more than it was for Petrozuata. Mr. Earnest recognizes that the 2006 Hamaca upgrader turnaround is being described as a partial turnaround. The Project partners referred to it as a "Pit Stop" and it cost only US$ 29 million (in 2006 US dollars). Mr. Earnest ignores economic realities. First, Solomon Associates, a well-known firm in these matters, has reported that the cost of turnarounds averaged a 15% increase each year from 2000 to 2008. Second, during the period between 2006 and 2009 (when the first real turnaround occurred) Venezuela experienced inflation at an annual average rate of 26.3%. Even based on Mr. Earnest's estimates, a turnaround in 2009 would have cost US$ 150 million. That is the figure that should be compared to the US$ 223.7 million incurred in implementation of the turnaround in 2009.

603. In 2006, the partners estimated the magnitude of the June 2008 turnaround as 5-10 times greater than the 2006 turnaround. In fact, the 2009 turnaround involved the intervention at seven times the number of equipment items as had been tested during the 2006 pit stop. On this basis, one would obtain a base figure of US$ 145 million, which will become, when accounted for industry and country inflation, a cost for a full turnaround at PetroPiar in 2009 of US$ 256 million. That is higher than the amount actually incurred. The cost for the combined PRAC/turnaround in 2012 of US$ 313.2 million is also in line with these estimates.

604. Mr. Earnest's opinion should also be compared with his May 2009 report in the ICC *Mobil* case, where he recognized the upcoming cost for the turnaround at PetroPiar and thought that the

costs for the smaller turnaround at Cerro Negro could be raised above the expected US$ 100 million. The maintenance activities during the 2012 turnaround at PetroMonagas cost US$ 393 million. In comparison and given the relative size and complexity of the PetroPiar upgrader as compared with that of PetroMonagas, the costs of the major maintenance work at PetroPiar can hardly be considered unwarranted.

605. The Respondent also notes that other significant costs actually incurred by PetroPiar were not included in the pre-nationalization economic model and not mentioned in the first phase of this case. It was only in 2011 that Chevron and CVP made the determination that the upgrader would require annual major maintenance activity in the form of the PREM programs that commenced in 2012 and will run through 2022. That decision resulted from the detailed assessment of the upgrader following its continued poor performance despite the extensive 2009 turnaround. To date, PetroPiar has incurred US$ 357 million in connection with the PREM activities conducted annually between 2012 and 2015. The incidents that occurred with Tank 12 required repairs that could not appear in the 2006 model.

606. The installation of electrical generating capacity was equally not included in the 2006 economic model. This issue arose in November 2009, when the Government made the decision to require PDVSA and its affiliates to reduce their reliance on hydroelectric power in light of the needs of the communities in which they operate and the nation-wide shortage of power. In accordance with Decree 6.992 PetroPiar has installed 40 megawatts of capacity at a cost of approximately US$ 95 million in a project that was headed by Chevron. The Claimants and Mr. Earnest claim that these costs are too high, but the documentation submitted by the Respondent cannot seriously be contested.

607. In sum, the Respondent submits that there is no basis for excluding costs that have been and will be incurred in the post-nationalization period simply because those costs were not contemplated prior to the nationalization and not included in the modeling that was carried out at that time. The Claimants have not shown that if their employees had conducted the operations, those costs would have been avoided.

b. The Respondent's Cost Estimations

608. The Respondent agrees with the Claimants that neither Party has based its "but-for" case on actual costs incurred by the Projects in the historical period. For the Respondent that is because many of the costs incurred resulted from the fact that the new mixed companies, operating under the 2001 Hydrocarbons Law, have been authorized to produce and sell blended crude oil. In contrast, the Projects operating under the Association Agreements were only authorized to sell upgraded products. Therefore, certain costs in the historical period are to be excluded, just as certain revenues (from blended sales) have to be excluded.

609. For the Respondent, the assumption that costs in the "but-for" world would remain the same for more than three decades as they were projected in a 2006 model is invalid for the Projects as they would be invalid for any project, but especially for a megaproject in the oil industry. It is indisputable that large costs items were not included in or contemplated by the 2006 models, for Petrozuata (CEM) as for Hamaca (AEM or PAM). Such a position is nonsensical and defeats the basic purpose of an *ex post* analysis. If the Claimants argue that account be taken of what has actually happened in the field, they have a heavy burden of establishing the inappropriateness of the actual costs incurred. They have not come close to meeting that burden. There is no doubt, for instance, that substantial additional costs were incurred for items such as turnarounds and fire-fighting improvements, which make the Claimants' position of ignoring all these costs irrational. The overwhelming majority of the cost figures the Claimants say are unsupported are in fact based on the starting figures in the CEM and the AEM, but then provided with information on inflation and exchange rates. The rest of the costs the Claimants say are unsupported are in fact attributable to drilling and well repair costs that are not only supported by Mr. Figuera and Mr. Patiño but also corroborated by the Claimants' own evidence in the record.

610. The Claimants simply brush aside any cost not included in the 2006 model on the unwarranted assumption that it would not have been incurred in the but-for world. The record shows, for instance, that the Projects incurred significant costs relating to the upgrader maintenance, including the Petrozuata 2011 turnaround, costs that would have been the same if ConocoPhillips had remained in the Projects. Similarly, the post-nationalization incidents that resulted in the required repairs to the Solids Handling Facility and the trucking and handling of solids were not contemplated in the 2006 model; the associated costs would have been incurred regardless of whether ConocoPhillips was a Project participant.

611. With respect to inflation, the Respondent do not share the Claimants' position that a U.S. inflation index should apply to both US$ and Bolivar costs in the CEM, even though Venezuelan inflation was far higher than inflation as captured in that U.S. index. There is nothing inappropriate to take account of the currency proportion involved in OPEX (70% bolivars/30% US$) and CAPEX (30% Bolivars/70% US$). These percentages were included in Mr. Figuera's testimony and have never been contested[403]. A large portion of costs incurred in Bolivars were for labor-related expenses and such costs are correctly inflated on the basis of domestic, consumer inflation rates in Venezuela. When the Petrozuata 2011 turnaround took place, it was after almost two years of Venezuelan inflation cumulating in a rate of 51%; the impact of such high inflation cannot be measured correctly when turning costs in US$ in order to subject the expense to much lower US inflation rates.

[403] Figuera, Third Supplemental Testimony, 15 August 2014, para. 59. The Tribunal notes that the other references given by the Respondent do not contain this information.

612. The Claimants contend again that there were multiple legal exchange rates available, but they never explain how this could have been done when every Exchange Agreement prior to Exchange Agreement No. 35 (issued in March 2016) provided that US$ obtained in the sale of hydrocarbons could only be exchanged at the official rate (CADIVI), which was Bs. 2.15 per US$ until 7 January 2010, Bs. 4.3 per US$ from 8 January 2010 until 7 February 2013, and Bs. 6.3 per US$ from 8 February 2013 until 9 March 2016. Exchange Agreement No. 35 applied only to PDVSA, its subsidiaries and mixed companies.

613. The Claimants may say that they inflate costs using "annual industry inflation rates", but what they actually do is that (a) they have converted all costs in the model that are in Bolivars into 2006 US$, (b) added these additional US$ costs to the existing US$ costs retained in the model to obtain total costs in US$, and then (c) inflated the total costs using a US inflation index (the US Producer Price Index for oil industrial commodities). That is an exercise that completely ignores Venezuelan inflation, as if the Projects would be operated entirely in the United States and not in Venezuela.

614. The Respondent also recalls that it was the Claimants who insisted on the production of financial statements of the mixed companies. These statements reflect the actual costs incurred by the Projects in the post-nationalization period, even if one were to exclude the costs related to blending. Further, many of the Claimants' comments on the financial statements make little sense. Thus, when production remained relatively flat, this did not have as a consequence that costs behaved the same way, which would ignore the enormous inflation caused by the increase in oil prices, particularly in the summer of 2008.

3. *The Tribunal's Findings*

a. Preliminary observations

615. The evidentiary situation with respect to costs is deplorable and surprising. Indeed, if there is one category of items that should easily be documented, it should be the costs that have at least passed the stage of invoicing and payment that can be shown by documents. The Tribunal's record is grossly incomplete. The Respondent, who bears the main burden of proof in respect of the Projects' costs, has presented as its key witness Mr. Figuera, who left the Projects so early that he could not offer to the Tribunal information based on personal knowledge of the factual background of the many cost items debated between the Parties. Witness Figuera provided about 5000 pages of cost documents he asked the Projects to compile; he did not proceed himself with the selection, nor did he provide any indexing[404]. The valuation experts from both sides take the defense of their

[404] TR-E, 2017 February Hearing, Day 8, p. 2397:7-2398:1.

respective clients in supporting their cost assumptions, not aware of how far away they are from reality. Despite the Respondent's repeated designation of Mr. Patiño as its witness, the Tribunal recalls once again that Mr. Patiño has been introduced into this proceeding as an expert; he cannot give testimony on facts and costs relating to the Projects. It is equally manifest that the Respondent cannot, before this Tribunal, characterize as testimony statements delivered by an individual appearing as a witness in another proceeding, even if the fact pattern in that case – the *Mobil* arbitrations – presents some resemblance to two of the Projects to be considered by this Tribunal[405]. The documentary evidence is based in part on projections dating from before the expropriation and disconnected from considering the potential of costs that may have characterized the historical life of the Projects, including the usual price increases occurring when business is flourishing and the economy growing. In addition, actual costs are very often alleged with poor documentary support.

616. Faced with the difficulties caused by evidence presented by pieces that cannot be put together to provide a clear picture, the Tribunal will consider the various cost items in determining first whether a specific claim for costs is valid as a matter of principle, and then examining whether the actual costs claimed are supported with reliable evidence showing that such costs did or may be incurred in the future in amounts that can be considered as realist and fair.

617. The Tribunal also notes that costs represent claims the Respondent invokes in order to reduce the estimation of cash flow and ultimately the revenue accruing to the Projects' partners and the Claimants in this proceeding. Therefore, the Tribunal will not allocate costs that have not been claimed although it may appear as reasonably certain that they have occurred or may occur in the future.

618. The Parties adopted the usual distinction between Capital Expenditures (CAPEX) and Operating Expenses (OPEX). The Tribunal follows the same order and the same categories that the Parties have adopted. The analysis of their respective positions is based on their briefs, including the evidence supplied, and on their respective cost assessments filed with the Tribunal on 20 March and on 2 June 2017.

619. Both Parties accept that the Composite Economic Model (CEM - LECG-085) serves as a plateau document from which to start. The Petrolera Ameriven Hamaca Economic Model (quoted either as AEM or as PAM) is equally important for that Project (LECG-129). The difference between the Parties consists in that the Claimants refer to these documents dated from the second half of 2006 exclusively (subject to yearly inflation), whereas the Respondent is (i) updating the figures

[405] Cf. the Respondent's Cost Estimations in respect of Petrozuata, p. 15, 59/61, and for Hamaca, p. 16, 57, 86/88, where it is argued that documents on the record of this Tribunal are supported by the testimony of Mr. William Cline of Gaffney delivered in the *Mobil* arbitrations (R-550, R-551). The fact that Mr. Cline appeared in the *Mobil* arbitration as the Claimants' witness does not change the fact that he has not been introduced in this proceeding as a witness.

contained therein to what it assumes as actual costs and (ii) adds further costs experienced in the Project's life but not yet projected in the CEM. The figures relating specifically to Hamaca are contained in the PAM. Those that are relevant for the Tribunal for the present examination also appear in the CEM, albeit sometimes with small and insignificant differences. The Tribunal refers primarily to the CEM with the effect that the rounding of numbers is the same for both Projects[406].

b. The difficulty to identify past and future costs

620. The Tribunal accepts that the Claimants have certainly more difficulty than the Respondent in having access to pertinent information on actual costs. However, the Claimants have a well-known reputation in the oil industry and the expertise to provide useful information about costs attached to projects for oil production. They also know perfectly well that prices for expenses over the lifetime of a project, after having been retained in models in 2006, certainly will go up in the future. They also know that expenses may occur in the future that have not been and could not be modeled in 2006. They cannot rely on the 2006 models and tell the Tribunal that these assumptions were valid for 30 years, even if associated to future inflation indexes that are rarely accurate when compared to actual market values.

621. The Respondent is correct when it states that certain costs in the historical period should be excluded because they are related to the production and sale of blended oil, which was not allowed under the Association Agreements. However, the Tribunal also notes that the Respondent does not assist the Tribunal in identifying the portion of such costs that should be taken out of the overall cost-estimation. This is the case, for instance, for part of the costs for turnarounds. The Respondent accepts that this operation takes more time subsequent to the expropriation and since blending became permitted[407]. But the Respondent does not explain the cost-portion that should be removed from the turnaround budget based on the same experience and logic.

622. In relation to the update of amounts mentioned in the CEM to actual levels of costs, the Respondent uses inflation indexes and it relies on what it considers as the pertinent exchange rate. Both of these factors are applied to what is called a "split" between costs incurred in Venezuelan Bolivars and US dollars, in a proportion of 30:70% for CAPEX and the reverse proportion for OPEX. The Tribunal notes at the outset that these elements of accounting are approximate. There is no evidence upon the actual occurrence of this "split", whether in respect of several categories of costs or in respect of certain more specific items. Mr. Figuera provides these figures without any explanation or support on any documents or testimony[408]. Further, inflation rates applicable at the

[406] Cf. CEM, p. 41-43/pdf (Petrozuata), 244-246/pdf (Hamaca).

[407] Cf. TR-E, 2017 September Hearing, Day 16, p. 4569:14-22 (Preziosi), 4571:6-10 (King); Day 17, p. 4854:10-17 (Preziosi).

[408] Cf. Figuera, Third Supplemental Testimony, 15 August 2014, para. 59.

time in Venezuela are quoted but not supported by evidence. Moreover, such rates are applied to a great number of costs items without determining whether the 30%:70% split for Bolivars is of actual pertinence in respect of each item.

623. The same observation applies to the split the Respondent and its valuation experts have made between portions of expenses incurred either in Bolivars or in US dollars. The documentary evidence available to the Respondent would undoubtedly allow identifying whether, and if so to what extent, such splitting did actually take place. Additionally, evidentiary support would also have revealed whether the 30:70 split adopted by the Respondent's experts did apply in this proportion throughout the whole period between 2007 and 2015 or 2016, or whether certain costs initially incurred in one of these currencies were not shifted towards expenses made in the other currency in case the inflation or other macroeconomic influences did render such shift advisable.

624. The Tribunal finds that a split that attributes to costs incurred in Bolivars a substantially higher percentage in OPEX than in CAPEX is reasonable given that the documents on the record suggest that a major portion of the costs related to OPEX were incurred in Venezuela in local currency. Indeed, when observing the division adopted in the 2006 models between the parts of certain cost items that are accounted for either in US$ or in Bolivars, it appears that for Petrozuata (unlike Hamaca) the Project's participants had modeled the applicable currency split differently[409], sometimes adopting higher Bolivar portions than the 30% that have the preference of the Respondent in respect of CAPEX, sometimes counting with a greater portion than the 30% applicable to the US$ portion of OPEX. The Tribunal notes that different cost items had their individual cost split. It would be an almost impossible task to determine an exact split taking each item and subitem. However, the Respondent provides for a split[410] that is not contested by the Claimants and that in the overall analysis of the available documentation appears as reasonable. Therefore, the Tribunal will adopt such a split.

625. The Tribunal understands that inflation indexes are reflecting impact on prices based on the currency to which they are tied up. The difficulty in the present matter results from the fact that a number of items on costs imply US$ and Bolivars, when these two currencies are applicable to specific parts of a same cost item. Therefore, to the extent that this is relevant, inflation must be determined separately for each currency. In this respect, the Tribunal approves the Respondent's position that the inflation occurring in Venezuela's market must be taken into consideration at its own rates when expenses in Bolivars are applicable. The Tribunal does not accept the inflation rates known on the US market that have been put forward by the Claimants' experts[411].

409 Cf. CEM, p. 41-43/pdf (LECG-085).

410 Cf. Brailovsky & Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 154-181, 300-305.

411 Cf. Abdala/Spiller, Consolidated Update Report, 17 November 2016, paras. 61/62, 153.

626. The Respondent introduces a further adjustment based on the assumption that 30% of total operating costs (OPEX) are variable, with the effect that the EHCO production projected by the CEM should be corrected by 30% based on the EHCO production volume estimated by the Respondent. This latter volume being lower, the corresponding OPEX should be reduced accordingly[412]. The Tribunal does not adopt the Respondent's position in respect of EHCO production, based on Mr. Patiño's conclusions. Therefore, it does not follow the Respondent's and its experts' calculation based on this assumption.

627. The documentary evidence, if it had been filed with the Tribunal, would also have allowed to identify the applicable exchange rates. The record before the Tribunal contains a great number of invoices where the official rate was applied. When this was the conduct adopted within the Projects, one would expect the Claimants' valuation experts to demonstrate with convincing evidence that this conduct was actually inappropriate since it could be overturned. In this respect, the Claimants' experts offer nothing more than hypothetical submissions on the availability of more favorable rates through "exchange rate management"[413]. No demonstration is provided on how the experts' "private manager" would have optimized each cost item more favorably than the actual costs incurred. The experts had to admit that their reliance on the "parallel market" raises a legal issue[414]; they could not remove the objection of promoting illegal action on the black market[415]. The Tribunal does not agree with the Claimants when they argue that the Respondent was "converting back" into US$ expenses initially incurred in Bolivars and subject to Venezuelan inflation rates. The Tribunal understands that the Respondent has tied the Bolivar portion of a cost item to the local inflation rate (running since 2006, base year for the CEM), and added the resulting amount to the remaining US$ fraction in applying the pertinent exchange rate, both elements being included in its experts' CAPEX and OPEX inflation index.

c. Drilling

628. The Tribunal takes this first item on the list of CAPEX, which is one of those matters where the lack of evidence and explanations is truly regrettable. The Respondent relies on the projections of Mr. Patiño, including its splitting of drilling new wells and repairing existing wells year by year.

[412] Cf. Cost Estimation for Petrozuata, p. 14, 43/44, 48, 52/53, 56/57, and Hamaca, p. 15, 55, 59/60, 64/65, 69/70, 74; Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 308, 315. The Respondent refers to Witness Figuera, Testimony, 20 July 2009, footnotes 28, 31; Third Supplemental Testimony, 15 August 2014, paras. 59, 97, where it is stated that 30% of OPEX are variable and related to the volume of CCO production.

[413] Cf. Abdala/Spiller, Consolidated Update Report, 17 November 2016, paras. 63/64, 148, 153-162. In their document serving as evidence rates are recorded, for Secad II, as from 24 March 2014, and for Simadi between 2 December 2015 and 3 July 2016 (CLEX-095); such presentation is manifestly incomplete and useless for an assessment to be made by the Tribunal.

[414] Cf. TR-E, 2017 March Hearing, Day 13, p. 3865:10-3866:15 (Abdala).

[415] Cf. Respondent's 2017 Post-Hearing Brief, para. 171.

The numbers he thus determined are linked to his conclusions on decline rate and other specificities that made him believe that both Projects will not successfully reach the targets for production of EHCO and CCO. The Tribunal's findings are that this approach is not appropriate and results in projections far removed from the real production and upgrading capacity of each of the Projects. Therefore, the Tribunal cannot take the numbers and their ventilation per year as a basis for determining the costs for drilling.

629. The Respondent's reliance on Mr. Patiño's figures permits nonetheless the identification of the total number of wells to be drilled which have been retained by Mr. Patiño on the basis of the initial projections reflected in Mr. Figuera's testimony. The Tribunal has explained that this total number of wells, as determined at the outset of the Projects, are very close, if not identical, to those that can be found in the 2006 models. In light of the Respondent's position as to the fixing of the costs of drilling, the Tribunal does not have to develop an approach of its own in providing for more wells to be drilled and to be accounted as CAPEX.

630. The Tribunal's preference would clearly be to rely on evidence of actual costs of drilling as experienced by the Projects. The Claimants are correct in assuming that such information would have permitted a more accurate assessment of the *ex post* valuation in this respect. The Tribunal will therefore have recourse to inflation rates in order to update costs for drilling to the best of its knowledge based on its record. It finds comfort for so proceeding in the position taken by both Parties, as the Claimants and the Respondent rely on inflation indexes to explain how costs are moving forward, albeit showing considerable disagreement in respect of the indexes to be taken as pertinent.

631. The Respondent's position is defined through a list of new wells, re-drills and replacement wells to be provided each year between 2007 and 2016[416]. For each year, the total amount of costs is given in US$. No specific evidence is mentioned, except the reference to Mr. Patiño's conclusions[417], which have been based on the instructions in respect of the well's decline he received and not on the true capacities of the Projects. The Respondent's valuation experts reproduce the same figures. They do not use Mr. Figuera's figures listed in his first Witness Statement[418]. On this basis, the Tribunal cannot reach any conclusion. Costs for new wells, repaired wells or re-drills are

[416] Cost Estimations for Petrozuata, p. 19, and Hamaca, p. 26.

[417] Appendices 81 and 84 (Appendices 89 and 90 are again not considered). Mr. Patiño did not provide expertise on costs relating to wells; he makes comparisons of costs without giving numbers. He mentions that in the *Mobil* case, an expert told that repair of a well would cost US$ 360,000; cf. Expert Report, 18 August 2014, footnote 12; Consolidated Expert Report, 17 October 2016, footnotes 179, 306. This information relates to repair well only and it is unreliable and no evidence; the Respondent's experts use the same number, without further verification. The Respondent cannot allege well repair costs "based on Mr. Patiño's expert report" (Cost Estimations for Petrozuata, p. 59, and Hamaca, 25/26); this report does not contain such information based on Mr. Patiño's knowledge.

[418] Testimony, 20 July 2009, para. 29, p. 19.

different for each category and need to be identified and translated in actual amounts. Costs for wells have been debated between the Parties, but no useful conclusion can be derived from this debate. On the other hand, the costs projected in 2006 have not been contested as they were retained at that time, but simply considered in need of updating to what can be accepted as correct in actual terms and for the future[419]. Therefore, the Tribunal will take the cost items for drilling as contained in the models and – in the absence of evidence on actual real costs – bring them forward through the relevant inflation indexes. In addition, the Tribunal notes that the same conclusion applies to costs for well repairs that the Respondent added to Petrozuata's and Hamaca's OPEX costs as a separate item, allegedly based on Mr. Patiño's expertise although, manifestly, Mr. Patiño's report does not contain such information, which would not be based on evidence anyhow. Well repair costs not being identified by evidence, they remain included in the costs for upstream based on the CEM from where the Respondent suggested to have them removed.

632. The Tribunal notes that the initial selection of each year's portion of new wells or replacement wells is uncertain. In the absence of evidence on the real sequence of drilling during the historical period, which only the Respondent could provide, the projections of 2006 are nevertheless a good indicator about the moving forward of the wells setting, which is at the basis of the EHCO production for the years following the expropriation. A simple addition of a total of numbers of wells drilled over the life-time of the Project and then recalculated by averages per year appears considerably more uncertain than the sequence of drilling as projected in 2006. In respect of Petrozuata, a further element of confirmation can be added: the sequence of drillings presented in the CEM corresponds for years 2011 to 2022 exactly to the numbers of wells to be added as they were presented by Mr. Figuera in his first Witness Statement. A big difference appears for year 2023, but the Tribunal will not retain drilling costs in that year, immediately before the Project's production drops seriously. For the years 2007 to 2010, the Tribunal will retain the figures of the CEM. In light of the convincing presentation in the CEM for Petrozuata, the Tribunal will also retain the corresponding figures for Hamaca. For purposes of this calculation, the Tribunal has applied the split between Bolivars and US dollars as pertinent at the time, by using the CAPEX inflation index applicable to each currency.

[419] For instance, an amount of US$ 3.5 million has been mentioned several times, but it remained unclear whether this sum includes just the drilling, or also separate equipment, roads and well pads. Cf. Witness Lyons, TR-E, 2010 Hearing, Day 5, p. 1195:15-1197:17; 2017 February Hearing, Day 7, p. 1959:15-1961:11.

Costs for Drilling						
	Petrozuata			Hamaca		
	CEM	CAPEX inflation index	US$ MM total	CEM	CAPEX inflation index	US$ MM total
2007 ½	49,100	1.19	58,429	7,977	1.19	9,493
2008	54,011	1.42	76,696	60,259	1.42	85,568
2009	55,281	1.49	82,369	53,432	1.49	79,614
2010	43,718	1.28	55,959	7,001	1.28	8,961
2011	33,135	1.45	48,046	36,237	1.45	52,544
2012	46,312	1.59	73,636	58,473	1.59	92,972
2013	50,480	1.56	78,749	65,665	1.56	102,437
2014	47,137	1.89	89,089	68,980	1.89	130,372
2015	48,748	2.70	131,620	59,367	2.70	160,291
2016	55,085	1.03	56,738	43,050	1.03	44,342
2017	45,888	1.53	70,209	55,729	1.53	85,265
2018	55,334	1.33	73,594	60,291	1.33	80,187
2019	59,501	1.32	78,541	38,515	1.32	50,840
2020	62,234	1.33	82,771	42,060	1.33	55,940
2021	78,581	1.34	105,299	40,085	1.34	53,714
2022	88,033	1.36	119,725	55,784	1.36	75,866
2023	0		0	61,975	1.39	86,145
2024	0		0	67,525	1.41	95,210
2025	0		0	67,405	1.43	96,389
2026	0		0	70,455	1.46	102,864
2027				147,615	1.48	218,470
2028				70,500	1.51	106,455
2029				69,010	1.53	105,585
2030				66,890	1.56	104,348
2031				20,795	1.59	33,064
2032				0		0
2033				0		0
2034				0		0
2035				0		0
2036				0		0
1	2	3	4	5	6	7

d. Turnarounds

633. The Respondent states rightly that post-nationalization turnarounds were more expensive than those operated before the nationalization, and in particular the small sized turnarounds in the first years of the Projects. The reason for this is not only based on price increases. The other and maybe more important reason is the significant increase in the number of equipment items that were examined.

634. Nonetheless, the Respondent cannot simply state that the Projects would have had higher costs if no nationalization had occurred. The comparisons that the Respondent offers with other sites are interesting but not conclusive as long as they are not accompanied by information about

the size of the site, the actual duration of the turnarounds, the volumes of EHCO and CCO treated and many other factors necessary to render such analysis useful. The Respondent added to the uncertainty when submitting that since 2009, turnarounds needed more time, basically 60 days, when the Projects produced significant volumes of blended oil[420]. The Respondent did not specify the period of time that was added for this reason. The impact on costs has not been measured. Nonetheless, such a fact cannot be ignored by the Tribunal.

635. The Respondent insists that the Hamaca turnarounds operated by the mixed companies were unsuccessful because they did not improve the OSF. In light of the undisputed objective of increasing OSF of any turnaround, one may wonder how costs can be claimed by the Respondent who is asserting simultaneously that those turnarounds have not reached their purpose. The Respondent's position is manifestly inconsistent. The Respondent's claim for turnaround costs does make sense only under the assumption that the turnaround's purpose of improving the OSF has been fulfilled, and that this reflects the actual situation – contrary to the Respondent's unsupported assertion of low OSFs resulting from the turnarounds conducted during the historical period.

636. The model sequence of regular turnarounds was every five years for Petrozuata and every four years for Hamaca[421]. This was a rule that could suffer derogations. For Petrozuata, the turnaround coming after 2011[422] would have been in 2015 but was deferred to 2016 and ultimately did not happen[423]. For Hamaca, the turnaround of 2009[424] was followed by a PRAC in 2012[425], and was thus scheduled for 2016, but equally differed. For both Projects, there is no schedule fixing dates for the next turnarounds. In light of these delays, it seems unlikely that the Claimants' schedule for future turnarounds (based on the CEM) for Petrozuata (2019, 2024) and Hamaca (2020, 2024, 2028, 2032) will become the real timeline[426]. The Respondent's dates are the same for

[420] Cf. TR-E, 2017 September Hearing, Day 17, p. 4854:10-17 (Preziosi). The record contains almost no information in this respect. Together with its Reply of 31 July 2017, the Respondent submitted an Annex 9 relating to the PetroPiar Turnaround of 2009, explaining the handling of tanks for the simultaneous production of Merey and Commercial crude (Question 3).

[421] Cf. CEM, p. 41-43/pdf (Petrozuata), p. 244-246/pdf (Hamaca); TR-E, 2017 March Hearing, Day 13, p. 3758:20-3759:1 (Spiller).

[422] Figuera Appendix 46, PetroAnzoátegui, Turnaround Report October 2011, 31 March 2012.

[423] Witness Figuera, TR-E, 2017 February Hearing, Day 8, p. 2401:13-2402:11; TR-E, 2017 September Hearing, Day 17, p. 4868:10-4869:2 (Preziosi).

[424] Figuera Appendix 76, Final Report on PetroPiar's 2009 Turnaround, 21 September 2010 (also C-584). This turnaround was initially planned for 2008; cf. Figuera, Supplemental Testimony, 26 January 2010, footnote 203; Lyons, Fifth Witness Statement, 13 October 2014, para. 30; Second Witness Statement, 30 October 2009, para. 48.

[425] Figuera Appendix 46, Final Report of the 2012 PRAC, August 2013.

[426] Claimants' Reply of 10 July 2017, p. 21 (Question 15); cf. also the debate with Counsel in TR-E, 2017 September Hearing, Day 17, p. 4872:20-4878:21.

Hamaca, whereas only one turnaround is scheduled for Petrozuata (2020)[427]. Given the unclear timing of turnarounds and the equally uncertain background of macroeconomic events that may have an influence on the taking of such an important decision to operate a turnaround, the Tribunal cannot allocate costs for turnarounds to any specific date or year, nor is it possible to refer to any specific inflation factor or exchange rate.

637. The record makes it very difficult to determine the number of days required for each turnaround. The 2011 turnaround at Petrozuata took 67 days, whereas 52 days had been estimated[428]. At Hamaca, the 2008 turnaround was scheduled for 48 days, and 36 days were envisaged in subsequent years[429]. The 2009 turnaround (October - early December) was completed in 55 days, whereas 49 days were planned[430]. The 2012 PRAC was planned for 45 days, but lasted 82 days[431]. These indications imply considerable uncertainty, which is compounded by the fact that the extensive actual blending renders turnovers longer. Based on the evidence in the record the Tribunal considers that 40 days would be a reasonable average duration for a turnover conducted under the operational scheme of the Association Agreements.

638. A further uncertainty results from the determination of the costs for turnarounds. For instance, the Respondent explained that the total costs for the 2012 PetroPiar PRAC was noted, not only in the final report on this operation, but also in the PetroPiar 2012 Audited Financial Statement[432]. The amount of US$ 313 million can indeed be found in this statement[433], in a text that reads as follows:

> Durante el año terminado el 31 de diciembre de 2012, las adiciones a las obras en progreso comprenden, principalmente, el costo de ejecución de los proyectos de perforación y completación de pozos de desarrollo, y construcción de facilidades por $334,950 miles (Bs1.440.283 miles) y proyectos asociados al mejorador por $439.068 miles (Bs1.887.988 miles), dentro los que se incluyen desembolsos relacionados con el PRAC por, aproximadamente, $313.000 miles (Bs1.345.900 miles).

The term "incluyen" and the numbers explain the accounting. The costs for the PRAC were included in the "proyectos asociados al mejorador". The respective amount of MUS$ 439.068, added to the costs for drilling and related items set at MUS$ 334,950, result in the total of MUS$ 774,018

[427] Cf. Respondent's Answers of 10 July 2017, p. 24-26 (Question 15).

[428] Figuera Appendix 82, Petroanzoátegui Upgrader Turnaround Report, 21 October 2012, p. 1.

[429] 2007 Budget Presentation, 12 September 2006, p. 3.

[430] Figuera Appendix 76, Final Report on PetroPiar's 2009 Turnaround, 21 September 2010, p. 5.

[431] Figuera Appendix 46, PetroPiar, 2012 Final Report on PRAC, August 2013, p. 13.

[432] Respondent's Post-Hearing Brief, para. 151 and footnote 241.

[433] CLEX-94, p. 236/pdf; TR-E, 2017 March Hearing, Day 15, p. 4474:17-20 (Kahale).

that is recorded in the account "Obras in proceso" for 2012 in the US$ section, and with the number of 3,328,271 in the Bolivar part[434]. In other words, the accounting did include the costs for PRAC in the overall figure for costs related to the upgrader, with the effect that the costs for the upgrader and the PRAC would not have exceeded the sum of MUS$ 439,068. The Respondent, on the other hand, accounted for both elements separately, and took the upgrader cost from the CEM (*i.e.* MUS$ 249,614) combined with the inflation index (*i.e.* MUS$ 285,259), resulting together with the PRAC (US$ 313 million) in a combined total of MUS$ 598,459. While the conclusion to be drawn from this observation may be uncertain at a more general level, the fact that is certain is that the numbers presented for the costs for turnaround (CAPEX) and Upgrader (OPEX) in the Respondent's Cost Estimation for Hamaca for the year 2012 are partially overlapping, in an amount of MUS$ 159,391, on the basis of the Financial Statement for that year.

639. The Parties are at odds about the acceptable amounts for costs of past turnarounds in the historical period and in respect of costs to be projected for future turnarounds. The usual course of a turnaround was to overturn prior cost estimations. The Petrozuata turnaround of 2011 had a budget of 597.7 MMBs, but finally needed 1110 MMBs[435]. The turnaround projected for 2015 was estimated at US$ 350 million[436]. The Hamaca 2009 turnaround had actual costs of 223.7 MMUS$, whereas 210 MMUS$ were budgeted[437]. The PRAC 2012 was estimated at 225 MMUS$, but ultimately needed 313 US$ million[438]. The Tribunal finds the evidence scarce[439]. In addition, blending made the turnarounds longer; the Tribunal is faced with the unresolved problem of converting this fact into its cost assessment.

640. The Tribunal will use as guidance the actual costs submitted through the reports on the Tribunal's record. Under the circumstances, it appears impossible to assume a specific currency

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[434] CLEX-094, p. 234/235(pdf).

[435] Figuera Appendix 82, PetroAnzoátegui Upgrader Turnaround Report, 21 October 2012, p. 1, 7, 24, 29. At an exchange rate of 4.3, the total amount would be US$ 258 million. However, the Respondent claims US$ 236 million, based on Witness Figuera, Third Supplemental Testimony, 15 August 2014, para. 97, p. 69, also reported in Cost Estimation for Petrozuata, p. 33; Brailovsky/Flores Appendix 406, CAPEX (PZ). The pertinent amount has not been identified in the Financial Statements (CLEX-093).

[436] Witness Figuera, TR-E, 2017 February Hearing, Day 8, p. 2402:12-2403:16, 2411:8/9.

[437] Figuera Appendix 76, Final Report on PetroPirars' 2009 Turnaround, 21 September 2010, p. 5, 65.

[438] Figuera Appendix 46, PetroPiar, 2012 Final Report on PRAC, August 2013, p. 6, 59, 81, 113/pdf.

[439] The Claimants' expert Mr. Earnest (Consolidated Expert Report, 17 October 2016) observed that Mr. Figuera's expected maintenance expenditure did "greatly exceed" that required by a competent operator (para. 86), that the cost of US$ 335 million for Petrozuata's 2015 turnaround was "unreasonably high" (para. 88), and, in conclusion, that the costs provided in Mr. Figuera's testimony are "highly excessive" and are "unreliable" (para. 93).

split[440]. In respect of the costs for the 2012 PetroPiar PRAC, the Tribunal reduces the claimed amount of US$ 313 million by MUS$ 159,391, thus deducting the double payment claimed by the Respondent on the basis of the inflated amount taken from the CEM (MUS$ 285,259) added to the costs for the 2012 PRAC, which is overstated in light of the 2012 Financial Statement that records an overall expense for the upgrader of MUS$ 439,068, including the costs for the PRAC.

641. With respect to future turnarounds, the Tribunal is faced with two opposing positions, the Claimants referring to the model figures of the CEM, and the Respondent claiming never ending increases of prices. The financial projections for turnarounds in 2015[441] and 2016[442] seem excessive and in any event not supported by evidence of any weight or explanations. Overlaps with the accounting position devoted to upgrader maintenance are in the Tribunal's mind in light of the experience with the 2012 PetroPiar PRAC. The Tribunal retains as a reasonable prognostic the amount of US$ 300 million per turnaround (or PRAC), divided in equal parts per year over a period of four years until the end of each Project's lifetime (respectively a reasonable point in time before the cessation of production). Assuming for each Project a turnaround in 2018, the Tribunal finds that no more turnaround can be reasonably ascertained at Petrozuata before the Project is faced with a severe drop in 2023, whereas for Hamaca, there remains an expectation for two further turnarounds or PRACs after the one expected in 2018.

e. Other CAPEX and OPEX based on the CEM

642. The Tribunal will not repeat what it has already said about inflation and exchange rate. The Tribunal now addresses, in respect of Petrozuata, CAPEX Upstream Facilities, Upgrader Facilities and G&A, and for Hamaca, the CAPEX items pertaining to the same categories as Upstream Facilities, Upgrader Facilities[443], G&G (Exploration) and G&A (General and Administrative).

643. In these matters, as explained above, the Tribunal will retain the numbers projected in the CEM, to which neither Party objected, and then apply the exchange rate and the combined inflation rate suggested by the Respondent. The resulting figures will be listed further below.

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440 A division of 50:50% between Bolivars and US$ has been noted but remained uncertain in light of the absence of documentary evidence and the impossibility to determine the actual dates. Cf. TR-E, 2017 March Hearing, Day 12, p. 3530:14-21(Kahale, Spiller), 3533:1/2 (Kahale).

441 Respondent's Cost Estimation for Petrozuata, p. 33: US$ 457,576,000. A budget plan provided for an expense of 1,118.81 MM US$; C-571; Earnest, Technical Assessment of the Hamaca and Petrozuata Upgrader Performance, 13 October 2014, Exhibit 04. Cf. TR-E, 2017 February Hearing, Day 10, p. 2926:13-2931:17 (discussing with Mr. Earnest the impact of exchange rate). The final work list of the 2015 Petrozuata turnaround does not allow any conclusions in respect of costs (cf. Figuera Appendix 141).

442 Respondent's Cost Estimation for Hamaca, p. 42: US$ 512,913,000.

443 Subject to the 2008 removal of US$ 30 MM for work to be done at the coker unit.

644. The same methodology applies to the comparable costs item in the category of OPEX, with one important difference. The Parties basically rely again on the bottom figures contained in the CEM, in the case of Petrozuata in respect of Upstream, Upgrader, G&A, plus "Third Party", whereas the same categories are retained for Hamaca, to the exception of "Third Party" and the addition of "Marketing". The Tribunal accepts that the impact of inflation in respect of the Bolivar portion of costs is based on the pertinent Venezuelan inflation rate, but in reversing the proportion between the two currencies, taking for OPEX 70% Bolivars and US$ 30%. The Tribunal notes that the OPEX inflation rate is slightly different from the CAPEX inflation rate, these categories reacting not in identical proportions to the impact of moving oil prices[444]. The Claimants have no further objection in this respect, as this has been discussed above, and they do not challenge the numbers used by the Respondent and its experts. The resulting figures will be listed further below.

645. The Respondent added another correction to OPEX in assuming EHCO volumes based on real terms for 2007 and 2008 and for later years on the projections prepared by Mr. Patiño and then adjusting 30% of OPEX accordingly[445]. EHCO production listed in Mr. Partiño's conclusions is based on pure speculations and cannot impact costs assessment in any way. Moreover, the Respondent does not explain why such adjustment should be limited to a 30% portion of OPEX.

646. The Tribunal also recalls the evidence that cost assessments having an impact on the Claimants' revenue and their damage claims can relate to events occurring since the taking only, which is later than 26 June 2007 (or, for practical reasons, 1 July 2007). The Respondent has submitted cost claims for CAPEX at Petrozuata where the amount refers to the full year 2007[446]. Such amounts must be divided by half.

f. Additional CAPEX and OPEX

647. For <u>Petrozuata</u>, the item "Others" under CAPEX consists of two elements, (i) firefighting, and (ii) fire repairs and restoration of solid handlings facility. The relevant costs had not been contemplated in 2006. However, the Claimants cannot object to costs that were not foreseen but that are closely related to the Projects in such a way that they appear as consequences that are in a range of events to be expected within a carefully operated Project.

648. Therefore, the Tribunal finds that improving *firefighting* systems in the years 2012 to 2014 is a normal occurrence in the oil industry and that even in cases where the costs exceeded the minimum required, such costs are reasonably connected to the Project and must be supported by

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[444] Cf. Cost Estimation Petrozuata, p. 41.

[445] Cf. *ibidem*, p. 43/44, 48, 52/53, 56/57.

[446] Cf. *ibidem*, p. 24 (G&A), 27 (Upstream Facilities), 30 (Upgrader Facilities).

its partners. This is equally true even when it cannot be demonstrated that such expense was required by an insurer[447]. The Tribunal takes the total expense of US$ 10,732,625 as established on the basis of the set of contractual documents and the proforma invoices submitted[448]. However, the division between the three years concerned is unclear and not explained. The Tribunal will thus proceed in splitting the total amount in three equal parts over the years 2012 to 2014.

649. As regards the *fire repairs and restoration of solid handlings facility*, the Tribunal observes that this cost item has allegedly been caused by a fire in that facility, which was undoubtedly an accidental and abnormal event, not to be expected in the normal course of such business. It has first to be noted that the restoration of the facility is presented as a separate opportunity cost[449]; it is thus not connected necessarily to the fire, but appears to have been a good occasion when the consequences of the fire had to be remedied. The invoices relating to the restoration of the facility are all dated 2012 or 2013[450], more than three years after the fire occurred in early 2009[451]. This portion of the cost item can therefore not be retained by the Tribunal, as there is no proof that such costs had been caused by the fire and would have been part of a but-for world scenario.

650. The accidental nature of that fire demonstrates that there can be no connection to any potential future involvement of ConocoPhillips in the Project after June 2007. Moreover, it is far from certain that the actual Project's governance was immune from any obligation of its own to cover the repair costs. From the alleged total costs of about US$ 49 million, only US$ 11 million were covered by insurance[452]. No evidence has been provided that would explain why the insurance did not cover a higher amount and whether such consequence resulted from the contractual framework. In addition, no explanation has been provided that would assist the Tribunal in understanding the division of costs on fire repair and restoration relating both to the same facility. A further debate before the Tribunal demonstrated the lack of evidence and the poor information available with

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[447] As this was objected by the Claimants (Cost Estimation Petrozuata, p. 38) and Mr. Earnest, Consolidated Expert Report, 17 October 2016, paras. 112/113.

[448] Figuera Appendix 148; Cost Estimation for Petrozuata, Annex I. An additional improvement of the firefighting system had been forecasted in July 2014 at US$ 100 million, an amount that is not included in the Cost Estimation (cf. Figuera, Third Supplemental Testimony, 15 August 2014, para. 97; Appendix 83).

[449] Cost Estimation for Petrozuata, Annex III, listing the invoices contained in Figuera, Appendix 146.

[450] *Ibidem*.

[451] No precise date is on the Tribunal's record. The first contract providing for reparation of the facility was signed on 8 January 2009; cf. Figuera Appendix 142. Counsel of the Respondent confirmed that it was in early 2009; TR-E, 2017 September Hearing, Day 16, p. 4726:20-4727:2 (Preziosi).

[452] Cost Estimation for Petrozuata, Annex II. Contractual documents and invoices are supplied in Figuera Appendix 142, without explanation. See also the Respondent's Answers of 10 July 2017, p. 19 (Question 11), and the table attached to Mr. Earnest's Consolidated Expert Report, 17 October 2016, Exhibit 10. Doubts about the seriousness of the work undertaken emerge when reading the governmental inspection report on the Orinoco Oil Belt dated 31 July 2015, p. 29 (C-649).

respect to the sequence of events and their interrelation[453]. For all these reasons, the Tribunal does not accept the cost item on fire repairs and restoration of the solid handling facility.

651. The Respondent did not provide clear information about the insurance coverage of the Projects. It was said that the available insurance did not cover damages to property. No evidence has been presented on this point, nor does the record contain documentary evidence in respect of insurance policies, requests for payment by the insurance company, invoices, etc. The Hamaca Association Agreement (C-22) provided in Article 8.8 that insurance shall be procured and maintained to cover, among others, property, control of well, liability, in such a way that reinsurance is made available[454]. The Petrozuata Offering Circular of 1997 stated that the Company will be obligated to maintain insurance customary for this type of project, including business interruption insurance and property insurance, covering all risks of physical damage or loss (C-75, p. 26, 51, 89/90). The Tribunal notes that the Hamaca Board meeting approved in 2006 liability insurance for claims relating to product liability (with an indemnity limit of 100 US$ million) and damages, and property damage and business interruption insurance, covering direct physical loss or damage all risks (for an indemnity limit of US$ 950 million)[455]. Some Financial Statements recorded expenses for insurance[456]. It may be assumed that the situation was not significantly different for Petrozuata. In light of this information, the burden would have been on the Respondent to demonstrate that such insurance either was not effectively concluded or did not cover more than the amount of US$ 11 million. The lack of evidence on insurance coverage affects various other alleged costs that *prima facie* would be eligible for coverage by insurance.

652. The Respondent submits in connection with the solid handling facility a further item covering an important amount of costs in respect of "*trucking*". It explains that the operational difficulties and the unavailability of the solids handling facility had the effect of requiring solids – mostly coke – to be transported away on a huge pile, which involved a great number of trucks and workers for a certain number of years. The Respondent explains that this was the consequence of the need to restore the facility and thus ultimately the result of the fire that had happened in 2009.

653. The Tribunal observes that the factual occurrence of these events raises more doubts about the relationship the Respondent asserts between these three key elements: fire – restoration of the facility – need for trucking coke away. When the facility was damaged by fire in early 2009, it took

[453] Cf. TR-E, 2017 September Hearing, Day 16, p. 4709:12-4736:19.

[454] More detailed provisions are then to be found in Article 11 of the Operating Agreement under Annex F, providing that the types of insurance shall cover all risk physical damage to all real and personal property of every kind (III), any coverage to be understood as primary insurance (V).

[455] Figuera Appendix 25, Hamaca Board of Directors Meeting, 18 May 2006, p. 11/12.

[456] Cf., Hamaca/PetroPiar Financial Statements (CLEX-094) for the years 2009 and 2010 (p. 151/pdf), 2012 (p. 298/pdf), 2013 (p. 298/299/pdf), for amounts between US$ 3.691 and 7.112 million.

the Project more than five months to sign the first contract relating to the coke transport[457]. At that time, the facility had become available, because basic repairs were done after three months[458]. The trucking began in 2009, but it was not intensified before 2011, and lasted until 2014. This results from the amounts of costs in US$ listed by the Respondent and supported by stacks of invoices supplied by Mr. Figuera without explanation: 13,328,992 (2009), 3,001,293 (2010), 35,322,929 (2011), 96,351,310 (2012), 64,466,776 (2013), 66,784,443 (2014)[459] – resulting in a total of US$ 279,255,742. These numbers show that more than 90% of the costs for trucking relate to the years 2011 to 2014. This demonstrates that the investment in trucking coke was not caused by the fire and the restoration of the solids handling facility. It had other logistical reasons that have nothing to do with the operational scheme based on the Association Agreements and the but-for scenario. If the facility needed further repair, one would expect the associated costs claimed, such as the US$ 203 million budgeted for the modernization and expansion of the facility[460]. This has not been done.

654. The Tribunal simply recalls that it rejected above a cost item the Respondent isolated for "*well repairs*" as OPEX that is not based on any evidence on the Tribunal's record; Mr. Patiño relies, without any further verification, on the statement of another individual, who appeared as a witness in the *Mobil* arbitration.

655. Finally, the Tribunal notes that although a number of financial statements are on its record (CLEX-093), the Respondent declared that it does not rely on them[461]. These statements cover the period between July 2007 to 2008 and 2011 to 2014. The Respondent explains that statements for the years 2009-2010 were not available because as from 1 January 2009, Petrozuata had its assets and related risks transferred to PDVSA. Nonetheless, this is not an argument sufficient to consider unreliable any information that may have been gathered on PDVSA's financial statements. In any event, the figures the Respondent mentions in its Cost Estimations as representing the financial statements are so massively divergent from the amounts of costs the Respondent claims in this

[457] Contract dated 18 June 2009; cf. Figuera Appendix 143. In the Respondent's Cost Estimations, the first contract was dated 4 September 2009 (Hamaca, Annex VIII), respectively 18 November 2009 (Petrozuata, Annex IV).

[458] Respondent's Answers of 10 July 2017, p. 18 (Question 11). The loss of opportunities report noted an unavailability of the facility for August 2009; cf. Figuera Appendix 73, p. 10/pdf. Witness Figuera could not confirm that the reparation of the solid handling facility had ever been completed: TR-E, 2017 February Hearing, Day 8, p. 2425:17-2426:9.

[459] Cf. Cost Estimation for Petrozuata, Annex IV. The invoices for 2009-2014 are mostly contained in Figuera Appendix 143, whereas part of invoices relating to 2014 are said to be contained in Figuera Appendix 172 that has not been produced before this Tribunal. See further Cost Estimation for Hamaca, Annex VIII, and Figuera Appendix 144. Another list of contracts supplied by PDVSA and included in the Claimants' file (C-572) notes a total amount of US$ 4.2 million for trucking between 2009 and 2014.

[460] Cf. Figuera, Third Supplemental Testimony, 15 August 2014, para. 71/72; Fourth Supplemental Testimony, 7 January 2015, para. 65.

[461] Cost Estimation for Petrozuata, cover page, last footnote.

proceeding that they can hardly constitute evidence for this proceeding[462]. The Respondent's Counsel declared to the Tribunal that the financial statement constitute evidence in support of expenses of the Projects[463]; he relied on these accounts on several occasions[464]. This position appears inconsistent with the Respondent's declaration made in its Cost Estimations.

656. For Hamaca, the Respondent lists several additional cost items, the first of which relates to an *electricity generating equipment* in the amount of US$ 94,800,000 in 2010. It is not disputed that this expense stems from a governmental decree requiring PDVSA and its affiliates to establish and use independent generation capacity so that they will no longer depend on the national electricity providers[465]. Such a governmental decision has been in the range of measures to be expected on a project such as Hamaca. The Claimants do not oppose the need to acquire such equipment. Their criticism addresses the amount of the expense and the omission to indicate a corresponding reduction in the costs of purchasing electricity from the national grid. The Respondent does not answer the second remark, and it does not comment on either the effect that such new electricity supply must have had on the increase in efficiency following the reduction in power failures, together with the impact on the OSF.

657. The Claimants' expert Mr. Earnest submits that the claimed costs are two or three times too high, all the more so as the financial benefits that self-generation provides are not discounted[466]. He submitted industry reports on power generators (Exhibits 12/13). However, he did not go further than raising doubts about the size of the electricity capacity acquired and the price paid. He does not submit that the equipment actually purchased was useless in any respect or manifestly overpriced. He does not provide even an idea about the decrease in costs in downstream facilities that may have been obtained. The Tribunal accepts that there may have been better opportunities to buy electricity generators for lower prices and capacities more closely tied to the needs of the upgrader. However, the Tribunal also finds that there is a margin of business decision making where it appears inappropriate to claim for better products and lower prices years after the purchase has been made, certainly on the professional advice available to all partners of the mixed company[467]. Therefore, the Tribunal retains the amount of US$ 94,560,000 invoiced in 2010, together with an additional amount of US$ 277,725 in 2011.

[462] Cf. *ibidem*, cover page and table, p. 67-75.

[463] TR-E, 2017 September Hearing, Day 18, p. 5277:18/19, 5301:15-21 (Kahale).

[464] Cf., for instance, TR-E, 2017 March Hearing, Day 12, p. 3516:3-14, 3540:20-3541:5; Day 15, p. 4474:17-20, 4475:19-4476:2 (Kahale); 2017 September Hearing, Day 16, p. 4695:22-4696:3, 4698:1-5 (Preziosi), 4705:15/16 (Kahale); all in relation to costs for turnarounds and PRACs.

[465] Cf. Decree No. 6.992 dated 21 October 2009 (Figuera, Appendix 69).

[466] Consolidated Expert Report, 17 October 2016, paras. 28, 121, 125/126. Another expert noted that costs of buying electricity from third parties should have been deducted: TR-E, 2017 March Hearing, Day 13, p. 3827:8-13 (Abdala).

[467] Cf. Figuera, Appendices 138-140.

658. The Respondent introduces in "Others" an amount of US$ 5,600,000 for an *EOR assessment* made in 2015[468]. The complete lack of evidence is sufficient to explain that the Tribunal will not retain this item. Moreover, it seems confusing to see the Respondent accepting attempts for EOR in the but-for scenario, when it had so strongly argued that steam injection and any comparable new extraction technique could not be envisaged in the framework of the Association Agreements.

659. Difficulties with the vibrations at the *Coker Unit* were well known before the expropriation[469]. It is equally not disputed that various attempts to resolve the problem failed and that at the critical time in 2007 and even thereafter, no advise was convincing and offering a final solution. The PAM included an amount of US$ 30 million for 2008 relating to the coker unit, however not provided with further explanation. The Respondent deducted this amount and claims instead costs for the installation of braces and other repair attempts at the coker unit for US$ 11,514,000 through 2014, and US$ 8,954,000 in 2015. The Tribunal cannot follow the Respondent when it takes the US$ 30 million forward into the costs for 2008, appropriately inflated, whereas the expense had not been made. This amount was not used; it must be removed from the list of costs. Instead, the two other amounts mentioned above correspond allegedly to actual expenses. The amount of US$ 11,514,000 is composed of a long list of amounts supported by invoices, in Annex I of the Cost Estimation for Hamaca. These invoices are said to represent a "total through 2014". In fact, they cover dates from June 2007 until December 2011. In the explanation provided by the Respondent, the total of US$ 11.5 million is for the period 2005-2014 (p. 51), which is manifestly not what results from the dates given for the invoices. Finally, the second amount of US$ 8.9 million is supported by a purchase order and a contract, not on this Tribunal's record, and it is said to relate to 2015 (p. 51). This Tribunal cannot approve this last amount, for lack of evidence and in light of missing explanation of the need for such substantial expense when between 2013 and 2014 apparently nothing, or very little, has been undertaken. In February 2013, an engineering study was made by Chevron Energy Technology Company, concluding that "the application of dampers under the current conditions was judged not practical", and that "proceeding with this option is not practical"[470]. No further clarification about the fate of this report and the coker unit has been brought before the Tribunal[471].

[468] Cost Estimation for Hamaca, p. 49. The Respondent referred to a statement made by Mr. Figuera in the ICC arbitration; TR-E, 2017 September Hearing, Day 16, p. 4658:16-4660:6, 4672:20-4673:11. No documentary evidence is on this Tribunal's record. In any event, Mr. Figuera did not have personal knowledge about the recent use of EOR.

[469] See the proposal for remedy by Foster Wheeler of 19 December 2006, Figuera Appendix 71.

[470] Figuera Appendix 72, p. 9, 25.

[471] The Respondent noted that the attempts led by Chevron in 2012 and 2015 were unsuccessful; cf. Cost Estimation for Hamaca, p. 51. No evidence was added to this statement. Witness Figuera noted that the sheer walls remain to be built: TR-E, 2017 March Hearing, Day 11, p. 3161:22, 3166:20-22, 3168:11-3169:4.

660. On the basis of the Tribunal's record, it cannot be denied that the coker unit was a serious problem that was in need of a solution[472]. It was not only known, but it was also generally considered as difficult to be remedied. Therefore, there must have been a margin of expenses that did not lead to successful reparation, with which the Claimants would also have been confronted with in a but-for scenario. The Claimants have the experience from the years 2005 to 2007 when the coker already caused problems. One would therefore expect that they would be able to scrutinize in detail the numerous invoices supplied by Mr. Figuera[473]. They are capable, if need be, of saying more than simply that the alleged coker repair costs "are not sufficiently substantiated" (p. 50). The Tribunal notes that the revision of the coker unit was a recurrent item at any turnaround. Costs identified as specifically related to such work may in fact have been counted as well in the budget for the 2009 turnaround[474] and the 2012 PRAC[475]. The Respondent could not dispel serious doubts in this respect. Therefore, the Tribunal deducts from the alleged costs for 2007 to 2012 a total of US$ 3,047,456 that it understands as representing work on the coker unit that was done during the 2009 turnaround and therefore most probably included in its budget[476]. The remaining costs to be retained for July 2007 until the end of 2011 are thus US$ 8,467,002, allocated for each year in appropriate proportions. Thereafter, the Claimants are no longer involved in a but-for scenario perspective. It has been convincingly shown that Chevron, actual partner of the mixed company, is the principal actor in resolving this issue, based on its February 2013 report[477].

[472] Witness Figuera explained that the problem did not consist in a current reduction of productivity and had no impact on the OSF, but it implied a potential loss of production in the event of an adverse incident; the vibration problem was a risk factor (Supplemental Testimony, 26 January 2010, paras. 90, 96; TR-E, 2017 March Hearing, Day 11, p. 3162:10-14). Probability calculations have been made by the Respondent's experts, which had no relation to reality (TR-E, 2017 March Hearing, Day 12, p. 3628:2-3635:11, 3642:13-16; cf., for an analysis, Earnest, Consolidated Expert Report, 17 October 2016, paras. 38-42); the Respondent did not share its own experts' methodology (cf. Respondent's Post-Hearing Brief, footnote 276).

[473] Appendix 121.

[474] A report of a technical team noted in January 2009 that flanges were successfully replaced, but that metal cracks remained to be repaired and a further inspection to be made at the forthcoming turnaround (p. 45-49). Annex 10 filed with Respondent's Reply of 31 July 2017 (Question 3). Prior to this, a Coker Structure Vibration Project has been prepared in April 2007, with the aim of making efforts as soon as possible but not later than the plant shutdown in August 2008 (C-382); but this turnaround was then differed to 2009: Lyons, Fifth Witness Statement, 13 October 2014, para. 30; Second Witness Statement, 30 October 2009, para. 48. Counsel of the Respondent told the Tribunal that nothing could be found in the turnaround reports about the coker vibration issue; TR-E, 2017 September Hearing, Day 16, p. 4630:15-4632:6 (Preziosi). This seems not convincing in light of those parts of the report that address specifically the coker items concerned by the vibration defect (p. 8/9).

[475] Coker equipment 12-V-001 to 004 was part of the repaired equipment during the 2012 PRAC. Figuera Appendix 46, PetroPiar, 2012 Final Report on PRAC, August 2013, p. 25; Annex II, Master Plan PRAC 2012, vol 2, p. 2, 3, 30, 32, 550/pdf.

[476] Relating to invoices 535, 537, 583, 603 602, 614; Cost Estimation for Hamaca, Annex I, p. 14/15.

[477] Cf. Earnest, Consolidated Expert Report, 17 October 2016, paras. 43-53.

661. The Respondent adds an item for *PREM* under OPEX, covering the period from 2012 to 2016. The invoices in the record[478] indicate that this activity covers a variety of items typical for upgrader maintenance. It has not been explained to the Tribunal why these costs could or should not appear under "Upgrader" OPEX – an item that represents by far higher costs to such an extent that an allegation that its budget could not be allocated to what is understood by the new label "PREM" would require serious explanation supported by consistent documentary evidence[479]. The Respondent has failed to act accordingly. The item "PREM" does not appear in the Financial Statements (CLEX-094). While it may be said that the Claimants are going too far in concluding that the PREMs had not affected the upgrader performance (p. 79), one would at least expect that the Respondent demonstrates that they had a positive effect, on the OSF or otherwise. The Respondent does not accept such an expectation, arguing that expenses may be justified even if they do not result in a measurable increase in the upgrader's OSF. Implicitly, the Respondent accepts that such an increase was not measured (p. 80). Nonetheless, the Respondent fails to demonstrate the specific purpose of these PREMs, other than to concentrate a certain number of maintenance interventions under a common label and operational structure.

662. In respect of a PREM for 2016, the costs are alleged through a simple inflation increase from the 2015 PREM. More should have been expected in June 2017, when the Estimation was filed with the Tribunal (like bids and contracts). Furthermore, there does not seem be a real need for a PREM in a year where a turnaround was scheduled. The Tribunal cannot accept on such a speculative cost allegation.

663. The Respondent attributes US$ 7 million to a *catalyst purchase* in February 2010. It is true that changes in the catalyst unit took place from time to time and in between turnarounds, requiring the shutdown of the upgrader. The 2009 turnaround also involved work on the catalyst[480]. The report on this turnaround identifies by their numbers all reactors that were concerned[481]. The Respondent did not identify the reactors affected by the change scheduled for 2010, but it stated that the change that took place was "partial"[482], referring also to Witness Figuera who explains the cause of this additional cost item. Purchase orders were supplied[483], but no invoices. A 2009

[478] Figuera Appendixes 115-118; see also Respondent's Reply of 31 July 2017, Annex 6; Claimants' Answers, 10 July 2017, Annex A.

[479] Serious disparities appear when comparing the projected expenses for 2012-2014 (Figuera Appendices 45, 77 and 79) to the amounts claimed by the Respondent (Cost Estimation for Hamaca, Annexes III-VI).

[480] Figuera Appendix 76, Final Report on PetroPiar's 2009 turnaround, 21 September 2010, p. 8/9, 17, 27, 46.

[481] Figuera Appendix 76, p. 46

[482] Cost Estimation for Hamaca, p. 81.

[483] Figuera Appendix 129.

Catalyst Change Price Summary shows costs for US$ 11.8 million[484]. Witness Figuera explains that the change in 2010 was only a partial one, since a portion of the catalyst that had been installed in 2009 was able to be salvaged. He states: "The catalyst that was installed in 2009 failed due to the fault of the contractor"[485]. This fact might explain the omission of the filing of any invoices. The testimony of Mr. Figuera leads to the conclusion that the costs for such reparation in 2010 cannot be borne by the Claimants.

664. Another item on the unsuccessful operation of equipment of the upgrader relates to the *Tank 12 Repairs*. The Respondent explains that the operating procedures for start-up of the upgrader allowed volatile hydrocarbons to be routed to tank 12. The tank venting system as designed was inadequate to accommodate an overpressure situation when light hydrocarbons were routed to the tank. Several deformations to the tank's roof and cracks in the walls did occur already before the nationalization and they were contributors to the serious 2011 overpressure event when the tank caught fire[486].

665. The Tribunal wonders why the Project let the tank 12 in operation until the incident in 2011 when the critical condition of this item was known already before June 2007[487]. This leaves room for contributory negligence by the actual operators of the upgrader for more than four years. The incident appears less dramatic than it has been described. When the accident happened, the tank was taken out of service, but after two days, it started again with a limited load through a piping system that bypassed tank 61-TK-012 and permitted the direct flow of vacuum residue from the Crude Unit to the Coker Unit[488]. A decision had been made to undertake the construction of a new tank (61-TK-061), which was scheduled to commence by mid-2012[489]. Tank 12 came back on line in May 2013[490].

[484] Figuera Appendix 130.

[485] Figuera, Fourth Supplemental Testimony, 7 January 2015, footnote 125.

[486] Figuera Appendix 46, PetroPiar 2012 Final Report on the PRAC, August 2013, p. 86. For Witness Figuera, tank 12 had a design flaw; however, he did not object considering operational errors occurring on multiple occasions; Fourth Supplemental Testimony, 7 January 2015, para. 50.

[487] Difficulties with tanks also appeared at Petrozuata, where a tank roof repair project was ongoing in early 2007 already; cf. Petrozuata Preliminary Monthly Report of February 2007, p. 2 (LECG-156, p. 38/pdf).

[488] Cf. Memorandum from Francisco Velásquez, Manager of the Upgrader, to Ysaac Donis, President of PetroPiar, 19 June 2013, Figuera Appendix 132.

[489] Cf. Figuera Appendix 131, PetroPiar, Motivated Administrative Act dated 10 February 2012 (p. 1), further noting that the reconstruction of tank 12 had to be accomplished on 30 June 2012 (p. 4). The construction of the new tank was not undertaken; Fourth Supplemental Testimony, 7 January 2015, footnote 134; TR-E, 2017 September Hearing, Day 16, p. 4787:15-21, 4788:11-18 (Preziosi).

[490] Figuera, Third Supplemental Testimony, 15 August 2014, footnote 109.

666. No explanation was provided by the Respondent about the availability of contributions from an insurer. The fact that documents provided to the Tribunal are all contracts including amendments, without any invoice, raises suspicion. The Respondent does not prove that the costs were actually incurred by the Project and not by a third party, like a contractor or an insurance company. Counsel for the Respondent told the Tribunal that no property damage or business interruption insurance was available[491], but he ultimately admitted that the evidence was missing[492]. More than half of the amount of costs was contracted before the 2012 turnaround; this would mean that work on tank 12 was performed during this period and may be included in that budget[493]. Witness Figuera showed a presentation of costs for major repairs of the tank, which are substantially different from those in Annex VII of the Respondent's Cost Estimation for Hamaca[494]. The matter remained unclear. It would have been the Respondent's burden to demonstrate that the costs claimed have not been paid by any third party and that there is no overlap with the 2012 turnaround. The question also remains unanswered whether tank 12 did not serve the production of blended oil that contains a fraction of light hydrocarbon. For all these many reasons, the Tribunal cannot accept that these costs should be borne by the Claimants in a but-for scenario.

667. The Respondent lists for Hamaca a separate item on *well repairs*, as it does for Petrozuata. The Tribunal's conclusion remains the same. The Respondent's figures are allegedly based on Mr. Patiño's findings and on testimony submitted in the *Mobile* arbitration. As stated above, Mr. Patiño provides no expert knowledge in this respect and the testimony delivered in another proceeding cannot be introduced into the record of this Tribunal. Well repairs' costs not supported by evidence, they remain included in the costs for upstream based on the CEM from where the Respondent suggested to have them removed.

668. As for Petrozuata, the Respondent's cost list for OPEX at Hamaca includes an item on *solid handling facilities trucking*, covering the period between 2009 and 2014 for a total amount of US$ 70,628,979[495]. The bulk of these costs relate to the years 2012 to 2014; no invoice refers to 2011, and for each year 2009 and 2010, the invoices are less than one million. These figures demonstrate, as this applies to Petrozuata, that the investment in trucking coke was not caused by the fire and the restoration of the solids handling facility. It had other logistical reasons that have nothing to do with the operational scheme based on the Association Agreements and the but-for scenario.

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[491] TR-E, 2017 September Hearing, Day 16, p. 4806 :12-15 (Kahale).

[492] TR-E, 2017 September Hearing, Day 16, p. 4807 :18-22 (Kahale).

[493] At the 2009 turnaround, tank 61-V-012 was an item of examination between 18 October and 25 November 2009; cf. Figuera Appendix 76, Final Report on PetroPiar's 2009 Turnaround, 21 September 2010, p. 15.

[494] Figuera Appendix 78.

[495] Annex VIII of the Cost Estimation for Hamaca.

669. In respect of Hamaca, as it had done for Petrozuata, the Respondent adds figures representing the compounded amounts for CAPEX and OPEX taken from those *financial statements* that were available (CLEX-094). It states that it did so in response to the Tribunal's request for further information on actual production. But the Respondent has not relied on these statements[496]. The Respondent wanted at least to show that taken from an overall perspective the actual costs reported in the financial statements are above those claimed in this proceeding.

670. A particular item relates to the amounts of costs to be considered at Petrozuata and Hamaca during the three years after the Projects suffer a serious decline since 2024 and 2034, respectively. The available documentation shows that as from these years, the projections for CAPEX go down to about 30%, while OPEX only slightly decreases for three more years at least (not taking account of drilling and turnarounds any longer)[497]. The Tribunal will use these estimates.

g. Totals for CAPEX and OPEX

671. The totals for CAPEX and OPEX are as follows:

Petrozuata – CAPEX									
	Drilling	Upstream Facilities	Upgrader Facilities	G&A	CEM (subtotal)	CAPEX inflation index	Turna-rounds	Fire-fighting	US$ MM total (column 6/7, 8, 9)
2007 ½	49,100	16,132	2,980	3,900	72,112	1.19			85,813
2008	54,011	53,310	9,800	7,520	124,641	1.42			176,990
2009	55,281	19,256	5,500	5,000	85,037	1.49			126,705
2010	43,718	28,006	5,500	5,000	82,224	1.28			105,247
2011	33,135	12,413	5,500	5,000	56,048	1.45	236,000		317,270
2012	46,312	21,636	5,500	5,000	78,448	1.59		3,578	128,310
2013	50,480	23,941	5,500	5,000	84,921	1.56		3,578	136,055
2014	47,137	13,020	5,500	5,000	70,657	1.89		3,577	137,119
2015	48,748	20,871	5,500	5,000	80,119	2.70			216,321
2016	55,085	25,428	5,500	5,000	91,013	1.03			93,743
2017	45,888	20,210	5,500	5,000	76,598	1.53			117,195
2018	55,334	20,195	5,500	5,000	86,029	1.33	75,000		189,419
2019	59,501	8,830	5,500	5,000	78,831	1.32	75,000		179,057
2020	62,234	9,215	5,500	5,000	81,949	1.33	75,000		183,992
2021	78,581	9,791	5,500	5,000	98,872	1.34	75,000		207,488
2022	88,033	11,148	5,500	5,000	109,681	1.36			149,166
2023	0	22,700	5,500	5,000	33,200	1.39			46,148
2024	0								20,000
2025	0								20,000
2026	0								20,000
1	2	3	4	5	6	7	8	9	10

[496] Cost Estimation for Hamaca, cover page, last footnote, p. 95.

[497] Cf. CEM, p. 41/pdf (LECG-085).

Hamaca – CAPEX (1)								
	Drilling	Upstream Facilities	Upgrader Facilities	G&G	G&A	CEM (subtotal)	CAPEX inflation index	subtotal
2007 ½	7,977	33,153	44,650	925	10,757	97,462	1.19	115,980
2008	60,259	101,177	106,800	925	23,824	292,985	1.42	416,039
2009	53,432	38,427	20,000	725	19,393	131,977	1.49	196,646
2010	7,001	15,478	20,000	475	23,969	66,923	1.28	85,661
2011	36,237	19,561	20,000	675	22,882	99,355	1.45	144,065
2012	58,473	22,960	20,000	313	21,646	123,392	1.59	196,193
2013	65,665	25,219	17,000	650	21,015	129,549	1.56	202,096
2014	68,980	15,862	18,000	1,000	20,801	124,643	1.89	235,575
2015	59,367	4,988	10,000	900	20,845	96,100	2.70	259,470
2016	43,050	11,064	17,000	913	19,545	91,572	1.03	94,319
2017	55,729	34,354	18,000	11,525	19,271	138,879	1.53	212,485
2018	60,291	38,039	10,000	11,675	19,789	139,794	1.33	185,926
2019	38,515	13,842	17,000	350	18,545	88,252	1.32	116,493
2020	42,060	2,024	18,000	225	18,805	81,114	1.33	107,882
2021	40,085	25,089	10,000	225	19,359	94,758	1.34	126,976
2022	55,784	56,941	17,000	300	18,640	148,665	1.36	202,184
2023	61,975	44,658	18,000	225	18,859	143,717	1.39	199,767
2024	67,525	23,227	10,000	325	18,744	119,821	1.41	168,948
2025	67,405	21,600	17,000	125	18,641	124,771	1.43	178,423
2026	70,455	30,343	18,000	175	20,707	139,680	1.46	208,123
2027	147,615	31,078	10,000	200	18,955	207,848	1.48	307,615
2028	70,500	25,111	17,000	125	18,573	131,309	1.51	198,277
2029	69,010	21,470	18,000	150	18,653	127,283	1.53	194,743
2030	66,890	12,999	10,000	225	18,885	108,999	1.56	170,038
2031	20,795	3,998	17,000	125	17,230	59,148	1.59	92,271
2032	0	6,974	18,000	125	15,748	40,847	1.61	65,764
2033	0	7,284	10,000	125	15,319	32,728	1.64	53,674
2034								
2035								
2036								
1	2	3	4	5	6	7	8	9

Hamaca – CAPEX (2)				
	Turn-arounds	Electri-city	Coker Re-pairs	US$ MM total (column 9-12)
2007 ½			941	116,921
2008			1,882	417,921
2009	223,000		1,881	421,527
2010		94,560	1,882	182,103
2011		228	1,881	146,174
2012	153,809			350,002
2013				202,096
2014				235,575
2015				259,470
2016				94,319
2017				212,485
2018	75,000			260,926
2019	75,000			191,493
2020	75,000			182,882
2021	75,000			201,976
2022	75,000			277,184
2023	75,000			274,767
2024	75,000			243,948
2025	75,000			253,423
2026	75,000			283,123
2027	75,000			382,615
2028	75,000			273,277
2029	75,000			269,743
2030				170,038
2031				92,271
2032				65,764
2033				53,674
2034				30,000
2035				25,000
2036				20,000
	10	11	12	13

Petrozuata – OPEX							
	Upstream	Upgrader	G&A	Third Party	CEM (subtotal)	OPEX inflation index	US$ MM total (column 6/7)
2007 ½	24,344	39,546	19,387	5,149	88,426	1.17	103,458
2008	57,169	78,870	39,615	2,063	177,717	1.47	261,244
2009	57,192	78,870	39,615	2,063	177,740	1.76	312,822
2010	57,369	78,870	39,615	2,063	177,917	1.27	225,955
2011	57,651	78,870	39,615	2,063	178,199	1.53	272,644
2012	58,122	78,870	39,615	2,063	178,670	1.79	319,819
2013	58,239	78,870	39,615	2,063	178,787	1.73	309,302
2014	58,661	78,870	39,615	2,063	179,209	2.49	446,230
2015	58,638	78,870	39,615	2,063	179,186	4.78	856,509
2016	59,128	78,870	39,615	2,063	179,676	1.04	186,863
2017	57,927	78,870	39,615	2,063	178,475	2.12	378,367
2018	51,030	78,870	39,615	2,063	171,578	1.61	276,241
2019	52,059	78,870	39,615	2,063	172,607	1.56	269,267
2020	51,421	78,870	39,615	2,063	171,969	1.53	263,113
2021	53,198	78,870	39,615	2,063	173,746	1.53	265,831
2022	54,130	78,870	39,615	2,063	174,678	1.56	272,498
2023	54,516	78,870	39,615	2,063	175,064	1.58	276,601
2024						1.61	250,000
2025						1.64	220,000
2026						1.67	200,000
1	2	3	4	5	6	7	8

Hamaca – OPEX								
	Upstream	Upgrader	G&A	Marketing	Gas Feedstock	CEM (subtotal)	OPEX inflation index	US$ MM total (column 7/8)
2007 ½	28,248	93,622	25,872	5,622	24,993	178,357	1.17	208,678
2008	52,147	262,769	51,119	11,450	47,872	425,357	1.47	625,275
2009	49,810	191,140	52,135	7,312	55,806	356,203	1.76	626,917
2010	49,981	187,773	50,870	7,328	53,101	349,053	1.27	443,297
2011	50,136	201,671	50,573	7,332	61,162	370,874	1.53	567,437
2012	50,085	249,614	51,042	7,326	57,665	415,732	1.79	744,160
2013	50,624	194,805	50,786	7,330	66,529	370,074	1.73	640,228
2014	50,765	195,717	50,800	7,329	62,644	367,255	2.49	914,465
2015	51,131	211,483	50,788	7,329	72,177	392,908	4.78	1,878,100
2016	49,952	258,635	50,514	7,333	68,040	434,474	1.04	451,853
2017	51,348	198,505	50,455	7,334	78,495	386,137	2.12	818,610
2018	52,801	197,719	51,139	7,325	74,069	383,053	1.61	616,715
2019	51,690	213,301	50,661	7,331	85,396	408,379	1.56	637,071
2020	50,834	260,356	50,559	7,332	80,646	449,727	1.53	688,082
2021	51,588	200,466	50,162	7,337	92,673	402,226	1.53	615,406
2022	52,616	199,546	50,658	7,331	87,202	397,353	1.56	619,871
2023	53,191	215,364	44,762	7,408	100,241	420,966	1.58	665,126
2024	52,397	262,252	44,791	7,408	94,122	366,942	1.61	590,777
2025	52,430	202,583	45,048	7,404	107,982	415,447	1.64	681,333
2026	52,657	201,474	45,239	7,402	101,201	407,973	1.67	681,315
2027	53,460	217,521	45,224	7,402	115,930	439,537	1.69	742,818
2028	54,333	264,223	45,115	7,404	108,494	479,569	1.72	824,859
2029	55,372	204,783	45,216	7,402	124,057	436,830	1.75	764,453
2030	55,519	203,493	45,741	7,395	115,977	428,125	1.78	762,063
2031	55,825	219,807	46,215	7,389	132,663	461,899	1.81	836,037
2032	51,019	266,342	45,858	7,394	124,003	494,616	1.84	910,093
2033	51,420	207,213	46,078	7,391	141,813	453,915	1.87	848,821
2034								700,000
2035								600,000
2036								500,000
1	2	3	4	5	6	7	8	9

B. <u>Corocoro</u>

672. The Claimants note that Mr. Figuera's documentary support for alleged costs for Corocoro is virtually non-existent. He relies on a number of slides and on a single contract relating to the Interim Processing Facility (IPF) lease. The Respondent's valuation experts assume an additional cost of over US$ 2 million each month until the Central Processing Facility (CPF) came online in February 2012. However, the IPF was no longer needed as from the time when the CPF came on track. The second difference in the Parties' positions relates to the exchange rate applicable to the Bolivar-denominated costs. The resulting cost inflation is unwarranted.

673. In sum, as for Petrozuata and Hamaca, the Claimants submit that the Projects' pre-expropriation business planning documents and Economic Models are the most reliable evidence of the production-related costs that the Corocoro Project would incur in the but-for world. With respect

to the alternative valuation scenarios, the Parties' quantum experts apply essentially the same methodology on costs with respect to their 2007 valuations.

674. The Respondent states once more that in the post-nationalization period costs have been significantly higher, due not only to industry inflation and high inflation in Bolivar-based costs as a result of Venezuelan inflation that was not offset by timely devaluations, but also because of costs associated with maintenance activities that were grossly underestimated in the models in question. In an *ex post* analysis, the Claimants are not entitled to be compensated on the basis of picking and choosing the historical facts that are to their benefit, such as the increase in oil prices, while ignoring those to their detriment, such as the higher costs resulting from inflation and the higher than projected costs on maintenance.

675. The Respondent's experts have relied largely on the costs set forth in the ConocoPhillips Composite Economic Model, with two adjustments. First, because the production profile they have used has lower annual volumes than those set forth in the model, the annual operating costs are somewhat lower, reflecting the fact that a portion of the operating costs vary with production. Second, because the IPF would have been required for a longer period of time in light of the delays in the completion of the skids and the integration and commissioning of the CPF that would have been expected as of the date of nationalization, the Respondent's experts have included additional operating expenses based on the fee schedule established in the contract for the lease of the IPF.

676. The Respondent's experts have used actual operating and capital costs incurred through 2013. After that time, there were no additional capital costs. As to the post-2013 operating costs, the Respondent assumes that such costs are 70% fixed and 30% variable. It is also assumed that the IPF would have continued to be used until April 2012, when the CPF was commissioned.

677. The Tribunal notes again the poor documentary evidence for costs. As it has done for Petrozuata and Hamaca, the Tribunal takes as a basis for Corocoro the figures retained in the Composite Economic Model (CEM)[498]. It assumes that the input of inflation together with exchange rates on the Bolivar portion of the expenses is the same for this Project[499]. The Claimants do not offer calculations of their own that the Tribunal could use for its assessment. The Respondent refers to numerous PetroSucre Management reports that appear to have been prepared for internal use and contain no information which make it possible for the Tribunal to understand the components of broader cost items[500].

[498] Cf. p. 127/128/pdf.

[499] Witness Figuera confirmed that as for Petrozuata and Hamaca, the operating costs for Corocoro are approximately 70% in Bolivars and 30% in US dollars (Third Supplemental Testimony, 15 August 2014, para. 114).

[500] For CAPEX and OPEX: Figuera Appendices 93-96. These documents are presented by the Respondent as "Reports" (Cost Estimation for Corocoro, p. 9, 11). They are not. They are slides used in a presentation without any explanation.

678. One other remaining critical item is the leasing cost for the IPF. While the Claimants accept IPF leasing costs through 2008, when their own involvement in the Project caused a delay of delivery for the CPF, they oppose the inclusion of leasing costs for a longer period, until April 2012. For the Claimants, this second part of delay is attributable to PDVSA that took over the Project in March 2007 when the CPF was on track to be completed by the end of 2008. Additionally, no invoices are shown that would cover the period between 2009 and April 2012. The Claimants also observe that the IPF was expropriated in 2009, with the effect that no leasing was required to be paid after that date.

679. The Tribunal is not convinced that such leasing costs would have been charged to the Project in a but-for situation. No invoice has been submitted. The contract between Conoco and Hanover has been executed on 25 September 2006[501]. The Tribunal's copy does not contain the "Service Schedule" (Exhibit D). In another Annex it is noted that the service period shall be 24 months (Exhibit E). This would mean that the lease was not for a longer period than until end September 2008[502]. Beyond that date, it is not explained how any extension of such performance would be connected to a but-for situation. Additionally, when it is correct that, as stated by the Respondent[503], compensation for the expropriation was paid in mid-2005, the expropriation effective on 26 June 2007 did not deprive the Project of an asset it was no longer holding as its property at that time. The legal holder of the IPF has not been clarified by the Respondent nor the legal relation between the (expropriating) State and the Project (user of the IPF). Witness Figuera stated that the nationalization occurred in May 2009 and it follows for him that if the Corocoro Project had continued as an Association, a rent would have to be paid until April 2012 when the CPF was commissioned[504]. However, as long as this nationalization is not explained, there is no evidence before this Tribunal that the IPF would not have been expropriated anyhow. In sum, the Tribunal does not include IPF leasing costs for 2007 when no oil was produced, but it adds to the amount of OPEX for year 2008 the sum of MUS$ 120,883 that is accepted by the Claimants.

[501] Figuera Appendix 97.

[502] A project for an extension of the IPF to 45,000 BPD for 18 months has been submitted to the Tribunal (Figuera Appendix 98). The Respondent did not confirm that this project was executed but it claims the related costs.

[503] Cost Estimation for Corocoro, p. 15.

[504] Third Supplemental Testimony, 15 August 2014, para. 113.

Corocoro – Costs						
	CAPEX US$ MM	CAPEX inflation index	CAPEX actual US$ MM	OPEX US$ MM	OPEX inflation index	OPEX Actual US$ MM
2007 ½	98,103	1.19	116,743	19,050	1.17	22,289
2008	40,048	1.42	56,868	64,311	1.47	215,420[505]
2009	3,668	1.49	5,465	113,700	1.76	200,112
2010	128,732	1.28	164,777	114,000	1.27	144,780
2011	10,000	1.45	14,500	109,100	1.53	166,923
2012				107,800	1.79	192,962
2013				98,600	1.73	170,578
2014				94,100	2.49	234,309
2015				74,000	4.78	353,720
2016				72,700	1.04	75,608
2017				72,300	2.12	153,276
2018				71,300	1.61	114,793
2019				70,900	1.56	110,604
2020				70,600	1.53	108,018
2021				69,900	1.53	106,947
2022				69,900	1.56	109,044
2023				69,500	1.58	109,810
2024				69,200	1.61	111,412
2025				69,200	1.64	113,488
2026				69,200	1.67	115,564
2027				0		0
1	2	3	4	5	6	7

VIII. Prices and Revenues

680. Based on the volumes of production determined above in Section VI, the monetary value of that production has to be determined. For the 2016 ex *post* valuation, actual market prices and the prices mentioned on the invoices for the historical period since the date of expropriation can be determined. The second part of the analysis on prices then relates to the oil price forecast from 2017 until the date of expiration of the production of each of the Projects. As the Tribunal has explained, it does not retain purely artificial prices projected in June 2007 and will retain prices that are known and therefore represent an indicator for the true loss suffered by the Claimants.

1. *The Claimants' Position*

681. The Claimants rely on their experts' valuation that is based on the relationship between the Projects' crudes and observed benchmark prices for the historical period. The experts then adopt an oil price forecast from 2017 until the expiration of the Agreements.

[505] This amount includes MUS$ 120,883 for IPF leasing costs; CLEX-086, OPEX(CR).

682. The Claimants submit that there are no major conceptual differences between the Parties' projections of syncrude prices. Both Parties: (a) take a primary benchmark, being either Brent crude or West Texas Intermediate crude. The Claimants' experts take the latter for the 2007 valuation and the former for the 2016 valuation; (b) determine the relationship between that primary benchmark and a regional marker for heavy crude (Maya crude), in order to generate a reliable price trajectory for this crude; and (c) they determine the relationship between the price of that regional, heavy crude (Maya) and the historic sales prices obtained for the products produced by the Projects.

683. Despite the broad agreement between the Parties, the prices they use in their valuation models differ. When leaving aside a number of smaller issues, there appear to be two major areas of disagreement.

684. The first disagreement concerns the Claimants experts' approach to the analysis of all available oil price projections with the aim of arriving at a single forecast for future prices until 2037. The Respondent's experts, on the other hand, conduct their price forecast until 2020 only, and then assume that oil prices will remain flat, in nominal terms. They assume that Brent crude will reach a price of US$ 67.50/barrel by the end of 2020, and then remain at that same price until the end of 2037, without any adjustment, even for inflation. This is unrealistic, and not reconcilable with the use of an inflation factor of 2% for Project costs. Therefore, for Brailovsky and Flores, crude oil becomes less and less valuable over time in real terms, while extracting it becomes more costly. These experts submit that there are not enough market forecasts beyond 2020. But there are sufficient numbers of market forecasts extending beyond 2020 to construct a reliable sample. In prior stages of this arbitration, the same experts adopted a 30-year oil price forecast to 2037. But now, they want to drive down damages by any means possible.

685. The second error of the Respondent's valuation relates to the price at which Hamaca syncrude has been and will be sold. Historically, it was sold at a premium to Maya crude oil, but the Respondent's experts assume that it has been and will continue to be sold at a discount to Maya. This assumption relates to post-expropriation operational choices by PDVSA, which have allegedly resulted in the sale of lower quality syncrude. Such a choice should not be considered in a but-for analysis. Absent the expropriation, the Project would have sold the same grade of Hamaca syncrude as had been sold prior to the taking. The Tribunal should reject Venezuela's erroneous price forecasting methodology, which ignores reliable market data.

686. Even if the Claimants' losses were to be valued as of the date of the taking in June 2007, the Tribunal would be entitled to take into account the post-expropriation increase in the market prices of crude oil, as was demonstrated in the Awards and Decisions *Rumeli Telekom A.S.*[506],

[506] *Republic of Kazakhstan v. Rumeli Telekom A.S.* and *Telsim Mobil Telekomunikasyon Hizmetleri A.S.*, ICSID Case No. ARB/05/16, Decision of the Ad Hoc Committee, 25 March 2010 (CL-232).

Tidewater[507], and *Amco*[508]. Accounting for those actual price increases would more accurately reflect the pre-expropriation value of the Projects and avoid a situation in which Venezuela is unjustly enriched. Actual oil prices shed light on the actual value of the Projects. In practical terms, using post-expropriation crude oil prices would increase the valuation of the Projects, as of June 2007, by approximately 48%.

2. The Respondent's Position

687. The Respondent also observes that with respect to prices in an *ex post* valuation the Parties' experts use similar methodologies. They both look at available oil price forecasts for Brent crude oil, a light crude oil produced in the North Sea, and Maya crude oil, a heavy oil produced in Mexico. From these figures, they derive a "light-heavy" differential, *i.e.* the difference between the higher quality Brent as compared to lower quality Maya. They then compare the prices at which CCO produced by the Projects has been sold historically to historical Maya crude oil prices as a basis for projecting the prices at which the CCO would sell in the future as compared with projected prices for Brent crude oil. The Respondent further explains that the Project crude oils are inferior in quality to WTI. WTI prices can therefore not be used alone. Light (high API), sweet (low sulfur) crude oils like WTI will have higher values than heavy (low API), sour (high sulfur) crude oils like those produced by the Projects.

688. The Respondent's experts compiled an updated sample of Brent price forecasts that were issued between 1 May and 30 September 2016 and calculated the median for these forecasts for the next five years, after which they have projected that the price of Brent would remain flat, on the assumption that no one can know whether such price will end up being above or below those forecasts as from 2020. The Claimants' experts, in contrast, assume that oil prices will continue to increase at the rate of expected US inflation. For the Respondent's experts, such simplistic perspective is not reliable. There is no justification for assuming ever increasing oil prices over the remaining 20-year terms of the Projects. In two forecasts made in June 2015 and May 2016, respectively, the Claimants' expert, Dr. Abdala, demonstrated the great difference in price scenarios and their high degree of uncertainty. On other occasions, ConocoPhillips has typically not forecast prices more than for a few years into the future. A May 2014 presentation for investors shows that even for a short period of time, ConocoPhillips' price projections did not contemplate the possibility of price dropping into the US$ 30-40 dollar range, as occurred in 2015 and 2016. In an update to investors in 2016, ConocoPhillips stated simply that price recovery remains unclear. In light of these uncertainties, the decision of the Respondent's experts to maintain nominal Brent price projections flat in the long term is reasonable.

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[507] *Tidewater Investment SRL and Tidewater Caribe, C.A. v. The Bolivarian Republic of Venezuela*, ICSID ARB/10/5, Award of 13 March 2015 (R-642).

[508] *Amco Asia Corp. and Others v. Republic of Indonesia*, ICSID ARB/81/1, Resubmitted Case, Award of 31 May 1990 (CL-48).

689. The Respondent's experts calculated a Maya-Brent differential of 14.11%, while the Claimants' experts reached a slightly lower differential of 13.65% for the historical period. (a) In respect of Petrozuata, the Respondent's experts relied on actual Petrozuata CCO prices through July 2016, and applied the historical Maya-Petrozuata CCO differential to their Maya price forecast, resulting in an average differential of 0.08%, Maya thus being traded slightly below Petrozuata CCO. On the other hand, the Claimants' experts set Maya and Petrozuata CCO at par. Both Parties are thus in virtual agreement on this point. (b) For Hamaca, the Respondent's experts, aside from taking into account all historic sales data through July 2016, include the fact that starting in October 2008, the Hamaca Project sold a lower-quality crude called Special Hamaca Blend, based on the lower performance of the upgrader and the quality of the EHCO. On average, Hamaca CCO has sold at 98.36% of Maya. The Claimants' experts do not take this into account and set the Hamaca CCO price at a premium of 5.56% over Maya, thereby artificially inflating compensation. The compensation provisions of the Hamaca Association Agreement stipulate that compensation shall be calculated assuming Brent prices of US$ 27 per barrel (in 1996 dollars). The Respondent's experts made the required adjustments. (c) In respect of Corocoro, the Respondent's experts relied on data from June 2007 through December 2015 to calculate the average differential between Maya and Corocoro crude oil prices. This resulted in an average differential of 0.4%, which was applied to their price forecast through 2037. The Claimants' experts have applied the same prices in their *ex post* valuation of Corocoro.

690. The result of the differences in the Parties' respective price assumptions on the Claimants' *ex post* calculations with the compensation provisions is that the Claimants' valuation moves downwards from 8.518 to 7.625 billion. If, on the other hand, compensation for measures the Claimants accept as not being discriminatory is excluded, and when further proper production and cost data are used, as well as proper price assumptions, the relevant figure that has to be compared to the initial amount of 8.518 billion becomes 1.484 billion.

691. In their *ex ante* valuation, the Respondent's experts projected the quality differentials between WTI and the crudes from the Projects by using the price ratio included in the Composite Economic Model (CEM). The experts relied on a survey of 11 forecasts from reputable sources and they calculated the median of the WTI forecasts in order to arrive at their WTI benchmark forecast. Further, the Respondent's experts generated a price forecast for Maya, to which a price ratio of 77.8% used in the ConocoPhillips CEM is then applied in order to obtain the Project valuations. The Claimants' experts introduced in their *ex ante* valuation a 20% Maya-to-WTI discount. In so doing, they artificially inflated the Maya price forecasts and reduced the Maya-WTI differential. The Respondent's experts equally relied on the CEM to obtain the price ratio applicable to the Corocoro crude oil. This projection reports that the price of Corocoro crude will be traded at 106.7% to Maya. The Claimants' experts base their price ratio on ConocoPhillips unsuccessful bid for Corocoro crude oil in June 2008, retaining a trade at 102.7% to Maya.

3. *The Tribunal's Findings*

a. Petrozuata and Hamaca

692. The Tribunal has explained that it will determine the Claimants' loss during the historical period by reference to the actual oil prices that have been submitted through Witness Figuera's statement and the invoices filed by the Respondent and supported by documents piled up in various Appendices of Mr. Figuera's statements. It does not follow the Respondent's experts' view that the pertinent calculations may be impacted, in the case of Hamaca, by the compensation provisions of the Association Agreements, which do refer, indeed, to oil prices but do not determine their amount as it is derived from the oil market.

693. In order to assist the Tribunal's understanding of the documentary evidence, the Parties submitted jointly at the 2017 September hearing a table reproducing the prices each side retains on a year-by-year basis for the purpose of calculating revenue from the sales of oil at Petrozuata and Hamaca. This table reads as follows:

	Petrozuata CCO Prices (US$/Bbl)		Hamaca CCO Prices (US$/Bbl)	
	Claimants' Prices	Respondent's Prices	Claimants' Prices	Respondent's Prices
July-Dec. 2007	70.14	70.14	72.95	76.31
2008	87.38	87.38	89.37	91.40
2009	55.49	55.49	59.31	50.19
2010	70.38	70.38	74.08	70.32
2011	100.42	100.42	104.12	93.57
2012	101.39	101.39	105.18	99.40
2013	100.49	100.49	102.64	100.58
2014	88.44	88.44	90.92	86.49
2015	43.24	43.24	46.70	43.35
2016	38.55	32.01	40.70	29.46
2017	47.36	47.14	50.00	46.33
2018	53.43	53.08	56.40	52.16
2019	56.99	54.15	60.16	53.22
2020	59.14	58.02	62.43	57.02
2021	68.89	58.02	72.72	57.02
2022	70.15	58.02	74.06	57.02
2023	72.37	58.02	76.39	57.02
2024	74.34	58.02	78.48	57.02
2025	76.47	58.02	80.73	57.02
2026	77.81	58.02	82.14	57.02
2027	79.18	58.02	83.58	57.02
2028	80.57	58.02	85.05	57.02
2029	82.13	58.02	86.70	57.02
2030	83.79	58.02	88.45	57.02
2031	85.47	58.02	90.22	57.02
2032	87.18	58.02	92.03	57.02
2033	88.92	58.02	93.87	57.02
2034	90.70	58.02	95.74	57.02
2035	92.51	58.02	97.66	57.02
2036	94.36	58.02	99.61	57.02
2037	--	--	101.60	57.02

694. The Tribunal retains the numbers provided for Petrozuata for the years 2007 and 2008 as presented by the Parties on the basis of Mr. Figuera's first statement[509]. For the period 2009 to 2015 the prices have also been presented on agreed terms and will be applied by the Tribunal. As will be shown below, these prices are identical or very close to those calculated on the basis of the invoices submitted by Witness Figuera[510]. The Tribunal notes that the Claimants explain that their experts "determine the correct relationship between the Project crudes and observed benchmark prices for that historical period"[511]. The correct understanding is that these experts used the sales

[509] Table submitted at the 2017 September Hearing; Figuera Testimony, 20 July 2009, paras. 11/12.

[510] Table submitted at the 2017 September Hearing; Figuera Appendix 81 (for 2009-2013). Appendix 105 covers part of 2014, which is completed by Appendix 154 for this year and by Appendix 158 for 2015, both of which have not been introduced as evidence but for the purpose of information only.

[511] Claimants' Final Submission on Quantum, para. 306.

prices reported by Mr. Figuera for 2007/2008 and through the sample of invoices for the years 2009 to 2015, and that they use this pricing for Petrozuata until July 2016[512].

695. The figures reported by the Parties for Hamaca do not coincide. For the years 2007 and 2008, the Respondent relies again on Mr. Figuera's first statement[513]. The Claimants' prices are lower. While no explanation for this difference can be found for the year 2007, the Claimants' experts contend that actual sales prices could not be used "because the Project has been selling lower quality crude at a small discount to Maya since 2008, reflecting PetroPiar's managerial decisions since the expropriation". They conclude that this had the effect of lowering Hamaca syncrude prices, which – so they say – "in our understanding" would not have happened in a but-for scenario[514]. Therefore, the Claimants support prices higher than those actually invoiced between 2009 and 2015. The Claimants' experts have not relied on any evidence for their allegation. If the assumption had been that the Hamaca CCO suffered from a lowering of its API gravity, the information provided through the invoices (mentioned in the table on Hamaca below) demonstrates that this would be wrong. Between the major part of years of observation (2009-2013), the API gravity varied in irregular sequences between 20.62° and 22.64°, whereas actual sale prices moved from US$ 55.50 (2009) to 100.58 (2011) and ultimately 100.50 (2013); there appears to be no relation of causality between the two groups of figures.

696. The allegation of Respondent, based on its own experts' assertion that since October 2008, the Hamaca Project sold a lower-quality crude called Special Hamaca Blend is unsupported on the basis of the invoices to which the experts refer, where no such quality information is provided, nor its potential effect on price[515]. Moreover, the argument has no support in Mr. Figuera's allegations in respect of the quality of EHCO supplied and of the upgrader[516], all the more so as Mr. Figuera does not draw consequences in respect of oil prices from his unsubstantiated assertions[517].

697. The Respondent's explanations are less convincing than the numbers they are intended to confirm. In fact, the prices it presents for the years 2009 to 2015 are the same (subject to very minor

[512] CLEX-086, Revenues (PZ). The experts explain in their Consolidated Update Report, 17 November 2016, paras. 66-72, that they used benchmark forecast of world crude oil prices and Maya prices exhibited under CLEX-087. However, the figures provided in this exhibit are inconsistent with the actual prices that have been invoiced by the Projects and used by the same experts in their valuation. They added ultimately that they determined the relevant prices by using the historical market prices (para. 73), at least for Petrozuata.

[513] Table submitted at the 2017 September Hearing; Figuera Testimony, 20 July 2009, paras. 37/38.

[514] Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 73(c), adding in para. 165 that this was so "apparently". The experts' explanation is inconsistent for the year 2008, where they are recording prices lower than the actual sales prices on which the Respondent relies.

[515] Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 288.

[516] Cf. Supplemental Testimony, paras. 64-79.

[517] Cf. TR-E, 2017 September Hearing, Day 18, p. 5164:21-5166:6 (Friedman).

differences caused by rounding and counting) as the average prices that can be derived from the invoices and the summary tables submitted at the end of the 2017 March hearing.

698. In respect of Hamaca, these invoices were originally compiled by the employees on the site at Mr. Figuera's request[518]. They provide the pertinent figures for each loading and the relevant totals per year, *i.e.* the volume of barrels sold and the price in US$ per year, together with the API gravity of each loading. From the total amount priced per year and the corresponding quantity of barrels the average price per barrel and per year can be calculated, as well as the yearly API gravity.

699. The Claimants' experts use a significant 20% Maya-to-WTI discount[519] for the purpose of reflecting "the market consensus about the heavy-light price differential in the crude oil market"[520]. They do not explain why this discount based on a lower oil price should be so high. There is a further element of speculation in the choice of forecast differentials between Brent and Maya between July 2016 and October 2016 only (generating a price forecast that is 13.65% lower than the Brent price)[521].

700. The Respondent's experts rely on the WTI and Maya differential they draw from the invoices for the period 2009 to 2015. Such differential, as it had been actually practiced during that period, was still a reliable marker for the pricing of oil from 2016 forward, as the Respondent's experts correctly submit[522].

701. The Claimants' experts' price forecast from 2016 is based on a sample of about 16 forecasts, from which a median is identified. The method as it has been applied raises a number of doubts, some of which have also been expressed by the Respondent. (1) Forecasts that are deviating in extreme proportions ("outliers") from the clear majority of forecasts should be eliminated, as they are manifestly not representative of the trend that needs to be identified. (2) Forecasts based on oil production in the region of the Projects should be included at a significant position; it is also not appropriate to disregard West Texas Intermediate (WTI) as the benchmark for an *ex post* valuation (and to replace it by an European index), but to adopt this benchmark for the *ex ante* valuation.

702. From another perspective, the Claimants' experts' position is placed in contrast to the real world of oil prices over 20 years. Indeed, the prices determined by the experts year by year lead to

[518] Figuera Appendix 42.

[519] Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 72.

[520] *Ibidem*, para. 65.

[521] *Ibidem*, para. 71. The experts explain confusingly that they used actual Maya prices observed on the market between June 2007 and December 2016, but that they had been unable to find a significant sample of long-term Maya to WTI differential forecasts as of June 2007.

[522] Cf. Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 286/289, further referring to their *Ex Post* Analyses and Projections Calculations as of 31 December 2016, Appendix 408.

a double increase that seems unrealistic. When 2020 is taken as a critical year (where the Respondent abstains from any further forecast), the Claimants' Brent prices increase year by year, at a pace that is not defined or explained. The natural course of price evolution is different: there are ups and downs that are then consolidated in an average that may show a line going up. Additionally, from year 2026, the Claimants' price coefficient also climbs up without interruption (for both Petrozuata and Hamaca): each and every increase from one year to the next is higher than the previous increase, thus rendering the increase exponential. The Claimants' submission that oil prices must be connected to inflation (US-origin for the experts) is overly simplistic. It suffices to observe a number of recent years when oil prices were moving whereas inflation remained stable in many countries.

703. In some respect, the Respondent's experts' position that no certainty is available as from year 2020 and that therefore a flat rate should be used until the end of each Projects' lifetime is interesting, or, as the Respondent puts it, "reasonable". All depends, however, what a "flat rate" means and how it is implemented. The Respondent's flat rate over 15 years is the rate identified for year 2020, *i.e.* US$ 58.02 for Petrozuata and US$ 57.02 for Hamaca. However, this is not the only method to determine a flat rate. In light of the need to fix a rate as closely as possible to the estimated future, a flat rate determined on the basis of an average over several years would certainly come closer to such goal. It may be difficult, as the Respondent's experts say, to identify such future rates year-by-year, but it appears highly artificial to suddenly stop the counting in 2020 and to take that year's figure as applicable for the coming 15 years[523]. It has also been said that keeping prices flat when costs are increasing is disturbing[524].

704. The Respondent's experts demonstrate that another approach is perfectly possible when they proceed with their *ex ante* valuation, where they identify prices increasing year by year until the end of each of the Projects, going up to US$ 71.48 for Petrozuata in 2036 and US$ 76.80 for Hamaca in 2037[525]. While it may be argued that these numbers are derived from the CEM and strictly related to an *ex ante* valuation, they nonetheless demonstrate that a valuation containing an increase in oil prices is possible, even if the underlying assumptions may be a matter for debate.

705. The Tribunal's conclusions develop as follows: (1) For the years 2007 to 2015, the prices experienced by the Projects' sales are the most reliable information about the revenues obtained under a but-for scenario. The Parties agree on the applicable figures for Petrozuata. The Tribunal retains the corresponding prices from the Hamaca sales, thus disregarding the Claimants' experts'

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[523] This can further be demonstrated in comparison to the analyses the experts performed in 2013 (Appendix BF-010), where the flat rate started in 2018 at US$ 82.42 for Hamaca and at US$ 83.24 for Petrozuata. A year later, the flat rate was set to begin also in 2018, but at a price of US$ 72.75 for Hamaca and US$ 73.54 for Petrozuata (Appendix BF-215).

[524] TR-E, 2017 September Hearing, Day 18, p. 5161:6-13 (Friedman).

[525] CLEX-085, Revenues (PZ) and (HC).

allegation on lower quality of Hamaca oil that is not evidenced by the prices actually obtained by the Project. The experts also fail in their allegation that a but-for situation would have produced oil of higher quality, paid at higher prices. In this respect, the Tribunal also recalls that the prices to be retained determine the loss suffered by the Claimants and their right for compensation. Therefore, the burden of proof of the applicable and most reliable estimations rest with the Claimants.

Petrozuata CCO Prices and Sales 2007 - 2015 (US$/Bbl)					
	Claimants' Prices US$	Respondent's Prices US$	Barrels sold	Invoices US$	Price per Barrel Sold US$
July-Dec. 2007	70.14	70.14	15,568,593	1,091,900,000	70.13
2008	87.38	87.38	35,700,904	3,119,400,000	87.38
2009	55.49	55.49	33,197,701	1,842,584,901.38	55,50
2010	70.38	70.38	21,718,453	1,525,217,426.98	70.23
2011	100.42	100.42	24,114,978	2,425,577,496.25	100.58
2012	101.39	101.39	33,974,140	3,496,629,804.93	102.92
2013	100.49	100.49	29,660,975	2,980,831,978.58	100.50
2014	88.44	88.44	25,913,252	2,291,651,539.98	88.44
2015	43.24	43.24	22,213,048	960,435,949.07	43.24
1	2	3	4	5	6

Hamaca CCO Prices and Sales 2007-2015 (US$/Bbl)						
	Claimants' Prices US$	Respondent's Prices US$	Barrels sold	API Gravity	Invoices US$	Price per Barrel sold US$
2007 ½	72.95	76.31	28,939,154		2,208,400,000	76.31
2008	89.37	91.40	52,430,724		4,792,200,000	91.40
2009	59.31	50.19	39,845,387	22.64	1,999,276,756.27	50.18
2010	74.08	70.32	49,468,161	20.86	3,475,144,882.06	70.25
2011	104.12	93.57	47,449,859	21.26	4,439,787,139.08	93,57
2012	105.18	99.40	25,214,117	20.62	2,506,219,558.63	90.40
2013	102.64	100.58	47,131,231	21.69	4,740,565,039.75	100.58
2014	90.92	86.49	52,955,490	19.93	4,580,123,865.36	86.49
2015	46.70	43.35	51,287,407	19.68	2,223,505,411.11	43.35
1	2	3	4	5	6	7

706. (2) The Tribunal cannot agree with the adjustments or the price differentials proposed by the Claimants' experts for the years starting in 2016, which are again simply stated but not explained or supported by evidence. The prices provided by the Respondent must therefore prevail for the years 2016 to 2020.

707. (3) The Tribunal does not share the Respondent's position which relies on a flat rate based on the prices retained for year 2020 until the end of each Project's lifetime. In its own *ex ante* valuation, the Respondent accepts that oil prices do not remain fixed at an identical level over many years, a view that would be totally incompatible with basic notions of market and economics. In this valuation, the Respondent submits that between 2020 and 2036 or 2037, prices move from

US$ 52.07 to US$ 71.48 for Petrozuata and from US$ 54.85 to US$ 76.80 for Hamaca, which means an approximate year-by-year increase of US$ 1.17 for Petrozuata and US$ 1.22 for Hamaca. The Tribunal takes this as a valid assumption.

708. (4) For the years 2021 onwards, the Tribunal has as its only reliable evidence the numbers retained by the Respondent's experts up to the year 2020. It takes the figures for that year (US$ 58.02 for Petrozuata and US$ 57.02 for Hamaca) as the basis to be completed by an average increase per year of 1.20% for each Project. By reference to the tables used above, the end price would become US$ 77.22 for Petrozuata (2036) and US$ 77.42 (2037) for Hamaca.

709. (5) The Tribunal finds further support for its approach in the comparison between the average prices for the period 2007 to 2020 and from 2021 until the end of each Project on the basis of the Association Agreements. For Petrozuata, the average price for the first period is US$ 68.70 and for the second term US$ 68.22, whereas for Hamaca, the average for the first period is US$ 67.84 and for the second term US$ 67.82. This means that except for a very small difference, the overall average price per year for each Project, counted between 2007 and 2036/2037, is the same.

710. At this juncture, the Tribunal takes account in the presentation of the pertinent figures for prices and sales of the dates it determined for the end of production for each Project, *i.e.* 2026 for Petrozuata and 2036 for Hamaca.

Tribunal's Assessment of Oil Production for Sale and Prices						
	Petrozuata			Hamaca		
	MMB	Price per Barrel sold US$	Total Income US$	MMB	Price per Barrel sold US$	Total Income US$
2007 ½	15,568,593	70.14	1,091,981,113	28,939,154	76.31	2,208,346,842
2008	35,700,904	87.38	3,119,544,992	52,430,724	91.40	4,792,168,174
2009	36,200,000	55.49	2,008,738,000	58,400,000	50.18	2,930,512,000
2010	36,200,000	70.38	2,547,756,000	58,400,000	70.32	4,106,688,000
2011	36,200,000	100.42	3,635,204,000	58,400,000	93.57	5,464,488,000
2012	36,200,000	101.39	3,670,318,000	58,400,000	99.40	5,804,960,000
2013	36,200,000	100.49	3,637,738,000	58,400,000	100.58	5,873,872,000
2014	36,200,000	88.44	3,201,528,000	58,400,000	86.49	5,051,016,000
2015	36,200,000	43.24	1,565,288,000	58,400,000	43.35	2,531,640,000
2016	36,200,000	32.01	1,158,762,000	58,400,000	29.46	1,720,464,000
2017	36,200,000	47.14	1,706,468,000	58,400,000	46.33	2,705,672,000
2018	36,200,000	53.08	1,921,496,000	58,400,000	52.16	3,046,144,000
2019	36,200,000	54.15	1,960,230,000	58,400,000	53.22	3,108,048,000
2020	36,200,000	58.02	2,100,324,000	58,400,000	57.02	3,329,968,000
2021	36,200,000	59.22	2,143,764,000	58,400,000	58.22	3,400,048,000
2022	36,200,000	60.42	2,187,204,000	58,400,000	59.42	3,470,128,000
2023	36,200,000	61.62	2,230,644,000	58,400,000	60.62	3,540,208,000
2024	26,600,000	62.82	1,671,012,000	58,400,000	61.82	3,610,288,000
2025	22,100,000	64.02	1,414,842,000	58,400,000	63.02	3,680,368,000
2026	19,000,000	65.22	1,239,180,000	58,400,000	64.22	3,750,448,000
2027				58,400,000	65.42	3,820,528,000
2028				58,400,000	66.62	3,890,608,000
2029				58,400,000	67.82	3,960,688,000
2030				58,400,000	69.02	4,030,768,000
2031				58,400,000	70.22	4,100,848,000
2032				58,400,000	71.42	4,170,928,000
2033				58,400,000	72.62	4,241,008,000
2034				51,000,000	73.82	3,764,820,000
2035				47,000,000	75.02	3,525,940,000
2036				43,000,000	76.22	3,277,460,000
Total	661,969,497		44,212,022,105	1,682,369,878		112,909,071,016
1	2	3	4	5	6	7

711. The next and last step in this Section will consist of matching the sales figures for each Project with the costs as they have been assessed in the preceding Section, and to determine the Gross Revenue for each Project (before Royalties and Taxes). The resulting figures are as follows:

Tribunal's Assessment of Gross Revenue (Sales minus Costs, before Royalties and Taxes) for Petrozuata				
	Total Income US$	CAPEX US$ MM	OPEX US$ MM	Gross Revenue Total US$
2007 ½	1,091,981,113	85,813	103,458	902,710,113
2008	3,119,544,992	176,990	261,244	2,681,310,992
2009	2,008,738,000	126,705	312,822	1,569,211,000
2010	2,547,756,000	105,247	225,955	2,216,554,000
2011	3,635,204,000	317,270	272,644	3,045,290,000
2012	3,670,318,000	128,310	319,819	3,222,189,000
2013	3,637,738,000	136,055	309,302	3,192,381,000
2014	3,201,528,000	137,119	446,230	2,618,179,000
2015	1,565,288,000	216,321	856,509	492,458,000
2016	1,158,762,000	93,743	186,863	878,156,000
2017	1,706,468,000	117,195	378,367	1,210,906,000
2018	1,921,496,000	189,419	276,241	1,455,836,000
2019	1,960,230,000	179,057	269,267	1,511,906,000
2020	2,100,324,000	183,992	263,113	1,653,219,000
2021	2,143,764,000	207,488	265,831	1,670,445,000
2022	2,187,204,000	149,166	272,498	1,765,540,000
2023	2,230,644,000	46,148	276,601	1,907,895,000
2024	1,671,012,000	20,000	250,000	1,401,012,000
2025	1,414,842,000	20,000	220,000	1,174,842,000
2026	1,239,180,000	20,000	200,000	1,019,180,000
Total	44,212,022,105			35,589,220,105
1	2	3	4	5

Tribunal's Assessment of Gross Revenue (Sales minus Costs, before Royalties and Taxes) for Hamaca				
	Total Income US$	CAPEX US$ MM	OPEX US$ MM	Gross Revenue Total US$
2007 ½	2,208,346,842	116,921	208,678	1,882,747,842
2008	4,792,168,174	417,921	625,275	3,748,972,174
2009	2,930,512,000	421,527	626,917	1,882,068,000
2010	4,106,688,000	182,103	443,297	3,481,288,000
2011	5,464,488,000	146,174	567,437	4,750,877,000
2012	5,804,960,000	350,002	744,160	4,710,798,000
2013	5,873,872,000	202,096	640,228	5,031,548,000
2014	5,051,016,000	235,575	914,465	3,900,976,000
2015	2,531,640,000	259,470	1,878,100	394,070,000
2016	1,720,464,000	94,319	451,853	1,174,292,000
2017	2,705,672,000	212,485	818,610	1,674,577,000
2018	3,046,144,000	260,926	616,715	2,168,503,000
2019	3,108,048,000	191,493	637,071	2,279,484,000
2020	3,329,968,000	182,882	688,082	2,459,004,000
2021	3,400,048,000	201,976	615,406	2,582,666,000
2022	3,470,128,000	277,184	619,871	2,573,073,000
2023	3,540,208,000	274,767	665,126	2,600,315,000
2024	3,610,288,000	243,948	590,777	2,775,563,000
2025	3,680,368,000	253,423	681,333	2,745,612,000
2026	3,750,448,000	283,123	681,315	2,786,010,000
2027	3,820,528,000	382,615	742,818	2,695,095,000
2028	3,890,608,000	273,277	824,859	2,792,472,000
2029	3,960,688,000	269,743	764,453	2,926,492,000
2030	4,030,768,000	170,038	762,063	3,098,667,000
2031	4,100,848,000	92,271	836,037	3,172,540,000
2032	4,170,928,000	65,764	910,093	3,195,071,000
2033	4,241,008,000	53,674	848,821	3,338,513,000
2034	3,764,820,000	30,000	700,000	3,034,820,000
2035	3,525,940,000	25,000	600,000	2,900,940,000
2036	3,277,460,000	20,000	500,000	2,757,460,000
Total	112,909,071,016			85,514,514,016
1	2	3	4	5

b. Corocoro

712. The first step in the pricing analysis of Corocoro consists in determining the price of Corocoro oil over the Project's time:

Corocoro Pricing (US$/Bbl)			
	Claimants' Prices[526]	Respondent's Prices[527]	Price per Barrel sold[528]
2008	86.16	86.16	86.70
2009	56.40	56.40	56.63
2010	71.64	71.64	70.62
2011	98.60	98.60	97.16
2012	99.43	99.43	99.42
2013	98.68	98.68	98.55
2014	88.83	88.83	87.89
2015	41.83	41.83	42.09
2016	38.71	33.15	
2017	47.55	47.29	
2018	53.64	53.25	
2019	57.22	54.33	
2020	59.38	58.21	
2021	69.17	58.21	
2022	70.43	58.21	
2023	72.66	58.21	
2024	74.64	58.21	
2025	76.78	58.21	
2026	78.12	58.21	
2027	79.49	58.21	
2028	80.89	58.21	
2029	82.46	58.21	
2030	84.13	58.21	
2031	85.81	58.21	
2032	87.53	58.21	
2033	89.28	58.21	
2034	91.06	58.21	
2035	92.88	58.21	
2036	94.74	58.21	
2037	96.64	58.21	
1	2	3	4

713. The Tribunal notes that both Parties express the same position as to the pricing for Corocoro oil. They accept that for the period between 2008 and 2015 the actual oil prices as experienced with the sales that have been reported by Witness Figuera are to be used. The Tribunal retains the

[526] CLEX-086, Price.

[527] Brailovsky/Flores Appendix 406; *Ex Post* Analyses and Projections Calculations as of December 31, 2016, Appendix 408.

[528] Figuera Appendices 84-89, Brailovsky/Flores, Appendices 359, 360.

numbers jointly presented by the Parties, while noting that they are slightly different than the prices mentioned on the yearly summaries of the sales reported by Witness Figuera. The positions also became identical between the experts on both sides for the years from 2016. The Respondent's experts had derived from the data between July 2007 and 2015 an average differential of 0.4% between Maya and Corocoro crude oil prices that they applied to their price forecast[529]. For their 2016 valuation, the Claimants' experts understand that this figure reflects the "average historical differential" that they accept to apply as 0.4% premium over Maya[530]. The Respondent therefore noted correctly that the Claimants' experts apply the same method for pricing[531]. However, when looking at the figures reproduced in the summary tables of each experts' team, on which the further calculations in view of the assessment of damages are based, it appears that the numbers do not match. Taking first the numbers for the years 2016 to 2020, the Claimants' experts' figures[532] are always higher than those of the Respondent's experts[533], although both sides have declared that they used the same method, including the same Maya differential. The explanation detected by the Tribunal is the following: The Maya prices for each Party are different[534], and this results in different oil prices for the years 2016 to 2020.

714. The Parties' experts have admitted that the pricing for Corocoro oil follows very closely, if not identically, the prices applied to Petrozuata CCO. Therefore, the Respondent's experts' assessment that for the years 2016 to 2020 prices for Corocoro are in line with those for Petrozuata must prevail. This also means that the Maya differential used during the years 2008 to 2015 remains the same for the following years. Although the Claimants' experts affirm that they follow the same method, based on a 0.4% Maya differential, this is not correct as they take into account a different evolution of Maya prices.

715. As the Tribunal has found above in respect of the pricing for Petrozuata and Hamaca from 2020, it cannot follow the Respondent's choice of a flat rate staying constant until the end of the Projects. Such excessively artificial approach cannot determine the Claimants' losses. The most

529 Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 295; *Ex Post* Analyses and Projections Calculations as of December 31, 2016, Appendix 408.

530 Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 73(c). However, the experts also explained that beginning 2010 or so, they took the differential between the Brent and the Maya; TR-E, 2017 March Hearing, Day 13, p. 3769:10-3770:17 (Abdala).

531 Respondent's Final Brief on Quantum, para. 393.

532 CLEX-086, Price.

533 BF-406, Revenues (CR).

534 For the Claimants' experts, the price for Maya is for each year from 2016 on: US$ 38.55, 47.36, 53.43, 56.99, 59.14 (CLEX-086, Price). For the Respondent's experts, the corresponding figures are: 33,02, 47.11, 53.04, 54.11, 57.97 (BF-406, Price Inputs). Based on each group of numbers, the prices as listed above result from the multiplication by the differential of 1.004.

reasonable assessment of the price forecast is the model retained by the Tribunal for these two other Projects, consisting of a 1.2% price increase per year until the end of the Project.

716. The next step is then to apply the correct figures for prices to the volumes of production determined above until the end of production of the Project Corocoro, which is in 2026.

Tribunal's Assessment of Oil Production for Sale, Prices and Costs at Corocoro						
	MMB	Price per Barrel sold US$	Total Income US$	CAPEX US$ MM	OPEX US$ MM	Gross Revenue Total US$
2007 ½	0	0	0	116,743	22,289	- 139,032,000
2008	7,182,000	86.16	618,801,120	56,868	215,420	346,513,120
2009	11,483,000	56.40	647,641,200	5,465	200,112	442,064,200
2010	13,152,000	71.64	942,209,280	164,777	144,780	632,652,280
2011	13,214,000	98.60	1,302,900,400	14,500	166,923	1,121,477,400
2012	13,479,000	99.43	1,340,216,970		192,962	1,147,254,970
2013	13,336,000	98.68	1,315,996,480		170,578	1,145,418,480
2014	12,839,000	88.83	1,140,488,370		234,309	906,179,370
2015	12,069,000	41.83	504,846,270		353,720	151,126,270
2016	11,027,000	33.15	365,545,050		75,608	289,937,050
2017	11,204,000	47.29	529,837,160		153,276	376,561,160
2018	9,411,000	53.25	501,135,750		114,793	386,342,750
2019	8,444,000	54.33	458,762,520		110,604	348,158,520
2020	7,747,000	58.21	450,952,870		108,018	342,934,870
2021	7,205,000	59.41	428,049,050		106,947	321,102,050
2022	6,765,000	60.61	410,026,650		109,044	300,982,650
2023	6,268,000	61.81	387,425,080		109,810	277,615,080
2024	5,741,000	63.01	361,740,410		111,412	250,328,410
2025	5,508,000	64.21	353,668,680		113,488	240,180,680
2026	5,297,000	65.41	346,476,770		115,564	230,912,770
Total	181,371,000		12,406,720,080			9,118,710,080
1	2	3	4	5	6	7

IX. Royalties and Taxes

A. <u>General Observations and Findings</u>

717. The taxation regime in Venezuela raises one of the key issues during the negotiation and the economic life of the Projects. Many different taxes have been introduced or raised prior to the expropriation. They constitute for the Claimants a series of coercive measures which, they submit, together with the forced migration, represent a bundle of discriminatory actions triggering their right for the compensation they claimed in the ICC Arbitration from PDVSA.

718. Before this Tribunal, the Claimants' claim is based on the violation of Article 6 of the BIT by the Venezuelan Republic. The taxation regime constitutes in this context a part of the economic life and value of the three Projects. Its impact on the valuation of the Claimants' loss and their

claim for damages is important and now has to be addressed. The compensation provisions of the Petrozuata and Hamaca Association Agreements do not govern the Claimants' right for compensation that they claim is based on the Treaty. However, these provisions may have a role to play in case certain taxes constitute discriminatory actions triggering a right for compensation that might counterbalance the impact of such taxes.

719. The valuation experts on both sides have each established a list of all royalties and taxes they consider applicable since 26 June 2007 or at a later date; they also rely on their respective Party's position[535]. The Tribunal will therefore account for the following taxes and contributions:

(1) Royalties and Extraction Tax, both together operating as a royalty at a rate of 33.33%[536].
(2) Export Tax of 0.1% taken from the revenues of oil sold for export.
(3) Science and Technology Contribution of 2% taken from the prior year's revenue from the sale of crude oil, reduced to 1% with effect as from 2012.
(4) Anti-drug contribution of 1%[537].
(5) Social Contribution of 1% of the previous year's net income before taxes[538].
(6) Income Tax of 50% applicable to each Project's revenue (less royalties and other applicable taxes and contributions).
(7) Sports tax of 1% accounted as from 2012.

In sum, the royalties and contributions (1) to (5) operate before the Income Tax (6) which applies when these prior contributions have already been deducted.

720. A further precision relates to the determination of the base price to which the royalties and the extraction tax apply. These disbursements are not computed like all other contributions (2 to 5), including the sports tax (7), and income taxes (6). They are fixed by reference to the quantity

[535] Cf. Abdala/Spiller, March 2016 Update, 18 March 2016, para. 28; Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, paras. 140, 341. Cf. also the Tables submitted by the Claimants on 20 March 2017.

[536] The Respondent's experts state that the Projects "would have been" subject to a "Special Advantage" tax to be calculated in relation to the amount of royalties, taxes and contributions paid, but their explanation lacks precision and has no documentary support (cf. Consolidated Expert Report on Valuation, 17 November 2016, para. 140/g, further noting that this tax would not apply to Hamaca, cf. footnote 322). This tax seems to be comparable to the "Shadow Tax" noted by the Claimants' experts, but not explained either, nor supplied by any reference to legal or other sources (Abdala/Spiller, Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 251/d).

[537] The Claimants' experts do not account for the 1% anti-drug tax to the Hamaca Project, providing no reason (Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, footnote 290). The Respondent's experts refer to the Organic Law Against the Illicit Trafficking (BF-55), Article 96, that does not provide for such an exception (Consolidated Update Report, 17 November 2016, footnote 300). The difference in treatment appears in the CEM (LECG-085, p. 14/15/pdf).

[538] The Tribunal will take it a little bit simpler and count for this tax by reference to the income of the same year.

of barrels extracted, identified as EHCO in the case of Petrozuata and Hamaca[539]. The rate of 33.33% applies to the volume and value of EHCO used for upgrading to heavy syncrude (CCO). For the purpose of determining such value, a EHCO reference price (also called "royalty price") was fixed and published by the Ministry of Energy and Petroleum ("MENPET") on a monthly basis, in accordance with a complex formula contained in a governmental resolution. The experts on each side have noted this method used for collecting the royalty and extraction tax of 33.33%[540]. However, for the purpose of determining the applicable production volumes and the prices to be applied in this regard, they have relied on their own estimations, resulting in divergent projections of calculations of the ensuing royalty and extraction tax. Moreover, the impact of the Windfall Profit Tax must also be considered in this regard. This matter will have to be examined more closely when the latter tax is analysed.

721. For Corocoro, the experts on both sides mention a "PEG Tax" equal to 50% of the annual operating income. However, none of the experts went beyond the definition of the rate under Article I of the Association Agreement. Such rate would need to be examined and determined on the basis of Article 9 of the Association Agreement's Accounting Procedures, which have not been looked at by any expert. Without such an analysis, accounting for a PEG rate would be pure speculation.

722. The Parties and their experts are at odds about the applicability of the Windfall Profit Tax that was introduced in 2008 and amended since then several times. While this legislation will be examined closely below, another argument of the Respondent can be disposed of now. Indeed, it is argued that the Government had the power and would certainly have decided to exercise it for the purpose of taking additional fiscal measures or any other measure taking away from the foreign partners in the Projects any profit considered as excessive[541]. This position lacks any serious evidentiary support. There is no need to recall in detail Venezuela's political position during the negotiations of the Association Agreements to protect its sovereign right to take away excessive revenues from the investors. This right was expressly mentioned in the Congressional Authorizations. The compensation provisions were the result of the bargain that was at the centre of the debate between the Parties. These provisions were a reaction to the Government's position to raise taxes when it considered it was not able to share sufficiently in the profits resulting from increasing oil prices. As will be explained below, this had been done through the Windfall Profit Tax. Therefore,

539 The documentation shows that a distinction had been made between "EHCO Production" and "EHCO Fiscalized Production". The Tribunal's limited documentary evidence does not allow applying such distinction in a consistent manner. It is certain, at least, that the differences in quantity and value are relatively small.

540 Cf. Abdula/Spiller, Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, Appendix D, para. 34; Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 140(a), further noting that the formula to be used for the calculation of the reference price was set up in the Ministry Resolution No. 3 dated 11 January 2007, Article 5(e) (Expert Report on Valuation, 18 August 2014, footnote 322, BF-43). The monthly publications from the Ministry have not been filed with the Tribunal.

541 Cf. Respondent's Counter-Memorial on Quantum, para. 138; Respondent's Final Brief on Quantum, para. 263.

there is no point in arguing that more has to apply, based on political declarations, including Dr. Mommer's statements, that have all been made before the Windfall Profit Tax was first enacted. The Respondent knows and must accept that nothing more than the Windfall Profit Tax has been implemented for that purpose and that anything beyond these measures is pure speculation, for today and for the foreseeable future.

B. The Windfall Profit Tax

1. The Legal Structure

723. The payment of a "Special Contribution for Extraordinary Prices in the International Hydrocarbons Market", called "Windfall Profit Tax" or "Special Contribution" was enacted for the first time in 2008, by Decree No. 8.807 of 15 April 2008 (R-500, C-252/582). It applied to export or transportation of liquid hydrocarbons abroad when, in respect of any month, the average price of Brent crude exceeds US$ 70 per barrel. The tax was assessed as US$ 0.50 for every dollar that this average price exceeded US$ 70. When this reference price exceeded US$ 100, the tax went up to US$ 0.60 per dollar. The special contribution had to be paid to the National Development Fund (FONDEN). It was to be counted as costs for the purposes of calculating income tax; this means that it was to be accounted like a royalty.

724. Decree No. 8.163 of 18 April 2011 restructured the windfall tax (R-501, C-587). By reference to a price fixed in the Budget Law, 20% (0.20 per dollar) were to be paid as tax up to a threshold of the monthly average (extraordinary) price of Venezuelan liquid of US$ 70 per barrel. When prices were greater and became "exorbitant", but lower than US$ 90 per barrel, the tax went up to 80% for any price between these two amounts, and it went further up to 90% within a margin of US$ 90 to US$ 100, and 95% in respect of any amount above US$ 100.

725. Effective on 21 February 2013, Decree No. 40.114 modified again the payment structure (R-502, C-600). The initial rate of 20% went up from the Budget Law price to US$ 80 per barrel (extraordinary price). From there, when prices became higher and were considered to be "exorbitant", a tax of 80% applied up to the threshold of US$ 100, and above, 90% applied up to the level of US$ 110. When prices went higher, equal or greater than US$ 110, the tax rate was 95%.

726. Decree No. 8.807 of 15 April 2008 (Art. 2) and the Decree No. 8.163 of 18 April 2011 (Art. 13) provided for the possibility of an exoneration on the part of the National Executive "in favor of certain exports within the framework of political economy and international cooperation". Decree No. 40.114 of 20 February 2013 confirmed two cases of exemption mentioned in the 2011 Decree in a slightly modified drafting: (1) In case the oil production results from the implementation of new reservoir development projects, as well as volumes associated with recovery or upgrading projects, or with production remediation projects, declared as such by the Ministry of the

Popular Power with authority in the areas of petroleum and mining; (2) the exportation of volumes in implementing International Agreements of cooperation or financing.

727. A further point of general interest relates to Article 14 that was introduced by Decree No. 8.163 of 18 April 2011 and which reads as follows:

> In order to guarantee the achievement of the purpose of this Decree-Law, a maximum price limit for the calculation and settlement of Royalties, Extraction Tax and Export Registry Tax set forth in the Organic Law of Hydrocarbons is established at the quantity of seventy dollars per barrel (70 US$/bl).

The effect of this provision was that royalties and extraction tax were not collected to the extent their reference price went above the limit of US$ 70. For any revenue obtained through prices above this amount, the windfall profit tax became the substitute to the payment of royalties and extraction tax. Decree No. 40.114 of 21 February 2013 raised the maximum price limit from US$ 70 to US$ 80. This provision was not noticed by the Claimants or their experts. The Respondent's experts have mentioned that above US$ 70, the royalty and extraction tax have been substituted by the new assessment provided for through the windfall profit tax legislation[542]. Witness Figuera had noted in respect of Corocoro that with effect as of mid-April 2011, the royalty price was reduced to US$ 70; similarly, the limit went up to US$ 80 as of March 2013 when the Decree's revision of 2013 entered into force[543]. The Tribunal has not been informed that any change has been made to Article 14 of the WPT Law since 2013.

2. *The Claimants' Position*

728. The Claimants note that Venezuela enacted the so-called "windfall profit tax" (WPT) less than a year after its expropriation of the Projects. Venezuela contends that in evaluating the expropriated investments as of the date of the Award, the Tribunal should take into account any post-nationalization events that have a negative impact on value, such as increased taxes.

729. The Claimants' experts have factored into their cash flow forecasts several taxes of general applicability enacted by Venezuela since its unlawful expropriation. International law requires, however, that the WPT be disregarded, for two main reasons: (a) First, the effect of this special post-expropriation levy was to take away the benefit of much of the increase in value of the investment due to improved market conditions (essentially higher oil prices) between the dates of

[542] Brailovsky/Flores, Expert Report on Valuation, 18 August 2014, paras. 205/206; Second Expert Report on Valuation, 7 January 2015, para. 192. Cf. BF-406, Revenues.

[543] Third Supplemental Testimony, 15 August 2014, para. 104, Table 6, further referring to PetroSucre's Tax and Royalty Statement for 2011, where the impact of the royalty price reduction to US$ 70 is recorded (Appendix 84). See also the Statements for 2012 and 2013 (Figuera Appendices 88 and 89).

expropriation and valuation. It is precisely this increase in value that international law reserves for the Claimants in the case of unlawful expropriation. Under international law, States cannot rely on value-depressing measures enacted after a taking to reduce their compensation obligation, particularly where the effect would be to deny the investor the benefit of a date-of-award valuation. (b) Second, and in any event, on the specific facts of this case the WPT cannot be applied, because: (i) the Claimants could have enjoyed an exemption from the application of this special law, just as PDVSA has done; and (ii) the application of this levy to the Claimants' Projects would result in unequal treatment, in breach of Article 4 of the BIT. Each one of the foregoing reasons leads to the same conclusion: the Tribunal should not artificially reduce Venezuela's compensation obligation by assuming the application of this special post-expropriation levy to the Projects in the but-for world.

730. Venezuela must provide full reparation to compensate the Claimants for the unlawful expropriation of their investments. In such a case, the expropriator's responsibility must be increased by the fact that his action was unlawful. A date-of-award valuation ensures that, where there is an unlawful expropriation, any increase in value since the date of expropriation is retained by the injured investor and not diverted to the breaching State. Venezuela should not be rewarded for depriving the Claimants of the benefit of improved market conditions since the date of expropriation.

731. The Claimants contend that Venezuela seeks to negate the Tribunal's holding on the occurrence of an unlawful expropriation by applying the WPT to the expropriated Projects in the but-for-world. The Claimants' experts concluded that the WPT would have reduced the value of the Projects by US$ 4.4 billion. Based on the valuation presented by the Respondent's experts, the reduction would be equal to 49%. The effect produced by Venezuela's position is even clearer when one observes that its date-of-award valuation of US$ 1.463 billion is lower than its date-of-expropriation valuation of US$ 1.872 billion. Venezuela attempts to subvert the principle of full compensation through the application of the WPT, and thereby to reach an outcome even worse for the investor than one resulting from a lawful taking. To allow Venezuela to insulate itself in this manner from the consequences of its own wrongful actions would be perverse. It would allow any State that committed an unlawful expropriation to avoid the financial consequences of its acts by subsequently taxing away the very increase in value to which the investor is entitled under a date-of-award valuation.

732. The Claimants also mention that recently, the tribunal in *Yukos* confirmed that the victim of an unlawful expropriation "must enjoy the benefits" and receive the value that any improved market conditions may have added to the expropriated asset up to the date of the award[544]. Venezuela relies on another part of the *Yukos* award, where the tribunal considered the likelihood of

[544] *Yukos Universal Limited (Isle of Man) v. The Russian Federation*, PCA Case No. AA 227, Final Award dated 18 July 2014 (R-425).

future rate increases for certain existing taxes and duties in connection with its assessment of pre-award damages. However, the award noted that prior to the expropriation (a) the investor had already been paying those taxes, and (b) their rates had increased several times, which made similar rate increases likely in the future. That situation is radically distinguishable from the facts here. It is an altogether different proposition that under international law Venezuela can keep for itself billions of dollars that market conditions added to the Claimants' investments after the expropriation.

733. The Claimants' also submit that their damages in any event cannot be reduced on account of the WPT because in the but-for world the Claimants would have enjoyed an exemption from the application of this special levy, just as PDVSA and other companies have done.

734. First, the WPT Laws have excluded from their scope any exports to States with which Venezuela has entered into "international cooperation or financing agreements". The list of Exempt States is extensive. Thus, in the but-for scenario, the Projects would have directed their exports, if necessary, to one or more Exempt States to bring those exports within the scope of the exemption. Press reports indicate that PDVSA avoided US$ 11.2 billion of WPT in 2013, suggesting that 57% of PDVSA's exports were exempt from the WPT Laws pursuant to Article 12.2. Venezuela's International Agreements with Exempt States such as China and Russia have created joint ventures that are guaranteed an Article 12.2 exemption from the 2011 WPT Law. These same joint ventures are also accorded "fiscal incentives". Venezuela has not produced information in this respect, but press reports indicate that they may include exemptions from the 2011 WPT Law.

735. Second, the 2011 WPT Law excludes from its scope any exports from projects engaged in "enhanced oil recovery" (EOR), and this without time limitation (that was removed through the 2013 amendment of the law). The Claimants could and would have sought to implement EOR technology at both the Petrozuata and Hamaca Projects, in particular "Steam Assisted Gravity Drainage" (SAGD). PDVSA itself has recognized the value of such technologies. PDVSA subsidiaries and a large number of *empresas mixtas* have benefited from this exemption for EOR.

736. Third, the Projects could have significantly reduced their potential exposure to the WPT by selling production locally in Venezuela.

737. Fourth, the Projects could have reduced their exposure to the WPT by making "royalty in-kind" payments, by paying volumes of hydrocarbons towards royalties owed. Petropiar (Hamaca) had apparently benefited from such payments.

738. The Claimants' submission is that their position is strengthened further by Venezuela's conduct in the disclosure phase, when it refused to produce all responsive documents relating to

the WPT exemptions and how they have been applied. It is clear that PDVSA, and *empresas mixtas* have all been able to escape in significant part any application of the WPT Laws.

739. The Claimants note that Venezuela does not deny that they may have applied for certain exemptions, but that its answer is simply that this is speculation and that Venezuela would never have granted exemptions to the Claimants after they had refused to migrate in the mixed company regime. For the Claimants, this argument is unavailing. (a) Exemptions are not to be "granted". Once the Claimants complied with the requirements, they would have been entitled to the relevant exemptions by operation of law. (b) Venezuela's argument that the relevant exemptions could only be enjoyed by the mixed companies is incorrect. It follows from the text of Article 12.2 of the WPT Law that the exemption contained therein applies to any export to one or more Exempt States. Venezuela's suggestion that it would have penalized the Claimants and denied them one right because they refused to surrender another one lacks any integrity. In sum, in the but-for world the Claimants could – and rationally would – have been able to take advantage of the various exemptions from the application of the WPT.

740. Finally, the Claimants affirm that it is common ground that the WPT is subject to the provisions of Article 4 of the BIT, which ensures that, with respect to any tax or exemption thereto, it will not accord more favorable treatment to its own nationals (National Treatment) or the nationals of third States (MFN). Given that PDVSA (and its affiliates) and other enterprises have all been able to enjoy an exemption from the application of the WPT, Venezuela's position in this arbitration would result in the Claimants being accorded less favorable treatment. In such a case, the unlawful conduct of the State must be disregarded for valuation purposes.

741. The many exemptions provided under the WPT demonstrate a *prima facie* case of discrimination, which shifts to the State the burden to prove that no discrimination has taken place. Venezuela cannot discharge that burden here, in particular given its manifestly incomplete production of documents.

742. First, Venezuela argues that the Claimants were not in "like circumstances", given the fact that they had "a unique contractual framework". This argument collapses when compared to the law. When complying with the requirements, the Claimants would have been entitled to an exemption from the WPT by operation of the law. There is no distinction between entities operating based on a contract or entities controlled or owed by the State or a State-owned company. Venezuela has no difficulty in taking the position that the Claimants are subject to the WPT, despite their special "contractual" grounding, but it then relies on the same argument for its position that the Claimants are not subject to the law's exemptions.

743. Second, Venezuela argues that the WPT would put the Claimants in a less favorable position than the terms of the Association Agreements. The simple answer is that the statute does not

make any difference depending on the contractual arrangements of a concerned entity. Venezuela cannot apply the statute differently to different investors.

744. Third, Venezuela contends that the Claimants cannot show a preferential treatment based on nationality, because both Dutch and non-Dutch investors received windfall profit tax exemptions. This proposition ignores the very purpose of the MFN standard, which is to protect all investors from discriminatory treatment. A State simply cannot immunize itself from liability by discriminating against some but not all investors.

3. The Respondent's Position

745. The Respondent opposes the Claimants' position that their claim entitles them to the benefit of post-expropriation increases in value, and that the taxes would deprive them of such benefit. Nothing in the *Chorzów* decision or anywhere else grants the Claimants immunity from fiscal charges or other post-expropriation events that they do not like. The windfall profits taxes enacted by Venezuela are a legitimate and valid exercise of sovereign taxing authority. Changing circumstances in the international oil industry have prompted governments all over the world to enact fiscal and regulatory changes, including windfall profit taxes, to respond to dramatically increasing oil prices. There is no merit to the Claimants' allegations that Venezuela is trying to "insulate" itself and "negate" the effects of the Tribunal's ruling on unlawful expropriation by applying the windfall profits taxes in its valuation. The Claimants also accuse the Respondent of enacting these taxes specially to reduce the valuation in this Arbitration, but the laws were obviously not enacted for that purpose. The fact is that the new tax had a broad scope of application in the country's oil sector and that Venezuela has collected approximately US$ 12 billion of such taxes in the period 2008 to 2013.

746. The 2011 and the 2013 amendments of the Law contained certain categories of exemptions for (i) activities related to the execution of new projects, (ii) activities to increase production by enhanced recovery in ongoing projects, (iii) export volumes in implementation of international cooperation or financing agreements, and (iv) remediation activities. Exemptions must be approved in each instance, subject to the discretion of the Ministry of Petroleum. A 2013 Ministry directive clarified that (i) base production from ongoing production of existing wells is not eligible for exemptions; (ii) only the volumes of production that result from enhanced recovery activities (including new wells) are eligible for exemptions; and (iii) maintenance activities do not qualify as exemption (R-503, C-615). The Claimants' projects were obviously not eligible for exemptions under the "new" projects category. Exemptions for enhanced recovery or remediation activities were limited to the specific portion of production resulting from such activities; an exemption would not apply to the Projects as a whole. The Claimants' assertions that they could have modified their operations in order to be exempted for "new projects" categories are mere speculation.

747. There is no basis to expect that the Claimants would be granted any exemptions from windfall profits taxes. Having refused to migrate, it is not credible to assume that they would have nevertheless been granted exemptions from windfall profits taxes. The Claimants' argument that in such a case, they would be discriminated against in violation of Article 4 of the Dutch Treaty is unavailing. This provision addresses nationality-based discrimination between investors who are in like circumstances. In the absence of such discrimination, there is no violation. The essential factor is being placed in "like circumstances," when the treatment of a host State national or of a third State national is compared. It is the Claimants' burden to establish all elements of the test. The Claimants did not establish their hypothetical Article 4 claim under anyone of the required elements. They cannot show that the allegedly preferred investors were similarly situated. Thus, merely engaging in activities in the hydrocarbons industry, for instance, is not sufficient. The Claimants cannot be compared to investors engaged in new projects that are in the initial stages, nor can they be compared to investors in old projects. The Claimants had a unique contractual framework, created under the entirely different, pre-migration regulatory framework. None of the mixed companies has compensation provisions in their contracts such as the ones in the Association Agreements.

748. The Claimants cannot demonstrate that the windfall profits tax exemptions made other projects more favorable than the terms of the Association Agreements. In any event, the Claimants have made it quite clear that they did not want to accept the migration. They cannot show the allegedly preferential treatment applied on the basis of nationality. On the contrary, the record is clear that both Dutch and non-Dutch investors received windfall profits tax exemptions. Further, different treatment does not violate MFN or national treatment obligations if there is an objective, rational basis or policy justifying the treatment. The petroleum industry is of critical importance to Venezuela's economy. It was both rational and legitimate for the State to use fiscal incentives as a method of ensuring the vitality of that sector. Finally, MFN obligations are "without prejudice to the freedom of contract". Just as the Claimants obtained unique contractual arrangements, other investors may obtain other arrangements, and the State does not thereby violate MFN or national treatment obligations.

749. The Respondent notes that the Claimants have no answer to the fact that, as testified by Dr. Mommer, if the 2007 Nationalization had not occurred, the Government would have, and legally could have, taken additional fiscal measures to increase "government take". That is what Dr. Mommer had in mind when he described the compensation mechanism as a "contractually defined boundary for excess profit taxation". To compensate the Claimants as if they were immune from such measure would not be a "but-for" world exercise; it would be endowing the Claimants with benefits they never dreamed of obtaining when they entered into the Projects. Another limit is

accepted: "The Government has the right to introduce fiscal measures provided that they are not expropriatory"[545].

750. In sum, the Claimants argument on the windfall profits taxes is both factually incorrect and legally unsustainable on multiple grounds. The Claimants' entire argument on this issue misses the main point, which is that not only would the windfall profits taxes as they were enacted have been applied in the Claimants' "but-for" world, but the Government undoubtedly would have exercised its full sovereign rights to enact additional taxes to capture all excess profits resulting from high oil prices, up to the limit established in the compensation mechanisms established by the price caps agreed for the upgrading projects. While the Tribunal can assume that the State would not have exceeded those limits, thereby triggering the State company's indemnification obligation, it can also safely assume that the State would not have favored the associations that did not wish to accept the new mixed company structure with any more favorable tax treatment than was bargained for at the outset of those projects.

4. The Tribunal's Findings

751. The Tribunal shares the Claimants' view that a date-of-award valuation must ensure that, where there is an unlawful expropriation, any increase in value since the date of expropriation is retained by the injured investor and not diverted to the breaching State. The Claimants should not be deprived of the benefit of improved market conditions. However, such a broad statement mixes the notions of value and benefit. The Claimants argue as if gross revenue alone counts; they do not take account of any decrease in value occurring since the date of expropriation, remaining immune from increase in costs, and ignoring completely any variation in the tax regime.

752. The Tribunal recalls that the expropriation effective on 26 June 2007 was directed against the Association Agreements governing each of the three Projects. The content of the taking was composed of the laws and obligations enshrined in these foundations of the Projects. This necessarily means that any provision relevant for identifying the taxation regime of the Projects is part of what has been "taken", with the effect that the aggrieved party claiming compensation cannot claim more than what it was expected to receive on the basis of the relevant Association Agreement.

753. Since the time of negotiation of the Association Agreements, it was settled that the Government accepted to reduce under certain conditions and within limits that were matter of debate between the Parties the applicable royalties, governmental contributions and taxes. In the framework of the compensation provisions of the Association Agreements relating to Petrozuata and Hamaca, it was clearly established during the negotiations and within express clauses of the

[545] TR-E, 2017 February Hearing, Day 6, p. 1635:9-11 (Kahale).

Congressional Authorizations that the Venezuelan Government remained completely autonomous in the exercise of its sovereign power, including in particular its power to fix the tax regime of the partners in the Association Agreements[546].

754. Therefore, the Tribunal finds that modifications in the tax regime based on the Government's sovereign power were included in what is called the but-for phase of the Projects, subject to potential compensation under the appropriate provisions of the Petrozuata and Hamaca Association Agreements.

755. Additionally, it had also been made clear during the negotiations that the Government's ability to increase the tax burden of the Projects was directly connected to the increase in oil prices. The Government will have its part of the increase in profit resulting from more favorable market conditions for the sale of oil. Even if the Tribunal accepts the Claimants' assertion that, as victims of an unlawful expropriation, they were entitled to enjoy the benefits of the Projects including those resulting from improved market conditions, these benefits did not include a complete release from any increase in the tax regime. Quite the contrary. Such increase in taxes was part of the but-for scenario, as it was also part of an *ex ante* valuation (subject to the difficulty of estimating the increase of taxes to be expected).

756. The Tribunal further notes that the Claimants' position that they were victims of a new tax regime which specifically targeted them for the purpose of reducing their aspiration for compensation resulting from increased oil prices since 2007 does not find support in the legislation and its practical application, nor in the Parties' respective positions in this proceeding. The Government's policy had been clearly communicated to them at that time: The objective was to offer a tax incentive for Development Projects and operators increasing their production until they have recovered their investment[547]; this does not imply a target directed against the Claimants. The Respondent has produced a PDVSA 2013 Management Report demonstrating that over the years 2008 to 2013, an amount of US$ 12,280 million had been collected as Special Contribution under the WPT Laws, with an average of around US$ 3,5 million in the years 2011 to 2013 (R-499). PDVSA's Financial Statements for the years 2011-2013 note amounts in millions of US$ 13.247 (2011), 14.994 (2012)

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[546] For instance, Condition Sixteen of the Congressional Authorization of the Petrozuata Project (C-10A, R-21/92) provided that the provisions of the Association Agreement, and in particular its regime for compensation in case of discriminatory treatment, shall be "without prejudice to the sovereign right to legislate inherent in the very existence of the national, state and municipal legislative branches". The corresponding Authorization for Hamaca stated in its Condition Nineteen: "The Association Agreement, the creation and operation of the Entities and other activities shall not impose any obligation on the Republic of Venezuela or restrict its exercise of sovereign rights, …" (R-93, C-132).

[547] Cf. Minister Ramírez quoted in a PDVSA report of April 2011, C-589; Reuters articles of the same time, C-588, C-590.

and 10,435 (2013)[548]. The Claimants did not object to these figures. If the WPT were directed directly against the Claimants, the PDVSA Offering Circular of 8 November 2013 could not be written without any indication of such purpose. The Circular explains[549] that about US$ 60 million had been funded as social contribution between 2010 and June 2013; this amount is far above what would have been expected as the three Projects' contribution.

757. The Claimants argue correctly that the issue is whether Venezuela could reduce its liability for a wrongful act on the basis of another wrongful act[550]. However, in answering this question in the negative, it is by no means established that the WPT was a wrongful act. The foreign investor entered into a contractual relationship that had as its very basis the possible increase in taxes resulting from increasing oil prices, combined with the relief for compensation in case of a discriminatory action. The Claimants cannot claim the benefit of increasing oil prices after the expropriation while refusing the State's increase of taxes, which may trigger the compensation mechanism, agreed between all partners specifically for such a situation. The rates applicable under the WPT Laws were far below a level where they would have deprived the Claimants of the profit resulting from increasing oil prices. The situation was also considerably less dramatic given the fact that the amendment of 2013 had the effect of reducing the tax burden of the oil companies[551]. Finally, because the WPT was treated as a royalty and not as an income tax, it had the effect of reducing the latter tax by 50%; its financial impact was therefore reduced to half of its nominal terms[552]. The impact of the WPT was also softened by the effects of Article 14 (not observed by the Claimants), reducing the royalty reference price to US$ 70, and later US$ 80.

758. When the Claimants mentioned in their Memorial submitted on 15 September 2008 the first version of the WPT[553], as approved on 15 April 2008, they did not contend that the new tax had for its purpose to capture any future compensation owed to the investors in the three Projects. Such an intention appears all the more so artificial in light of the fact that at that time ConocoPhillips

[548] PDVSA, Consolidated Financial Statements, 2013, 2012, 2011 (C-616, p. 38/pdf). The contribution for 2010 was US$ 392 million; PDVSA, Consolidated Financial Statements, 2012, 2011, 2010 (C-562, p. 41). The respective amounts for 2008 and 2009 were US$ 14,733 and 1,865 million; PDVSA Annual Report 2009, p. 794; this Report contains a list of the projects supported by FONDEN in 2009 (p. 801). The PDVSA Annual Report for 2015 (CLEX-090) contains a list of all annual contributions to FONDEN from 2006 to 2015; the numbers for 2014 are US$ MM 10.400 and for 2015 US$ MM 976 (page 92).

[549] C-610, p. 10, 30, 41, 90.

[550] Cf. TR-E, 2017 September Hearing, Day 18, p. 5179:9-5186:17 (Partasides).

[551] The effect of this decrease was explained in PDVSA's Offering Circular of 8 November 2013 (C-610, p. 4, 35); the decrease between the first six months of the years 2012 and 2013 was US$ 3,810 million (from 6,447 to 2,637).

[552] Therefore, there is no point in claiming that Venezuela introduced a selective tax that attempted to transfer the billions of value of the investment to itself, thus rendering the concept of unlawful expropriation meaningless; TR-E, 2017 March Hearing, Day 15, p. 4387:14-20, 4388:5-10 (Friedman).

[553] Memorial, paras. 253/254.

and the Venezuelan Government were still involved in trying to negotiate compensation for the expropriation that had taken place on 26 June 2007, thus avoiding an arbitral proceeding that had been launched by the Claimants on 2 November 2007[554].

759. The Claimants correctly submit that exports to States with which Venezuela has entered into "international cooperation or financing agreements" would have been an opportunity for exclusion from the WPT Laws. The fact is, however, that no such agreement had been concluded that could have attracted export of oil from the Projects to one of the exempted States. And as the examples of Russia (C-583) and China (C-585, C-601, C-622) demonstrate, such agreements imply a substantial payment from the foreign State (2.2 billion in the case of Russia, and a 900 million bonus from China), for which the WPT exemption constituted a counterpart. The Claimants do not present more than a mere hypothesis of their involvement in such an international agreement, without considering the additional investment that would have been required to obtain the further advantage of being taken out from the scope of WPT. In a but-for scenario, there is no incentive that would have made such an exception agreement attractive for Venezuela, with the effect of rendering the financial equation fixed through the Association Agreements more favorable to the foreign investors.

760. The Claimants' submission that they would have obtained exclusions from the WPT Law on the basis of EOR technology they thought to implement is based on very weak grounds in light of the uncertain future of such technology within the framework of the Association Agreements. More information and evidence would be needed to demonstrate that the supplemental investment required for such technology would off-set the tax payments required under the WPT. In any event, the main part of the production under the Projects would not have been conducted through such modern technology that is the only one that would benefit from an exemption. It must be recalled, indeed, that the exemption did apply to specific projects only, covering in one of the examples referred to by the Claimants steam injection supplied to a set of 5 wells in 2012 and 104 in 2013 (C-615/618), whereas in another, concerning PetroPiar, an exemption was granted in 2013 for a period between April and December 2011 in the amount of about US$ 24 million, leaving a remaining tax amount of US$ 320 million for the same period (R-519, C-606). No exemption could be expected for cold production and for maintenance, which were the Projects' major activities[555].

761. There may have been an opportunity to reduce the exposure to the WPT by selling more oil on the domestic market. However, the Projects were manifestly oriented to sales of oil abroad,

[554] Cf. Interim Decision, paras. 94-131.

[555] PDVSA received exemptions in the amount of US$ million 1,583 (2013), 3,712 (2012) and 1,585 (2011); PDVSA, Consolidated Financial Statements, 2013, 2012, 2011 (C-616, p. 38/pdf). In the years 2012 and 2013 it received a Government grant for US$ 5,241, respectively 6,683 million, which appears in the accounts as a reimbursement through FONDEN (*ibidem*).

oversea. The Claimants refrain from any attempt to quantify the volumes that they would have sold locally with the benefit of being exempted from the WPT[556]. Equally unsupported is the argument that royalty-in-kind payments could have been made. In such a case, the State would have to be interested; no such evidence has been provided for such a perspective[557]. The example of PetroPiar that is supposed to be an "apparent" benefit of this kind is unsupported by the evidence submitted[558].

762. The Claimants complain that Venezuela refused in the disclosure phase to produce all responsive documents relating to the WPT exemptions and how they have been applied. The Tribunal accepts that PDVSA and *empresas mixtas* have been able to be exempted in significant part from the application of the WPT Laws. The Tribunal observes, however, when screening the Financial Statements of the *empresas mixtas* that have taken over Petrozuata and Hamaca, that these Projects have paid substantial amounts to the FONDEN, the entity collecting the special contribution. The Tribunal also finds that the examination of the main options for exemption has shown that the Projects, in a but-for scenario, had little or no chance to benefit in any significant part from being exempted from the payment of the special contribution. And even if there would have been an opening for exemption, the Claimants provide no estimate, nor any evidence, of the amounts of WPT they would have been able to save had they remained in the Projects. Moreover, even if it is true that the Respondent did not disclose all documents it was requested to submit[559], the Claimants did not show whether and to what extent such additional documentation would have demonstrated that it had any more opportunity to obtain exemptions from the WPT Law in the future[560] or the amounts that it would have allegedly saved. For instance, the presentation of all relevant cooperation agreements with foreign countries does not assist in proving that the Claimants would have had the benefit of such an agreement under the prevailing conditions based on the Association Agreements.

763. Given the above conclusion, the Claimants' argument that when complying with the requirements, they would have been entitled to an exemption from the WPT by operation of law,

[556] The Claimants' experts apply the export tax on the basis of the total revenue from the sales, making no discount for sales on the domestic market; cf. CLEX-086, Revenues. The Respondent's experts adopt the same position; cf. BF-406, Contractual FCF.

[557] The Claimants do not observe that such a change in production would imply a decrease in upgrading and costs for the installation of the facilities to deal with Mesa and Merey and to deliver crude oil as royalty payment. The matter had been examined at the Hamaca Board of Directors Meeting of 23 February 2006, upon a proposal made by PDVSA, when ConocoPhillips expressed concerns about the possibility of causing longer term reservoir problems and costs, and further noted that it would be necessary to assure that long term benefits would not be sacrificed for short term benefits (C-342, p. 3/4). Reluctance was equally voiced at the Hamaca Operations Committee Meeting of 8 February 2006 (Figuera Appendix 50, p. 4/5).

[558] Financial Statements, CLEX-094, p. 143, 186, 232/pdf.

[559] For a list of the documents disclosed, cf. Respondent's Post-Hearing Brief, 19 May 2017, para. 203.

[560] Cf. Claimants' Post-Hearing Brief, 19 May 2017, para. 199.

cannot succeed. In addition, Article 12.1 of the WPT on exemption for revenues resulting from new projects states expressly that the applicable parameters will be established by the Ministry, and that the decision will result from a declaration of the Ministry, which means that this Governmental authority enjoys some discretion to accept or deny an exemption in a particular case. Similarly, exports in the framework of political economy and international cooperation are subject to partial or total exoneration on the part of the National Executive (Art. 13), which means that the Government acts in its own discretion. The only more affirmative provision is Article 12.2, providing for an exemption in case of exportation implemented in International Agreements of cooperation or financing; this must be so for the simple reason that the exemption is part of such agreement. When considering this legal framework, applicants for WPT exemptions must expect to be treated differently, depending on whether or not they comply with the legal and administrative requirements. Contrary to the Claimants' position, there is no case for being placed from the outset in "like circumstances", as opposed to "discriminatory treatment".

764. It may happen therefore that the WPT would put the Claimants in a less favorable position than the terms of the Association Agreements, or vice-versa. Contrary to the Claimants' view, the statute may make a difference depending on the contractual arrangements of a concerned entity, for instance in relation to its ability to introduce steam-injection technology. The very terms of the statutory exemptions demonstrate that the statute can be applied differently to different investors, depending upon whether or not they comply with the full set of requirements.

765. The Tribunal notes that while the Claimants insist on having been treated less favorably than other investors who had taken advantage of the available exemptions, they nonetheless do not rely on the very specific provisions on discriminatory action contained in the Association Agreements of Petrozuata and Hamaca. In fact, these provisions may, if the applicable requirements are fulfilled, provide for a legal treatment different from the Claimants' understanding of the WPT and applicable under a but-for scenario[561].

766. In conclusion, the Tribunal finds that the Windfall Profit Tax would have been applicable to the Projects. No case for an exemption has been demonstrated or supported by evidence. The potential relevance of the compensation provisions of the Association Agreements of Petrozuata and Hamaca remains to be examined at a later stage. At this juncture, the accounting impact of the WPT Law has to be determined. It results from the legal structure explained above. The Law and its subsequent amendments operate by layers setting thresholds and margins determining the applicable percentage of the tax. The Law operates a distinction between extraordinary prices and

[561] Cf. Respondent's Post-Hearing Brief, 19 May 2017, paras. 198-201, 210, 216, noting that the compensation provisions would be relevant if the Windfall Profit Tax would be considered as a Discriminatory Action. This has been denied because increases in royalties are allegedly not discriminatory; TR-E, 2017 March Hearing, Day 15, p. 4493:12-4495:2 (Kahale). However, the opposite solution was also accepted as possible; TR-E, *ibidem*, p. 4533:4-4534:5 (Kahale).

exorbitant prices. The first type of price is determined by reference to the difference between the Venezuelan Budget Price and the Venezuelan liquid hydrocarbons basket. The second type of price is defined as a percentage between two prices serving as borderline for each of several categories going up from the Budget Price to different levels of prices as stated in the Law.

767. The Tribunal notes that the Claimants' experts were instructed not to examine the Windfall Profit Tax. They must have done so nevertheless because they reported to the Tribunal that whether or not the WPT is applied, the difference in taxation is 21%, which would be in the Claimants' case a reduction compared to the Respondent's position[562]. They also included in their 2016 December Full Valuation a section on the windfall tax, which follows in large part the presentation prepared by the Respondent's experts[563]. The Tribunal notes that while the Claimants object to the application of the WPT in the present case, they did not raise objections to the application as it has been submitted by the Respondent's experts in their reports and in their calculations as per December 2016[564]. This is mainly of concern for the fixing of the Venezuelan Budget Price and the Venezuelan liquid hydrocarbons basket[565]. The Tribunal further observes that the figures mentioned below reflect the production and the sales as presented above, including the prices stated which are all different from those on which the Parties rely. In particular, the Tribunal will not retain a flat rate for prices relevant in later years of the Projects.

768. Nonetheless, the fixing of the Budget Price requires special attention. This price represents the minimum threshold that triggers the tax rate as soon as and to the extent that the Venezuelan Basket price reaches a higher amount. The Venezuelan Basket represents an average price assessed on the basis of actual oil prices. In the present case, this Basket is in most years very close to the actual prices at which oil was sold in the three Projects[566]. The Budget Price has another function because it determines the minimum level at which the WPT can operate. It contains an important political component of the structure of the windfall profit tax.

769. For instance, when the WPT Law became operational in 2008, the Budget Price was set at US$ 70 whereas the average Venezuelan Basket was US$ 89.55. Article 1 of the Law fixed a tax

[562] Abdala/Spiller, Rebuttal Report, 21 April 2016, para. 55; Consolidated Update Report, 17 November 2016, footnote 12; TR-E, 2017 February Hearing, Day 6, p. 1714:4-1716:4 (Spiller); Claimants' 2017 Post-Hearing Brief, para. 189.

[563] CLEX-086, Windfall, referring to BF-333/335; Abdala/Spiller, Damage Assessment, Presentation, 27 March 2017, slide 27.

[564] BF-406, Special Contribution.

[565] In respect of this basket price also see the Respondent's experts' *Ex Post* Analyses and Projections Calculations as of 31 December 2016, BF-Appendix 408.

[566] For this reason and for the purpose of remaining consistent with the Tribunal's assessment of the future oil prices, the Tribunal proceeds with an adjustment of the Venezuelan Basket price on the same lines. In particular, the Tribunal does not accept the Respondent's experts' method based on flat rates in respect of this Basket as from year 2021; cf. BF-408.

rate of 50% that was to be applied to the difference between this Budget Price and this Basket, *i.e.* US$ 9.77. In other years, the Budget Law set the Budget Price at a lower level, *e.g.* 40, 50, or 60 US$, with the effect that the basis for taxation of extraordinary prices was extended, when considering a hypothesis where the Venezuelan Basket remains constant. The determination of the Budget Price is thus a key element for the assessment of the WPT applicable to extraordinary prices (the latter being set at US$ 70 and later US$ 80).

770. The information available on the Tribunal's record as to the method of setting the Budget Price for each year is poor. The Tribunal can accept the Budget Prices provided by the Respondent's experts for the historical period until the end of 2016 as realistic; the Claimants' experts did not raise objections in this respect although they must have had access to the relevant information that is in the public domain. For the years 2017 to 2020, the Respondent's experts retain a Budget Price of US$ 40[567]. For the years following 2020, they preserve the same rate as a flat rate, staying with the method they have adopted with other oil prices. In respect of the Budget Price, such option is particularly inappropriate. When a flat rate is applied to market rates in the future, it may be argued that the evolution of the market prices is so uncertain that the median rate may most appropriately be set at a flat level. With regard to the Budget Price, the situation is different. This price certainly has a relation to market prices, but it is above all a political reference, because it fixes the minimum threshold from which the WPT on extraordinary prices intervenes. Whether the Budget Price is set, for instance, at US$ 40 or 60 has the impact that the layer for the WPT of 20% for extraordinary prices applies to the price segment between US$ 40 to 70, or 60 to 70, which makes a difference of US$ 4 for each dollar income.

771. A cursory look at the rare budget explanations found on the Tribunal's record demonstrates the political and economic component of the Budget Price. When this price was set at US$ 60 in the years 2014 and 2015, it was said that with such price, the expectations and the uncertainties of the international oil market were valued, also taking into account the vulnerability of oil prices[568]. For these two years, the Venezuelan Basket Price was US$ 88.54 in 2014 and US$ 44.69 in 2015. Noting the decrease of prices in 2015, the Government must have been sensitive to the potential over pricing of the Budget Price in 2015. This had a strong consequence in year 2016, when the Basket Price went down to US$ 32.02: The Government took the Budget Price down to US$ 40, explaining this was a consequence of the decrease of crude oil prices on international markets[569]. This experience demonstrates that a Budget Price of US$ 40 is manifestly linked to a period of low market prices, when the Government must be careful not to raise taxes above reasonable

[567] Cf. BF-406, Special Contribution, filed together with Consolidated Expert Report on Valuation, 17 November 2016; BF-333, Table 5, filed together with Valuation Update, 18 March 2016.

[568] Cf. Explanations provided with the draft law for the fiscal year 2014 (BF-049, page 23) and 2015 (BF-384, page 21).

[569] Cf. the television report dated 1 December 2015, page 2 (BF-385).

proportions. The stability of the fiscal regime confronted with highly volatile pricing was also a consideration. Thus, when the Budget Price was set at US$ 40 in 2011, it was with the intention of taking maximum profit from increasing prices[570], but this approach was then corrected in 2012 when it was noted that a more prudent approach was to be preferred, resulting in a price level of US$ 50[571] that was further raised to US$ 55 in year 2013[572], before it went up again in 2014 to US$ 60. Therefore, when in years after 2016, prices went up or can be expected to go up again it is unconvincing to retain a low Budget Price of US$ 40 for all future years as a flat rate. The Respondent's experts have no explanation for their assumption that such a flat price would apply until the end of the life of the Projects. Their position is untenable when contrasted to the Budget Price the same experts had adopted two years earlier: Indeed, in their calculations annexed to their Second Report of 7 January 2015[573] and to their Expert Report of 18 August 2014[574], the Budget Price was set at a flat level of US$ 60 as from 2014 and until the end of the Projects. Therefore, these experts' own assumptions support a view that the Budget Price of US$ 40 was exceptional for the low-price year of 2016, while prices as experienced in 2014 and 2015 (between US$ 45 and 90) can have the effect of raising the Budget Price to the level of about US$ 60, in order not to overcharge the financial benefit of oil production in Venezuela. The Tribunal concludes that the most reasonable assumption of the Budget Prices retained as from year 2017 is US$ 60, which corresponds to the actual price in the years 2014 and 2015 and to the amount the Respondent's experts have envisaged before oil prices crashed in 2016. The Tribunal further notes that all the pertinent knowledge and experience related to the assessment of the Budget Price in years later than 2016, including its political component, lies in the hands of the Government of Venezuela appearing as the Respondent in the present case. The Respondent is thus fully aware of the relevance of the appropriate determination of the Budget Price and it had the opportunity to provide the Tribunal with evidence beyond its experts' speculations.

772. One other point remains. The Respondent's experts recognized that the WPT substitutes its rates to the rates for royalty and extraction tax above a threshold of US$ 70 and, respectively, US$ 80[575]. They applied these amounts as the maximum limit, in case the actual royalty reference price

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[570] Cf. Explanations provided with the draft law for the fiscal year 2011 (BF-045, page 23).

[571] Cf. Explanations provided with the draft law for the fiscal year 2012 (BF-046, page 23).

[572] Cf. Explanations provided with the draft law for the fiscal year 2013 (BF-048, page 23).

[573] Appendix BF-210, Table 5, filed together with Brailovsky/Flores, Second Expert Report on Valuation, 7 January 2015.

[574] Appendix BF-004, Table 5, attached to Expert Report on Valuation, 18 August 2014. This Report mentions in footnote 328 that this choice had been made, without further explanation.

[575] The Respondent's experts' presentation is not without confusion. In their updated compensation calculation filed with their Second Report dated 7 January 2015, the royalty reference price of US$ 70, later US$ 80, is taken into account (BF-210, Table 4; see also BF-005, Table 4). However, the report itself notes that the royalties are not capped at the prices established by the windfall profit legislation (cf. Second Expert Report on Valuation, 7 January 2015, footnote 315). In the calculation appended to the Consolidated Brief of November 2016, the limits of US$ 70 and US$

based on the Ministry's price formula was higher. This occurred in fact in the high price period from 2011 to 2014 only, whereas in the other years, prices stayed below this threshold. Such a calculation avoids double taxation: The royalty rate of 33.33% is applied on the basis of the total EHCO production, whereas the WPT is applied by reference to the total volume of upgraded oil sold. Article 14 WPT Law requires the separation of the two regimes along the line fixed by the above-mentioned threshold. Below prices of US$ 70 (or US$ 80 as from 2013), the royalty and extraction tax of 33.33% applies; above that limit, this rate is ineffective and replaced by the rates determined by the WPT Law. This price represents the lowest threshold of what the WPT Law qualifies as "exorbitant prices". Prices below that level but still above the Budget Law price fixed for each fiscal year are called "extraordinary prices" where a tax rate of 20% applies (Art. 7) together with the royalty and extraction tax. Above that limit, each of the two tax regimes operates separately. The Tribunal will therefore retain the reference price for Royalties at the appropriate stage as it results from Article 14 of the WPT Law.

773. The calculated terms of the application of the WPT on each of the Projects are as follows:

80 are mentioned as "Reference Price Adjustment by B&F (Cap)"; cf. BF-406, Revenues. The calculations in Appendix 408 do not mention the Royalty price resulting from Article 14 WPT. The experts never mention this provision.

	WPT – Petrozuata						
	MMB	Total Income US$	Sales Price US$	Venezuela Basket	Budget Price[576]	Rate[577]	Tax US$
2007 ½	15,568,593	1,091,981,113	70.14				--
2008	35,700,904	3,119,544,992	87.38	89.55	70	6.15[578]	219,560,559
2009	36,200,000	2,008,738,000	55.49	56.48	70	--	0
2010	36,200,000	2,574,756,000	70.38	71.57	70	0.19	68.780
2011	36,200,000	3,635,204,000	100.42	100.66	40	26.68[579]	965,816,000
2012	36,200,000	3,670,318,000	101.39	103.37	50	32.20	1,165,640,000
2013	36,200,000	3,637,738,000	100.49	101.22	55	23.10[580]	836,220,000
2014	36,200,000	3,201,528,000	88.44	88.54	60	10.80	390,960,000
2015	36,200,000	1,565,288,000	43.24	44.69	60	--	0
2016	36,200,000	1,158,762,000	32.01	32.02	40	--	0
2017	36,200,000	1,706,468,000	47.14	48.42	60	--	0
2018	36,200,000	1,921,496,000	53.08	54.51	60	--	0
2019	36,200,000	1,960,230,000	54.15	55.62	60	--	0
2020	36,200,000	2,100,324,000	58.02	59.59	60	--	0
2021	36,200,000	2,143,764,000	59.22	60.79	60	0.15	54,300
2022	36,200,000	2,187,204,000	60.42	61.99	60	0.39	141,180
2023	36,200,000	2,230,644,000	61.62	63.19	60	0.63	228,060
2024	26,600,000	1,671,012,000	62.82	64.39	60	0.87	231,420
2025	22,100,000	1,414,842,000	64.02	65.59	60	1.11	245,310
2026	19,000,000	1,239,180,000	65.22	66.79	60	1.35	256,500
Total		44,212,022,105					3,579,422,109
1	2	3	4	5	6	7	8

[576] According to the first version of the WPT Law, the reference was US$ 70 and not the Budget Price. The comparison had to be made with the Brent crude price and not the Venezuelan Basket. The Tribunal refers to the actual prices of the oil sold.

[577] The applicable rates are those pertinent for each layer determined by the Decree applicable to any period of time as fixed by the legislation. The prices applicable for each layer are not repeated here.

[578] The rate for 2008 has been adjusted from 8.69 to 6.15 because Decree No. 8.807 entered into force by 15 April 2008 only.

[579] In the year 2011, the rate was 15.21 until April when Decree No. 8.163 entered into force, with the effect that the rate went up to 31.40, resulting in a combined rate for the year of 26.68.

[580] In the year 2013 the rate was 29.15 until 20 February 2013 when Decree No. 40.114 entered into force and reduced the overall rate to 22.00, resulting in a combined rate per year of 23.10.

WPT – Hamaca							
	MMB	Total Income US$	Sales Price US$	Venezuelan Basket	Budget Price	Rate [581]	Tax US$
2007 ½	28,939,154	2,208,346,842	76.31				--
2008	52,430,724	4,792,168,174	91.40	89.55	70	7.58	397,424,887
2009	58,400,000	2,930,512,000	50.18	56.48	70	--	0
2010	58,400,000	4,106,688,000	70.32	71.57	70	0.16	93,440
2011	58,400,000	5,464,488,000	93.57	100.66	40	26.68	1,558,112,000
2012	58,400,000	5,804,960,000	99.40	103.37	50	32.20	1,880,480,000
2013	58,400,000	5,873,872,000	100.58	101.22	55	23.10	1,349,040,000
2014	58,400,000	5,051,016,000	86.49	88.54	60	10.80	630,720,000
2015	58,400,000	2,531,640,000	43.35	44.69	60	--	0
2016	58,400,000	1,720,464,000	29.46	32.02	40	--	0
2017	58,400,000	2,705,672,000	46.33	48.42	60	--	0
2018	58,400,000	3,046,144,000	52.16	54.51	60	--	0
2019	58,400,000	3,108,048,000	53.22	55.62	60	--	0
2020	58,400,000	3,329,968,000	57.02	59.59	60	--	0
2021	58,400,000	3,400,048,000	58.22	60.79	60	0.15	87,600
2022	58,400,000	3,470,128,000	59.42	61.99	60	0.39	227,760
2023	58,400,000	3,540,208,000	60.62	63.19	60	0.63	364,920
2024	58,400,000	3,610,288,000	61.82	64.39	60	0.87	508,080
2025	58,400,000	3,680,368,000	63.02	65.59	60	1.11	648,240
2026	58,400,000	3,750,448,000	64.22	66.79	60	1.35	788,400
2027	58,400,000	3,820,528,000	65.42	67.99	60	1.59	928,560
2028	58,400,000	3,890,608,000	66.62	69.19	60	1.83	1,068,720
2029	58,400,000	3,960,688,000	67.82	70.39	60	2.07	1,208,880
2030	58,400,000	4,030,768,000	69.02	71.59	60	2.31	1,349,040
2031	58,400,000	4,100,848,000	70.22	72.79	60	2.55	1,489,200
2032	58,400,000	4,170,928,000	71.42	73.99	60	2.71	1,582,640
2033	58,400,000	4,241,008,000	72.62	75.19	60	3.03	1,769,520
2034	51,000,000	3,764,820,000	73.82	76.39	60	3.27	1,667,700
2035	47,000,000	3,525,940,000	75.02	77.59	60	3.51	1,649,700
2036	43,000,000	3,277,460,000	76.22	78.79	60	3.75	1,612,500
Total		112,909,071,016					5,832,821,787
1	2	3	4	5	6	7	8

[581] For the calculation of the WPT rate, the observations made in relation to Petrozuata equally apply for Hamaca. For the prices substituted to the Budget Price in the years 2008 to 2010 the sales prices of Hamaca apply.

WPT – Corocoro							
	MMB	Total Income US$	Sales Price US$	Venezuelan Basket	Budget Price	Rate[582]	Tax US$
2007 ½	0	0	0				--
2008	7,182,000	618,801,120	86.16	89.55	70	5.72	410,810
2009	11,483,000	647,641,200	56.40	56.48	70	--	0
2010	13,152,000	942,209,280	71.64	71.57	70	0.58	76,281
2011	13,214,000	1,302,900,400	98.60	100.66	40	26.68	352,549,500
2012	13,479,000	1,340,216,970	99.43	103.37	50	32.20	434,023,800
2013	13,336,000	1,315,996,480	98.68	101.22	55	23.10	308,061,600
2014	12,839,000	1,140,488,370	88.83	88.54	60	10.80	138,661,200
2015	12,069,000	504,846,270	41.83	44.69	60	--	0
2016	11,027,000	365,545,050	33.15	32.02	40	--	0
2017	11,204,000	529,837,160	47.29	48.42	60	--	0
2018	9,411,000	501,135,750	53.25	54.51	60	--	0
2019	8,444,000	458,762,520	54.33	55.62	60	--	0
2020	7,747,000	450,952,870	58.21	59.59	60	--	0
2021	7,205,000	428,049,050	59.41	60.79	60	0.15	10,807
2022	6,765,000	410,026,650	60.61	61.99	60	0.39	26,383
2023	6,268,000	387,425,080	61.81	63.19	60	0.63	39,488
2024	5,741,000	361,740,410	63.01	64.39	60	0.87	49,946
2025	5,508,000	353,668,680	64.21	65.59	60	1.11	61,138
2026	5,297,000	346,476,770	65.41	66.79	60	1.35	71,509
Total		12,406,720,080					1,234,042,462
1	2	3	4	5	6	7	8

C. The Net Revenue

774. The Tribunal will now proceed to determine the Net Revenue that results, year by year, from the Gross Revenue (income minus costs), minus Royalties and all other deductions taken from this Revenue, the sum of which will be the basis for the assessment of the payment of the Income Tax.

775. The first step consists in computing royalties and extraction tax, together with associated contributions. As this has been mentioned in the general observations above (part A), the royalty and extraction tax of 33.33% is taken from a basis composed of three components: (a) the production volume, (b) the reference price, and (c) the applicable rate. The reference price is either adopted by the Ministry (MENPET) or it is reflected by the maximum price determined by Article 14 of the WPT Law (US$ 70 between 18 April 2011 and 20 February 2013, US$ 80 as from 21 February 2013). When the reference price is below the WPT threshold and no Ministry pricing or other evidence is available, the Tribunal determines such price in using its discretion when considering

[582] For the calculation of the WPT rate, the observations made in relation to Petrozuata equally apply for Corocoro. For the prices substituted to the Budget Price in the years 2008 to 2010 the sales prices of Corocoro apply.

the Parties' submissions[583]. In particular, it does not follow the Respondent's experts' flat rate after year 2020 and adopts a slight increase per year of US$ 1, lower than for oil market prices. The basis for this calculation are the volumes of EHCO extracted from the field and used for upgrading to heavy syncrude[584]. For Corocoro, the volumes of extracted oil from the fields below the sea apply.

776. The sales income constitutes the basis for the accounting of various contributions: Science and Technology Contribution of 2%, reduced to 1% with effect as from 2012; Anti-drug contribution of 1%; Social Contribution of 1%; and the Sports Tax of 1% accounted as from 2012. The total is thus 4% for each year. The Tribunal adds to these expenses the export tax of 0.1% (except for the years 2011 to 2014 when Article 14 of the WPT Law applied).

777. The second and final step before reaching the net revenue is to deduct the 50% Income Tax.

[583] The experts of the Claimants and the Respondent use the same reference price for Corocoro for the years 2008 to 2010. In respect of Petrozuata and Hamaca, where year 2007 is to be added, the differences are very small. As it has followed the Respondent's information on actual sales for these years, it will also take the royalty reference price noted by this Party's experts. Cf. BF-406, Revenues, BF-408; CLEX-086, Revenues.

[584] For this reason and given the limited information provided by the Claimants, the EHCO by-pass quantities – anyhow small in their volume – are not included in this counting.

Net Revenue – Petrozuata								
	Royalties			Contribu-tions 4.1%	WPT	Subtotal before Income Tax[585]	Income Tax 50%	Net Revenue
	EHCO	Reference Price	33.33%					
2007 ½	19,531,383	59.14	384,990,160	44,771,226	--	472,948,727	236,474,363	236,475,364
2008	41,398,549	72.04	994,017,744	127,895,400	219,560,559	1,339,837,289	669,918,644	669,918,645
2009	41,785,200	52.50	731,167,875	82,358,258	0	755,684,867	377,842,433	377,842,434
2010	41,785,200	66.18	921,689,333	104,457,996	68.780	1,190,337,891	595,168,945	595,168,946
2011	41,785,200	75.89	1,056,920,573	145,408,160	965,816,000	877,146,299	438,573,149	438,573,150
2012	41,785,200	70	974,890,501	146,812,720	1,165,640,000	934,845,779	467,422,889	467,422,890
2013	41,785,200	78.60	1,094,662,762	145,509,440	836,220,000	1,115,988,798	557,994,399	557,994,399
2014	41,785,200	78.40	1,091,877,361	128,061,120	390,960,000	1,007,280,519	503,640,259	503,640,260
2015	41,785,200	39.61	551,648,753	64,176,808	0	- 123,367,561	--	- 61,683,780
2016	41,785,200	33.96	472,961,163	47,509,242	0	357,685,595	178,842,797	178,842,798
2017	41,785,200	42.49	591,758,534	69,965,188	0	549,182,278	274,591,139	274,591,139
2018	41,785,200	48.28	672,395,905	78,781,336	0	704,658,759	352,329,379	352,329,380
2019	41,785,200	49.33	687,019,263	80,369,430	0	744,517,307	372,258,653	372,258,654
2020	41,785,200	53.11	739,663,350	86,113,284	0	827,442,366	413,721,183	413,721,183
2021	41,785,200	54.11	753,590,357	87,894,324	54,300	828,906,019	414,453,009	414,453,010
2022	41,785,200	55.11	767,517,364	89,675,364	141,180	908,206,092	454,103,046	454,103,046
2023	41,785,200	56.11	781,444,371	91,456,404	228,060	1,034,766,165	517,383,082	517,383,083
2024	30,850,000	57.11	587,222,438	68,511,492	231,420	724,046,650	372,523,325	372,523,325
2025	25,650,000	58.11	496,790,815	58,008,522	245,310	619,797,353	309,898,676	309,898,677
2026	22,000,000	59.11	433,429,986	50,806,380	256,500	534,687,134	267,343,567	267,343,567
Total								7,712,800,170
1	2	3	4	5	6	7	8	9

[585] Determined on the basis of the Gross Revenue (cf. Section VIII/3a), less the taxes noted in this table.

Net Revenue – Hamaca								
	Royalties			Contributions 4.1%	WPT	Subtotal before Income Tax	Income Tax 50%	Net Revenue
	EHCO	Refe-rence Price	33.33%					
2007 ½	31,570,422	58.38	614,298,976	90,544,400	--	1,177,904,466	588,952,233	588,952,233
2008	58,112,475	71.14	1,377,902,686	196,480,200	397,424,887	1,777,164,401	888,582,200	888,582,201
2009	61,374,750	52.16	1,066,995,609	120,150,992	0	694,921,399	347,460,699	347,460,700
2010	61,374,750	65.70	1,343,972,614	168,374,208	93,440	1,968,847,738	984,423,869	984,423,869
2011	61,374,750	75.89	1,552,421,334	218,579,520	1,558,112,000	1,421,764,146	710,882,073	710,882,073
2012	61,374,750	70	1,431,934,292	232,198,400	1,880,480,000	1,166,185,308	583,092,654	583,092,654
2013	61,374,750	78.60	1,607,857,648	234,954,880	1,349,040,000	1,839,695,472	919,847,736	919,847,736
2014	61,374,750	77.82	1,591,901,808	202,040,640	630,720,000	1,476,313,552	738,156,776	738,156,776
2015	61,374,750	39.27	803,315,137	103,797,240	0	- 513,042,377	--	- 256,521,188
2016	61,374,750	33.81	691,624,263	70,539,024	0	412,128,713	206,064,356	206,064,357
2017	61,374,750	42.18	862,847,692	110,932,552	0	700,796,756	350,398,378	350,398,378
2018	61,374,750	47.94	980,670,428	124,891,904	0	1,062,940,668	531,470,334	531,470,334
2019	61,374,750	48,98	1,001,944,880	127,429,968	0	1,150,109,152	575,054,576	575,054,576
2020	61,374,750	52.74	1,078,860,208	136,528,688	0	1,243,615,104	621,807,552	621,807,552
2021	61,374,750	53.74	1,099,316,412	139,401,968	87,600	1,343,860,020	671,930,010	671,930,010
2022	61,374,750	54.74	1,119,772,616	142,275,248	227,760	1,310,797,736	655,398,688	655,398,688
2023	61,374,750	55.74	1,140,228,820	145,148,528	364,920	1,314,572,732	657,286,366	657,286,366
2024	61,374,750	56.74	1,160,685,024	148,021,808	508,080	1,466,348,088	733,174,044	733,174,044
2025	61,374,750	57.74	1,181,141,229	150,895,088	648,240	1,412,927,443	706,463,721	706,463,722
2026	61,374,750	58.74	1,201,597,433	153,768,368	788,400	1,429,855,799	714,927,899	714,927,900
2027	61,374,750	59.74	1,222,053,637	156,641,648	928,560	1,315,471,155	657,735,577	657,735,578
2028	61,374,750	60.74	1,242,509,841	159,514,928	1,068,720	1,389,378,511	694,689,255	694,689,256
2029	61,374,750	61.74	1,262,966,045	162,388,208	1,208,880	1,499,928,867	749,964,433	749,964,434
2030	61,374,750	62.74	1,283,422,249	165,261,488	1,349,040	1,648,634,223	824,317,111	824,317,112
2031	61,374,750	63.74	1,303,878,454	168,134,768	1,489,200	1,699,037,578	849,518,789	849,518,789
2032	61,374,750	64.74	1,324,334,658	171,008,048	1,582,640	1,698,145,654	849,072,827	849,072,827
2033	61,374,750	65.74	1,344,790,862	173,881,328	1,769,520	1,818,071,290	909,035,645	909,035,645
2034	48,300,000	66.74	1,074,406,548	154,357,620	1,667,700	1,804,388,132	902,194,066	902,194,066
2035	44,500,000	67.74	1,004,709,519	144,563,540	1,649,700	1,750,017,241	875,008,620	875,008,621
2036	40,700,000	68.74	932,479,409	134,375,860	1,612,500	1,688,992,231	844,496,115	844,496,116
Total								20,084,885,425
1	2	3	4	5	6	7	8	9

Net Revenue – Corocoro								
	Royalties			Contributions 4.1%	WPT	Subtotal before Income Tax	Income Tax 50%	Net Revenue
	Production	Reference Price	33.33%					
2008	7,182,000	86.79	207,754,482	25,370,845	410,810	112,976,983	56,488,491	56,488,492
2009	11,483,000	56.72	217,083,542	26,553,289	0	198,427,369	99,213,684	99,213,685
2010	13,152,000	71.73	314,432,873	38,630,580	76,281	279,512,546	139,756,273	139,756,273
2011	13,214,000	78.38	345,203,249	52,116,016	352,549,500	371,608,635	185,804,317	185,804,318
2012	13,479,000	70	314,478,549	53,608,678	434,023,800	345,143,943	172,571,971	172,571,972
2013	13,336,000	78.60	349,368,259	52,639,859	308,061,600	435,348,762	217,674,381	217,674,381
2014	12,839,000	80	342,339,096	45,619,534	138,661,200	379,569,540	189,784,770	189,784,770
2015	12,069,000	45.89	184,597,008	20,698,697	0	- 54,169,435	--	- 27,084,718
2016	11,027,000	39	143,336,666	14,987,347	0	131,613,037	65,806,518	65,806,519
2017	11,204,000	48.60	181,486,649	21,723,323	0	173,351,188	86,675,594	86,675,594
2018	9,411,000	54.57	171,168,971	20,546,565	0	194,627,214	97,313,607	97,313,607
2019	8,444,000	55.65	156,620,536	18,809,263	0	172,728,721	86,364,360	86,364,361
2020	7,747,000	59.54	153,736,751	18,489,067	0	170,709,052	85,354,526	85,354,526
2021	7,205,000	60.54	145,382,360	17,550,011	10,807	158,158,872	79,079,436	79,079,436
2022	6,765,000	61.54	138,758,822	16,811,092	26,383	145,386,353	72,693,176	72,693,177
2023	6,268,000	62.54	130,653,839	15,884,428	39,488	131,037,325	65,518,662	65,518,663
2024	5,741,000	63.54	121,582,220	14,831,356	49,946	113,864,888	56,932,444	56,932,444
2025	5,508,000	64.55	118,501,948	14,500,415	61,138	107,117,179	53,558.589	53,558,590
2026	5,297,000	65.55	115,727,876	14,205,547	71,509	100,907,838	50,453,919	50,453,919
Total	181,371,000							1,833,960,009
1	2	3	4	5	6	7	8	9

X. Dividends and Compensation

A. Lost Dividends

778. It was provided for each Project that net profits were distributed to the participants of the Association Agreements through the dividends in proportion to their participation as affiliates, respectively shareholders, in the Project. The payment of dividends was based on the respective By-Laws ("Documento Constitutivo - Estatutos") of the Projects' joint venture companies contained as Annex C to each of the Association Agreements. On this basis, the Claimants submit that they would have received, from June 2007 onwards dividends representing their share of the profits in accordance with their ownership interest. The Parties' valuation experts direct their calculation of the final net amount (without interest and discount) to the respective ConocoPhillips' company's share in each of the Projects[586]. It may be noted that the dividends were not paid out from the joint

[586] Abdala/Spiller, Exhibit CLEX-086 (FCF: "Foregone Dividends"); Brailovsky/Flores, Exhibit 406 (Contractual FCF: "Dividends Foregone").

company to the participants of the Projects. In fact, the money received from the sales was kept overseas and part of it sent to the Projects in Venezuela to contribute to the costs[587].

779. On the basis of the Tribunal's analysis, the corresponding dividends are the following:

ConocoPhillips' Dividends						
	Petrozuata		Hamaca		Corocoro	
	Net Revenue	CPZ - 50.1%	Net Revenue	CPH - 40%	Net Revenue	CPG - 32.2075%
2007 ½	236,475,364	118,474,157	588,952,233	235,580,893	--	--
2008	669,918,645	335,629,241	888,582,201	355,432,880	56,488,492	18,193,531
2009	377,842,434	189,299,059	347,460,700	138,984,280	99,213,685	31,954,307
2010	595,168,946	298,179,642	984,423,869	393,769,548	139,756,273	45,012,002
2011	438,573.150	219,725,148	710,882,073	284,352,829	185,804,318	59,842,926
2012	467,422,890	234,178,868	583,092,654	233,237,062	172,571,972	55,581,118
2013	557,994,399	279,555,194	919,847,736	367,939,094	217,674,381	70,107,476
2014	503,640,260	252,323,770	738,156,776	295,262,710	189,784,770	61,124,930
2015	- 61,683,780	- 30,903,574	- 256,521,188	- 102,608,475	- 27,084,718	- 8,723,311
2016	178,842,798	89,600,242	206,064,357	82,425,743	65,806,519	21,194,635
2017	274,591,139	137,570,161	350,398,378	140,159,351	86,675,594	27,916,042
2018	352,329,380	176,517,019	531,470,334	212,588,134	97,313,607	31,342,280
2019	352,258,654	176,481,586	575,054,576	230,021,830	86,364,361	27,815,802
2020	413,721,183	207,274,313	621,807,552	248,723,021	85,354,526	27,490,559
2021	414,453,010	207,640,958	671,930,010	268,772,004	79,079,436	25,469,509
2022	454,103,046	227,505,626	655,398,688	262,159,475	72,693,117	23,412,655
2023	517,383,083	259,208,925	657,286,366	262,914,546	65,518,663	21,101,923
2024	372,523,325	186,634,186	733,174,044	293,269,618	56,932,444	18,336,517
2025	309,898,677	155,259,237	706,463,722	282,585,489	53,558,590	17,249,883
2026	267,343,567	133,939,127	714,927,900	285,971,160	50,453,919	16,249,946
2027			657,735,578	263,094,231		
2028			694,689,256	277,875,702		
2029			749,964,434	299,985,774		
2030			824,317,112	329,726,845		
2031			849,518,789	339,807,516		
2032			849,072,827	339,629,131		
2033			909,035,645	363,614,258		
2034			902,194,066	360,877,626		
2035			875,008,621	350,003,448		
2036			844,496,116	337,798,446		
Total	7,712,800,170	3,854,092,885	20,084,885,425	8,033,954,168	1,833,960,009	590,672,730
1	2	3	4	5	6	7

[587] TR-E, 2017 March Hearing, Day 13, p. 4005:12-4006:16 (Spiller).

B. The Impact of the Compensation Provisions

780. The payment of compensation in case of Discriminatory Actions based on the Petrozuata and Hamaca Association Agreements is related to the payment of dividends. It is therefore appropriate to deal with this matter following the assessment of the dividends the Claimants would have received if the expropriation had not taken place.

781. Relying on the explanations provided above in Section V/B, the Tribunal, referring firstly to the compensation provision contained in the Petrozuata Association Agreement (Section 9.07), recalls that the operation of the mechanism contained therein requires a Discriminatory Action as defined in Section 1.01 of the Agreement. Such action must be consecutive to a "Development Decision" that results in "unjust discriminatory treatment to the Company or any of its shareholders". Further, such action has as its characteristic element of discrimination the fact that it is "not applicable to all enterprises in Venezuela". For the purpose of triggering the mechanism of the compensation provision, the discriminatory action must produce a "significant economic damage" to the shareholders other than the Class A Privileged Shareholders which are those affiliate to or part of PDVSA; a minimum loss of US$ 6.5 million is required.

782. This definition has an addition that is here important. Indeed, the treatment as defined above shall not be discriminatory if it "equally applies to the enterprises (*empresas*) within the oil industry in Venezuela". This applies, *prima facie,* to the Windfall Profit Legislation that applies to all enterprises in the oil business in Venezuela. The provision has an exception that relates exclusively to income tax; in such a matter, even if generally applicable within the oil industry, the treatment is discriminatory if it is not also generally applicable to most enterprises in Venezuela. This exception does not apply to the WPT that is not designed as an income tax and operates like a royalty.

783. The issue to be decided is therefore whether the WPT applies "equally", or not, to the enterprises within the oil industry in Venezuela[588]. The provision using this term does not define it. Such definition cannot be derived from another law, like the WPT Law, which is a legal instrument separate from the Association Agreement. The fact that the WPT Law contains exceptions to its taxing provisions that all obey to the same legal requirements means that equal treatment is provided to those collecting extraordinary profits and potentially applying for an exemption. Nonetheless, the WPT Law provides for unequal treatment between the operators in the oil industry, because for some companies, exemptions are available, whereas for others, they are not. This also means that for the beneficiaries, an exemption implies a tax release, whereas for the others, the tax

[588] The Tribunal notes that there is a further exception in case an equally applicable treatment within the oil industry has the effect of causing economic damage to the shareholders of the Company that was not actually suffered by government owned companies within the oil industry (Sec. 1.01/a/3). In the present case, such a situation is not demonstrated, although the Claimants point to a great number of exceptions obtained by PDVSA or affiliate companies. The considerable amount of special contribution payments recorded in the Financial Statements of the Projects does not support such an allegation.

applies with its full strength. From the point of view of the rules of the Association Agreement, the WPT Law provides for unequal treatment among participants in the oil industry and potential tax payers targeted by the WPT Law. The Association Agreement, when using the expression "equally applies" does not distinguish depending whether such circumstance is legal or illegal. The simple fact of unequal treatment, including unequal treatment based on the law, is sufficient to cause the situation to become a discriminatory action under the Agreement. In the present case, there is ample evidence that the Claimants and the ConocoPhillips Company participating in Petrozuata in particular did not obtain any of the various exemptions provided by the WPT Law. Compared to all those who enjoyed one or more of those exemptions, the unequal treatment is established.

784. Significant Economic Damage is established on a (fiscal) yearly basis. As was explained in Section V/B above, compensation is determined by reference to the price of Brent Crude Oil deflated or inflated annually to the year 1994 by the US inflation index. In the present case, one hypothesis only is to be retained, *i.e.* the case where the Brent price reached levels above 25 US$ (inflated from 1994). Based on these requirements, the Brent price to be retained year by year was in a range of about US$ 25 and 50[589]. In such situations, compensation is awarded if the economic damage suffered is greater than US$ 75 million (in 1994 $ inflated by the US inflation index). The amount to be compensated is then the greater of 25% of the actual economic damage or the amount resulting from a "sliding scale" set at 100% for a damage of US$ 18 and then decreasing by 14.29% per one dollar (Sec. 9.07/c). In fact, in light of the actual oil prices experienced since 2007, the compensation to be retained corresponds to 25% of the actual damage resulting from the WPT's application in the years where the tax went above the amount of US$ 75 million (inflated as from 1994 by the US inflation index[590]). Further, the reduction of the maximum level for the royalties and extraction tax based on Article 14 of the WPT Law has to be taken into account. The impact of the WPT was less significant when the tax applied to exorbitant prices (above US$ 70, later US$ 80) and the upper royalty level was fixed at these amounts. This relates to years 2011 to 2013 when the official royalty reference price was US$ 89,91 (2011), 92.98 (2012) and 87.85 (2013), whereas the actual price based on Article 14 of the WPT Law was US$ 75.89 (2011), 70 (2012) and 78.60 (2013)[591].

785. The Petrozuata compensation provision contained a number of procedural requirements that can be considered as settled in a but-for scenario, such as the absence of any other legal or administrative action providing a remedy from the application of a discriminatory action (Sec. 9.07/d). In particular, the compensation provision does not address any potential legal action directed against state authorities for the purpose of denying any legal obligation allegedly based on

[589] Leitzinger/Finizza, Expert Report dated 24 July 2009, Appendix 6.

[590] Based on the information provided by the Respondent's experts Leitzinger and Finizza, the respective amounts moved upwards from US$ 75 million to US$ 135 million in 2023 (Expert Report dated 24 July 2009, Appendix 6). Accordingly, the threshold was reached in the years 2008 and 2010 to 2014, but no longer as from year 2015.

[591] Cf. B/F Appendix 408. In 2014, both prices were at the same level of US$ 78.40.

the WPT Law. The right to compensation relates to damages suffered during the fiscal year previous to the year in which the written notice relating to such damage has been sent to the Class A Privileged Shareholder (Sec. 9.07/e). This means that the compensation is paid the year after following the discriminatory action has been implemented. It may be assumed that sufficient cash was available and that therefore the hypothesis of deferred payments has not to be taken into account (Sec. 9.07/a). The figures of the resulting compensation are as follows:

ConocoPhillips' Compensation (Petrozuata)			
	WPT US$	Reduction to Royalty reference price (Art. 14 WPT)	Brent Price higher than $25.00, damage higher than $75MM (both inflated): compensation in US$ the following year
2007 ½	--		--
2008	219,560,559		0
2009			48,038,760
2010	68.780		0
2011	965,816,000	- 195,256,640	0
2012	1,165,640,000	- 320,042,624	45,014,391
2013	836,220,000	- 128,824,817	0
2014	390,960,000		74,484,514
2015	0		101,203,324
2016	0		0
2017	0		0
2018	0		0
2019	0		0
2020	0		0
2021	54,300		0
2022	141,180		0
2023	228,060		0
2024	231,420		0
2025	245,310		0
2026	256,500		0
Total	3,579,422,109	- 644,124,081	286,740,989
1	2	3	4

786. The <u>Hamaca</u> compensation system was both more complicated and less protective in respect of the actual WPT Law. The key point here is that the obligation of Corpoven Sub to compensate the affected party for any material adverse effect (corresponding to a reduction of more than 5% of its cash flow) of a Discriminatory Action suffered in a fiscal year is no longer effective when the price of Brent Crude Oil is equal or greater than US$ 27.00 (not inflated) as from the end of the initial period in December 2007 (Sec. 14.2/b, d and g). In the relevant period as from 2008 when the WPT Law entered into force, the Brent Crude price was always above this threshold.

Therefore, there is no dispute that no compensation results from the Hamaca Association Agreement in respect of the windfall tax[592].

XI. Interest

787. Interest is a component of reparation based on amounts of money. It serves to establish the value of reparation determined at a particular date as it moves forward into the future as from that date. In respect of the historical period from the date of the expropriation in June 2007 up to the end of year 2018, interest can be determined based on real terms, as the Tribunal has already established the net revenue that the Claimants have lost. As from the date of this Award, interest is based on an estimation of the future progress in value of the amounts awarded until effective payment.

1. The Claimants' Position

788. The Claimants submit that compensation for delayed payment is an essential part of full reparation under international law. To the extent that payment is delayed, the claimant loses the opportunity to use the funds for productive ends. The Claimants are entitled to two categories of reparation for delayed payment in this case: (a) compensation for the loss of use of the historical cash flows that they would have received from the date of expropriation up to the date of the Tribunal's final Award; and (b) post-award interest on the total amount of damages awarded, running until the date of full and final payment. The proper measure of compensation in both instances is the same: the Claimants' opportunity cost, as reflected in the cost of equity of the expropriated Projects.

789. Relying on the *Chorzów Factory* case[593], the Claimants contend that the rate at which lost cash flows should be updated to present value or increased by interest must ensure that they are restored to the same position it would have enjoyed had the expropriation not occurred. In both scenarios, the loss to the claimant is the opportunity cost of having been deprived of the funds in question. The Claimants were deprived of the periodic dividends generated by the Projects, and were instead, de facto, forced to reinvest those funds into the Projects. The minimum rate is therefore the Projects' cost of equity. A claimant may rightly select interest at its opportunity cost of

[592] Cf. TR-E, 2017 February Hearing, Day 6, p. 1555:3-8, 16-18 (King), p. 1714:12-14 (Friedman), p. 1649:16-1650:7, 1730:22-1731:4 (Abdala); 2017 March Hearing, Day 11, p. 3327:18-3328:2 (Spiller); Claimants' 2017 Post-Hearing Brief, footnote 342. Venezuela's Counter-Memorial, paras. 69-74; Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, footnote 725; TR-E, 2017 February Hearing, Day 6, p. 1809:19-1811:4 (Brailovsky); Leitzinger/Finizza, Expert Report dated 24 July 2009, paras. 59-62.

[593] Permanent Court of International Justice, *The Factory At Chorzów (Claim for Indemnity) (The Merits), Germany v. Poland*, Judgment No. 13, 13 September 1928, 1928 P.C.I.J. (ser. A) No. 17 (CL-84).

capital. This is particularly true for a business operating under an on-going concern. The expropriation meant that the periodic dividends that would have been generated by the Projects and distributed to the Claimants from the date of expropriation onwards were not in fact distributed. Instead, these dividends were effectively retained – forcibly reinvested – in the Projects. The Claimants should therefore be compensated for the risks of the compelled investment.

790. The Claimants explain that this approach has been endorsed by the tribunal in *Vivendi v. Argentina*[594]. The tribunal ultimately ordered pre-award interest based primarily on the claimant's cost of capital, noting that the proper rate should be a reasonable proxy for the return claimants could otherwise have earned. Similarly, the tribunal in *France Telecom v. Lebanon* awarded pre-judgment interest at 10%, noting that this rate reflected the reasonable profitability of the capital of which the claimant was deprived[595].

791. In *Alpha Projektholding v. Ukraine*, the tribunal updated past-due sums based on the "risk-free rate plus the market risk premium", for a total interest rate of 9.11%, reasoning that "this rate better reflects the opportunity cost associated with Claimant's losses, adjusted for the risks of investing in Ukraine"[596]. Thus, the tribunal recognized that a risk-free rate, alone, would under compensate the claimant. The tribunal in *ConocoPhillips v. PDVSA* awarded compound pre- and post-award interest at a rate corresponding to the Projects' then existing cost of equity, determined using the ICAPM method (10.55%)[597].

792. The principle of opportunity cost was also recently applied in determining the applicable interest rate in *SAUR v. Argentina*[598]. Rejecting a simple risk-free interest rate as unreasonably low, the tribunal instead adopted the agreed rate of return of the project at issue. It identified this rate as the Weighted Average of Capital (WACC), which the tribunal also applied to the discount rate – describing this as the rate at which the claimant investor was prepared to continue its long-term investment.

793. For all these reasons, the Claimants' historical lost cash flows should be brought to present value by applying the Projects' cost of equity as the update factor. The Claimants' experts have

594 *Compañía de Aguas del Aconquija S.A. & Vivendi Universal S.A. v. The Argentine Republic*, ICSID Case No. ARB/97/3, Award of 20 August 2007 (CL-42).

595 *France Telecom Mobile International, S.A. v. Lebanese Republic*, UNCITRAL, Award dated 31 January 2005 (CL-307).

596 *Alpha Projektholding GmbH v. Ukraine*, ICSID Case No. ARB/07/16, Award dated 8 November 2010, para. 514 (CL-253).

597 *Phillips B.V. v. Petroleum Company Venezuela Limited & ConocoPhillips Petrozuata Petróleos de Venezuela, S.A.* (ICC 16849/JRF), Award dated 17 September 2012 (CL-255).

598 *SAUR International S.A. v. Argentine Republic*, ICSID Case No. ARB/04/4, Award dated 22 May 2014 (CL-341).

calculated the Projects' historical cost of equity at 13.0%. They apply this update factor for their 2016 (and 2007) valuations[599].

794. The Respondent objects to this approach and submits that it cannot be known what the Claimants would have willingly chosen to do with dividends from the Projects in a but-for world. Their experts go so far as to argue that the update factor should be the risk-free rate. In fact, the Claimants remained investors in the Projects, and remained exposed to the Projects' risks. The dividends that would have accrued to the Claimants were by compulsion reinvested into the Project.

795. The Respondent demands that the Tribunal apply an extremely low update factor of 1.30%. It essentially assumes that the Claimants would have put their money in a savings account. This update factor, as proposed by the Respondent's experts, is also unjustifiable in light of the 27.7% and 19.8% discount rate they propose for the 2016 and 2007 valuations. According to the experts, the risk associated with the cash flows generated by the Projects is 1.30% for historical cash flows, but 27.7% (or 19.8%) for future cash flows[600]. The asymmetry in the discount and interest rates proposed by the experts has the effect of artificially reducing the Claimants' recovery for both historical and future cash flows. This result is incompatible with the principle of full reparation.

796. The Claimants also note that a failure properly to compensate them for their opportunity cost would not only undermine the principle of full reparation, but would also lead to the unjust enrichment of the Respondent. By not paying compensation to the Claimants for the expropriation, Venezuela has had free access to the funds that it wrongfully appropriated. It was receiving the earning capacity of the borrowed money without compensation to the Claimants. The reasonable cost that Venezuela would have incurred in borrowing the amount in question is the rate at which investors lend to Venezuela, *i.e.* the yield on its sovereign debt. At present, that rate is close to 24%. The average rate since the date of expropriation has been approximately 15%. This is higher than what the Claimants seek.

797. Moving to post-award interest, the Claimants submit that the considerations are the same. The opportunity cost to the Claimants is the same: the Projects' cost of equity. The only difference is that the present-day cost of equity figure should be used, which is 15.2%.

798. The Claimants further contend that both the update factor and post-award interest should be granted on a compound basis. The Respondent claims that simple interest is called for by both Venezuelan law and international authorities. This is wrong on both counts. Principles of Venezuelan law play no role in an analysis based on customary international law. The prevailing trend

[599] Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 103, table 5.

[600] Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 662, table 43.

among investor-State arbitration tribunals is to award compound pre-award interest, as an element of full reparation for violations of international law. The *Occidental* tribunal concluded that the recent practice in favor of compounding interests accords with the *Chorzów* principle[601]. It is the norm in recent expropriation cases under ICSID. Accordingly, historical lost cash flows should be updated to present value at a rate of 13.0%, and post-award interest should accrue at a rate of 15.2%. Both should be subject to reasonable compounding, under an annual periodicity, because the cost of equity is calculated on the basis of expected annual returns. The Tribunal would also be justified in applying a rate of 15%, Venezuela's average borrowing rate since the expropriations.

2. The Respondent's Position

799. The Respondent submits that it would be appropriate to deny any pre-award interest in this case, for two reasons. First, if the Claimants had accepted the generous offers made to them in 2007, instead of insisting on compensation "on top of the fair market value of the assets", this Arbitration would never have been necessary. Second, if the Claimants had not misled this Tribunal with their misrepresentations on the compensation negotiations, this case in all likelihood would have ended long ago. If any interest is to be awarded, it should be calculated as provided below, depending upon whether the valuation made is with or without taking into account the compensation provisions of the Petrozuata and Hamaca Projects.

800. If the first alternative applies, the Respondent notes that the Parties agree that pre-award interest (if any) for the Petrozuata and Hamaca Projects in both the *ex ante* and *ex post* scenarios applying the compensation provisions should be calculated using the interest rates specified in these provisions. For Petrozuata, the interest rate is the LIBOR for 12-month deposits, in accordance with Sections 1.01 and 9.07(d) of the Petrozuata Association Agreement. For Hamaca, the interest rate is the 3-month LIBOR, as specified in Section 14.3(d) of the Association Agreement.

801. There are only two remaining differences between the Parties with respect to the calculations of pre-award interest. First, the Claimants apply compound interest, whereas the Respondent uses simple interest. Simple interest is called for by both international authorities and Venezuelan law. Although the Claimants have argued that compound interest is the norm in international arbitration, this is contradicted by a long line of authorities, including the *Yukos* Awards, where the tribunal not only applied simple interest to the pre-award period but also granted a 180-day grace period for payment of the award during which no post-award interest applied[602]. With respect to Venezuelan law, which governs the Association Agreements, compounding is allowed in only two

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[601] *Occidental Petroleum Corporation and Occidental Exploration and Production Company v. The Republic of Ecuador*, ICSID Case No. ARB/06/11, Award dated October 5, 2012 (CL-256).

[602] *Hulley Enterprises Limited (Cyprus) v. The Russian Federation*, UNCITRAL (ECT), PCA Case No. AA 226, Final Award dated July 18, 2014 (R-424); *Veteran Petroleum Limited (Cyprus) v. The Russian Federation*, UNCITRAL (ECT), PCA Case No. AA 228, Final Award dated 18 July 2014 (R-426).

situations contemplated in Article 530 of the Venezuelan Commercial Code (R-166), neither one being applicable in this case. Therefore, only simple interest can be awarded. The second difference is due to an arithmetical error on the part of Claimants in their *ex ante* valuation, when they calculated interest individually for each of the Hamaca and Petrozuata Projects, and then added those numbers. The error results in an amount of US$ 135 million.

802. In the scenario where the valuation is disregarding the compensation provisions, the Respondent notes that a huge gap remains between the Parties. The Claimants propose a figure of 13%, using a cost of equity analysis that is wholly inappropriate to the determination of pre-award interest. The Dutch Treaty establishes that compensation for expropriation should "include interest at a normal commercial rate" (Article 6c). The Claimants argue that the Treaty standard does not apply "where a respondent has expropriated in violation of the Treaty's requirements, as Venezuela has done here". There is now no doubt that the Tribunal's decision on bad faith is unsustainable; this should dispose of the Claimants' attempt to avoid the Treaty standard.

803. It is well established that pre-award interest should be based on a short-term, risk-free rate, reflecting the borrowing costs that the Claimants would normally expect to incur on a commercial basis in a "but-for" world. If the Claimants had planned investments to be financed with the dividends from the Project, they could still have made them with short-term borrowing. This approach is supported by a wealth of authority. On this basis, the Respondent's experts concluded that the appropriate rate should be the three-month US Treasury rate plus 1%. The same approach should be followed in respect of post-award interest.

804. The Respondent objects that the Claimants' experts' interest rate of 13% is based on the flawed premises that the Claimants were "forced" to reinvest historical cash flows in the Projects and they should therefore be compensated for the risks of that compelled investment. That approach would in effect compensate the Claimants for risks that they did not bear rather than place them back in the position they would have occupied in a "but-for" world. The flaws in Claimants' "cost of equity" approach have been repeatedly exposed in commentary and arbitral decisions.

805. The Respondent also refers to the decision in *Tza Yap Shum*[603], where experts from the same consulting firm than Claimants' experts in this case argued that it was not appropriate to use the claimant's cost of equity to calculate pre-award interest. The use of financing costs is not appropriate when the risk premium included in those costs disappears at the moment the company is expropriated. The *Tza Yap Shum* tribunal rejected the idea that interest should correspond to the cost of equity of the investment and awarded interest at a rate tied to US Treasury bonds.

[603] *Mr. Tza Yap Shum v. The Republic of Peru*, ICSID Case No. ARB/07/6, Award dated July 7, 2011 (R-566).

806. The Respondent also replies to the Claimants' argument that a "comparable rate" should be used for interest and discount rate. In its view, the opposing Party ignores the fact that the discount rate applies to future cash flows, which are affected by all relevant risks, while the interest rate applies to historical cash flows, which are not affected by those risks. The recent *Vestey* award rejected claimant's approach, finding that it would reward them for risks that they had not born[604]. The tribunal also rejected the claimant's alternative that the interest rate should be the cost of capital of the investment, finding that this would compensate it for risks that it did not assume after the expropriation. The *Vestey* tribunal ultimately found that the appropriate interest rate was a risk-free rate applicable to US currency debt, *i.e.* the six-month US Treasury bond rate, noting that this conclusion was supported by the practice of international tribunals.

3. *The Tribunal's Findings*

807. In light of the explanations provided above and the detailed analysis of the negotiations between the Parties and of the representations made in this respect, the Tribunal can refer to its Interim Decision dated 17 January 2017, thus replying to the Respondent's argument that this Arbitration may not have been necessary.

808. The Tribunal also notes that the question to be answered here is not simply one about "interest". Interest represents generally a proportion of an amount lent, deposited, or borrowed. Such proportion is usually expressed through a percentage representing interest, or a rate. Interest is a profit derived from an amount of money. However, profits other than interest can result from such amounts. This is the case when capital is invested for the purpose of production of goods and services that have values that may be expressed in terms of money, but that are not interest.

809. In the instant case, the principal capital from which an eventual profit is to be determined are the dividends the Claimants were entitled to receive in a but-for scenario on a yearly basis and for each of its respective Projects. The Claimants argue that they were "forced" to leave these dividends in the Project. While the term "forced" may not be appropriate, the fact is that the amounts corresponding to each of the Claimants' share of dividends remained in the Projects. They were not paid to these Parties and they were not consigned in a separate account or used for any other special purpose distinct from the Projects' operation. As a simple matter of fact and contrary to the Respondent's assumption, the dividends could not have been used by the Claimants for the purpose of financing other investments. The profit resulting from the dividends, as they remained in the Projects, cannot be compared to the costs for short-term borrowing of money on the market.

810. The Tribunal has already determined that the profit accruing to the Claimants during the historical period from the Projects' operation in the hypothesis the Association Agreements would

[604] *Vestey Group Limited v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/06/4, Award dated April 15, 2016 (BF-502).

have continued to apply as if no expropriation had taken place. That profit was retained by the Respondent from the dividends it withheld, which would have accrued if the but-for operation of the Projects is considered together with the assumption that these dividends were not released and remained in the Projects' accounts. The situation is therefore completely different from the Respondent's hypothesis where the Claimants would have borrowed money on a short-term basis at a rate of 1.5%. Even if that would have been done, the fact remains that the Projects' holder retained the amounts reserved for the payment of dividends, including its inherent potential of profit resulting from the Projects' operation[605].

811. As a matter of fact, these dividends remained part of the Projects' resources and were undoubtedly used in support of the Projects' operation. They represented therefore an additional resource for the Projects, corresponding – in a but-for scenario – to an increase of the Claimants' financial support and investment. Such an increase served the financing of the Projects. Its value must be determined, however, not on this basis alone. It must include the profit generated by the Projects in proportion to the investment made.

812. The Claimants' experts have used as reference the cost of equity required from an investor as a minimum rate at which it could be convinced to postpone the collection of the dividends[606]. The loss suffered by the Claimants in this respect resulted in an increase of the investment in the Projects through the retention of dividends not paid out. Such reference is project-related and not related to the equity market.

813. The Claimants' experts observed that, in principle, the Claimants would have voluntarily reinvested additional monies in the Project only if they expected to receive back at least the Project's cost of equity. The cost of equity of the Projects is the minimum rate at which such investors would have voluntarily reinvested additional monies in the Projects[607].

814. While the Claimants' experts' principle is clearly set out, the resulting figures are difficult to understand. The Consolidated Report refers in a footnote to other reports where the respective rate was determined as 10.6% (2007), 10.8% (2008), 11.7% (2009), 11.8% (2010), 14.5% (2015) and 15.2% (2016), and the appropriate rate for the full historical period as 13%[608]. The experts

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[605] The Tribunal also notes that the awards referred to by the Respondent for its approach retain the date of expropriation as valuation date. Cf. *Mr. Tza Yap Shum v. The Republic of Peru*, ICSID Case No. ARB/07/6, Award, dated July 7, 2011, paras. 286-292; *Vestey Group Limited v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/06/4, Award dated April 15, 2016, paras. 436-449 (BF-502).

[606] Cf. Abdula/Spiller, March 2016 Update, 18 March 2016, para. 65.

[607] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, para. 84.

[608] Consolidated Update Report, 17 November 2016, footnote 35, para. 103. General explanations (not related to numbers) are given under paras. 27, 96-99. In another report, the percentages were 14.5% for May 2014, 15.4% for October

further refer to their April 2016 Report, where these numbers are not mentioned or explained, further reference being added to two earlier reports[609]; the main focus is the criticism of the Respondent's experts' suggestion to retain a risk-free rate of about 1.5%. The experts' October 2014 Report simply repeats that the rate for historical cost of equity was 11.7%, further pointing to the discrepancy in the Respondent's experts' position when they adopt an actualization rate of 1.4% for past cash flow, whereas they retain 23.3% for the discount rate applied to future cash flow[610]. The May 2014 Report also mentions the 11.7% rate[611]. The matter has then to be traced back to the LECG Second Report where it is stated in a footnote that the experts determined that the costs of equity of the Projects are 11.87% for Petrozuata, 11.88% for Hamaca and 11.70% for Corocoro as of September 30, 2009[612].

815. On the other hand, retaining low rates for interest, like the 1.4% rate suggested by the Respondent, would make it substantially attractive for the Project holder to borrow money from the investor at such rate through the retention of dividends not released, instead of paying a significantly higher market rate for borrowing money (as the rates around 8% that were paid to the Petrozuata's bond holders, or the 1.5% rate suggested by the Respondent in case of a short-term borrowing). Even if it were considered that the Claimants do no longer bear the risks of the Project, they were entitled to receive the profit resulting from their investment at a value taking into consideration the inherent risk factors of their investment. If it is assumed that the dividends that were not distributed were used to cover costs, like CAPEX or OPEX, the reduction in financing such costs would also represent a value corresponding to the reduction of the profit to be received by the shareholders which does not correspond to the rate they would have to pay for borrowing short-term money on the financial market. In any event, it seems highly unrealistic to assume, as the Respondent's experts seem to do, that an investor would find money to borrow on the exclusive basis of risk-free rate at the level between 1% and 2%, when the Project includes an industry risk and a (specific) country risk component that raises the cost for equity far above 10%, as accepted by these experts in their own submission in respect of the value of dividends in case of a discount of future profits.

2014, and 16.7% for March 2016, also concluding at an average rate of 13%; March 2016 Update, 18 March 2016, footnote 30.

609 Rebuttal Report, 21 April 2016, paras. 63-67

610 Cf. Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, paras. 14, 78-80, 109-111, 248.

611 *Ibidem*, footnote 26, para. 76.

612 Second Valuation Report of ConocoPhillips' Investments in Venezuela, 2 November 2009, Appendix A, footnote 7. The percentages provided are not explained, neither as such nor in comparison to the cost ratings for the discount rate – of about 1% to 2% lower –, which seems to be related to the impact of the cost of debt rate. Further reference is provided in LECG-237, where numbers are supported by further numbers but not explained as to their pertinence.

816. The Tribunal finds that the Respondent's approach to determine interest on dividends is not acceptable, the same way as it is not acceptable that the host State retains earnings from the sale of crude oil while paying the expropriated investor a minimal price having no relation to market prices. It appears unreasonable that the Respondent's Projects' holders would retain dividends over years and make profit resulting from it at the rate inherent in the Projects' operational configuration, while the Claimants would have to be content with the most minimal rate available on the money market. Such rate would not cover the risk inherent when the Claimants would use the borrowed money for the purpose of an investment into the Projects.

817. The rate of profit resulting from the dividends, or, as it may be simply said, the interest resulting from such principal capital has the function that it should reflect the profit the investor can expect to receive from the Project in light of all of its operational circumstances. Such interest should not be below this level, because this would have the effect of providing the holder of the Project with an undue advantage because it would retain money at a lower cost than what it would have to pay when borrowing money from an investor[613]. On the other hand, the Claimants' claim for recovery based on the profit resulting from the dividends not released should not be higher than this level, unless there would be evidence for serious expectations that the resulting benefit from the equity withhold in the Project would be significantly higher. It would be contradictory, as this results from the Respondent's and their experts' arguments, to simply say that the Claimants having left the Projects in June 2007 have no longer been in a position to support any risk in the Projects and that, therefore, their indemnification must be reduced to a risk-free level on the money market. Such reasoning ignores that in a but-for scenario where no expropriation had taken place, the Claimants would have been entitled to retain profits arising from the Projects by taking account of all risks underlying the determination of such profits. This is what has been "taken away", not the costs for borrowing risk-free money.

818. Therefore, the appropriate rate must be set at a level at which the investor expects to retain a profit, by keeping the amount corresponding to the dividends within the Projects. Such rate should represent the sum of risks inherent in the Project and expressed in the form of a proportion of profit, or interest. It represents the level at which the investor, all factors considered, accepts to assume the investment in considering the assessment of risks related to the Projects' operation.

819. The Claimants and their experts use the term "update factor" as an equivalent to interest that has the purpose of compensating the damaged party for the time delay in collecting the funds of which it was deprived between the date of deprivation and the date of the Award. In other words, the Claimants are to be restored to the position they would have had if the collection of dividends had not been interrupted through the expropriation and they would have decided willingly to retain those dividends within the Project. In such a case, the Claimants' bargain represents the return at

[613] Cf. *Phillips B.V. v. Petroleum Company Venezuela Limited & ConocoPhillips Petrozuata Petróleos de Venezuela, S.A.*, ICC 16849/JRF), Award dated 17 September 2012, para. 295 (CL-255).

the minimum level at which they would have expected to make a profit. The update factor is equal to the Claimants' cost of equity for financing the investment in the Projects. It reflects the increase in value actualized to the date of valuation.

820. The Tribunal assumes in a first step that the cost of equity determined by the Claimants' experts is correct. This interest has been initially set at 11.7%, but in the course of the economic development came up to 15%, resulting in an average of 13%. The Respondent must fail in its position that the value of the dividends withheld in the Projects should be brought forward at a level of around 1.5% as if these amounts had been set aside in a bank account or borrowed from a bank. The Respondent did not comment further on the percentages indicated by the Claimants, except through its basic rejection of the approach adopted by the Claimants' experts. Nevertheless, the Claimants' experts' information is incomplete and of limited evidentiary support. First, neither the initial figure of 11.7% nor the later percentages were supplied with explanation or further documentary evidence. Second, the information for several years is missing, before the rate climbs over 14% in 2014 and 15% in 2015, a difference that would normally call for reasons to be given. The average of 13% submitted by the Claimants thus represents a number having uncertain foundation, in particular in light of the important consequences that are drawn therefrom in respect of the updating[614].

821. Further, the Tribunal notes that the rate for historical cost of equity suggested by the Claimants' experts is based on the assessment on profits derived from the Composite Economic Model (CEM), including in particular the figures on production and costs that were retained at that time, by the end of 2006 and still applicable before the expropriation. The update factor may have been set at 13% at that time, but such percentage must be adjusted in light of the conclusions the Tribunal reached in this Award in respect of production and costs. The Tribunal found different quantities and amounts in this regard, after a detailed analysis of production and costs of each of the three Projects. This examination was based on all of the elements of evidence on the Tribunal's record, based on a prudent and realistic assessment. Compared to the Model the Parties use as prepared towards the end of 2006 and still reliable in June 2007, the Tribunal's assessment is different. The said Model was based on business estimations that were certainly prepared seriously, with a high degree of professionalism, but they may also have received an input of optimism that may have designed the future of the Projects better than what it finally became. It may be sufficient to note here the cliff on productivity as of the end of year 2023 that affected the Petrozuata Project that was not recorded in the early Model of 2006, and the difficulties the Hamaca upgrader was facing. The Tribunal has thus adopted values in respect of both production and costs significantly different. The effect of these differences is that the overall profitability of the Projects appears reduced in comparison to the initial estimation in the CEM. The Tribunal measures the overall impact of such

[614] At the 2017 March Hearing, the average of 13% was confirmed and further explained as being obtained by reference to the average stock market return of the largest five companies of a sample, thus obtaining 11%; TR-E, 2017 March Hearing, Day 11, p. 3342:5/6, 3343:7-21 (Spiller).

reduction in proportion of profit at about 25%, comparing the figures retained in the CEM to those retained in this Award. This leads to a reduction of the project related update factor from 13% to 9.75%.

822. Cost of equity represents amounts re-invested in the Project. However, the amounts re-invested do not have the effect of increasing dividends. They contribute to the financing of the projects, in one way or another; when this is accomplished, they do not further improve the financing or increase the investment. In other words, the year-by-year value increase generated from the dividends remaining in the Projects does not produce an effect comparable to the compounding of interest.

823. Once the dividends and their update value have been determined for the historical period between the date of the expropriation and the date of end 2018 retained by the Award, the question may be raised and has to be answered whether the resulting amounts should be discounted back to 26 June 2007, the date of the expropriation, when the right for compensation originated from Article 6c of the BIT. At that point in time, the right for compensation could not have been assessed otherwise than through a discount of the estimated future profits resulting in favor of the Claimants had they remained on the Projects. Some of the decisions quoted by the Claimants in support of the allocation of pre-award interest also deal with the allocation by reference to the date of the injury. They have accepted that the resulting amount be discounted to the time of the expropriation or any other violation of a BIT relevant in the particular case[615]. The *Alpha* Tribunal awarded pre-award interest, as the Claimants noted correctly, but the Tribunal also ruled that the future revenue streams were to be discounted to the day of the expropriation[616]. In the case of *Telecom*, the Claimants note that a pre-judgment interest of 10% was awarded; this had been done, however, in combination with a discount back to the date of the breach of the BIT[617].

824. However, when the value of future revenue is to be determined, or *ex post*, any discount is justified only in a situation only where payment of compensation is to be assessed as per the day of such payment, together with an appropriate commercial interest. Such discount cannot operate in relation to amounts of money that are assessed on the basis of actual facts in the historical period, resulting in profits that are not owned in the future but were due to the Claimants had they remained in the Projects. In the present case, no compensation was provided by the Respondent as from the

[615] The relevance of the *Vivendi* award seems doubtful in this regard in light the fact that the claim for lost profit was rejected for lack of evidence. Cf. *Compañía de Aguas del Aconquija S.A. & Vivendi Universal S.A. v. The Argentine Republic*, ICSID Case No. ARB/97/3, Award of 20 August 2007, para. 8.3.11 (CL-42). The Tribunal noted that the claim for anticipated future cash flow was discounted (para. 8.1.2).

[616] *Alpha Projektholding GmbH v. Ukraine*, ICSID Case No. ARB/07/16, Award of 8 November 2010, paras. 481-483, 491, 493, 497 (CL-253).

[617] *France Telecom Mobile International, S.A. v. Lebanese Republic*, UNCITRAL, Award dated 31 January 2005, paras. 202, 209 (CL-307).

day when it was owned to the Claimants based on Article 6c of the BIT. Therefore, the Claimants' claims are to be evaluated at their value at the time of this Award, including profits accruing in a but-for scenario up to that date. Any discount back to 2007 would result in an enrichment of the Respondent who would retain the difference between (i) the profits it would have obtained had it operated the Projects under the circumstances pertinent in case no expropriation had taken place and (ii) the discounted amount that would be left for the Claimants, together with interest determined at a commercial rate.

825. The Tribunal has noted that the argument could be made – in light of the duration of this proceeding – that in case the Claimants would recover the full benefit accruing during the historical period (until the time the Award is rendered), and assuming that the earnings allocated for the post-award period are discounted, the Claimants would recover a benefit simply through the passage of time during which the arbitral proceedings are moving forward. The profit accruing from the Projects in a but-for scenario that the Claimants' claim to be applicable appears to be higher than the recovery of the discounted post-award dividends. It would seem, so the argument, that such ongoing accrual of benefit is not based on any causation link to the expropriation. The Tribunal notes, however, that the argument is misleading: the difference between pre- and post-award allocation of moneys is not based on a variation in the valuation of the Claimants' benefit (before and after the time of the award). It is based simply on the fact that at the date of the Award, the Claimants receive their future profits, determined on the same basis than for the historical period, together with a discount that accounts for the fact that they receive – or should receive – the future profits awarded by the Tribunal at the time of the Award and not in later years when they would be due had the Claimants remained in the Projects.

826. Finally, with regard to post-award interest, the main question that arises is whether there are grounds for diverging from the method and rates applied to pre-award interest.

827. The Tribunal notes that the damage incurred by the passing of time is largely the same after the issuance of the Award as before. However, after the issuance of the Award, the compensation of the Claimants' losses is no longer based on the Projects nor does it further result from their investment. The purpose of post-award interest is to compensate the loss suffered by the Claimants due to the fact that the discounted value of future dividends has not been paid and the corresponding amount was not available to the Claimants for their usual business, separate from the Projects. Therefore, there is no necessity based on logic or economics that would require the updating interest of the historical profits to be the same as the interest bringing the value of the Award forward until effective payment. This does not mean, as the Respondent submits, that the increase of the value of the outstanding amounts should be measured through interest factors used for saving money on bank accounts. The Claimants' activity consists of operating business opportunities in the oil industry. Therefore, the interest should reach a level corresponding to the financing of such opportunities. As will be explained below when concluding about the appropriate discount rate, the

pertinent industry risk premium is 5.5%. The same percentage shall serve as post-award interest rate. If the interest was not set at this level, the Respondent would have an incentive not to pay the Award. This would result in an unjust enrichment that must be avoided.

828. In the instant case, post-award interest represents compensation for the loss of the money awarded. Such interest will not serve to increase the amounts of dividends to which the Claimants are entitled in a but-for scenario. Post-award interest serves to compensate the Claimants for the lack of revenue represented by the amounts awarded and the profit that the Claimants would most probably derive from it in the usual course of its business. This business is certainly not to have the money paid by the Respondent placed in a saving account with minimal interest. It must be assumed that the interest awarded and paid will become part of the Claimants' business and accumulate the profit derived from it. In order to comply with this economic component of the post-award interest accruing on the basis of this Award, such interest must be awarded on an annually compounded basis.

829. One exception must be added. The compensation awarded on the account of ConocoPhillips Petrozuata B.V. (CPZ) includes an amount of US$ 286,740,989 based on the compensation provisions of the Petrozuata Association Agreement. This amount follows the allocation of interest contained in these provisions, *i.e.* post-award simple interest to run until the date of full and final payment at 12-month LIBOR (Sec. 9.07(d), Sec. 1.01) or any other comparable rate in case LIBOR should be discontinued in the future.

XII. Discount Rate

830. The presentations of the Parties' experts are comparable in the sense that the discount rate has three components: (1) a risk-free rate, (2) an industry rate reflecting the risks of an equity investment in oil production, and (3) a country risk.

831. While their positions are very close on the two first elements, they are deeply divided in respect of the so called "country risk". The division of opinion is such that the comparison of the numerous and sometimes confusing arguments is difficult to follow, and in large part not useful due to the fact that assertions are made and theories presented without taking care of the need to remain connected to the specificities of the instant case and particularly, to the economics of the Projects at issue. The Tribunal will take those arguments that are relevant to the resolution of the instant case and will avoid the use of expressions used by the experts that make the matter confusing or that are presented by the experts in a way that is difficult to translate in the legal analysis that is required for the drafting of an award that provides the reasons that guided the members of the Arbitral Tribunal.

832. The confusion and uncertainty in the Parties' presentations on the issue of the discount rate is also due to the fact that they – together with their experts – spend more time and effort criticizing the opinions expressed by the opposing party than to explain their own position. Criticism, by itself, does not result in precise figures and conclusions, and is therefore of limited use for the Tribunal.

1. The Claimants' Position

833. The Claimants submit that a discount rate is used to convert the expected future cash flows (future production multiplied by prices, minus costs and net of applicable taxes) back to present value as of the date of valuation. The discount rate reflects the risk that the future cash flows will not materialize as projected, and also accounts for the time value of money. All else being equal, a higher discount rate leads to a lower present value of future cash flows. Selection of an appropriate discount rate is essential to achieving full reparation. The Claimants say that their discount rate is reasonable, conservative and appropriate.

834. Consistent with standard valuation practice, the Claimants' experts Abdala and Spiller have used the International Capital Asset Pricing Model (ICAPAM) "building blocks" approach. (i) Starting with a risk-free rate (1.9%), they (ii) added a factor reflecting the risks associated with an equity investment in the upstream crude oil industry in a developed economy like the United States (5.5%), which together with the risk-free rate yielded a discount rate for a U.S. upstream oil and gas project; and (iii) then applied a country risk premium to reflect the country-specific risks to which the Projects would have been exposed but-for their unlawful expropriation (4.2%). This shows a discount rate of 11.6%.

835. The Claimants explain that their experts base their country risk premium on the credit rating of the debt issued by the Petrozuata Project before the possibility of expropriation began to be discussed publicly. This rating at the time reflected the market's perception of the risk of an investment in the Petrozuata Project. The difference between that rating and the rating of a comparable investment in the U.S. yields the incremental country risk applicable to the Projects. The experts thus derive an updated discount rate of 11.6% for the 2016 valuation (and 8.9% for a 2007 valuation). Venezuela, by contrast, comes up with an indefensibly high discount rate of 27.7% for the 2016 valuation (and 19.8% for a 2007 valuation).

836. The Claimants note that their discount rates are: (a) consistent with the rates used by the Project participants and their affiliates throughout their relationship; (b) consistent with the discount rates used by investment bank analysts and global energy consultants; and (c) higher than the discount rate used by ConocoPhillips to value developed projects.

837. The Claimants also submit that their discount rates are consistent with the Projects' own practices. A report prepared by the Petrozuata Project in January 2000 shows PDVSA using a "real

discount rate" of 8.53% (C-323). Similarly, a Financing Memorandum prepared by the Hamaca Project in August 2000 applied a 10% discount rate (C-101), also used for Petrozuata (C-75), as this also results from the Offering Circular of 2013 (C-610). A document produced after the August 2016 hearing proposed a discount range of 8% to 12% (C-696). These discount rates are virtually the same rates that the Claimants' experts have calculated.

838. Proceeding with some comparisons, the Claimants observe that 8% to 12% discount rates are not outliers. The annual Consolidated Financial Statements for PDVSA and its subsidiaries have used discount rates of 10% to bring expected cash flows from PDVSA's proven oil and gas reserves to present value every year between 2008 and 2014 (C-593, C-616). The inconsistency is obvious. Venezuela discounts future cash flows at 10% when reporting to the global capital markets, but discounts at 27.7% when calculating the Claimants' damages.

839. In 2014 PDVSA endorsed the use of an 8% discount rate in valuing a natural gas project between PDVSA and foreign investors Eni and Repsol (C-619, C-617). In May 2010, Venezuela entered into a treaty with China concerning the development of the Junín 4 Block through a joint venture between a PDVSA subsidiary and the Chinese National Petroleum Corporation (CNPC). This Block is an extra heavy oil field in the Orinoco Belt; it was an undeveloped greenfield project and thus far more risky than Petrozuata and Hamaca. Nevertheless, Venezuela agreed in the Junín 4 Block treaty to apply a 10% discount rate (C-585), a rate that was endorsed by the National Assembly (C-586). Thus, the Venezuelan government has twice endorsed the application of a 10% discount rate for future cash flows generated by future projects riskier than an operating project. Outside the arbitration context, Venezuela itself uses discount rates that are close to, or lower than, those proposed by the Claimants.

840. The Claimants add that a significant body of arbitral tribunals have adopted discount rates comparable to the rates proposed by the Claimants, but have been largely ignored by the Respondent, like *Occidental Petroleum v. Ecuador* (12%)[618], *Enron v. Argentina* (12.6%)[619], *Alpha Projektholding v. Ukraine* (12.14%)[620], *Gold Reserve v. Venezuela* (10.09%)[621].

841. Turning to the analysis of the Respondent's experts' conclusions, the Claimants observe that they have constructed a made-for-arbitration discount rate of 27.7% for the 2016 valuation (and 19.8% for the 2007 valuation), with absurd effects such as the result that five years before the

[618] *Occidental Petroleum Corporation and Occidental Exploration and Production Company v. The Republic of Ecuador* (ICSID Case No. ARB/06/11), Award dated 5 October 2012 (CL-256).

[619] *Enron Corporation, Ponderosa Assets, L.P. v. Argentine Republic*, ICSID Case No. ARB/01/03, Award of 22 May 2007 (CL-60).

[620] *Alpha Projektholding GmbH v. Ukraine*, ICSID Case No. ARB/07/16, Award dated 8 November 2010 (CL-253).

[621] *Gold Reserve Inc. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB(AF)/09/1, Award dated 22 September 2014 (CL-328).

expiry of the Association Agreements, every dollar would have been reduced to less than two cents. The major source of divergence between the experts is the country risk premium: 4.2% for the Claimants' experts and 18.1% for Brailovsky and Flores. The purpose of such a premium is to account for the increased uncertainty or volatility of the Projects' cash flows resulting from the Projects being located in Venezuela as opposed to a more developed economy, such as the United States. The country risk must be assessed on a but-for basis. The inquiry is what the country risk would have been for these Projects (considering their specific characteristics, including their Treaty and contractual protections) absent unlawful conduct by Venezuela. But that is not the exercise undertaken by the Respondent's experts.

842. The first error the Respondent's experts have committed in the Claimants' views is to include in the discount rate the near-default status of Venezuela's sovereign debt. Venezuela is on the brink of economic collapse. Its sovereign bond yield is around 23%. The Respondent's experts impute the risk of an expected sovereign debt default to the Projects. However, the Projects have not been, and will not be, in financial distress bordering a bankruptcy. To apply to the Projects a country risk premium that reflects the likelihood that Venezuela will default on billions of dollars of sovereign debt is entirely unjustified. A but-for analysis should not be confused with an actual analysis. There is little, if any, relationship between the riskiness of a loan to Venezuela, which is close to defaulting on its debt, and the riskiness of the Projects. International tribunals have rejected the notion that the cost of debt of a sovereign that is in or near default represents an appropriate measure of country risk for a commercial enterprise, like in the *EDF*[622], and *Sempra Energy*[623].

843. In the view of the Claimants, the second major conceptual flaw in the Respondent's experts' study is that they refuse to accept the principle that a State may not avoid or reduce its liability for violating international law by relying on its own propensity to violate international law. They have factored into their discount rates Venezuela's record of unlawful expropriations and other breaches of legal obligations owed to foreign investors. Their country risk includes expropriation risks. This attitude is also evidenced by the experts' reliance on data apparently obtained from IHS Global Insight in 2009. However, data from or derived from IHS are not tailored to the specific nature of the Projects and inappropriately include the risk of unlawful expropriation or other unlawful state measures. The inclusion of unlawful state action would result in higher discount rates and thus allow Venezuela to benefit from its own unlawful acts. The prospect of an unlawful expropriation can create risk, but only to the extent that an investment enjoys no legal protection from that unlawful act. Therefore, when an investment enjoys protection against an uncompensated and unlawful expropriation, the discount rate must exclude that risk, because the investment is not subject to it.

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[622] *EDF International S.A. et al. v. Argentine Republic*, ICSID Case No. ARB/03/23, Award of 11 June 2012 (CLEX-045).

[623] *Sempra Energy International v. Argentine Republic*, ICSID Case No. ARB/02/16, Award dated 28 September 2007 (CL-59).

844. The Tribunal's finding on the Claimants' protection against unlawful expropriation should have resulted in Venezuela excluding the risk of uncompensated expropriation from its calculation of country risk in this phase of the proceedings. Venezuela suggests that while the risk of the specific expropriation of the Claimants' assets may be excluded from the discount rate, the general expropriation risk caused by the State's background conduct can still serve to increase the country risk premium. In the *Gold Reserve* case, involving Venezuela's unlawful treatment of a mining investment in violation of the applicable BIT's fair and equitable treatment provision, Venezuela's experts proposed a discount rate between 16.5% and 23.8%, incorporating a country risk premium of between 6.7% and 16.4%. The tribunal rejected these premiums because they took account of Venezuela's policies at the time. It considered that it was not appropriate to increase the country risk to reflect the market's perception that a State might have a propensity to expropriate investments in breach of BIT obligations. The tribunal was correct. Any other result would reward violations of international law, and create an incentive for a State to take property in violation of its international obligations. The tribunal ultimately adopted a 4% but-for country risk premium, yielding a total discount rate of 10.09%. This discount rate is consistent with the discount rates derived by the Claimants' experts.

845. The Claimants note that the Respondent nevertheless insists that the risk of uncompensated expropriation should be included in a discount rate, relying on the awards in *Tidewater*[624] and *Flughafen Zurich*[625]. While *Tidewater* included expropriation risk in its valuation, there is an important distinction in comparison to *Gold Reserve*. *Tidewater* awarded compensation for a lawful expropriation. The same applies to the *Mobile* ICSID Award[626]. In any event, the *Tidewater* tribunal's analysis is unpersuasive and should not be followed. Reducing the value of the investor's compensation to account for the risk of unlawful conduct by the State creates a benefit for the wrongdoer. The *Tidewater* analysis allows compensation to be reduced based on a pattern of past unlawful conduct against other parties. As for *Flughafen Zurich*, the Respondent mischaracterizes what the tribunal did. The tribunal affirmed the principle that a State cannot benefit from its own wrongful acts. It found, however, that this principle did not apply to the specific facts of the case. The tribunal found that the 14.4% discount rate suggested by Venezuela was closer to reality than the 4.6% proposed by the claimants, and that it coincided with a 15% discount rate used in a business plan adopted prior to the expropriation. The only way to achieve full reparation, and to avoid a result in which a State profits from its own unlawful conduct, is to exclude from the discount rate the risks and occurrence of Venezuela's unlawful actions.

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[624] *Tidewater Investment SRL and Tidewater Caribe, C.A. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB/10/5, Award dated 13 March 2015 (R-642).

[625] *Flughafen Zürich A.G. and Gestión e Ingeniería IDC S.A. v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/10/19, Award dated 18 November 2014 (R-559).

[626] *Venezuela Holdings, B.V., et al. v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award dated 9 October 2014 (CL-348).

846. The Claimants further submit that the Respondent fails to account for the limited exposure of the Projects to general Venezuelan country risks. The Projects were largely insulated from such risks, as they (a) produced a commodity for which there is international demand; (b) sold their products abroad in U.S. dollars; (c) acquired critical inputs from international markets; (d) used little local capital; (e) were removed from population centers in Venezuela; and (f) had legal protections designed to reduce their exposure to adverse governmental actions. The Respondent's experts did not adjust their discount rate to take account of risk mitigating factors specific to the Projects, such as product sales abroad in U.S. dollars.

847. The Claimants' experts, by contrast, consider only the specific country risks to which the Projects would actually have been exposed in the but-for scenario. They did so by basing their country risk premium on the credit rating of the debt issued by the Petrozuata Project before the possibility of expropriation began to be reported publicly. The difference between that credit rating, and the credit rating of a comparable investment in a U.S. oil and gas project, yields the incremental country risk actually applicable to the Projects. It reveals how investors perceived the incremental risk of an investment in the Projects, taking into account their specific characteristics, including the fact that they had certain contractual and international law protections, but excluding the additional risks created by actual or potential unlawful conduct on Venezuela's part. The Respondent did not address any of the Project-specific factors. Its experts rely largely on the assertion that the Projects were not protected against expropriation.

848. The Claimants suggest clarifying further a number of notions that have been improperly used by the Respondent. Thus, there was a confusion made when the discount rate was conflated by the internal rate of return (IRR) that an investor would look for when deciding, at the outset, whether to invest in a proposed project. Venezuela points to Mr. McKee's testimony that the Claimants had a "hurdle rate" for their investment in the Petrozuata Project of 20% as support for the rate that Venezuela's experts now advocate for their valuation[627]. But IRR and a discount rate are different things: Only a discount rate measures risk; an IRR is the rate of return at which the net present value of future cash flows from a project equals zero. Witness Sheets explained: Once the risks at the beginning of a project are going to be reduced or eliminated, the discount rate would be lower, as the risks have been taken out of the project[628]. The critical distinction to be made is to know what level of risks remains in the project. To the extent risks go out of the project they would be discounted at a lower rate. On the other hand, the IRR would not be affected by such decrease.

849. The Claimants explain in this regard that by the time of the illegal expropriation, the Projects had confirmed the existence of huge quantities of extractable EHCO, and thus had proven

[627] TR-E, 2010 Hearing, Day 3, p. 731:7-732:17.

[628] Second Witness Statement of Jeff. W. Sheets, dated 14 May 2014, para. 6; TR-E, 2010 Hearing, Day 6, p. 1611:14-1612:7 (Sheets).

their ability to extract the oil, and the market for syncrude had been established. Accordingly, a great number of the risks that existed at the time of the investment decisions had disappeared by the time of the expropriation. Therefore, it would make little sense to apply the same measure of risk – the same discount rate – to the Projects at two different periods in their lives. The Respondent chose to ignore this distinction, even though its experts have recognized that an IRR and a discount rate serve different purposes and are used in different ways. The same distinction is made in Article 6 of the Junín 4 treaty between Venezuela and China, which applies a 10% discount rate to future cash flows, while targeting an IRR of 18% (C-585). The Projects routinely applied different IRR measures and discount rates.

850. The Claimants also contend that the comparison to a 3640-mile international gas pipeline from Alaska is not a useful comparator for the risk of the expropriated Projects in Venezuela. The Respondent seeks to convey the impression that the statements made by Conoco officers before the Legislative Budget and Audit Committee of the Alaska State Legislature justify the discount rates it is seeking in this case (C-575). Such comparison misses the mark. The proposed pipeline from Alaska would have been one of the riskiest construction project in the world. Nothing that has been said in respect of this project lends any support to the 27.7% discount rate that Venezuela now seeks to apply. Witness Sheets confirmed this understanding at the 2010 Hearing[629]. The discount rates referred to were specific to the risks associated to the Alaska pipeline. These discount rates have no bearing on the appropriate discount rates for the developed Projects in this case. Dr. Finizza's presentation to the Committee in 2006 can stand for not more than the fact that a project in Venezuela faces higher country risk than would an identical project in the U.S.

851. Finally, the Claimants note that the Respondent is unable to find support in the case law for its exaggerated discount rates and instead cites a handful of easily distinguishable awards. In the *Himpurna v. Indonesia*[630], the underlying asset was a geothermal electricity project that had only reached the exploration phase during an economic crisis in Indonesia. The project was exposed to high construction and operational risks because it was at a nascent stage and was driven to a single local market. The tribunal noted the claimant's failure in that case to account for country risk altogether.

852. In *Lemire v. Ukraine*, the tribunal applied a discount rate of 18.51%. That case is uncontroversial, when concluding that (a) a discount rate must reflect some measure of country risk; and (b) a company in the United States is exposed to less country risk than the same company would face in Ukraine[631]. The case presents a number of distinctive features: (a) First, *Lemire* involved

[629] TR-E, 2010 Hearing, Day 6, p. 1610:17-1611:6.

[630] *Himpurna California Energy Ltd. (Bermuda) v. PT (Persero) Perusahaan Listruik Negara (Indonesia)*, Final Award dated 4 May 1999 (R-252).

[631] *Joseph Charles Lemire v. Ukraine*, ICSID Case No. ARB/06/18, Award dated 28 March 2011 (R-461).

damage to a small private broadcasting company operating exclusively within the Ukrainian market, and therefore depending on most volatile radio advertising revenue in post-Soviet Ukraine. (b) Second, a significant part of the venture's future prospects was based on the individual claimant personally, thus adding a risk relating to eventual succession issues. (c) Third, the asset being valued was at the pre-development stage. (d) Finally, because the broadcasting company had no debt, the tribunal applied a discount rate of 18% based on the cost of equity, instead of the 13% WACC. The *Lemire* decision offers no comparison and support for the application of the discount rate proposed by Venezuela in this case.

853. The Claimants note that the Respondent seeks to rely on the 18% discount rate applied by the *Mobil* ICC and ICSID tribunals. In the ICC Award *Mobil Cerro Negro v. PDVSA*[632], (a) the tribunal mistakenly used the rate of return to ExxonMobil's shareholders as a basis for the discount rate applicable to the future stream of indemnity payments from PDVSA; the tribunal misunderstood the distinction between a discount rate, which measures future risks, and a historical rate of return, which measures past profitability; (b) it was left without a reasonable alternative to PDVSA's discount rates, and thus adopted a rate proposed by PDVSA; (c) finally, the *Mobil* ICC award decided (i) contractual "Discriminatory Measures" claims, (ii) based on contractual compensation provisions, and (iii) under Venezuelan law – not damages for the fair market value of an expropriated asset under customary international law. The more recent ICSID award in *Venezuela Holdings v. Venezuela* adopted the same 18% discount rate[633]. The ICSID tribunal's concern was to avoid inconsistencies between the two cases. However, if this had been the main concern of the tribunal, it would have been preferable to follow the approach of the ICC tribunal in *ConocoPhillips v. PDVSA*, where a rate of 10.55% was applied to value the lost cash flows from one of the same Projects at issue here[634]. Although the *Mobil* ICSID tribunal included expropriation risk in its calculation of the discount rate (which departs from settled principles), it did so in the context of a lawful expropriation, subject to the compensation standards provided by the applicable treaty. In the instant case, Venezuela's expropriation was unlawful, and the customary international law standard of full reparation therefore applies. Any other outcome would allow Venezuela to profit from its own wrongdoing.

854. In conclusion, the Claimants submit that in all events, specific discount rates adopted in previous decisions are necessarily less instructive than the legal and economic principles underlying the choice of a particular rate. Here, the legal principle is an award of full reparation. Therefore, the discount rate should reflect, but not overstate, the actual country risks to which these particular

[632] *Mobil Cerro Negro, Ltd. v. Petróleos de Venezuela, S.A. and PDVSA Cerro Negro, S.A.*, ICC Case No. 15416/JRF/CA, Final Award dated 23 December 2011 (R-462).

[633] *Venezuela Holdings, B.V., et al. v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award dated 9 October 2014 (CL-348).

[634] *Phillips B.V. v. Petroleum Company Venezuela Limited & ConocoPhillips Petrozuata Petróleos de Venezuela, S.A.* (ICC 16849/JRF), Award dated 17 September 2012 (CL-255).

Projects, at their advanced stage of development and benefitting from important contractual and international law protections, would have been exposed in the but-for world. The discount rates adopted by the Claimants' experts are reasonable and conservative, and they are consistent with the discount rates adopted by other tribunals, PDVSA and Venezuela itself. By contrast, the discount rates presented by the Respondent's experts are inflated and designed to allow Venezuela to escape its obligation to provide full reparation or anything approaching it.

2. *The Respondent's Position*

855. The Respondent submits that basic principles must be observed in any serious discount rate analysis. One of those principles was described in the *Himpurna* case as "the fundamental issue of country risk"[635]. This means that a project in Venezuela cannot be evaluated with the same discount rate as a project in Texas. The Respondent's experts Brailovsky and Flores have presented a discount rate analysis that utilizes well-recognized and widely respected methods for calculating an appropriate discount rate. Their conclusion was that such a rate as of 26 June 2007 would be 19.8%. They also analyzed the proposed 2007 discount rate of the Claimants' experts, an average of 9.53%, showing that they effectively ignore the fundamental issue of country risk and do not even correctly apply their own methodology. The conclusions of the Respondent's experts are the only ones consistent with (i) those of other tribunals in cases involving the very same nationalization as it is at issue here and (ii) statements made by the Claimants' own representatives, their experts and counsel in other proceedings.

856. The Respondent notes that the Claimants are unable to distinguish this case from the two *Mobil* decisions, one in the ICC case[636] and the other in the ICSID case[637]. Both were based on the 2007 nationalization, and both involved an upgrading project in the Orinoco Oil Belt under an association agreement that included "Discriminatory Action" provisions similar to those in the Petrozuata and Hamaca Association Agreements. Both tribunals rejected Mobil's positions on quantum, awarding less than 10% of the claim; both held that the appropriate discount rate was 18%. The *Mobil* claimants could not avoid the fact that the Cerro Negro project at issue in their case, a sister project of Petrozuata and Hamaca, was in Venezuela, not in Texas, and that any proposed discount rate that does not take into account full country risk cannot be taken seriously. On the Respondent's side, the experts were the same as in this case; both *Mobil* tribunals obviously found their analyses persuasive.

[635] *Himpurna California Energy Ltd. (Bermuda) v. PT (Persero) Perusahaan Listruik Negara (Indonesia)*, Final Award dated 4 May 1999, para. 364 (R-252).

[636] *Mobil Cerro Negro, Ltd. v. Petróleos de Venezuela, S.A. and PDVSA Cerro Negro, S.A.*, ICC Case No. 15416/JRF/CA, Final Award dated 23 December 2011 (R-462).

[637] *Phillips Petroleum Company Venezuela Limited & ConocoPhillips Petrozuata B.V. v. Petróleos de Venezuela, S.A.*, ICC Case No.16848/JRF/CA (C-16849/JRF), Award dated 17 September 2012 (CL-255).

857. The Respondent recalls that it explained the relevance of the reasons retained by the *Mobil* ICC tribunal in its letter submitted to this Tribunal on 18 March 2012. The Respondent noted that the Claimants misunderstand what the ICC tribunal was doing, which was obviously to select a discount rate to obtain the present value of future cash flows. The actual IRR of a particular project is not, as the Claimants seem to think, what the ICC tribunal relied on. But the minimum expected IRR a buyer would demand in determining whether to enter into the project, also known as the "hurdle rate", is of course relevant. If a project is not expected to yield an IRR at least equal to the hurdle rate, the company will not invest. The kind of returns the Claimants expected from the Projects is relevant in determining the hurdle rate prospective buyers would likely use in deciding whether to invest in the Projects at issue in this case. Witness McKee told the Tribunal that the Petrozuata Project was approved at about a 20% IRR[638]. Other evidence in the record, including the testimony of ConocoPhillips's own chief economist, Marianne Kah, in Alaska in 2006, and the testimony at the same Alaska hearing of Econ One's Dr. Finizza, the former chief economist of Arco (a former partner of Phillips in the Hamaca Project), are to the same effect (C-575).

858. The Claimants further argue that the *Mobil* ICSID Award is irrelevant because the discount rate was calculated in the context of a lawful expropriation, subject to the compensation standards provided by the applicable treaty. Several points are to be made. First, the discount rate analysis did not depend upon the issue of the legality of the expropriation. Second, the expropriation that was found lawful in the *Mobil* ICSID case is the same expropriation that is at issue here. Third, a willing buyer would consider all political risks in determining what discount rate to apply in calculating a purchase price for the Claimants' interests as of the valuation date, including not only expropriation, but also the risk of fiscal measures. Fourth, it is surprising that the Claimants are still relying on this argument although it became clear after the August 2016 hearing that no finding of unlawful expropriation has ever been made and that there was no bad faith negotiation. It is truly difficult to imagine a case more on point on the issue of discount rate than the two *Mobil* decisions.

859. The same rigorous discount rate analysis was performed by the same experts in *Tidewater v. Venezuela*[639]. This case also involved nationalization, albeit not as politically sensitive, as it related to the maritime service business. The tribunal adopted a country risk premium of 14.75%, yielding a total discount rate of approximately 26%. The tribunal stated that the country risk factor was not specific to the particular State measure that gives rise to the claim. Rather the country risk premium quantifies the general risks, including political risks, of doing business in the particular country. The inescapable fact is that these cases cannot be meaningfully distinguished from this case. They provide the most directly relevant and valuable guidance on the discount rate issue here.

[638] TR-E, 2010 Hearing, Day 3, p. 731:7-732:17.

[639] *Tidewater Investment SRL and Tidewater Caribe, C.A. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB/10/5, Award dated 13 March 2015 (R-642).

860. The second point to be stressed, according to the Respondent, is that the Claimants' discount rate analysis cannot be reconciled with their own statements and positions taken in other proceedings. The Claimants try to confuse the issue by distinguishing the concept of the discount rate from that of internal rate of return or hurdle rate. It is elementary that the minimum expected by an investor in order to make its decision to invest in a project is precisely equivalent to the discount rate. If an investor's hurdle rate for a project is 20%, it will not invest in the project unless, applying a discount rate of 20% to the projected future cash flows, a positive result is achieved. Otherwise, the 20% expected IRR or hurdle rate would not be achieved based on the projected cash flows. The Respondent pointed out the connection between minimum expected IRR or hurdle rate, on the one hand, and discount rate, on the other, in its letter of 18 March 2012. As stated in a textbook, terms as "minimum rate of return", "hurdle rate", "discount rate" and similar, are all interchangeable with the term "cost of capital". They represent "opportunity cost of capital" and must not be confused with the "financial cost of capital", which is the cost of raising money by borrowing or issuing new bond or related debt/equity offerings. Other definitions of "hurdle rate" can be found. They focus on the notion of minimum rate of return required in order to make an investment. For setting such rate, risk, costs of capital, and projected investment returns are all factors to be considered. Anyone using a discount rate lower than the hurdle rate in determining whether to enter into a project would be grossly overpaying for that project. Witness McKee acknowledged that Conoco's hurdle rate for the Petrozuata Project was 20%. Witness Sheets explained that as an investor, they determined what kind of return they would get on the capital investment; that is what is referred to as the "internal rate of return". He agreed that if the Tribunal were to use a 10% discount rate, it would come up with a higher value than if you would use a 19% discount rate. The Claimants' expert, Mr. Moyes, noted in a presentation in the year 2013 that in the industry a 20-30% Expected Rate of Return is acceptable (R-560).

861. Another ConocoPhillips Executive Vice-President said in a meeting that their projects in Western Canada have rates of return above 20% (BF-465). The Claimants had argued that Dr. Finizza had supported a 10% discount rate in the proceeding in Alaska. But a document shows that the appropriate rate considered at the time by the Claimants and their experts was at least double of approximately 10%. In his 2005 presentation in the Alaska proceeding, Dr. Finizza explained that projects need to be evaluated at the risk-adjusted cost of capital, which may be above the Weighted Average Cost of Capital (WACC) due to the fact that a project is made riskier by uncertainty, political and economic risks (C-502). He distinguished between the expected IRR of a project and the threshold rate of return or hurdle rate. The latter rate, when retained between 12% and 15%, would be appropriate for a project that was without significant risk factors. Dr. Finizza further stated that a 25% discount rate would be appropriate for an oil project in Venezuela. He took the same position when he appeared before the Alaska State Legislative Committee in June 2006 (C-519). The Claimants' counsel did not ask Dr. Finizza a single question on the subject at the 2010 hearing.

862. Ms. Kah took a similar position before the same Legislative Committee, when explaining that IRR is a very important measure that the company takes very seriously, because it does not want to invest in a project that will have such a low return that will dilute the return on capital employed (C-575). When looking at the energy industry in the U.S., the discount rate would probably be higher than the 12% retained for the U.S. in general. Ms. Kah's opinion was thus that a return of higher than 12%, presumably at least 15%, would be necessary for an energy project in the U.S. For a project in a developing economy with a country risk rating like that of Venezuela, the required return would be much higher. This position confirms what both Mr. McKee and Dr. Finizza stated, meaning that a discount rate in excess of 20% would be appropriate, even before the adverse conditions facing Venezuela today.

863. The Claimants have also contended that the discount rate produced by IHS Global Insight in 2009 are suspect and should not be given any evidentiary value. The Respondent's experts support those conclusions on the basis of a database of transactions in the oil and gas industry maintained by IHS Herold, a sister company of IHS Global Insight. This analysis shows that discount rates are highly correlated with location, and that higher rates are found in less developed regions, resulting in a media discount rate of 28.5% for Latin America. Working on the same database, the Respondent's expert Mr. Leitzinger testified that there was only about 1 in 1'000 chance that the value of the Petrozuata and Hamaca Projects would have been as high as the level LECG proposed[640]. At the 2010 Hearing, the Claimants did not examine Mr. Leitzinger on the subject. In response to a question asked by the Tribunal, Mr. Leitzinger stated that LECG presented a table with a series of transactions for other properties, none of them having the same reserves, the same production life, the same type of crude oil, or the same location, as the Projects relevant in the instant case. "Averages of incomparable transactions don't make them comparable."[641] At least you can establish regular ratios between reserve volume, production and prices paid. That was what he had done in his regression model.

864. The Respondent notes that if this Tribunal would simply take the average of the discount rates proposed by ConocoPhillips and its experts for other oil projects and adjust them to the projects in Venezuela, it would be using a discount rate at or higher than the level proposed by Respondent's experts. To conclude, says the Respondent, this Tribunal should follow the example set by the two *Mobil* tribunals and *Tidewater*, whose analysis leads to the conclusion that the *ex ante* discount rate proposed by the Respondent's experts is eminently reasonable and the rate proposed by the Claimants would not even be reasonable for a similar project in the United States. The 18% discount rate cuts the Claimants' valuation of US$ 4.227 billion almost in half, *i.e.* US$ 2.509 billion for all three Projects, even when assuming that all other elements of their claim would be correct. Even this reduced amount is still grossly inflated. When compensation for concededly non-

[640] Expert Report of Jeffrey Leitzinger, 5 January 2015, para. 10.

[641] TR-E, 2010 Hearing, Day 11, p. 3104:15-22.

Discriminatory Actions is excluded, such amount is reduced to US$ 1.786 billion. When, in addition, the appropriate adjustments to the Claimants' production and cost assumptions are made, the pertinent amount becomes US$ 1.520 billion. After further using the proper price differentials, the valuation ends up with US$ 1.433 billion.

865. When considering a 26 June 2007 valuation disregarding the compensation provisions, the Parties' respective *ex ante* valuations differ greatly, the pertinent amount representing for the Claimants US$ 5.854 billion and for the Respondent US$ 1.677 billion. Since the Claimants give full effect to the full fiscal regime existing as of 26 June 2007, the difference between the Parties is attributable mainly to the Claimants' use of an indefensibly low discount rate of 8.9%. If a rate of 18% would be used, this would cut the Claimants' valuation by more than 50%.

866. In a scenario where a 31 December 2016 valuation would be retained, the Claimants' *ex post* discount rate analysis suffers from the same fundamental flaws as their *ex ante* discount rate analysis. The Respondent's updated discount rate of 27.7% reflects current conditions, giving full effect to the "fundamental issue of country risk, obvious to the least sophisticated businessman", and is very similar to the rate of approximately 26% applied by the *Tidewater* tribunal. If a reasonable discount rate is used, the Claimants' valuation, when applying the compensation provisions, but taking all other assumptions of the Claimants as correct, is reduced from US$ 8.518 to 7.037 billion. The impact of the discount rate is not nearly as significant as in the *ex ante* calculation because discounting applies only for future cash flows, and the future cash flows in the *ex post* valuation begin in 2017 only. When the Claimants' valuation is adjusted by (i) using a reasonable discount rate, (ii) excluding compensation for concededly non-Discriminatory Actions and the Special Contribution, (iii) making the appropriate corrections to the Claimants' production and cost assumptions and (iv) using proper price assumptions, the resulting *ex post* valuation would be US$ 1.313 billion.

867. Finally, when the compensation provisions would be disregarded, the Projects being set up as if they enjoyed fiscal and legal stabilization, the Respondents valuation of the Petrozuata and Hamaca Projects would be US$ 1.331 billion, whereas in the same setting, the Claimants demand for compensation is approximately US$ 14.119 billion. The Claimants use again a very low average of 11.54% for the three Projects. When the Claimants' valuation is subject to their 11.54% rate, their valuation would be US$ 14.119 billion, while the amount resulting from the input of the Respondent's discount rate would be US$ 11.404 billion.

3. *The Tribunal's Findings*

a. Basic elements

868. There is common ground between the Parties that the discount rate serves to convert expected future revenue (or cash flow) back to present value as of the date of valuation. It assists in determining the capital required at such date for the purpose of reaching the amount to which a creditor is entitled at a certain point in time in the future. In the instant case, such future amounts are the dividends to which the Claimants were entitled every year in each Project until the end of production (equivalent to the end of profit). Such rate is usually expressed in connection with the risk implied in reaching the future amount determined in the award. The analysis of the relevant risk therefore plays a large part in the determination of the discount rate.

869. However, risk must not be the only focus. The risk inherent in an investment translates economically into the profit the investor must obtain in order to proceed with the investment. Therefore, risk and profit are complementary concepts; profit is commensurate with risk. One is closely related to the other. In an optimal scenario, the minimum profit an investor expects to obtain must cover the economic dynamic inherent in the risks associated to the particular business. This also means that an investment having a high-risk component must yield a correspondingly high profit to become and to remain attractive for an investor evaluating whether or not it wants to transfer assets into the project.

870. While the respective amounts to be earned from the Projects as dividends in the future are based on the Projects economics, the same applies to the discount rate. The value of the Projects is the discounted present value of their future profits. The Claimants must be treated by reference to the situation they would have been in at the date of valuation. At that time, absent the expropriation, they would have lived with the expectation of obtaining dividends in the future as determined by the Tribunal. This expectation is the same they would have anticipated when operating the Projects in a but-for scenario at the time of valuation.

871. The amounts corresponding to the dividends to be earned in the future do not represent money placed in a bank account or in any other opportunity on the financial market. They are the profits resulting from the Projects, including all of their economic and financial components. Therefore, their calculation "upwards", towards the future, must be based on the same components. The profit they represent must be proportionally higher than the profit resulting from a savings account. If this was not so, there would be no investment in an industry, usually much more uncertain than placing money into a bank.

872. The discount rate reflects, to the extent applicable, the diversity of the sources of money and the related costs. The costs for money are determined by the suppliers of capital by reference

to the nature and the size of risks that have to be covered. This discount rate includes the cost required for obtaining such capital.

873. The cost of debt is to be taken as it stands in the project's books, like bank loans, whereby the applicable interest to be paid must be reduced by the tax return available in the particular case.

874. The cost of equity capital includes money provided as risk-free, on a low interest rate, and money provided as industry-risk for specific industries, at higher cost and interest rate that reflects the risk component of such industry in general. For an investor operating with his own money, it is important to also take account of risks involved in the investment project itself. Under an economic and financial perspective, such risks must be compensated by higher returns to the investor. Otherwise, the investor would not invest in the specific project and use the money on the market place investing in bonds of similar projects or funding similar projects like a bank or other lenders would do. The coverage of these risks adds to the cost for equity capital. The determination of this component is difficult, as it must be driven by the characteristics of the specific project.

875. The past profit resulting from the investment represents the increase of value resulting from the business involved. It is usually expressed through a rate, based in particular on points of reference that can be observed with some regularity. Viewed from such perspective, such rate corresponds to the update factor. When taken from the opposite perspective, which is more hypothetical, the expected profit or dividends to be captured in the future can be traced back to the initial value of the project at the point in time when the valuation is made. This is the project inherent discount factor, which serves the reverse objective of the update factor.

876. However, the economy of an investment does not consist only of a value representing the expected profit defined in relation to the inherent risks of the project. This is, in simple terms, the "upper part". The investment further comprises the costs the investor has to take into account for its own financing of the amounts to be invested into a particular project. This represents the "bottom part", corresponding to the cost – represented in terms of a rate of money required for the purpose of funding the investment. Both experts' teams use in this respect the same concepts, referring on the one hand, to a risk-free rate, and on the other hand, to an industry risk-rate, which is higher and related to the risks implied in a certain industry in general, independent from a particular project.

877. The discount rate must reflect the costs for the increase in capital that is required to reach the required amounts representing dividends in the future. First, account must be taken of the rate of profit on which the Projects are based, which is equal to the monetary portion of risks assumed by the investors expressed as a rate. The discount effect means that the dividends are to be brought down to present value in proportion to such rate.

878. Second, to determine the value required to bring a capital awarded to present value, it is also necessary to take account of the financing costs required to fund an industry producing further profit. Such value represents the financing costs of the investment, which can be determined by reference to the respective conditions applicable on the relevant market. In terms of rate, the risk-free rate and the industry rate are relevant here. Here again, the input of the discount rate has the effect that the dividends are brought to present value.

879. The Respondent's experts consider that the discount rate, and, at the time the investor enters into a project, its "hurdle rate" are minimum rates[642]. The Claimants' experts consider that the discount rate serves a different purpose than the hurdle rate[643]. The experts also debate the purpose of the internal rate of return (IRR), as a rate of profit calculated by the investor at the time of the investment. Irrespective of the differences between the experts, and even assuming that the rates determined by the investor or the shareholders at the time of considering the investment are minimum rates, nothing prevents the investor from earning more than the minimum. In such a case, as well as in the hypothesis where the discount rate is lower than the hurdle rate, it is not correct to speak of a windfall or, in case of arbitration, of excessive compensation[644]. Such recovery would only imply a risk of double payment when the specific discount rate was too low for the particular project and thus allow compensation that is not discounted fully to the date of present valuation. The reverse can also occur, when the investment project accounts for high discount rates that exceed by far their cost of financial capital. The proper method consists of avoiding overruns in both opposite directions.

880. This also means that for an on-going project, at a point in time after the hurdle rate was observed, the IRR is not, or must not be the same as the discount rate. The IRR is the profit the investor expects and that it earns for his shareholders. As the Parties have explained, various sources on the Tribunal's record mention that ConocoPhillips' IRR was 20%. It is usually above the discount rate that sets the limit of cost of capital and thus of the profitability of the investment vehicle. Documents from the early period when the Projects were initiated noted IRR's higher than discount rates regularly set at 10%[645]. The Respondent's experts cannot be right when they reject

[642] "The hurdle rate is the minimum amount of return that a person requires before they will make an investment in something." TR-E, 2017 March Hearing, Day 11, p. 3374:4-7 (Brailovsky).

[643] Cf. Abdala/Spiller, Consolidated Update Report, 17 November 2016, paras. 187/188.

[644] As is done by Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 354; Additional Expert Report on Country Risk in Discount Rate, 19 May 2017, para. 3. The experts' position comes down to the assumption that the IRR and the discount rate are the same; TR-E, 2017 March Hearing, Day 14, p. 4083:17-4084:11 (Brailovsky).

[645] The IRR was 14.9% in the Memoria Descriptiva of October 1996 (C-92), 14.2% in the Hamaca Project II Business Plan of 30 April 1999 (C-461, p. 7, 25), 14.17% in the Corpoven presentation of 9 May 1996 (C-108) and 24% in the Feasibility Study prepared by Conoco and Maraven in August 1992 (C-73, p. 7, 45, 48, 95). A Board of Directors'

this difference, treating IRR as representing the discount rate in the absence of debt[646]. The Treaty concluded between Venezuela and China on 17 April 2010 shows the distinction when the discount rate applicable to the recovery of the investment was set at 10%, while the mixed company's operation was aimed at obtaining an IRR of 18%[647].

881. The hurdle rate is no longer relevant once the "hurdle" has been passed and the investment is made. When the investment vehicle is on-going and legally binding on the participants there is no longer such a hurdle. While the hurdle rate may be based on a methodology similar to that of discount rates, it may be higher than the average cost of capital if this is the option of the investor who wants to obtain a higher profit than the one that would correspond to the project's discount rate. In such a case, the hurdle rate and the IRR, expressed as the investor's hurdle, are different from and higher than the discount rate.

882. Thus, the Respondent's experts are basically correct when they state that a buyer's hurdle rate is the minimum acceptable rate of return it will receive as an investor[648] (except when he sets a higher hurdle because this is how he understands his own interests). At that point in time, the discount rate (corresponding to the hurdle rate) reflects the expected rate of profit.

883. The Parties' respective positions are not substantially different from what has been explained above in a language slightly different from the one used by the experts. The Parties' experts use their professional language and they rely on concepts that serve as vehicles for a great number of complex developments, some of which give the impression that they serve primarily the purpose of creating confusion instead of assisting the Tribunal with information leading to useful results. The study of this voluminous material shows that the disputed elements are related to a number of assumptions made by reference to sources that sometimes have nothing or little to do with the Projects at the core of the instant case. The Tribunal will in a first step take away a number of such assertions and options, without enumerating all of them, before focusing on the main elements to be considered for the purpose of reaching appropriate conclusions.

884. The Tribunal would have preferred to be faced with proposals presented clearly by the experts in such a way that the Tribunal could reach a decision without becoming involved too deeply into the field of economics which, after all, should be the experts' foremost area of expertise.

meeting of Petrozuata noted on 7 December 2000 an IRR at 34% and a net present value of US$ 537 million at 7.7% (C-326).

646 Consolidated Expert Report on Valuation, 17 November 2016, paras. 384.

647 Article 6 (C-585). An expert explained: "You discount the cash flow at a particular Discount Rate, but you have an IRR, you always want to have an IRR which is above the Discount Rate, so you have a cushion. You have value in the Project." TR-E, 2017 March Hearing, Day 13, p. 3964:1-5 (Spiller).

648 Consolidated Expert Report on Valuation, 17 November 2016, para. 388/389.

However, such a guided choice is impossible when the experts' proposed discount rates are, respectively, 11.6% and 27.7%, a difference of more than 16%. As another Tribunal noted in a similar situation where the opposing rates were 8.5% and 26%: "There was an air of unreality with respect to both Parties' arguments with respect to the DCF method"[649]. The Tribunal tried by letters dated 4 and 12 April 2017 to direct the experts to confer with the aim of narrowing the gaps between their respective positions related to discount rates, in general, and country risk, in particular. By letter dated 25 April 2017, the Claimants informed the Tribunal that the experts were unable to succeed with such task. There were manifestly grounds to bring the respective opposing positions at least a little bit closer, based in particular on the results of the two hearings held in February and March 2017, where a number of errors in the experts' assumptions were highlighted. The Tribunal made an effort that seemed to be the minimum of a reasonable approach. It has been faced by a surprising and indefensible refusal, originating – on one or on both sides – either from the experts themselves or from one or both Parties, through the instructions they had given. The Tribunal's approach may imply certain approximations the Parties may have not wanted to undertake by offering their comprehensive assistance. The members of the Tribunal, being exposed to suggestions so extreme that they manifestly cannot be retained, will have to make certain adjustments that some experts may consider to be a deviation from economic discipline[650].

885. The matter to be addressed as a priority is the full hybrid complex of a variety of intellectual and mathematical distortions on the subject of country risk. This needs to be looked at first, whereas the consideration of risk-free and general industry-risk based financial resources is nearly agreed between the experts who nevertheless thought it was preferable to demonstrate once more their ability to entertain controversial esoteric debates rather than providing assistance to the Tribunal which is responsible for resolving the case.

b. U.S. market assumptions

886. In many respects, the Claimants' experts refer to U.S. market characteristics as a basis and then simply add adjustments to what they assume reflect differences of the comparable concepts pertinent for the situation in Venezuela. In essence, the Claimants' experts purported after 2008 to proceed with a "but-for valuation of Claimants' interests in the Projects" on the valuation date[651]. But, in fact, they addressed the matter through data available on the U.S. market that is then simply adjusted to Venezuelan market components and without or with very little further scrutiny of the

[649] *Himpurna California Energy Ltd. (Bermuda) v. PT (Persero) Perusahaan Listruik Negara (Indonesia)*, Final Award dated 4 May 1999, para. 355 (R-252).

[650] This is said under the assumption that such a discipline exists. Serious doubts are permitted given the extreme discrepancies of the results from highly educated professionals who should have a scientific background allowing conclusions coming closer to one another in their elaboration and in their results.

[651] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, para. 54.

economics of the Projects. This approach is reflected already at the first level of considering country risk, which is presented as a premium accounting for the increased uncertainty or volatility of the Projects' cash flows resulting from the Projects being located in Venezuela rather than a more developed economy, such as the United States[652].

887. In the May 2014 report of the Claimants' experts, the Venezuela component of country risk disappeared:

> To determine the extent of country risk applicable to the Projects, we evaluate the (incremental) risk of the Projects' cash flows compared to a similar project located in the U.S. To do so, we first identify the potential sources of country risk, and then we implement a methodology that reflects the market's perception of the Projects' exposure to overall country risk.[653]

888. When they discuss the comparison with the Alaska pipeline, the Claimants accept that the information conveyed stands at least for the fact that a project in Venezuela faces higher country risk than would a similar project in the U.S.[654]

889. One of the factors used by the Claimants' experts as support for low discount rates is the Weighted Average Cost of Capital (WACC) model that serves to pull most relevant rates together and offers a final rate to be used for further valuation. The experts were not always explicit in showing that this model works with U.S. market assumptions, and retains Venezuela risk factors as they are looked at from a U.S. perspective, without accepting any link or relationship to the local country market. Thus, when calculating the appropriate WACC for the Projects, they "first estimate the industry risk through the calculation of a WACC for a U.S.-based company in the same industry segment as the Projects (oil and gas exploration and production, or E&P)". To take account of the Venezuelan component of the Projects, they "then adjust it to reflect differences in the relative risks of investing in Venezuela versus the U.S."[655]. For this purpose, they did not use Venezuelan market data, because these data, as they say, were not available and in any event not reliable. The Respondent's experts go a step further in noting that this is simply playing with bond ratings for the purpose of reaching what appears to have been their target for the discount rate[656].

890. When they use the Capital Asset Pricing Model (CAPM) to estimate cost of equity (part of the WACC), the Claimants' experts use data from U.S. capital markets, while noting that a cost of

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652 Claimants' Final Submission on Quantum, para. 412.

653 Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, para. 56.

654 Claimants' Final Submission on Quantum, para. 454.

655 Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, para. 102.

656 Consolidated Expert Report on Valuation, 17 November 2016, paras. 479/480.

equity estimated from U.S. data fails to account for the fact that the activities take place outside of the U.S. To address this, say the experts, they included a country risk premium to account for the different political and macroeconomic risks in Venezuela as compared to the U.S.[657] However, when determining such country risk, the experts choose the sovereign debt approach that was based on the Emerging Markets Bond Index (EMBI) developed by JP Morgan, a U.S. bank[658] in 1999 – nearly 10 years before their report– and that did not estimate country risk directly but in comparison with the total market capitalization of all instruments included in the index. The index is defined as a market debt benchmark, which seems to have limited relevance for a cost of equity determination. The global factor determined by the index was 5.6% for Venezuela. However, the experts choose a 5-year horizon resulting at the end of July 2008 in a country risk premium of 4.37%; the experts did not refer to any source for such an assumption[659]. With this premium, the experts made an adjustment based on the rating of Petrozuata's bonds in 1998 and further determined Petrozuata's debt to country risk in comparison to U.S. exploration and production (E&P) companies, using an index of U.S. industrial bonds whose ratings were two levels above Venezuelan sovereign debt. Whereas the experts purportedly rely on Venezuelan bond ratings, the reference from where the calculation starts is again the U.S. market. Finally, while accepting that equity is more exposed to country risk than debt, they assumed that Petrozuata had an optimal capital structure that is the same as the average of the U.S. E&P firms and thus adopted a 26.5% debt portion – all this without any verification by reference to companies operating in the Venezuelan oil industry or, what would be the basic requirement, to the company under examination, *i.e.* Petrozuata[660]. The experts' conclusion illustrates their approach:

> A willing buyer of the Projects would have an industry-representative capital structure. Reliable information for such a generic buyer is not available from the sample of Venezuelan E&P companies with the same risk characteristics as our target Projects. Accordingly, we used as a proxy the average capital structure observed in the U.S. sample of E&P companies, that is, a debt to equity ratio of 27%. Our use of U.S. data is supported by the fact that the

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[657] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, Appendix E, para. 5. The experts added that U.S. data are more reliable "than analogous data from Venezuelan capital markets, to the extent that such Venezuelan data exist". In other words, the experts concluded that Venezuelan data were not reliable although they had not verified whether such data exist. In the report covering this Annex, the experts were more affirmative: "We use the optimal debt-to-equity ratio from non-integrated exploration and production oil and gas firms in the U.S., as data from the Venezuelan market is limited and unreliable." (para. 113). Thus, the experts concluded that Venezuelan data were unreliable before they undertook the effort to search whether such data exist. They had 8 years to remedy this defect. In all later reports, the caution about maybe available data from Venezuela was no longer mentioned.

[658] LECG-171, referred to in Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, Appendix E, para. 17, footnote 21.

[659] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, Appendix E, para. 18.

[660] Cf. *ibidem*, Appendix E, paras. 16-36. As mentioned below, the debt portion was finally set at 26%.

E&P industry is basically an international industry, and that many U.S. companies have investments in other countries.[661]

c. Discount rates on foreign markets

891. Both expert teams made extensive studies of risk ratings derived from a great number of markets internationally or even world-wide. While such comparisons can be instructive in various regards, they suffer from the fundamental handicap of not being driven either to the market concerned in the instant case – the Venezuelan oil market – or, more specifically to the Projects that are the object of the valuation and thus at the core of the determination of the discount rate, and in particular, its inherent risk component.

892. The Respondent's experts rely in very large part on five approaches to determine discount rates, *i.e.* the Country Risk Rating Model published by International Investor, SPEE, their own Stock Market Data, and the Texas Comptroller of Public Accounts. All of these sources are grounded internationally, with the exception of the last one, which contains appraisals of more than 6,000 oil and gas properties in the State of Texas. A fifth source should be mentioned separately, because it provides information on upstream oil projects in Venezuela, assembled by the IHS Global Insight[662]. When all these sources are taken together, the range of discount rates under an *ex post* valuation is between 21.8% and 29.5%[663]. The experts then create another group, comprised of different methods represented by four different categories of indicators, *i.e.* (i) ICAPM, a method using the relative standard deviation of the stock markets of Venezuela and an advanced economy; (ii) ICAPM, other methods; (iii) methods combining non-CAPM expected rate of profit with the country risk rating model; and (iv) direct non-CAPM estimates. The Respondent's experts conclude from this comparison that the mean of cost of capital of the four groups is 27.7% for October 2016, which is the discount rate they apply to obtain the Net Present Value (NPV) of the Projects as of the *ex post* valuation date[664]. The experts do not explain the respective weight given to each one of these groups that show very different compositions. It appears that, in very large part, these groups do not reflect assessments based on the Venezuelan market, and that, when they do, the reference is not different than when considering stock markets of Venezuela. No connection is made to the economics of any of the Projects under valuation. This is striking. The experts state as one of their fundamental points that the discount rate reflects the expected rate of profit, at least as a minimum, which rate is reflected by the cost of capital as it is "looked at from the perspective of

[661] *Ibidem*, Appendix E, para. 50.

[662] The data relate to 2009 only and were given for oil projects in Venezuela generally; cf. Consolidated Update Report, 17 November 2016, paras. 378(b), 520/521; Additional Expert Report on Country Risk in Discount Rate, 19 May 2017, para. 11.

[663] Consolidated Expert Report on Valuation, 17 November 2016, paras. 378, See further paras. 478-552.

[664] *Ibidem*, paras. 380/381, 538, 540, Table 34, para. 578.

the project"[665]. However, none of the approaches and methods they use as guidelines implies any perspective focusing on the Projects.

893. The Tribunal also notes that the Respondent's experts express a number of limitations in respect of a methodology based on the CAPM approach that to a certain extent, must also extend to ICAPM, its international companion. This method, they say, explains the pricing mechanism in financial markets under the assumption of perfect competition. They note that the theory has a poor track record for predicting actual discount rates for financial assets and that it also has serious limitations when the asset to be valued is a stand-alone physical oil project, which is not liquid, for which there are few buyers whose portfolios are not fully diversified. They conclude that the theory simply cannot be applied without important modifications when perfect competition does not prevail. Therefore, in this case, the CAPM can only provide a floor to the discount rate[666]. They further add that the CAPM was supplemented by adding a country risk premium, generating the ICAPM, the international version of the model. The experts note, however, that beyond the ICAPM other approaches must be used to determine discount rates "that are free from the strictures of that theory's assumptions"[667]. Nevertheless, as explained above, the experts use the ICAPM (in undefined proportion) as one of their basis for suggesting their discount rate of 27.7%, further noting that when relying exclusively on non-ICAPM methods, this rate would go down to 25.1%[668]. In any event, the reliance on numerous ICAPM based sources or other sources using comparable data under another methodology is largely misguided when not focusing on the Projects at hand and their economic environment. Additionally, as these Projects are on-going in a but-for scenario, there is no room for any "buyer"-oriented perspective that might be influenced by comparison with other or maybe similar markets.

894. The Respondent's experts also suggest that most of the CAPM estimates are made from U.S. stock market data. This market is highly liquid, while a physical project, usually, is not, as it has to face a limited market, where transactions take a long time to be concluded. To take account of this constraint applicable to the Projects, the Respondent's experts proceed with a liquidity adjustment of 4% to the first two groups of methods based on the ICAPM, with the effect of an average increase of the discount rate, based on the four groups, of 2%. This results, as they say, in a "discount rate (cost of capital) after liquidity adjustment" of 27.7%[669]. However, they also noted, at an earlier stage, that the same percentage represents the mean of the cost of capital of the four

[665] *Ibidem*, para. 390.

[666] *Ibidem*, paras. 394, 404. The experts emphasize the word "floor". See further paras. 492-497.

[667] *Ibidem*, para. 400.

[668] *Ibidem*, para. 383. The experts retained for their valuation ICAPM-based methods for more than 50%; cf. the same Report, page 275, Table 34.

[669] *Ibidem*, paras. 538, 540, Table 34.

groups mentioned above, not considering an adjustment for liquidity[670]. This is confusing. The Tribunal understands that this last figure must be lower than 27.7%, but that for the experts the final percentage is 27.7%, as further confirmed by the Respondent's briefs.

895. The Tribunal notes first that the Respondent's experts' argument is circular. The lack of liquidity is evaluated by comparison with the most liquid U.S. stock market, while it is asserted – correctly – that the discount rate should be based on a Project-oriented valuation and not by reference to U.S. data for stock marketed companies that have very little, or indeed nothing to add to such examination. Since the Projects were set up, there was never a liquid market for revenues in the form of dividends from oil production and upgrading. There was no market either for the shares, all the more so since the matter was governed by the Association Agreements. Therefore, the factor of illiquidity, if it was relevant, was at all times included as a commercially relevant component of the Projects and therefore also included in the valuation made by the investors, be it as discount rate or the hurdle rate. Thus, as the Claimants' experts have noted, there would be an obvious double counting if any lack of marketability was added to country risk[671]. It may also be observed that country risk cannot be measured, in the instant case, by reference to markets. The discount rate serves to determine the present value of future dividends. These are all characteristics exclusively related to the Projects at issue in the instant case.

896. The Claimants' experts, on the other hand, considered the comparable transactions and market multiples approaches as a means of testing the results of their DCF analysis. They examined over 1,600 crude oil exploration and production transactions that occurred between 2001 and the first half of 2008 for which reliable data was available. This approach is useful when there are numerous, recent, arm's length transactions of assets that are similar or comparable to the asset being valued. The general ranges of value, taken as a whole, provide an opportunity to confirm the conservative nature of the results of their DCF calculations. The experts did not identify any particular transaction that could be considered directly comparable in all material respects to the Petrozuata and Hamaca Projects (including in terms of size, location, and type of crude oil), but they say that they were able to evaluate the per-barrel transaction price of a sizeable number of recent transactions relating to heavy crude oil interests. Similarly, they examined transactions relating to shallow water projects and assets in an effort to find comparables for the Corocoro Project. They did not identify any particular transaction that could be considered directly comparable in all material respects to Corocoro, but the transactions, in the aggregate, offer a useful and independent basis for confirming the conservative nature of their DCF analysis.

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670 *Ibidem*, para. 381.

671 Abdala/Spiller, Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 33.

897. The experts also sought to corroborate the results of their DCF analysis by examining the valuation multiples that arise from publicly-traded exploration and production companies extracting heavy crude oils in Canada and elsewhere. Although they did not identify a particular company directly comparable to the Petrozuata or Hamaca Projects, they found that this exercise provides a useful and independent means for confirming the conservative nature of their DCF results[672].

898. The "market multiples" approach (sometimes called the comparable company approach) is similar from an economic viewpoint to the comparable transactions approach. The approach is applied by (1) identifying publicly-traded firms that are sufficiently similar to the target enterprise, (2) computing a ratio that expresses the firm's value to some relevant variable (*e.g.* earnings, production, proved reserves), and (3) applying the observed multiple to the variable (in this case reserves) to determine its value. If the stock market is reasonably efficient then the prices of equity shares incorporate the market's knowledge and expectations of the future business prospects for firms and thus provide a reasonable estimate of fair market value. If the selected public firms are sufficiently similar to the target enterprise, it is possible to draw an inference as to the probable value of the target based on an industry appropriate multiple. In this case, the relevant indicator of value, which they have identified, is the ratio of the enterprise value to the number per barrel of oil equivalent (BOE) of proved reserves.

899. The Claimants' experts conclude that their analysis confirms the conservative nature of the value that they calculated for the Petrozuata and Hamaca Projects using the DCF approach.

900. The Tribunal finds that without denying the interest of multiple comparisons, with either projects or transactions multiples, such methods do not permit to arrive at conclusions concrete enough to be applicable to the Projects in the instant case. The experts accept that they did not identify any particular transaction that could be considered directly comparable in all material respects to the Projects. Therefore, if no reasonable comparison can be derived from the multiple comparisons and analysis of a large number of oil production sites worldwide, what is the purpose of such an exercise if it does not lead to concrete results in respect of the Projects at issue in the instant case? Such comparisons may show differences between extremes where discount rates may be discovered. Yet, this does not lead to any concrete result.

901. Similarly, it is hypothetical or rather speculative to conclude from a comparison to average cost of debt of supposedly comparable E&P companies located in China, Russia, Kazakhstan, Colombia and Brazil, as compiled by the U.S. company Bloomberg, that the Projects' cost of debt

[672] Cf. Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, paras. 57/58; Appendix G completed by Appendix D to the Second Valuation Report of ConocoPhillips' Investments in Venezuela, 2 November 2009, and the Rebuttal Report to Respondent's Experts' Second Reports, 15 April 2010.

was 7.31% as of June, and 6.06% as of December 2016[673], when data must have been available from the Projects' accounts at least for the historical period.

d. General country risk assumptions

902. The Tribunal finds that while it may be true that the general economic situation of Venezuela may have a negative effect on the Projects' economics, for instance by increasing the risk of increased taxation, political instability, turbulences on the labor market or lack of technical supply, there is no point in drawing conclusions from the risks implied in Venezuela's sovereign debt, close to collapsing, in respect of the financial standing of the Projects that enjoy considerable autonomy compared to the country's economy taken as a whole.

903. On the other hand, governmental policy directions affecting Venezuela's oil industry in general (whether they are called country risk or not), like royalties and taxes, currency exchange limitations, OPEC production restrictions, and many other regulatory measures related to the conduct of oil projects must be taken into consideration. The Petrozuata Offering Circular of 1997 (C-75) contains an extensive enumeration of such risks that do not need to be listed here again. However, in this respect as well, the impact of such governmental measures cannot be converted into the risk component of a specific project without further considering many other factors and mainly those related to the particular project at stake. The financial statements also contain comprehensive lists of risks affecting the Projects[674].

904. The same concern applies to comparisons made by the Claimants' experts with many other loans that are rated by professional agencies for the purpose of impacting the financial market. The debt quality of the respective borrowers may allow indirect conclusions as to the inherent risks of the relevant business, but this does not allow an immediate transfer of such risks for the purpose of identifying the risk components of the Projects at issue without further verification. Therefore, the Tribunal finds the Claimants' experts' assumptions in this respect, without denying some intrinsic interest, to be close to simple speculations not connected to the characteristics of the Projects. The experts must have been aware of the weakness of such position when they stated: "In any case you need to analyze the project-specific risk and not the country risk in general."[675] This is also the Claimants' position: "The relevant inquiry, then, is what the country risk *would have been* for these Projects (considering their specific characteristics, including their Treaty and contractual protections) absent unlawful conduct by Venezuela."[676]

[673] Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 175.

[674] See, for instance, the Report for Petrozuata for the years 2006/2007, p. 18-21 (CLEX-093).

[675] TR-E, 2010 Hearing, Day 10, 2689:17-2690:8 (Spiller). And again: "… the country risk ought to be Project-specific", TR-E, 2017 March Hearing, Day 11, p. 3335:7/8 (Spiller).

[676] Claimants' Final Submission on Quantum, para. 412.

905. In any event, even if bond ratings like those of the Venezuelan sovereign debt are taken as reference, they cannot represent more than a bottom line on which the specifics of the Projects have to be build and translated into costs leading to appropriate rates. The bond rating as such is not pertinent for a project-driven valuation. The risk of a physical project attracting foreign investments is much higher than the risk of a bond. If this was not the case, the investor would simply buy bonds, which include country risk, but not other risks inherent in the particular investment[677].

e. The risk of expropriation and taxation

906. The Tribunal accepts that the discount rate should not serve as a premium for unlawful acts committed by the host State and detrimental to the investment. Therefore, it is not appropriate to include the risk of unlawful expropriation or other unlawful state measures into the determination of the risk/profit equation of the Project, and henceforth, into the discount rate.

907. The Claimants, however, go too far when they submit that no expropriation risk should be considered. This is not correct in view of the protection provided by the BIT against illegal acts committed by the host State, which delineate, conversely, the scope left for legal intrusions from the State affecting the economics of an investment. Thus, expropriation is permitted within the limits determined by Article 6 of the BIT. This includes the right of the investor to be awarded "just compensation". As the Claimants have submitted this standard is not as exact as full reparation, with the effect that if just compensation is actually paid, the investor must assume the risk of being deprived of compensation allowing full recovery for the loss suffered. To this extent, the Treaty protection has its limits, which translate into a risk inherent to the investment.

908. As to the principle, the Tribunal agrees with the Claimants that unlawful conduct should not be converted into a benefit for the wrongdoer.

909. The same principle applies in respect of the consequences of discriminatory actions. To the extent that the compensation provisions of the Petrozuata and Hamaca Association Agreements provide for a limited indemnity for the Class B Shareholders, the difference, representing uncovered loss, must count as a risk of the Projects that translates into the discount rate.

910. Therefore, one of the basic assumptions of the Claimants' experts, *i.e.* that "in these proceedings the discount rate must be free of expropriation risk and of the risk of wrongful taxation"[678] must be tampered. The Projects were not free of the risk of expropriation, provided it was lawful within the framework of Article 6 of the BIT. They were also exposed to the risk of increased

[677] Brailovsky/Flores, Consolidated Expert Report on Valuation, 17 November 2016, para. 398(c).

[678] Rebuttal Report to Respondent's Experts' Second Reports, 15 April 2010, para. 9.

taxation, however within the limits determined by the compensation provisions. Therefore, the Claimants' experts' criticism of the Respondent's experts on these points, expropriation and taxation, is not persuasive[679].

911. At a later stage, in 2014, the Claimants' experts moved from their initial position and focused more on the Projects' production and cost parameters. They noted: "A major difference in the inputs selected by B&F [Brailovsky&Flores] relates to the Projects' expected operational performance in the absence of expropriation."[680] Additionally, when enumerating the specific features of the Projects that support the experts' low country risk premium, they state:

> The Projects' private shareholders not only enjoyed specific protections against expropriation in the BIT but also had specific protections against adverse actions by Venezuela in the Petrozuata and Hamaca Association Agreements, which further limited their exposure to political and regulatory risk.[681]

Additionally, the Claimants' experts note that the Projects contain their own risk management when considering the protection available through bilateral investment treaties and the compensation provisions of the Association Agreements[682]. Nonetheless, when the experts analyze the Petrozuata Agreement they take as a basis the years 2002-2004, arguing that the Petrozuata's credit ratings were affected thereafter by reports on possible expropriations[683].

912. The Tribunal also recalls that the Claimants' experts were instructed not to examine the application of the Windfall Profit Tax (WPT). Consequently, they did not consider either the potential of an impact of this taxation on the risks inherent in the Projects.

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[679] *Ibidem*, para. 10: "The differences between the country risk premium we use and the country risk premium used by B&W [Brailovsky&Wells], in turn, is due to B&W's failure to isolate the expropriation and wrongful taxation risk elements embedded in this premium, risks that the Projects would not have faced in the but-for world." In their earlier reports, the Claimants' experts assumed an income tax of 34% for Petrozuata and Hamaca. In fact, in 2007, the income tax in the hydrocarbons industry rose to 50%, and the Claimants had concluded that such increase should not trigger the applicability of the compensation provisions in the instant case. The experts changed their tax scenario in their Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, paras. 2, 4, and in their Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, footnote 9, paras. 19, 249.

[680] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 6.

[681] *Ibidem*, para. 86(d).

[682] *Ibidem*, para. 192.

[683] *Ibidem*, para. 118; Consolidated Update Report, 17 November 2016, para. 89.

f. The risk inherent in the credit rating of debt

913. The Claimants rely heavily on the risk component included in the rating for the Petrozuata bonds. As noted above, the experts restricted their analysis of but-for cost of debt to the years 2002-2004, considering that the later reports on expropriation risks would impact this valuation. The experts' years of reference are thus more than 10 years before the effective valuation date and based on a hypothesis that is in contradiction with their acceptance that the Projects were protected by the BIT. At the time they wrote the May 2014 Report and the 2016 Consolidated Report, the experts knew that the BIT was applicable since 2005/2006[684]. Nevertheless, the experts are of the view that the Projects' credit risk profile would have maintained the BB rating it had in the 2002-2004 period through to December 2016[685]. No evidence is provided for such an assertion, which simply conveys the experts' personal opinion.

914. This opinion is not without contradiction. In support of the downward trend of the lenders risks since the early days of the investment, the Claimants' experts argue that "many of the material risks initially associated with the Projects were no longer present as of 2016 (such as, for example, construction and development risks), and given the reduction in risk free rates, the interest rates required by bond holders as of 2016 would have been lower than those offered by lenders in 1997"[686]. Such reduction does not affect, say the experts, the country risk component of cost of equity: "… because of Venezuela's increased fiscal deficit and the deterioration in its overall macroeconomic situation, the Projects could be adversely affected due to other political risk factors, such as an increase in the risk of supply chain disruptions"[687]. The Tribunal observes, firstly, that these arguments are incomplete in light of the available information of risks characteristic of the oil market in Venezuela and in respect of the Projects in particular, as they are enumerated extensively in the Petrozuata Offering Circular and in other official reports. Secondly, the experts' estimation of risks in Venezuela is inconsistent with the use of an initial credit rating in 2004, without further verification in respect of the following years, and this in reliance on a proxy of the U.S. corporate market[688].

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[684] The ownership in the Projects was transferred to CPZ on 27 July 2005, to CGP on 11 August 2005, and to CPH on 22 September 2006, respectively; cf. 2013 Decision on Jurisdiction and the Merits, para. 276.

[685] Consolidated Update Report, 17 November 2016, paras., 91, 173; see also Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, para. 119. Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 89, further referring to the Merrill Lynch Emerging Markets Corporate Plus Index, once again not sourced on the Venezuelan oil market.

[686] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 12.

[687] *Ibidem*, para. 32.

[688] Cf. also Brailovsky/Flores, Additional Expert Report on Country Risk in Discount Rate, 19 May 2017, para. 19.

915. The Tribunal does not share the Claimants' experts' view that the bond ratings can be seen as equal to the Projects' risk ratings pertinent for the investors[689]. As the Respondent's experts say, "the risks of investment in equity, particularly in the case of non-financial assets, must be higher than those for an investment in bonds"[690]. The risk of lenders is certainly below the risk assumed by the investors who are directly involved in the operation of the Projects and must be awarded revenue higher than the benefit obtained by the lenders. Therefore, the country risk assessment made by the Claimants' experts at the level between 4 and 5% has no real relationship with the economics of the Projects as defined in the official documents supporting the Petrozuata bonds. The result of such a comparison is rather that the risk inherent in the Projects as perceived by the Claimants must have been significantly above the risk converted into a bond rate of 8%. The Claimants' experts seem to take advantage of this bond rating as it yields lower risks than the Venezuelan sovereign bond, at least for a certain period of time. However, such assumption is speculative, because oil-producing companies are exposed to risks that can easily develop at levels above the risks retained for sovereign bonds, as well as for average companies in the same country. The key point in this respect is that the risk rate inherent in a bond rate of 8% is certainly of interest, in light of the Circular's most extensive enumeration of all risks the lenders are facing, but it is equally certain that an investor's risk burden must be heavier because it applies directly and without the safeguards available to the lenders through the protections available on the financial market, in particular the guarantees provided by the bond sponsors. The Claimants' experts did not ignore that this makes a difference and invalidates comparisons relevant to an assessment of the credit quality of unsecured debt[691]. At no point did they mention that in the circumstances of the instant case, the risk factor is not impacting the value of the bonds but the prospect of being paid the dividends arising from the Projects' performance. The discount rate made on this basis would result in different and higher proportions. Yet, this is not the approach that they choose:

> "We considered three alternative approaches to calculate the project-specific exposures to country risk as suggested by Prof. Damodaran. … none of these approaches produces a meaningful result for the Projects, so we proceeded to our own implementation based on the observed Projects' debt performance."[692]

916. It seems to be simple to understand that a debt performance guaranteed by the sponsors and the shareholders of the parent companies has a lower risk component than the payment of dividends that comes in the stream of revenue after the payment of interest to the lenders.

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[689] Or, as the Claimants say in their 2017 Post-Hearing Brief: "The yield on the Petrozuata bonds reflected the market's perception of the risk of an investment in the Petrozuata Project itself." (para. 214).

[690] Consolidated Expert Report on Valuation, 17 November 2016, para. 436.

[691] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, footnote 120.

[692] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, footnote 66. The Tribunal observes that this footnote is attached to paragraph 47, opened by this statement: "In assessing the level of country risk relevant to the Projects, we follow the approach put forward by Prof. Damodaran (2003), termed the "Lambda Approach," which posits that the measurement of country risk must be asset-specific."

917. As neither the sovereign bond nor the Petrozuata bond are useful indicators for the Projects' cost exposure and discount rate, the debate between the experts on whether one bond is rated above the other, or the reverse, is moot.

918. The Claimants' experts further submit that for the companies involved in the Projects, the effective cost of debt is not the interest paid to the lenders, but the net rate obtained when the income tax is deducted. Considering the effect of a reduction on an income tax of 50%, this cuts the risk component approximately by half[693]. Here again, such calculation does not include consideration of the higher risk component for investors, compared to lenders, and the methodology is further biased by a debt to equity ratio of 26% that is based on averages retrieved from E&P companies indexes unrelated to Venezuela[694].

g. Consideration of a willing buyer

919. The Claimants' experts, when introducing the DCF methodology as the most reliable tool to determine the Claimants' losses, use the comparison of a "willing buyer" who would consider purchasing the Project at the time of valuation[695]. They also refer to the World Bank Guidelines[696]. However, these Guidelines refer to the market value used for the calculation of just compensation at the time of expropriation. At the point of valuation of the three Projects in the instant case – whether it is the end of 2016 or 2018 – there is no willing buyer to consider. Such buyer may have its own views about weighing risks and profits inherent in the Projects compared to his own interests and the offers of other competing buyers. Each of those potential buyers will adopt his own debt-to-equity ratio. In this case, what matters is the valuation of future revenues attributable to the Claimants under the conditions of their experience in a but-for scenario. These conditions are predetermined by the Projects' inherent parameters. They cannot be moved for the purpose of complying with an incoming buyer's operational and financing choices.

920. More particularly, when looking at the WACC at the basis of the Claimants' experts' conclusions, reference is made to "the weighted average of the cost of debt and the cost of equity, with the weightings (which sum to 100%) determined by the optimal capital structure in the industry"[697]. However, this definition is given in the abstract, and its elements are determined through parameters used by the "industry" and its pertinent market field. Such definition might be useful for an evaluation by a prospective buyer and allow him to compare with other projects interesting in view

[693] Cf. Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, Appendix E, paras. 37-47.

[694] *Ibidem*, Appendix E, paras. 35, 50.

[695] *Ibidem*, Appendix E, para. 62.

[696] LECG-037.

[697] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, para. 69.

of an investment. For the purposes of valuation of an on-going project and its forthcoming cash-flows, these factors must be determined by reference to the projects under consideration.

h. Cost of debt

921. The Claimants' experts submit that their WACC was based on cost of equity. However, they accept a more than 25% proportion of cost of debt as it is retained in U.S. business-oriented market manuals, with the effect of reducing significantly country risk for Venezuela down to about 4%. The experts' debt-to-equity ratio underwent changes. While the equity portion was initially set at 27%[698], for August 2014, the debt to equity ratio was given as 29% to 71%[699]. This was shortly after the May 2014 report, where the debt-to-equity ratio was 40.7% as of March of the same year, and by reference to U.S. E&P industry[700]. In March 2016, the debt to equity ratio was said to have changed from 41% to 30%, without explanation[701]. The Consolidated Report noted that the "debt-to-firm" ratio became 25.6% in December 2016[702]. Finally, it was set at 26% for the same date[703]. In light of the confusing curb of the relevant ratio provided by the experts over the years, and the U.S. sourced information used as evidentiary support, the Tribunal notes that no effort has been provided to extract the pertinent percentages, if any, from the Projects' economic and financial structure itself[704]. The matter is relevant here because of the implications on the country risk factor. This factor is considerably higher in relation to cost of equity than in respect of cost of debt[705]. Therefore, when increasing the cost of debt portion, the country risk component decreases and so does the discount rate.

[698] *Ibidem*, Appendix E, para. 50.

[699] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 163.

[700] *Ibidem*, paras. 114/115. The same report presents the debt to equity ratio for the Projects' "Base Case" as 29% to 71% (para. 129).

[701] March 2016 Update, 18 March 2016, para. 26.

[702] Cf. Consolidated Update Report, 17 November 2016, footnote 95, where it is explained that the ratio provided results as an average from the capital structure of E&P Projects, referenced back to the sample of companies in Bloombergs' SIC Code 1311. No analysis is provided on the reasons why and, if so, to what extent these sources are relevant for the Projects at issue in the instant case. In Table 3, para. 95, the percentage noted is 25.9%.

[703] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 63(c).

[704] In its closing statement at the 2017 September Hearing, Counsel for the Claimants simply stated that the cost of equity was more than two times the cost of debt, and that a company was funded by debt and equity; TR-E, Day 18, p. 5167:19-5168:3 (Friedman).

[705] "If things go wrong, the debtholder gets paid first. The equity holder, if there is any money left, gets paid last. So, that's why the Rate of Return that the investor would require the Hurdle Rate for, the investor would be substantially higher"; TR-E, 2017 March Hearing, Day 14, p. 4167:12-17 (Flores). "In general, equity is riskier than debt."; *ibidem*, p. 4236:21 (Spiller).

922. The Respondent's experts' position is ambiguous. Without close examination, the experts simply mentioned "that the Projects have some debt"[706], whereas they had noted in August 2014 that there remained no debt-related expenses after 15 May 2014[707]. Nonetheless, the experts included consideration for cost of debt in their discount rate valuation[708] and they retained a debt to asset ratio of 23.7%, referring to the Standard Industrial Classification Code prepared by the U.S. administration (SIC 2911, BF-62)[709]. Assuming no debt any longer in mid 2014 seems incompatible with the hypothesis of a debt portion of the Projects of more than 20%.

923. The Claimants' experts are more explicit. They included cost of debt "by comparing the Projects' cost of debt with the cost of debt of comparable U.S. E&P producers" and this "absent the threat of expropriation"[710]. The experts explained that they took that measure – the debt country risk – and amplified it by the relative risk of E&P companies' equity to their debt, to reflect the increased riskiness of equity investments in the industry, as compared to investments in debt[711]. Such analysis completely moves away from considering the Projects' own risk components, even to the extent it would be related to its cost of debt. Indeed, when adjusting the country risk based on debt yields, the experts say that they "increase the debt country risk premium by capturing the US industry risk differential as applicable to general equity and debt investors"[712]. In addition, cost of debt includes the risk component as perceived by the bond holders, with the effect that there is no further risk determination based on the Projects[713]. The experts were aware of the Projects' financing at least to the effect that the Hamaca and Corocoro Projects had not issued bonds and that the Petrozuata bonds had been paid back long before the valuation date in December 2016. This would have provided good reasons to examine more closely whether the debt ratio of 26% was reasonable and a good cause for the downgrading of the country risk by about one third compared to the country risk adopted in relation to cost of equity.

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[706] Consolidated Expert Report on Valuation, 17 November 2016, para. 424.

[707] Expert Report on Valuation, 18 August 2014, footnote 57.

[708] *Ibidem*, paras 282-284.

[709] Consolidated Expert Report on Valuation, 17 November 2016, pages 275 (Table 34) and 342 (Table B.2). The ratio was set at 3.3% only in June 2007 (pages 274, Table 33, and 340, Table B.1).

[710] One may recall that the experts had later accepted that the Projects were protected by the BIT against expropriation; Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 86(d).

[711] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, para. 62; Consolidated Update Report, 17 November 2016, para. 87. As explained at the 2017 March Hearing, the experts proceeded as follows: "But, if we agree that the Shareholders are more risky than debt, and if on average it's two - it's twice more risky, which is what we find, then I take the risk to the debt and multiply it by 2.2, and I get the risk to the Shareholders." TR-E, 2017 March Hearing, Day 14, p. 4239:1-6 (Spiller).

[712] Consolidated Update Report, 17 November 2016, para. 92.

[713] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, paras. 39-41, 50(b).

924. There is more. The Claimants' experts knew that the Petrozuata bond was the only debt they could take into consideration. They noted, indeed, that "[b]ecause the financial debt of the Projects was cancelled immediately after expropriation, there have been no direct observations of the Projects' cost of debt since mid-2007", and further: "If the Projects had outstanding debt as of 2016, however, one would still have to assess to what extent the yields on the bonds would be representative of a but-for scenario". The experts then concluded: "Because the Hamaca loan facilities did not represent traded market assets, we relied on an analysis of Petrozuata's bond for our country risk measurement for the Projects".[714] Thus, there was no debt to look at other than the Petrozuata bond and this in the abstract only, as the bond had been paid back and was no longer on the market. The credit rating up to December 2016 was indeed derived from the rating for the years 2002 to 2005 (further extended to 2007) on the basis of ratings concerning ten E&P companies operating in emerging markets, reported by credit agencies, and entirely unrelated to Venezuela[715]. It was then concluded that the bonds carried an average yield of 6.06% that the experts included in their calculation of the WACC, where it applied to the total debt exposure of 26% that the experts assumed based on U.S. market references for investors, while accepting that such exposure did not exist at the Projects under valuation[716]. This also means that the credit risk that the experts assume was included in the debt rate has no relation to either Venezuela or the Projects. Two errors must be mentioned here. First, ConocoPhillips Composite Economic Model of late 2006 (CEM, LECG-085) shows that the exposure for financing of the Projects compared to the total revenue after tax amounted to no more than 6%[717] (a number far below the Claimants' experts' debt portion of 26%), the bottom level of zero US$ being reached for Petrozuata in year 2023 and for Hamaca in 2018, while no financing was noted for Corocoro. Second, the risk component of the debt based on the bonds was not borne by the lenders alone. These bonds were accompanied by guarantees provided by sponsors and the shareholders' parent companies; through their involvement and the fees they had to pay to the banks operating as intermediary, these companies serving as back-up were equally covering part of the Projects' risk. This means that the cost of debt (anyhow small and later disappearing completely) must be treated like cost of equity in respect of this involvement of the Projects' holders. This renders the cost of debt portion highlighted by the Claimants' experts insignificant. This also means that the WACC cannot serve its purpose, which is to determine average cost of capital when more than one source of financing is involved.

i. The Projects' inherent discount rate

925. When considering more closely the Projects, the Tribunal observes that in this respect as well, the Parties are inclined to proceed by comparison to other projects and decisions, rather than

[714] *Ibidem*, para. 53, including footnote 75.

[715] Cf. *ibidem*, paras. 55-58.

[716] *Ibidem*, paras. 58, 63(b).

[717] LECG-085, page 12/pdf.

by addressing the relevant conditions of the Projects directly. The Respondent submits that the awards of other tribunals in cases involving the very same nationalization as the one at issue here should be looked at. This is correct, but not precise enough. The fact that the same nationalization took place does not mean, without further examination, that the conclusions reached in respect of another project must be the same as those pertinent for the Projects at issue in the instant case, which are based on different operational and economic parameters, conducted by different foreign investors, and which have to be valued at a different point in time. Any comparison to be conclusive should operate by analogy, which requires that the situations to be exposed one against the other are comparable, because they are based on the same or similar key-components and characteristics. Most discount analysis disregard this basic requirement, taking large numbers of companies into a sample that offers averages, but not analogies to the company at issue in the particular case. The experts on both sides were not successful in their approach based on comparisons of different kind but never involving the characteristics of the Projects in the instant case.

926. The Respondent insists on putting at the forefront as a comparative reference the *Mobil* cases discount rate of 18%. It referred to these decisions with so much emphasis that it gave the impression that it would be satisfied with such rate despite its experts' assertion that the proper rate should be 27.7%. In any event, while acknowledging that some assistance may be provided when considering the results reached in the *Mobil* decisions, this Tribunal must reach its own conclusion with its own reasons and it cannot therefore adopt the *Mobil* rate without examining the *Mobil* arbitrators' reasoning. In this respect, the result is not enlightening. The ICC *Mobil* Tribunal favored the respondent's assessment of the discount rate because it was left with no alternative, having rejected the claimant's position that was understood as submitting that no industry or country risk premium should apply[718]. More basically, the ICC Tribunal took as the main point of comparison the historical rate of return of the parent company's shareholders, which is in most cases, like the IRR, above the discount rate[719]. The ICSID *Mobil* Tribunal[720], ruling three years later, did not add to the ICC Award's analysis. The Tribunal noted that while the claimants had excluded the confiscation risk when determining the discount risk, it was unable to adopt their experts' approach. The Tribunal did not consider that other elements of the experts' reasoning could be of assistance[721]. It then noted that the Respondent's experts arrived at discount rates ranging from 18.5% to 23.9%, which represents a margin also retained by other arbitral tribunals. Thus, concluded the

[718] *Mobil Cerro Negro, Ltd. v. Petróleos de Venezuela, S.A. and PDVSA Cerro Negro, S.A.*, ICC Case No. 15416/JRF/CA, Final Award dated 23 December 2011, paras. 719, 722, 774-777 (R-462).

[719] *Ibidem*, paras. 775-777.

[720] *Venezuela Holdings, B.V., et al. v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/27, Award dated 9 October 2014 (CL-348).

[721] Cf. *ibidem*, para. 365.

Tribunal, an 18% discount rate appropriately reflects the existing risks in the present case[722]. In the instant case, in view of the extensive presentations made by the Parties and their experts, the Tribunal must find additional support for its conclusions. Little inspiration can be taken from discount rates retained by other arbitral awards relating to investments in Venezuela, adopting discount rates and their country risk portion offering variations between 10.09% (4%)[723], 14.9% (7.9%)[724], 18% (8.89%)[725], 19.88% (10.26%)[726], 21.25% (14.75%)[727], and 23% (6%)[728]. One may think that such divergence simply demonstrates inconsistencies in the arbitral tribunals' work. While this may be true up to a point, another and more convincing conclusion is that the disparity in rates demonstrates a disparity in the businesses involved and the need to derive discount rates based on the characteristics of each particular investment involved in each case.

927. As already expressed, the discount rate that the Tribunal must consider as pertinent at the present date of valuation, is different from the hurdle rate and from the internal rate of return (IRR). These latter rates express the estimated rate of return to obtain the profit the investor expects. Such expectation is influenced by the investor's understanding of the revenue it hopes to earn from the project. The information on the Tribunal's record shows that the expected profit return was estimated at about 20%. The hurdle rate, which is calculated by using techniques similar to those of discount rates, is again different, in the sense that it also reflects the investor's expectations, but does so in respect of his bottom level or minimum acceptable return, indicating the line where the decision to invest or not to invest reaches its crucial check point. Hurdle rates depend on the available capital budget and the overall business and expectations of risk bearing of the investing company[729]. The hurdle rate is therefore focused on the interests of the investor at the time he is investing and debating whether he should, or should not, jump over the "hurdle". A project's discount rate results from the economics of the project.

[722] *Ibidem*, paras. 366-368. It may be noted that the paragraphs here referred to have not been annulled by the Decision on Annulment, dated 9 March 2017, para. 196(3/4) (R-658).

[723] *Gold Reserve Inc. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB(AF)/09/1, Award dated 22 September 2014, paras. 839-844 (CL-328).

[724] *Flughafen Zürich A.G. and Gestión e Ingeniería IDC S.A. v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/10/19, Award dated 18 November 2014, paras. 878-910 (R-559).

[725] *Phillips Petroleum Company Venezuela Limited, ConocoPhillips Petrozuata B.V. v. Petróles de Venezuela S.A.* et al., Final Award, ICC 20549/ASM/JPA, dated 24 April 2018, paras. 1015-1084.

[726] *Saint-Gobin Performance Plastics Europe v. Bolivarian Repubic of Venezuela*, ICSID Case No. ARB/12/13, Decision on Liability and the Principles of Quantum, dated 30 December 2016, paras. 669-758 (R-655).

[727] *Tidewater Investment SRL and Tidewater Caribe, C.A. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB/10/5, Award dated 13 March 2015, paras. 169-197 (R-642).

[728] *OI European Group BV v. Bolivarian Republic of Venezuela*, ICSID Case No. ARB/11/25, Award dated 10 March 2015, paras. 762-817.

[729] Cf. Abdala/Spiller, Consolidated Update Report, 17 November 2016, para. 188.

928. The Claimants observe quite rightly that, as the internal rate of return, the discount rate may change over time. It may have been higher at the beginning of the Projects than at the time of expropriation, and it may have further decreased since then. However, in order to demonstrate that such evolution has taken place, the evidence should be presented that the inherent value of the Projects has changed over time and that the prevailing rate shows some stability over the future until the end of the Projects. Such a study has not been made. Additionally, whereas some factors of risks disappeared after a certain time, such as the uncertainty about the available EHCO in the early years of the Projects (mentioned by the Claimants), other risks appeared at a later stage, such as the growing uncertainty about the available reserves in the later years of the Projects, the instability of oil prices and the risks enumerated in various documents mentioned above.

929. The perception of the Claimants' experts' analysis and conclusions is impacted by the understanding they had, at least at certain points in time, about the claims the Claimants brought before this Tribunal. Thus, in their third report, the Claimants' claim was, in their experts' understanding, twofold, comprising: (a) the Respondent's expropriation of Claimants' interests in the Projects, and (b) the prior changes to the Projects' fiscal regimes, implemented by the Respondent before 26 June 2007[730]. As the second claim is not before this Tribunal, the risk assumption should have been modified.

930. The Claimants' experts had determined a country risk premium of 4.37% in their Preliminary Report of 2008[731], which then moved up to 4.55% in May 2014[732], and to 4.8% in October 2014[733], before decreasing to 4.1% in December 2016[734] and increasing to 4.2% in May 2017[735]. The experts do not explain in a clear and convincing manner why their country risk conclusion leads to these different figures.

931. Whereas they do not address directly the country risk premium as related to the Projects, the Claimants' experts indirectly explain that the difference that appears between their own and the Respondent's experts' county risk formula is based, *inter alia,* on their difference in respect of the cost of debt, which is 6.1% for them, but 10.8% for the experts of the opposing Party[736]. This

[730] Rebuttal Report to Respondent's Experts' Second Reports, 15 April 2010, para. 1.

[731] Preliminary Valuation Report of ConocoPhillips' Investments in Venezuela, 12 September 2008, para. 18.

[732] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, paras. 4, 64, 67.

[733] *Ibidem*, paras. 81, 100.

[734] Consolidated Update Report, 17 November 2016, footnote 111.

[735] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 66.

[736] Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, Supplemental Report, 13 October 2014, para. 82.

position raises considerable doubt when observing that neither these experts nor the experts of the Respondent offer evidence of any debt portion of the Projects, at least in recent years.

932. The Claimants' experts accept that general country risk cannot be retained alone. Project-specific country risk has to be considered. Such risk is, by contrast, "the incremental risk that an investor in a particular project faces as a result of the location of the asset". Indeed, "when assessing the market value of an asset it is necessary to focus on how the particularities of the project interact with the riskiness of the jurisdiction where the project is located. In other words, the project-specific country risk is the relevant measure of country risk when calculating the fair market value of an asset".[737] While here the project-specific risk appears somehow intermingled with the country risk, there is evidence that both have to be separated: "In any case you need to analyze the project-specific risk and not the country risk in general."[738]

933. However, when the Claimants' experts, having stated this broad definition, identify such project-specific country risk, they do it in order to mitigate and reduce general country risk. Country risk attempts to capture incremental risks such as the additional volatility of domestic demand, the infrastructure of a developing country (exposing the projects to more supply risks than a company located in the U.S.), and Governmental actions and macroeconomic policy affecting businesses. However, say the experts, in the case at hand, the Projects' particular features limited their susceptibility to all sources of country risk, in particular because they produce a commodity (crude oil) traded worldwide and mostly exported from Venezuela, they are only partially exposed to supply-side sources of country risk, as most of the infrastructure used to operate the Projects is self-contained, and from a regulatory perspective, the Projects are protected against expropriation risks. In addition, the shareholder agreements provide additional protection to private investors against the imposition of arbitrary or discriminatory measures by Venezuela. In sum, the experts state, "the Projects were structured in a manner that minimized exposure to Venezuelan country risk"[739].

934. The Claimants' experts do not explain how this analysis is connected to the 4.55%, 4.8%, and later 4.2% of country risk they adopted[740]. In any event, it suffices to mention that while the compensation provision offer some protection to the investor, as the experts say, this is one facet

[737] *Ibidem*, para. 57; Consolidated Update Report, 17 November 2016, para. 82.

[738] TR-E, 2010 Hearing, Day 10, p. 2690:7/8 (Spiller).

[739] Consolidated Update Report, 17 November 2016, paras., 169/170. See also Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, paras. 48/49.

[740] The experts simply state, as a conclusion, that "overall", their "assessment of the Projects' country risk exposure is reflected in a country risk premium of 4.55%", no explanation being provided why such exposure leads to this percentage. Cf. Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, para. 64.

of the compensation system only; the same provisions implicitly transfer to the Projects the host State's sovereign independence to take regulatory measures affecting the Projects' profitability ("no stabilization clause"), which is of course a risk inherent in the Projects' value. No negative factor increasing risks of the Projects is mentioned by the experts. The Petrozuata bonds are taken as reference, but the many risks enumerated in the bond circular, addressed to the bond holders, do not merit any mention or examination. As a contrast, the bond holders are told that in light of the fact that Venezuela's increased fiscal deficit and the deterioration in its overall macroeconomic situation, "the Projects could be adversely affected due to other political risk factors, such as an increase in the risk of supply chain disruptions"[741]. Nonetheless, the experts affirm that "the Projects have limited exposure to country risk"[742]. Thus, what were of serious concern for the bond holders is considered irrelevant for the equity holders, and these risks are not factored in their calculation when the WACC is determined. The taxation risk, represented in particular by the WPT, is not examined; it would have impacted the Projects but not the lenders.

935. It was only during the 2017 February and March hearings that the Claimants' experts acknowledged that the ConocoPhillips Composite Economic Model of late 2006 (CEM, LECG-085) set the Projects' discount rate at 13%. The experts had never mentioned this information before although they used the same Model extensively for their assessment of production and costs of the Projects. The experts argued that such rate had only been retained at the "time of the initial investment" and this may not be indicative of the risks that are relevant for a valuation at a more current date, such as December 2016[743]. Two remarks reduce the pertinence of this observation. The initial investments were to be examined before the years 1995 to 1997 when the Association Agreements were concluded, which means about 10 years before the Model was made. The assumption that discount rates were higher in the first years of operation of the Projects is incorrect in light of the difficulties and uncertainties appearing in 1999 as a result of the change of government and later at the end of 2001 when President Chávez obtained the legislative power by delegation for the purpose of changing the Law of Hydrocarbons. When the Composite Economic Model was set up, the economic situation was already far different from what the experts describe as the initial time for investment. Irrespective of the comments made by the experts, the fact is that the Projects' management at the relevant time retained a discount rate of 13% that cannot simply

[741] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 32.

[742] *Ibidem*, paras. 45, 49. See also Damages Assessment for the Takings of ConocoPhillips' Investments in Venezuela, 19 May 2014, paras. 58/59; Consolidated Update Report, 17 November 2016, paras. 83/84.

[743] *Ibidem*, paras. 5/6. In this last report, the experts note a number of other discount rates and sensitivities resulting from the Projects' documents, which they had never addressed before. At the 2017 March Hearing, when the matter was raised, the experts acknowledged that they had not looked at the CEM's discount rate before, and that one would first have to know whether reference was made to cost of equity or to a WACC; TR-E, 2017 March Hearing, Day 13, p. 3979:8-3980:17 (Abdala/Spiller). This distinction relates to the presence of cost of debt that one would expect the experts to know. The answer seems rather to show an escape for not having searched for a truly specific project rate.

be qualified as irrelevant because of the circumstances prevailing at the time and on which the experts have based on the Composite Economic Model the assessments of other relevant characteristics of the Projects, such as the estimations on the costs of production. It may also be noted that the discount rate of 13% was not only mentioned in the Model at the time it was adopted, as the experts say. The same rate was included in the Model throughout the duration of the Projects, and this must have been well known to all participants[744].

936. This 13% rate must be looked at more closely. There is evidence from the Claimants that this rate represented a standard rate with little significance for the Projects[745]. However, this discount rate – and no other is used for comparison purposes – has been used to determine the Net Present Value (NPV) of the Projects and of ConocoPhillips' share; this results from the comparison of the Control Panel on the "COP Venezuela LRP Model" and the rubric on Economic Measures for each of the Projects[746]. Therefore, the 13% discount rate was a component of the Projects' economic valuation and has to be taken into account in the analysis of the value of the Projects' capital. All participants in the Projects, including the ConocoPhillips companies, have referred to this valuation. Therefore, it must be retained in a but-for scenario for which the Claimants rely heavily on the CEM.

937. The Claimants' experts accept that for an investment in debt, such as the Petrozuata bonds, the effective interest rate is a function of all risks associated with that investment at a particular point in time, as perceived by the debt holders[747]. The interest rate of approximately 8% set by the

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[744] An exchange of views at the 2017 March Hearing allows to understand that an internal ConocoPhillips presentation from October 2006 (C-474, p. 18/pdf) calculated Net Present Value on the basis of a discount rate of 13%; cf. Day 15, p. 4502:14-4504:14 (Kahale). The same rate was mentioned in a report to the Phillips' Management Committee, dated 17 July 1999 (LECG-65, p. 2), in a Note to the Phillips' Board of Directors, dated 5 May 1997 (LECG-114), and in a presentation of the Corocoro Project of 8 August 2005 (LECG-225, p. 8, 29).

[745] Witness Statement of Jeff. W. Sheets, 30 October 2009, para. 20, affirming that the "discount rate of 13% is simply an approximate, hurdle rate used in an economic model built up for ConocoPhillips' internal screening of projects", and that he "would never use the flat 13% discount rate in the CEM to determine the fair market value of a particular asset". The Witness further stated that ConocoPhillips usually transacted developed projects at discount rates of 10% or lower; Second Witness Statement dated 14 May 2014, para. 6. This notwithstanding, the fact is that the 13% was used in the CEM and this in connection with the determination of the Net Profit Value of a Project that had been transacted about 10 years earlier. At the 2010 Hearing, the Witness told the Tribunal that ConocoPhillips did not have a standard risk factor; Day 6, p. 1638:4-6. He added that 13% was used as a standard metrics that allows comparisons between different ConocoPhillips projects and it had to be understood in nominal terms; *ibidem*, p. 1640:2-1641:2. The Respondent's experts also insisted on the fact that this rate was "standard"; TR-E, 2017 March Hearing, Day 14, p. 4137:17-4140:11 (Brailovsky/Flores). There was no evidence other than what had been said by Witness Sheets, and in particular no evidence demonstrating why a discount rate should be less reliable simply because it was "standard". Counsel of the Respondent also insisted on the discount rate being a standard rate, adding that then ConocoPhillips did "adjust based on the Net Present Value"; TR-E, 2017 March Hearing, Day 15, p. 4501:9-4502:10 (Kahale). This does not focus on the fact that in the CEM, the discount rate of 13% was used to determine the Net Present Value.

[746] Cf. LECG-085, pages (pdf) 10/11, 75 (Petrozuata), 125, 156 (Corocoro I), 14, 272 (Hamaca).

[747] Report on the Project-Specific Country Risk Applicable to the Claimants' Investments in Venezuela, 19 May 2017, para. 11.

lenders in 1997 represented all risks that were listed in the Circular. The Tribunal finds that the premium that was offered could have retained its value in later years, in view of the political risks as well as the Governments' regulatory and taxation measures derived from its sovereign power expressly reserved since the Projects' early days. However, the Claimants' experts reduce such premium to a minimal rate without taking account of the Projects' ongoing uncertainties in respect of the economic and financial future.

938. The experts accept that the Petrozuata Offering Circular is a valuable source of information to prospective investors; however, those investors will usually perform their own assessment of the risks they perceive as relevant at the point in time when they decide to invest, irrespective of whether those risks are mentioned explicitly in the initial offering documents. Moreover, the bond rate does not include consideration of the share of risks borne by the bond sponsors and the shareholders of the parent companies who are investors in the Projects but not investors in the bonds. Contrary to what the experts conclude, the Circular does not provide the proper measure of the overall risk of the asset, as assessed by equity investors in the Projects. When entering in the Projects in the 1990s, the Claimants accepted to run a risk of a dimension that has little elements of comparison to risks that later emerged as a counterpart of an investment in industry bonds for the same type of business.

939. Therefore, the Projects' inherent discount rate of 13% must prevail over the bond rate of 8% that is tied to the lenders' interests that comprise a smaller risk component and are protected by the sponsors and the shareholders' parent companies.

940. The Claimants' experts are right when they state that the compensation provisions offered an additional layer of protection[748]. They should also recognize, however, that this protection had the purpose of compensating, in part only, for discriminatory actions of the Government to which the investors were otherwise exposed to their detriment with no other additional protection than the BIT. Therefore, the damages suffered through such action had to count as risk factors to the extent they were not compensable through either PDVSA's compensation payments or through the measures of safeguard provided by the BIT.

941. The Respondent's experts were aware of the 13% Composite Economic Model's (CEM) discount rate of 13%; they referred to it in 2009[749] and 2010[750]. However, they chose not to discuss it further any more than the other rates used for comparison purposes in the CEM. They were given ample opportunity in the 2017 February and March hearings to reflect on the matter and were

[748] *Ibidem*, paras. 15-17.

[749] Brailovsky/Wells, Expert Report on the Discount Rate to be Applied to Projected Cashflows, 24 July 2009, para. 68.

[750] TR-E, 2010 Hearing, Day 12, p. 3325:22-3326:2 (Brailovsky).

invited to provide reactions and answers. However, they decided to remain silent even in their Additional Report of May 2017 after the hearings. But whatever the reason for their silence, they did not object to the CEM 13% rate, they simply decided to ignore it.

942. The Claimants have referred to a number of documents reflecting in their view the Projects' own practices, revealing rates in a range between 8% and 12%, many of them using a rate of 10%[751]. However, they omitted to mention the 2006 CEM for the discount rate but took it as the basic document for the economic and financial structure of the Projects for other purposes.

943. The Claimants' experts leave the Tribunal with little assistance. The characteristics of the discount rate they propose is that they are (a) representing averages and not guidelines to be directed to particular investment vehicles, and (b) in predominant part based on information collected on foreign markets by institutions that are well-known but predominantly oriented at market appraisals for new businesses rather than at the valuation of on-going investment operations.

944. As a first step in its conclusion, the Tribunal notes that in the Composite Economic Model (CEM) the Projects' discount rate of 13% was retained as the factor representing the risk component specific to the investment in which the Claimants engaged in the 1990s and would have conducted to the end of the Projects' life under a but-for scenario.

945. However, there is a second step. When considering the 13% rate mentioned in the CEM, the Tribunal notes that such rate cannot serve as the final criterion for discounting the dividends awarded in view of the future years. Indeed, when the Tribunal found the respective amounts, it did so after a detailed analysis of production and costs of each of the three Projects. This examination was based on all of the elements of evidence on the Tribunal's record, based on a prudent and realistic assessment. Compared to the Model the Parties use as prepared towards the end of 2006 and still reliable in June 2007, the Tribunal's assessment is different. The Model was based on business estimations that were certainly prepared seriously, with a high degree of professionalism, but they may also have received an input of optimism that may have resulted in envisaging a better future for the Projects than what it became in reality. As mentioned earlier it may suffice to note the cliff on productivity at the end of year 2023 that affected the Petrozuata Project that was not recorded in the early Model of 2006, and the difficulties the Hamaca upgrader was facing. The Tribunal has thus incorporated in its assessment risks that resulted from the evidence and events in the historical period that have not been included in the valuation on which the Model was based. As explained earlier in respect of interest and update factor, a similar comparison is to be made in respect of the profitability of the Projects, when comparing the data retained in the CEM with the values retained in this Award.

[751] Claimants' Final Submission on Quantum, paras. 399-401; Claimants' Memorial on Quantum, para. 185.

946. If the Tribunal were to retain the project related risk component of 13%, as mentioned in the Model, without adjusting it as a result of its findings, it would result in double counting. This is because the Tribunal's assessment of the Claimants' revenue already includes a portion of such risk that resulted in reduced figures on production and higher amounts of costs, compared to the corresponding amounts provided for in the Model. That portion of risk was included in the Model's 13% rate and has already been substantiated in the revenue determined by the Tribunal as the basis for the calculation of the dividends. These risks cannot be counted twice. The project-related risks that remain as part of the discount rate for purposes of this Award can only be unsubstantiated risks, such as all the risks mentioned in the Circular, excluding those that were identified by the Tribunal when it proceeded with its estimate of production and costs. In sum, when referring to the 13% discount rate used in the CEM, the pertinence of such rate must be evaluated in light of a comparison between the assessment on production and costs as retained in the Model, and the corresponding figures retained for the purposes of this Award. These differences are either based on reductions in respect of year-by-year production (mostly due, for instance for Hamaca, in the operation of the upgrader) or related to the shortening of the period of operation until its end, or on cost items consequential to risks that materialized already in the consideration of a but-for scenario. The Tribunal measures the overall impact of such substantiated risks at 25%. Therefore, if the CEM discount rate is taken as the reference, such impact leads to a reduction of the project related discount rate from 13% to 9.75%.

947. However, the Parties' submissions and their experts' views on respect of the pertinence of the CEM's 13% discount rate is less than satisfactory. The Model calculates the Projects' Net Present Value (NPV) by applying a discount rate of 13% to the dividends that were expected to accrue to the ConocoPhillips' B Shareholders, year by year, over the whole duration of the Projects (35 years for Petrozuata and Hamaca). While the Model is clear in that the calculations were based on the option to apply the 13% discount rate, the Parties failed to explain clearly the reasons why this rate was retained rather than any other one among the range of rates listed in the Model between 0% and 16%. As explained above, the Parties and their experts did not explain why the option for 13% was taken. This is striking in light of both Parties' insistence on the relevance of other of the CEM's components as important elements of the evidence before this Tribunal. It has been said by the Claimants that this rate was a "standard rate". However, nothing can be derived from the term "standard" in this matter, because a discount rate fixed for determining the value of money earned in the future implies necessarily a measure of average and thus of a "standard" to be applied at the same level during all the relevant years.

948. The Tribunal also notes that no explanation has been provided in reference of the main components of a discount rate specifically set at 13%. As noted above, this rate was used for calculating the Net Present Value of the Projects in light of the assumed profits represented by the Projects' dividends. Such method of calculation and the corresponding rate must have been based on a choice of policy made by those who operated the Projects in the years 2006/2007. The Parties

concentrated their efforts to reduce (Claimants) or increase (Respondent) the discount rate based on hypothesis such as assuming that the Petrozuata Bonds were to maintain a given rating throughout several years or that the Projects' discount rate would be somehow tied to the rate of the Venezuela sovereign bonds. They even mentioned discount rates used by each other in other projects and in completely different scenarios but failed to refer and sustain the discount rate that they have agreed to include in the CEM. The Parties did not consider or explain whether the 13% rate was assessed on the exclusive basis of the Project's economics, including production, costs, cash-flows up to the resulting dividends. They have speculated on what would be the costs of capital of ConocoPhillips as the foreign investor without indicating which costs of capital, if any, and on which basis, were included to determine the 13% rate included in the Model. Nonetheless, the Tribunal has evidence on the record of the fact that it had been decided at the time when the CEM was prepared and agreed upon that the discount rate of 13% was the most suitable option to determine the Net Present Value of the Projects. More information and cooperation from the Parties would have been useful, however, even if based on a comparative analysis.

949. The Tribunal finds additional support for its assessment in the set of documents originating in the earlier period of the setting up of the Projects in the years 1990s and in the references to discount rates made by the Parties during this arbitration. In the 1990s, the margin for possible discount rates was set between 8% and 12%, with a clearly prevailing focus put on the middle number of 10%. The Petrozuata Descriptive Report dated October 1996 used a discount rate of 10%[752]. For the Hamaca Phase II, the same rate served as the basic assumption in the years 1998 and 1999[753]; it was also applied in an Information Memorandum sponsored by the participants in the Project in August 2000[754]. The working draft of a Hamaca Economic Model dated 30 October 2006 was based on a 10% discount rate[755]. Witness Sheets also stated that ConocoPhillips usually transacted developed projects at discount rates of 10% or lower[756]. On the other hand, consolidated financial statements concerning PDVSA also refer to a discount rate of 10%[757]. The same rate had been retained in the Treaty concluded between Venezuela and China on 17 April 2010[758].

[752] Joint Venture Project Maraven-Conoco, Petrozuata C.A., Descriptive Report, p. 22-24 (C-92).

[753] Cf. the Business Plans dated 14 October 1998, p. 233 (LECG-002) and 30 April 1999, p. 7, 25, 28, 48 (C-73/461).

[754] Hamaca Confidential Preliminary Information Memorandum prepared by Morgan Stanley Dean Witter, Volume I, p. XII-1 (C-101).

[755] LECG-129, p. 253/pdf.

[756] Second Witness Statement dated 14 May 2014, para. 6.

[757] Petrozuata Offering Circular dated 17 June 1997, Annex G, p. G-45, p. 336/pdf (C-75).The 10% rate is also mentioned in the PDVSA Consolidated Financial Statements for years 2008 to 2010 (p. 88/pdf, C-593) and 2011 to 2013 (p. 106/pdf, C-616).

[758] Article 6 (C-585).

950. When compared to the discount rate of 13% on which the CEM is based, the rate of 10% as the prevailing figure in the years mainly prior to 2000 may be different in the sense that it has not, and could not at that time, reflect a detailed assessment, year by year, of all the pertinent figures for production, costs, oil prices, taxes, cash-flow and dividends, etc. Therefore, when the Tribunal reduces the 13% rate to 9.75%, it does so on the basis of its own assessment of the economics of the Projects as detailed and specific as this had been done for the CEM in 2006. However, the 10% discount option made in the years 1995 to 2000 and the references to the 10% rate in later years also reflect the expectations of the Parties. Even though the 10% option was based on the ConocoPhillips' long standing business experience, it is closer to the rate that was determined in the CEM than the Parties' exaggerated rates presented to the Tribunal.

951. Thus, the Tribunal finds much support in the evidence on its record for the most reasonable assessment of the discount rate to be used for the determination of the value of the future dividends at the time of the Award. Indeed, both assessments lead to a nearly identical result. Starting with the CEM 13% discount rate resulting from the calculations based exclusively on the dividends produced in the future, the Tribunal's assessment of the actual figures representing the economics of the Projects in a but-for scenario must have the effect of reducing this number down to 9.75%, thus not considering yet the investor's own cost of capital. On the other hand, the more historical but nevertheless firmly supported rate of 10% stays very close to the rate of 9.75% derived from the CEM and updated to present time. Both rates taken together offer a solid margin for the assessment of the applicable discount rate.

952. By reference to one or the other rate mentioned above, the component of the risk valuation must be completed by the cost of capital the investor collects on the market for the purpose of transferring the required assets into the investment operating in the future. Both Parties and their experts share the view that this component must be divided in a risk-free rate and in an industry risk related part. The Parties' experts disagree in respect of the appropriate rates, but neither one of them puts forward any convincing argument when focused on the present time. Thus, when the Respondent's experts base their study of the market risk premiums on statistics dating back to 1926[759], the Tribunal does not feel that this is realistic for a present time assessment, where market rates for the oil production industry must be available worldwide. In view of the little effort made to bring numbers close when the difference is minimal and essentially based on statistics rather than on actual markets figures, the Tribunal will not proceed to examine highly hypothetical assessments which cannot possibly be converted into a legal perspective. As for the risk-free rate, the Tribunal adopts the Claimants' experts' choice to rely on a slightly more flexible 10-year U.S. Treasury Bonds instead of such Bonds having 20-year duration. The respective rate is 1.9%[760]. For

[759] Cf. Brailovsky/Flores, Consolidated Update Report, 17 November 2016, para. 415, pages 339 (Table A.2), 342 (Table B.2).

[760] Abdala/Spiller, Consolidated Expert Report on Valuation, 17 November 2016, paras. 76, 181(a), 166 (Figure 29).

the industry risk share, the Claimants' experts selected the beta factor corresponding to companies in the crude petroleum and natural gas industry, which is a sector close to the industry where the Projects belong, more than the midstream and downstream business that was the preference of the Respondent's experts. The rate thus to be retained is 5.5%[761].

j. Conclusion

953. When taking the above mentioned components of the cost of capital (1.9+5.5) and adding each of the above mentioned rates adopted on the basis of the assessment of the Projects' economics and cash flows, the resulting discount rate becomes 17.15%, and 17.40%. As explained above, the evidence before this Tribunal does not permit a definitive conclusion in favor of one or the other rate. In light of the uncertainties implied in such estimation, the Tribunal uses its margin of discretion and sets the discount rate to be retained in the instant case at 17.25%.

954. The calculations resulting from the explanations given above in both Sections XI and XII are therefore as follows:

[761] *Ibidem*, paras. 78/79, 181(b), 166 (Figure 29). The rate of 5.5% was also used by the experts in their presentation at the 2017 March Hearing (slide 29), while their WACC Model mentions a 6.12% market risk premium. The same table is presented in Claimants' Final Submission on Quantum, para. 411.

ConocoPhillips' Dividends together with Update (9.75%) and Discount (17.25%)						
	Petrozuata		Hamaca		Corocoro	
	CPZ Dividends		CPH Dividends		CPG Dividends	
2007 ½	118,474,157	130,025,387	235,580,893	258,550,030	--	
2008	335,629,241	368,353,092	355,432,880	390,087,586	18,193,531	19,967,400
2009	189,299,059	207,755,717	138,984,280	152,535,247	31,954,307	35,069,852
2010	298,179,642	327,252,157	393,769,548	432,162,079	45,012,002	49,400,672
2011	219,725,148	241,148,350	284,352,829	312,077,230	59,842,926	65,677,611
2012	234,178,868	257,011,308	233,237,062	255,977,676	55,581,118	61,000,277
2013	279,555,194	306,811,825	367,939,094	403,913,156	70,107,476	76,942,955
2014	252,323,770	276,925,338	295,262,710	324,050,824	61,124,930	67,084,611
2015	- 30,903,574	0	- 102,608,475	0	- 8,723,311	0
2016	89,600,242	98,336,266	82,425,743	90,462,253	21,194,635	23,261,117
2017	137,570,161	150,983,252	140,159,351	153,824,888	27,916,042	30,637,856
2018	176,517,019	193,728,428	212,588,134	233,315,477	31,342,280	34,398,152
2019	176,481,586	150,517,344	230,021,830	196,180,665	27,815,802	23,723,499
2020	207,274,313	150,766,885	248,723,021	180,915,785	27,490,559	19,996,042
2021	207,640,958	128,817,518	268,772,004	166,742,356	25,469,509	15,800,924
2022	227,505,626	120,379,716	262,159,475	138,716,056	23,412,655	12,388,304
2023	259,208,925	116,971,536	262,914,546	118,643,748	21,101,923	9,522,528
2024	186,634,186	71,832,109	293,269,618	112,874,151	18,336,517	7,057,392
2025	155,259,237	50,964,823	282,585,489	92,760,468	17,249,883	5,662,383
2026	133,939,127	37,498,006	285,971,160	80,061,357	16,249,946	4,549,384
2027			263,094,231	62,819,472		
2028			277,875,702	56,588,067		
2029			299,985,774	52,102,560		
2030			329,726,845	48,842,633		
2031			339,807,516	42,930,466		
2032			339,629,131	36,595,206		
2033			363,614,258	33,415,514		
2034			360,877,626	28,284,827		
2035			350,003,448	23,396,734		
2036			337,798,446	19,258,639		
Total	3,854,092,885	3,386,079,057	8,033,954,168	4,498,085,150	590,672,730	562,140,959
1	2	3	4	5	6	7

k. Tax net Award

955. The Claimants recall that their experts' valuations are net of all applicable taxes. Any subsequent taxation by Venezuela of the Award would thus result in the Claimants being taxed twice for the same income. As the tribunal in *ConocoPhillips v. PDVSA* recently confirmed, any additional taxes applying to the amount granted under the award would undermine the principle of full compensation of the damage incurred[762]. The Claimants request that the Tribunal declare in the

[762] Cf. *Phillips B.V. v. Petroleum Company Venezuela Limited & ConocoPhillips Petrozuata Petróleos de Venezuela, S.A.*, ICC 16849/JRF), Award dated 17 September 2012 (CL-255).

Award that (a) the Award is net of all Venezuelan taxes; (b) Venezuela may not tax or attempt to tax the Award; and (c) the Claimants have no further taxation obligations to Venezuela in respect of the three Projects.

956. The Tribunal notes, with the Claimants, that the Respondent appears to agree, as it did not comment on or refute the Claimants' request.

957. The Tribunal has carefully evaluated and applied to the assessment of costs and expenses of the Claimants' claims in a but-for scenario all applicable taxation measures. Therefore, applying the same or further taxes to the amount awarded would undermine the principle of full compensation, and, at least in part, double taxation. The Tribunal therefore grants the Claimants' request to declare the Award net of taxes.

XIII. Hamaca's Debt Repayment

958. The Respondent submits that it is undisputed that after the nationalization, PDVSA worked with the Claimants to relieve them of their debt obligations to the lenders in connection with the Hamaca Project, through a payment of US$ 298 million on behalf of ConocoPhillips. The Claimants' valuation taking into account the compensation provisions does not deduct this amount. If such deduction is made, the overall valuation as of 26 June 2007 results in the amount of US$ 1.134 billion.

959. The Claimants' answers to a question raised by the Tribunal in July 2017 are explicit in the sense that the Claimants accept that PDVSA had made debt service payments of US$ 298 million to Hamaca Project's lenders (R-119). The Claimants object strongly, however, to Venezuela's experts' suggestion that this payment was somehow linked to compensation for the expropriation[763].

960. The Tribunal notes that the outstanding debt at the time is not disputed between the Parties, and it involves an obligation borne by ConocoPhillips to repay to the lenders an amount of US$ 298 million, from which it was relieved by the PDVSA's subsidiary. While it is not contested that ConocoPhillips kept an obligation to compensate the PDVSA subsidiary for such payment it is argued that ConocoPhillips might be over-compensated when it would be compensated for the loss of profit resulting from the expropriation and simultaneously relieved from its debt. However, the Tribunal finds that this debt repayment relates to transactions between ConocoPhillips and the PDVSA subsidiary (or its successor in law) in case it would claim reimbursement. If the amount of US$ 298 million would be deducted from the compensation the Respondent has the burden to pay, the benefit would be for the Venezuelan Government. This would not have the effect of

[763] Cf. Claimants' Initial Replies to the Tribunal's Questions, 10 July 2017 - Claimants' Replies of 10 July 2017; Claimants' Supplemental Comments on the Tribunal's Questions, 31 July 2017 (Question 20).

reimbursing the PDVSA Company that had initially relieved ConocoPhillips from its obligation to repay the lenders. In any event, the Respondent does not request such payment to be made for the purpose of its own compensation, and it did not raise a counterclaim either. The suggestion was made by the Respondent's experts for calculation purposes and not in view of a legal assessment. Consequently, the Tribunal does not pursue the matter any further.

XIV. Avoidance of Double Recovery

961. The Claimants have declared on several occasions and in relation to the ICC Arbitration that they intend to comply with the principle that there should not be any double recovery (*see*, for the first time, Claimants' letter dated 10 October 2014). Such statement has been explained at two of the Tribunal's hearings[764]. In their Consolidated Brief of 30 December 2016, the Claimants have added that if they obtain payment from the relevant governmental actor through the other remedies expressly contemplated in the compensation provisions, they must provide an offset to the PDVSA subsidiaries through an appropriate credit or reimbursement (para. 87). The Tribunal is aware that a similar statement has been made on part of the claimants in the ICC arbitral proceeding[765]. In their cover letter dated 25 April 2018 sending the ICC Award dated 18 April 2018 to this Tribunal, the Claimants stated:

> The Tribunal likewise does not need to be concerned with any risk of double recovery. The Claimants here, and in the ICC case, have formally and repeatedly undertaken to ensure that no double recovery will ensue. Furthermore, no issue of double recovery could even potentially arise until the ICC claimants actually obtain payment on the ICC Award. In the event that the ICC respondents do not honor that Award, enforcement proceedings will be necessary to obtain actual payment." (footnotes omitted)

To the Tribunal's knowledge, Respondent has not reacted, either in approving or in rejecting such statement[766], which thus appears to be made unilaterally by the Claimants. When the Parties informed the Tribunal on 20 and 21 August 2018 about the settlement agreement in respect of the amounts awarded by the ICC Tribunal, they did not submit the content of this agreement. Therefore, the Tribunal is not aware whether the Claimants' undertaking has been repeated therein or provided with more indications as to its meaning.

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[764] Cf. TR-E, 2017 March Hearing, Day 15, p. 4309:21-4311:3, 4510:5-17, 4513:18-4514:17, 4528:20-4529:15; 2017 September Hearing, Day 17, p. 5039:9-5065:5 (Partasides).

[765] *Phillips Petroleum Company Venezuela Limited, ConocoPhillips Petrozuata B.V. v. Petróles de Venezuela S.A.* et al., Final Award, ICC 20549/ASM/JPA, dated 24 April 2018, para. 1125.

[766] Counsel of the Respondent noted that he had not much positive to contribute to the discussion, except recalling that the issue had been raised in the *Mobil* case, where it was rendered moot because of the partial annulment of the Award. TR-E, 2017 September Hearing, Day 17, p. 5065:11-5066:16 (Kahale).

962. The Tribunal has raised with the Parties a number of questions as to the legal nature and effects of the undertaking made by the Claimants. The Tribunal is not, however, called to proceed with such examination any further and to draw conclusions having an effect on the resolution of the claims it is requested to make in its ruling.

963. The Tribunal notes that the Claimants' undertaking implies to produce effect when double recovery might become an issue, *i.e.* in the enforcement stage of one or both awards in case they reach such stage and the issue cannot be resolved through cooperation between the Parties. Therefore, in this regard, this Tribunal is not called to do more than to acknowledge the Claimants' undertaking, possibly in providing some support for the Claimants and some relief to the Respondent, as otherwise the official and solemn submission of this undertaking would have had no meaning.

964. The Tribunal finds that meaning can be given at least in the form of recalling the legal principle that is at the very basis of the Claimants' declaration, which implicitly invokes a principle of international law that it shall not be permitted to seek double recovery and thus cause an illegal enrichment that the international legal order must condemn. The Claimants were manifestly acting in good faith and their position was as such appreciated by the Respondent. The fundamental legal basis is thus the principle of good faith and it is in this regard that the Claimants, albeit without saying it so precisely, wanted undoubtedly to express their intention not to seek double recovery as a consequence of the two arbitral proceedings that had been launched and that are awarding amounts based at least in part on the same subject matters, albeit not between the same parties.

965. Both Parties recognized the close connection of the Claimants' commitment to the claim before this Tribunal, which means that the matter is to a minimal extent within this Tribunal's jurisdiction. The Tribunal therefore endorses the Claimants' undertaking and will declare that the Claimants are under a duty of good faith not to seek double recovery when seeking enforcement, in full or in part, of the Award rendered by this ICSID Tribunal.

XV. Legal Fees and Costs

A. <u>The Claimants' Position</u>

966. In their submission dated 16 April 2018 and updated on 17 September 2018, the Claimants stated their costs incurred as follows:

Category	Incurred Amount (US$)
<u>Advances paid to ICSID</u>	
Claimants' portion of advance on costs	4,525,000.00
Respondent's portion of advance on costs (paid in substitution by the Claimants)	1,400,000.00
Total advances paid to ICSID	5,925,000.00
<u>Legal fees</u>	
Freshfields Bruckhaus Deringer US LLP	36,777,972.00
Three Crowns LLP	3,889,622.50
Total legal fees	40,667,594.50
<u>Expert fees and expenses</u>	
Compass Lexecon / LECG	15,916,639.64
Moyes & Co.	271,633.51
Muse Stancil	492,587.87
Strickland Group	1,670,711.84
Total expert fees and expenses	18,351,572.86
<u>Disbursements and other charges</u>	
Freshfields Bruckhaus Deringer US LLP	3,150,362.39
Three Crowns LLP	133,772.75
Claimants' Travel & Expenses	589,227.58
Document & Translation Services	616,358.26
Other Vendors (trial graphics, etc.)	301,357.23
Total disbursements and other charges	4,791,078.21
<u>*Total costs claimed*</u>	69,735,245.57

967. In support of the reimbursement of these costs, the Claimants submit that they have been forced to incur substantial legal fees and costs in pursuing their right to reparation for Venezuela's unlawful expropriation over the course of nearly 10 years. Venezuela bears full responsibility for the costs the Claimants have incurred, and Venezuela must compensate the Claimants fully for them. Three principles support this conclusion.

968. First, the Tribunal has the authority to award costs that follow the event, as a large and growing body of investment tribunals have done. The allocation of the costs of the arbitration between the parties, including ICSID's administrative charges, the Tribunal's fees and expenses, and the legal and other expenses reasonably incurred by the Parties is governed by Article 61(2) of the ICSID Convention. There has been a marked and growing trend toward awarding costs to the

prevailing party, as a function of its success in the case, as confirmed in *Libananco v. Turkey*[767]. Numerous other tribunals have reached the same conclusion, as in the cases *Gold Reserve*[768] and *ADC*[769]. The Claimants are the prevailing party in this case. The Tribunal has already ruled for the Claimants on this arbitration's two largest questions: whether the Tribunal had jurisdiction under Article 9 of the BIT to hear the Claimants' claims and whether Venezuela breached Article 6 of the BIT. The Tribunal has also ruled for the Claimants on numerous applications, including: six motions to disqualify either their appointed arbitrator or the Tribunal President; a request for re-consideration of the Tribunal's 2013 Merits Decision; and a request for reconsideration of that reconsideration decision.

969. Second, awarding full costs and fees to a prevailing claimant is required to achieve full reparation, thus following the principle of full reparation established in *Chorzów Factory*. Had Venezuela complied with its obligations under the Treaty and international law, there would have been no need for this arbitration, and the substantial expenses associated therewith. Tribunals have recognized the complementarity of the "full reparation" principle with the practice of awarding costs to the prevailing party. These ICSID proceedings are of historic scale, now spanning over more than nine years, and involving no fewer than 11 major written submissions by the Claimants. Venezuela refused even to take the necessary initial step of negotiating compensation for the expropriation in good faith. Unless Venezuela compensates the Claimants for the arbitration expenses that they should not have had to incur, the Claimants will not be fully restored to their but-for position.

970. Third, the Tribunal should consider Venezuela's dilatory and obstructionist tactics in assessing costs against it. Assessing all costs against the Respondent is further justified by Venezuela's deliberately wasteful, dilatory and abusive tactics in this proceeding. Prior ICSID costs award have taken into account the fact that a party has obstructed or prolonged the proceedings, including by raising unmeritorious arbitrator and jurisdictional challenges. Venezuela's attempts to postpone accountability for its unlawful conduct have been serial. Venezuela has not limited itself to challenging the Tribunal's members on no better ground than displeasure at the substance of their rulings; it has also consistently refused to accept the Tribunal's decisions. Venezuela's refusal to respect adverse results has demonstrated its disrespect not only of the Tribunal's authority, but also of its own solemn Treaty obligations. On the basis of these tactics alone, the Tribunal would be entirely justified to assess costs and fees against Venezuela in full.

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[767] *Libananco Holdings Co. Ltd. v. Republic of Turkey*, ICSID Case No. ARB/06/8, Award dated 2 September 2011 (R-451).

[768] *Gold Reserve Inc. v. The Bolivarian Republic of Venezuela*, ICSID Case No. ARB(AF)/09/1, Award dated 22 September 2014 (CL-328).

[769] *ADC Affiliate Limited and ADC & ADMC Management Limited v. The Republic of Hungary*, ICSID Case No. ARB/03/16, Award of 2 October 2006 (CL-15).

971. The Claimants note that their costs were further increased by the Respondent's misconduct when Venezuela has chosen to disregard its financial obligations to ICSID and this Tribunal, forcing the Claimants to pay nearly US$ 1 million in substitution for the Respondent. This, too, is serious (and intentional) misconduct that should be given heavy weight in the overall allocation of costs.

972. For all the above reasons, the Claimants are entitled to full reimbursement of their arbitration costs and expenses, including legal and expert fees, to which shall be added post-award compound interest on these costs and expenses.

973. One particular element of full reparation in respect of legal fees and costs is expressed in Claimants' request that they should be granted pre-award compound interest, running from the time when the costs were incurred. Specifically, the Claimants' pre-award interest should be awarded on the sums and as of the dates of the following procedural key-events: (1) Merit phase: US$ 23,639,516.28 in legal fees and US$ 2,544,062.59 in related expenses with interest as from 7 September 2013; (2) first procedural interruption: US$ 1,616,075,62 and US$ 69,786.06 (5 May 2014); (3) written *quantum* phase: US$ 3,689,252.00 and US$ 220,465.55 (28 January 2015); (4) second procedural interruption: US$ 2,685,503.00 and US$ 65,493.37 (15 March 2016); (5) reconstituted *quantum* phase: US$ 9,037,247.60 and US$ 384,336.57 (date of the Award). The Claimants submit that pre-award interest should also be granted on the sum the Claimants paid to ICSID in substitution for the Respondent. In the alternative, the Claimants request that pre-award interest should at least be granted on legal fees and related expenses incurred during the first and second procedural interruptions, which represent the peak periods of the Respondent's procedural misconduct.

974. In their rebuttal letter dated 3 May 2018, the Claimants replied shortly to the Respondent's cost submission, affirming that the Respondent has no entitlement to recover any portion of its costs in circumstances where (i) it admits that it expropriated the Claimants' investment and that compensation is due, (ii) it never paid any compensation at all, and (iii) the Tribunal has found that expropriation to be unlawful. The Claimants also noted that it understood the Respondent making the concession that the procedural "chaos" after the first phase was engendered by its own "misrepresentation" allegations, which have been rejected by the Tribunal.

B. The Respondent's Position

975. In the submission contained in its letter dated 16 April 2018, the Respondent stated its costs incurred as follows:

Category	Hours	Amount Billed (US$)
Attorneys & Paralegals		
Partners	29,099.67	19,733,379
Counsel	4,289.40	2,253,966
Associates	50,871.37	17,565,381
Paralegals	17,584.23	3,536,621
Total Attorneys & Paralegals	101,844.67	43,089,347
Experts		
Econ One Research (Economic Experts: Jeffrey Leitzinger, Anthony Finizza, Joseph Wilkinson, Daniel Flores and Support Staff)		5,213,757
Vladimir Brailovsky (Economic Expert)		1,670,080
Louis T. Wells (Economic Expert)		816,917
Jesús Rafael Patiño Murillo (Technical Expert)		300,798
Rafael Sandrea (Technical Expert)		366,243
John Kirtley (Technical Expert)		272,562
M. Sornarajah (International Law Expert)		125,000
Enrique Urdaneta Fontiveros (Venezuelan Law Expert)		385,960
Gary Gartner (Tax Expert)		359,450
Total Experts		9,510,767
Expenses & Arbitration Costs		
Expenses (Travel, translations, and other expenses)		2,381,199
Arbitrators' fees and expenses and ICSID administrative costs		3,125,000
Total Expenses & Arbitration Costs		5,506,199
Overall Total		58,106,313

976. The Respondent submits that all of its costs should be deducted from any compensation award. This entire arbitration occurred only because the Claimants refused to accept exceedingly generous compensation offers more than nine years ago. The Claimants should not be rewarded for their strategy of rejecting those offers and pursuing a windfall in international arbitration.

977. The manner by which the Claimants litigated this case, in both phases, provides further reasons for assessing costs against them. (i) The Claimants and their fact witnesses made over 200 allegations of fiscal guarantees. (ii) The Claimants told the Tribunal that "Venezuela made it clear that it would not offer compensation based on Fair Market Value" and it made many other misrepresentations, which had an impact on the majority of the Tribunal, leading to its finding on bad faith negotiation.

978. In the second phase of this case, the Claimants did everything they could to avoid a hearing on their misrepresentations and on the finding of bad faith negotiation. It took three years until the Respondent was granted the opportunity to set the record straight. At the August 2016 hearing, Mr. Goff gave frank testimony on the subject of the compensation negotiations and showing that what the Claimants had told the Tribunal had been false.

979. At the end of the August 2016 hearing, the Tribunal requested the Parties to present four valuations, including valuations as of 26 June 2007, with and without considering the compensation provisions. That was the first time in this entire litigation that the Claimants showed what they considered to be fair market value as of 26 June 2007. The lengthy delay in this case is attributable in large part to that strategy.

980. Based on the foregoing factors, all costs should be assessed against the Claimants. The Tribunal has discretion to do so.

981. The Respondent did not comment the Claimants' cost submission, except in objecting, in its letter dated 18 April 2018, to the Claimants' attempt to reiterate their allegations of bad faith and misconduct.

C. The Tribunal's Findings

982. The Tribunal notes at the outset that the figures for costs and fees of each Party have not been contested by the opposing Party. Although the amounts put forward appear high in comparison to the great majority of ICSID arbitrations, the Tribunal has no reason to inquire about their substance in light of the long duration of this arbitral proceeding, the size of the record and the complexity of a great number of questions raised. The Claimants' reference to a total of 27 memorials and other substantive submissions of more than 3700 pages, and the 33 total hearing days, provide an idea of the size of the case.

983. The Parties have not reached an agreement as to the arbitration costs and their allocation. There is no provision in the BIT applicable to this matter[770]. The Tribunal shall therefore apply Article 61(2) of the ICSID Convention, which reads as follows:

> In the case of arbitration proceedings the Tribunal shall, except as the parties otherwise agree, assess the expenses incurred by the parties in connection with the proceedings, and shall decide how and by whom those expenses, the fees and expenses of the members of

[770] While interest is not mentioned in Article 9(3) of the BIT, the Tribunal concludes that it is included in the term "compensation".

the Tribunal and the charges for the use of the facilities of the Centre shall be paid. Such decision shall form part of the award[771].

984. This provision requires the Tribunal to make its own assessment resulting in a decision. This means implicitly that there does not exist an *a priori* solution on the allocation of costs, like a principle that would require that each party should bear its own costs and that the costs of the tribunal and the ICSID Secretariat should be borne in equal shares by the parties, regardless of the outcome of the arbitration and other circumstances pertinent to the proceeding.

985. Article 61(2) of the ICSID Convention does not determine any specific factor to be taken into account by the Tribunal for its decision on costs. This means that the Tribunal has wide discretion in determining the allocation of costs of the arbitration, including legal fees and expenses. That said, such discretion should of course be exercised with care and with due regard to the relevant criteria.

986. Arbitral tribunals usually state that when using their discretion, the tribunal will take account of a great number of factors having an influence on the allocation of costs. When looking closer to most awards, the prevailing circumstances are generally the outcome of the case and the procedural behavior and efficiency of the parties.

987. The key principle governing the allocation of costs in international arbitration is that costs "follow the event, *i.e.* the costs are to be borne by the unsuccessful party". The principle of "full reparation", on which the Claimants' claim for costs is based, relies on such an understanding.

988. However, "full reparation" cannot mean more, in this respect, than the amount of reparation accepted by the Tribunal. It does not support a claim for costs in proportion to the amounts claimed that have not been allocated by the Tribunal. Additionally, the assessment whether a party had been "successful" or not, in full or in part, cannot be based on the decision on quantum only. The outcome of jurisdictional objections also counts. A party's success may also be determined in light of the pertinence of the merits of its case independently from the resulting amounts. These factors will be examined further below.

989. The Tribunal does not put particular weight on the manner in which the Parties have conducted the case, keeping in mind the complexity of the case, the enormous size of the evidentiary documentation and the profound analyses provided by the economic and technical experts. Each Party is at liberty in the choice of its strategy in the litigation and the way it considers the most appropriate to assemble and present its evidence. Such choice of methodology should not become a factor of judgment by the Tribunal, even under the ancillary perspective of the allocation of costs,

[771] Arbitration Rule 47(1)(j) confirms that "any" decision of the Tribunal regarding the cost of the proceeding shall be contained in the award.

unless a particular behavior during trial shows signs of abuse of process, bad faith or reflects harassing litigation, which should not be awarded any merit in having the opposing party condemned to contributory payment of the associated costs.

990. In the present case, the Tribunal has appreciated the professional and courteous conduct of the proceeding on part of counsel, experts, and witnesses on both sides. Certainly, some pleadings may have shown to be excessive in their content and language, but the Tribunal has not felt being faced with attitudes beyond the limits noted above. The Tribunal also recalls that in its Interim Decision it had not approved the Respondent's allegation on misrepresentation directed against the Claimants, and that it had accepted that Venezuela was not acting in bad faith in the framework of the negotiations with the Claimants, the failure of which ended in the Claimants' initiative to commence these arbitral proceedings. Therefore, in sum, there is no point in penalizing the conduct of this litigation by one or the other side through a corresponding allocation of costs and fees.

991. The Tribunal considers that the ICSID fees and expenses have been determined irrespective of the amounts claimed and without evaluating the potential success or *prima facie* chance for prevailing before the Tribunal. Therefore, the sharing of the costs of this ICSID proceeding should not be influenced by the respective portion of success or loss of each Party in relation to its claims or defenses. There is no link of causality between the amounts of the costs of the arbitral proceeding and the amounts of damages claimed. These costs are based on the above mentioned circumstances of a highly complex and most extensively documented case. Therefore, neither the principle of "full reparation", nor its division in any portion of the claims should have a bearing on the allocation of these costs.

992. For this reason, the Tribunal decides that the Tribunal members' fees and expenses, the ICSID administrative fees and other direct expenses have to be evenly divided between the Parties in amounts represented in their statement of costs, and also including the share invoiced after the filing of these statements. The Respondent has not paid the last four advances requested by the ICSID Secretariat, in a total amount of US$ 1,400,000. The Claimants paid this amount in substitution of the Respondent; this amount must be reimbursed by the Respondent to the Claimants. The balance held by the ICSID Secretariat at the end of this proceeding shall be refunded to the Claimants. In order for the Claimants to recover the amount paid in excess of their share, the Respondent shall reimburse the sum of US$ 1,400,000, less the sum refunded by the ICSID Secretariat to the Claimants.

993. When further considering the translation of the principle of "full reparation" in the present case to the allocation of costs, the Tribunal must evaluate the respective weight of the Claimants' claims as they are awarded by the Tribunal, in comparison to the pertinence and the success of the Respondent's defenses, relating either to the Tribunal's jurisdiction or to the merits of the case.

994. The Tribunal observes at the outset that the Claimants are successful in their principal claim based on the violation of Article 6 of the BIT. This must lead to a decision ordering the Respondent to bear a significant part of the Claimants' legal fees and costs.

995. The Claimants submit that had Venezuela not failed to comply with its obligations under the Treaty and international law, "there would have been no need for this arbitration, and the substantial expenses associated therewith"[772]. These expenses are thus burdens among the consequences of Venezuela's conduct. However, such an assumption has no ground in respect of amounts claimed in the arbitral proceeding that have not been made subject of negotiations with Venezuela in order to settle the damages resulting – as alleged by the Claimants – from Venezuela's failure to satisfy its obligations under Article 6(c) of the BIT. At the time of the expropriation, the Claimants considered their assets having a net present value of more than US$ 20 billion[773]. Such amount is far below the US$ 30 billion claimed in the arbitration. The 20 billion figure was three times higher than the value of the asset trade ConocoPhillips offered to Venezuela in August 2007[774]. This shows that the 20 billion was a top-figure clearly above the amount that would have been in a range of an acceptable settlement.

996. As stated by the *Libananco* Tribunal, quoted by the Claimants, a rule under which costs follow the event also serves the purpose of discouraging unmeritorious actions and of providing a disincentive to over-litigation[775]. However, such a policy should be followed to the extent only as it sanctions excessive claims, defenses and procedural behaviors. If such threshold is not reached, a tribunal should be reluctant to reject a strategy chosen by a party in good faith twice, first as to the merits and second on the level of costs.

997. With these considerations in mind, the Tribunal compares the shares of the Claimants and those of the Respondent in the success of their claims and defenses, respectively.

998. The Claimants' Memorial dated 15 September 2008 determined the total amount of losses as of 31 August 2008 at US$ 20,468,700,000. To this amount was added a gross-up required to make the Claimants whole in respect of U.S. Federal and State Income Taxes in the amount of US$ 9,836,700,000. The total amount of the Claimants' claim was therefore US$ 30,305,400,000[776]. Based on the up-date as of 31 October 2009 provided in the Claimants' Reply dated 2 November

[772] Claimants' Statement on Costs, para. 11.

[773] Cf. Interim Decision, para. 105, together with the references, in particular Mr. Limbacher's letter to Dr. Mommer, dated 10 August 2007 (R-653).

[774] Cf. Interim Decision, para. 103.

[775] *Libananco Holdings Co. Ltd. v. Republic of Turkey*, ICSID Case No. ARB/06/8, Award dated 2 September 2011, para. 563 (R-451).

[776] Claimants' Memorial, paras. 387, 472/473; 2013 Decision, para. 214.

2009, the above mentioned figures became US$ 19,727,500,000 for the losses and US$ 9,441,000,000 for the tax burden caused by the expropriation, ending in a total amount of US$ 29,168,500,000[777].

999. Based on the findings of the Tribunal's 2013 Decision on Jurisdiction and the Merits, the Claimants determined in their Memorial on Quantum dated 19 May 2014 their stake in foregone cash flows to equity for the period June 2007 to May 2014 as US$ 9,484,811,792, and their stake in project equity as of May 2014 at US$ 9,747,930,323, both figures resulting in a total damages figure of US$ 19,232,742,115[778]. In the Claimants' Reply on Quantum dated 13 October 2014, the corresponding figures were US$ 10,211,058,984 and US$ 8,653,883,843, resulting in a total of US$ 18,864,942,827[779]. In the Claimants' Final Submission on Quantum these numbers again changed and became, as of 30 December 2016, US$ 16,070,029,788 and US$ 5,276,159,925, resulting in a damage claim in a total of US$ 21,346,189,713[780].

1000. In respect of the impact on the costs allocation of these claims and figures, the Tribunal deals firstly with the claim made by the ConocoPhillips Company based on its loss of future tax credits in an amount close to US$ 10 billion. The Tribunal decided in its 2013 Decision that it does not have jurisdiction under Article 22 of the Investment Law and accordingly the claims by ConocoPhillips Company are dismissed[781]. It also noted that only this Company and not the Dutch companies (the actual Claimants) made these claims and that this Company is not able to claim under the Dutch BIT[782]. Consequently, this Company had no longer any claim pending before the Tribunal. There was no agreement or order on the discontinuance of the proceeding in respect of the ConocoPhillips Company made or any other formal decision that this Company was no longer a Party to the proceeding. In its communication sent to the Parties on 3 September 2013, the ICSID Secretariat noted that "in light of the Tribunal's conclusions, the case will be renamed as *ConocoPhillips Petrozuata B.V., ConocoPhillips Hamaca B.V. and ConocoPhillips Gulf of Paria B.V. v. Bolivarian Republic of Venezuela* (ICSID Case No. ARB/07/30)". No decision was made on whether and to what extent the advances paid by or on behalf of the ConocoPhillips parent Company (including the resulting income) remained with the ICSID Secretariat. They were treated as

[777] Claimants' Reply, para. 608.

[778] Claimants' Memorial on Quantum, para. 234.

[779] Claimants' Reply on Quantum, para. 457.

[780] Claimants' Final Submission on Quantum, para. 534.

[781] 2013 Decision, para. 404(a).

[782] Cf. 2013 Decision, para. 263.

advances attributed to the three remaining Dutch ConocoPhillips companies. The Parties simply have taken note of the disappearance of the ConocoPhillips parent Company from the case[783].

1001. The Tribunal also decided in 2013 that questions concerning the costs and expenses of the Tribunal and the costs of the Parties' determination are reserved for future determination[784]. No objection has ever been raised against this conclusion. The assumption must have been, to the extent it came to the minds of those involved, that the three remaining Dutch ConocoPhillips companies were continuing the proceeding as claimant parties dealing with all potentially remaining procedural issues related to their parent company. The Tribunal concludes therefore that the allocation of fees and costs in this Award includes consideration of the dismissal of ConocoPhillips Company's claim for its loss of future tax credits to the extent it may have an impact on the assessment of costs and fees in the relation of the Parties actually involved in this proceeding.

1002. The Claimants lost in their defense of the Respondent's objection to the Tribunal's jurisdiction they argued to be based on Article 22 of the Investment Law and related to the ConocoPhillips Company's claim for its losses of future tax credits. This claim amounted to nearly US$ 10 billion, corresponding to one third of the total amount claimed when this arbitral proceeding was initiated[785]. However, the dismissal of this claim cannot have an effect on the allocation of costs in a proportion measured by the amounts involved. This claim was dismissed on grounds of lack of jurisdiction, a result that was not impacted by the amount of the claim. Moreover, this decision was the consequence of the Tribunal's conclusion that the three Dutch ConocoPhillips Companies failed in their argument that Article 22 of the Investment Law included Venezuela's consent to ICSID jurisdiction.

1003. While the Claimants prevail in their main claim for damages arising out of the expropriation enforced in violation of Article 6(c) of the BIT, the principle of "full reparation", to the extent it is applicable, cannot lead to a full allocation of costs and fees to the Claimants in this respect, given the fact that the Tribunal awards approximately 40% of the approximately US$ 21 billion claimed.

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[783] In its letter dated 8 September 2013, the Respondent noted that the Tribunal's conclusion "excludes the bizarre US$10 billion claim of the parent entity, ConocoPhillips Company, for alleged loss of U.S. tax credits, which undoubtedly would have been rejected even if jurisdiction had existed". The Claimants did not address the matter directly, but noted in their Memorial on Quantum (footnote 1) that the terms "ConocoPhillips" are used to refer collectively to the three claimant companies and their predecessors and affiliates, but with the exception of Section VI containing the Request for Relief, made in the name of the three Dutch Companies CPZ, CPH and CGP exclusively, who were henceforth the only claimant parties in this proceeding. The same Memorial was submitted on behalf of these three companies, whereas the ConocoPhillips Company was no longer mentioned as claimant on the cover page.

[784] 2013 Decision, para. 404(g).

[785] In this respect, when addressing the phase ending on 7 September 2013, the Claimants' cost submission of 16 April 2018 refers to a "Merits Phase" exclusively (paras 26, 30, Annex B), not observing that this phase included a jurisdictional part.

1004. When these both factors are taken together, the balance between success and loss on claims would leave the Claimants with about 40% of their initial expropriation claim dressed up to US$ 21 billion, further adjusted by the loss of the ConocoPhillips Company's claim for US$ 10 billion. However, the Tribunal considers that such valuation cannot be made on a basis reflecting claimed amounts only. Figures are not counting alone. The ConocoPhillips tax claim was certainly of an ancillary nature and must have represented a fraction much smaller than a third of each Party's costs and fees. This claim was dismissed on jurisdictional grounds, which were the same than those analysed in respect of the three Dutch ConocoPhillips Companies; it did not require an examination of its merits. Therefore, the dismissal of this claim cannot be counted for more than a part of US$ 13.5 million of the Claimants' legal fees and costs out of a total of approximately US$ 40.6 million. The main and overwhelmingly prevailing claim was based on the expropriation and the violation of Article 6 of the BIT, however granted for only 40% of its amount. On the other hand, it must also be taken account of the fact that the submissions and the associated evidence and lawyers' fees were in large part addressing the merits of the claim and its numerous factual and legal elements, independently from the amount of damages. Therefore, the Tribunal's balance focuses on a cost sharing where the Respondent shall share about 40% of the Claimants' fees and disbursements of a total of US$ 64.7 million less the reduction related to the ConocoPhillips Company's tax claim (US$ 13.5 million). The Tribunal therefore orders the Respondent to pay the Claimants (respectively to the claimant company they designate) the amount of US$ 20,461,000 million as contribution to the Claimants' legal fees and costs.

1005. The Tribunal also determines that the amount to be paid by the Respondent as reimbursement for legal fees and costs shall be subject to interest. In this respect, the rate of interest is not based on the commercial consideration on which interest on the profit of the investment, respectively on the Claimants' cost of equity, is based. Therefore, the Tribunal retains a rate of 3%, granted as simple interest. No circumstances requiring compounded interest have been demonstrated in this respect.

1006. The Tribunal does not accept the Claimants' request to be awarded legal fees and expenses by phases, with the effect that as from the end of each procedural phase the Respondent would be under an obligation to pay the Claimants' fees and expenses related to this phase, with the further effect that compound interest would be triggered as from any of such dates separately.

1007. Such an apportionment in several distinct credit amounts relating to fees and costs is not provided for in Article 61(2) of the ICSID Convention, which states that the decision to be made in this respect shall form part of the award, except as the parties otherwise agree. No such agreement has been concluded between the Parties. The assessment and the allocation of legal fees and costs can therefore not become legally effective before the Award is rendered; it cannot trigger pre-award interest either. Theoretically, this leaves open the option that fees and costs are calculated on a factual cost-to-date basis, together with interest representing the costs for financing the corresponding expenses during the proceeding. This is not, however, the method the Claimants requested this Tribunal to apply. On the other hand, the Tribunal cannot know whether such calculation has not yet been included in the figures presented by the Claimants, which are not given with their details nor accompanied by an explanation.

1008. The Tribunal also notes that in their cost submission dated 16 April 2018 the Claimants do not request a separate allocation of costs to the Respondent in respect of each of the seven arbitrator challenges and each of the three reconsideration applications, two of which failed, while the third was equally denied but resulted in a clarification expressed in the Tribunal's Interim Decision. The Claimants have based their cost submission on the exclusive basis of full reparation to be owed by the Respondent, which absorbs the Claimants' costs of these miscellaneous proceedings. Additionally, the Claimants have given finally their preference to a cost allocation by procedural phases, which supersedes their initial requests (in all cases deferred by the Tribunal to a later stage in the proceedings) to have such assessment made in respect of each of such procedural incident separately.

XVI. Decision

1009. The Tribunal incorporates by reference in this Award the Decision on Jurisdiction and the Merits dated 3 September 2013 and its Interim Decision dated 17 January 2017.

1010. Based on the reasons stated above, the Tribunal decides:

1. That the Respondent, the Bolivarian Republic of Venezuela, shall pay as compensation for the expropriation enforced on 26 June 2007 in breach of Article 6 of the Agreement on Encouragement and Reciprocal Protection of Investments between the Kingdom of the Netherlands and the Republic of Venezuela dated 22 October 1991, the following amounts to the Claimants:
    a. ConocoPhillips Petrozuata B.V. (CPZ) US$ 3,386,079,057;
    b. ConocoPhillips Hamaca B.V. (CPH) US$ 4,498,085,150; and
    c. ConocoPhillips Gulf of Paria B.V. (CGP) US$ 562,140,959.

2. The above mentioned amounts shall be paid together with interest at an annual rate of 5.5%, compounded annually, until the date of full and final payment of these amounts.

3. The Bolivarian Republic of Venezuela shall pay to ConocoPhillips Petrozuata B.V. (CPZ) the amount of US$ 286,740,989 based on the compensation provisions of the Petrozuata Association Agreement, together with simple interest until the date of full and final payment at 12-month LIBOR or any other comparable rate in case LIBOR should be discontinued in the future.

4. The claim of the Bolivarian Republic of Venezuela to deduct from the Claimants' claim the amount of US$ 298 million as repayment of a service payment made to the Hamaca Project's lenders by PDVSA is dismissed.

5. The Tribunal declares that the Claimants are under an obligation based on the principle of good faith not to seek double recovery when seeking enforcement, in full or in part, of this Award beyond the amounts awarded by the Arbitral Tribunal of the International Chamber of Commerce (ICC) through its Final Award dated 24 April 2018 (20549/ASM/JPA) between *Phillips Petroleum Company Venezuela Limited, ConocoPhillips Petrozuata B.V. (claimants) and Petróleos de Venezuela, S.A., Corpoguanipa, S.A., PDVSA Petróleo, S.A. (respondents)*.

6. The Bolivarian Republic of Venezuela shall pay the Claimants (respectively the claimant company they designate) the amount of US$ 20,461,000 as contribution to the Claimants' legal fees and costs, together with simple interest at an annual rate of 3% until the date of full and final payment of this amount.

7. The Bolivarian Republic of Venezuela shall pay to the Claimants (respectively the claimant company they designate) the amount of US$ 1,400,000 representing the advances for costs to ICSID paid by the Claimants in substitution for the Respondent, together with simple interest at an annual rate of 3% until the date of full and final payment of this amount. This amount shall be reduced by the balance refunded by ICSID to the Claimants.

8. Except for the amounts mentioned in the two preceding paragraphs, each Party shall bear its advances for costs paid to ICSID and its own legal fees and costs.

9. Payment by the Respondent of the amounts awarded herein shall be made not later than 60 days after the issuance of the present Award. Interests on the amounts awarded will start to run at the expiration of the above mentioned 60-day period.

10. The Tribunal declares that (a) the Award is net of all applicable Venezuelan taxes; (b) Venezuela shall not tax or attempt to tax the Award; (c) the Claimants have no further taxation obligations to Venezuela in respect of the three Projects; and (d) in case taxes have nonetheless to be paid by the Claimants, the Respondent shall be liable to compensate the Claimants for the corresponding amount in such a way that the amount effectively received by the Claimants after deduction of all applicable taxes corresponds to the full amount (including interest) granted by this Tribunal.

11. To dismiss any other claim submitted by the Parties.

[signed]

Prof. Andreas Bucher
Arbitrator

Date: 27 February 2019

[signed]

The Hon. L. Yves Fortier, QC
Arbitrator

Date: 27 February 2019

[signed]

Mr. Eduardo Zuleta
President of the Tribunal

Date: 27 February 2019