Assessing the Value of OPL 245

Shell and Eni Valuations from 2010 and 2011

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25 March 2019

RESOURCES for DEVELOPMENT CONSULTING

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TABLE OF CONTENTS

1.0 INTRODUCTION

Investigations into the payment of $1.3 billion as part of the Resolution Agreements (RA) for OPL 245 have raised the question of the value of the Block at that time, and how that value would compare to the amount paid.

In November 2018, Resources for Development Consulting published a report and economic model assessing potential government revenues from OPL 245.[1] The conclusion of the analysis was that a central feature of the deal, at that time not widely understood, was the unusually fiscal terms that were associated with the 2011 RA and the associated 2012 production sharing agreement (PSA). Over the lifecycle of the project we estimated that government revenues would be at least $4.5 billion less than under the contract terms that Shell had agreed to in 2003.

The objective of that study was to assess the differential impact in government revenues resulting from four sets of fiscal terms that have applied, or could be applied, to Block 245 based on a view of the field in 2018. That analysis, however, did not seek to estimate the value of the Block from the perspective of 2010/11.

This note seeks to provide an analysis of the value of the Block based on analyses conducted by Shell and Eni in 2010/2011 in advance of the signing of the RA, and to assess it against the payment of $1.3 billion.

1.1 Value versus Price

Oil blocks (concessions) are normally allocated in advance of exploration, either by direct negotiations or through a competitive bidding process.[2] The situation with OPL 245 was unusual. The Block was first awarded to Malabu in 1998, but was subsequently reallocated to Shell in 2003. Shell began exploration and discovered substantial volumes of oil in 2005 and 2006. At the time of the RA, the existence of commercial quantities of oil had been proven.

In advance of the negotiations of the 2011 RA, Shell and Eni both assessed the value of the Block as described below. The value of the Block, however, is only one factor in determining what a company would be willing to pay.

In asset acquisitions, in our view:

- A company would normally be willing to pay only a proportion of their base case valuation, as to pay the full valuation amount would be to forfeit the expected return while taking on substantial risk.
- Upsides such as exploration prospects and associated natural gas are not normally included in the formal valuation process but may lead the Board of Directors to offer something closer to the base case valuation.

[1] See Don Hubert, Government Revenues from OPL 245: Assessing the Impact of Different Fiscal Terms, Resources for Development Consulting, 2018.

[2] See Silvana Tordo, Petroleum Exploration and Production Rights: Allocation Strategies and Design Issues, World Bank, 2009.

- Acquisition decisions are also based on broader corporate strategy such as Shell's desire to move beyond the OPL 245 arbitration proceedings or Eni's desire to acquire operatorship in the Block and strengthen its position in deepwater in Nigeria.

2.0 THE VALUE OF OPL 245 IN 2010/11

The basic method for valuing an oil block is known as "discounted cash flow analysis." This methodology seeks to assign an economic value to future cash flows based on assumptions about:

- the volume of oil that might be produced,
- the costs that might be associated with that production,
- the price at which the oil might sell,
- the fiscal terms contained in the contract/legislation, and
- the discount rate (the minimum expected return on investment).

The result of the analysis is the net present value (NPV): the value, at a particular moment in time, of all future cash flows.

Shell and Eni both prepared economic analyses of the anticipated NPV of OPL 245 as part of their internal approvals processes and in support of their external negotiations during the 2011 RA negotiations.[3] Table 1 sets out the key input assumptions and the associated NPVs of the Block from the perspective of the two companies.

Table 1: Summary of Company Valuations – 100% Licence Holder and Contractor Rights

Company	Shell				Eni		
Date	2010				2011		
Volume of Oil (mmbbl)	458				460		
Dev. Costs ($ Billion [RT])	10.4				8.2		
First Oil	2019				2017		
Oil Price ($/bbl [RT])	50	60	80	100	60	70	70
Discount Rate (% Nominal)	10%				9%	9%	11.5%
Net Present Value ($ Billion)	0.762	**1.618***	3.238	4.792	2.808	**3.514***	3.2

* Base Case Valuations

As Table 1 illustrates, valuation depends on input assumptions. In the following paragraphs we analyse the most important assumptions.

[3] OPL 245 Brief, Shell, 23 September 2010; Nigeria acquisizione blocco OPL 245, Eni, 21 April 2011.

2.1 Recoverable Oil Reserves

The term *recoverable* refers to the combination of proven (90% confidence) and probable (50% confidence) reserves (known as 2P).[4] The valuations of Block 245 by Shell and Eni were based on a common assessment of recoverable reserves (458–460 million barrels).

2.2 Development Costs

There was a significant difference in the anticipated development costs between Shell and Eni. Shell assumed development costs of $10.4 billion whereas Eni assumed that costs would be more than $2 billion less ($8.2 billion). The difference in estimated development costs is one explanation for Eni's higher NPVs.

2.3 First Oil

Shell and Eni make very different assumptions about the timing to first oil. Eni (the operator of the Block) assumes first oil in 2017, Shell assumes first oil in 2019. The timing of first oil would be expected to have a significant impact on NPV as it would move project revenues forward in time. Eni base case valuation of $3.514 billion drops to $2.926 billion with a one-year delay.

2.4 Oil Price

As future oil price is entirely unpredictable, valuations are commonly generated at different price assumptions. While the average spot price for Brent in 2010 was $79.61/bbl and in 2011 was $111.26/bbl,[5] there was a widespread recognition at that time that oil prices were highly volatile.[6] Companies base their economic analyses on medium-term to long-term price forecasts ($60/bbl for Shell and $70/bbl for Eni). In the Shell valuation, the high-level conclusion is that the Block was worth $1.6 billion at $60/bbl and $3.2 billion at $80/bbl.[7] The analysis also includes valuations at $50/bbl and $100/bbl. Eni's valuation is $2.8 billion at $60/bbl and $3.5 billion at $70/bbl.

2.5 Discount Rate

The calculation of an NPV depends on an assumption about the future value of money. The values of future cash flows are discounted based on a company's cost of capital (known as the Weighted Average Cost of Capital or WACC) or their hurdle rate (which takes into account considerations such as country risk). The Eni valuation provides a clear example of the impact that the discount rate has on assessing the value of a block: an increase in the discount rate from 9% to 11.5% (taking into account Nigeria risk) resulted in a decrease in the NPV of around $300 million at $70/bbl.

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[4] SPE Petroleum Resources Management System Guide for Non-Technical Users, Society of Petroleum Engineers, n.d.

[5] 2011 Brief: Brent crude oil averages over $100 per barrel in 2011, US Energy Information Agency, 2011.

[6] World Energy Outlook, International Energy Agency, 2011.

[7] OPL 245 Brief, Shell, 23 September 2010, p. 1.

3.0 POTENTIAL UPSIDES: EXPLORATION PROSPECTS AND NATURAL GAS

The upside potential is not normally included in the base case valuation. It does however have an impact on what proportion of the base case valuation a company is willing to pay.

3.1 Exploration Prospects

Interest in the Block from international oil companies was based not only on the 2P reserves (as described above), but also on significant exploration prospects identified through Shell drilling and inferred due to substantial production in adjacent blocks. Shell's 2008 Group Investment Proposal indicates drilled and discovered volumes at 531 million barrels with an additional 600 million barrels "identified as Exploration upside." Total recoverable reserves of liquids (oil and condensate) in the adjacent block (OPL 246 / OML 130) are around 1.5 billion barrels.

The 2010 Shell evaluation includes an assessment (not reflected in Table 1) of a 20% (90 million barrels) increase in recoverable reserves resulting in an additional NPV of $1.25 billion at $80 barrel (total NPV of $4.488 billion). Eni provides an assessment of the upside potential of an additional 50 million barrels (not reflected in Table 1) resulting in a value increase of $230 million.

3.2 Associated Natural Gas

Neither Shell nor Eni include the value of associated natural gas in their assessments. In both cases the natural gas was seen as a non-quantified upside. The Shell development plan for the two fields (Zabazaba and Etan) called for the production of 650 billion cubic feet (BCF) of natural gas (approx. 110 million barrels of oil equivalent or mmboe).[8] The valuation of the Block included the costs related to gas production. However, Shell attributed no revenue to natural gas because commercial terms had not been included in the 2003 Production Sharing Contract (PSC). Based on a gas price of $3/mmbtu (approximate Henry Hub USA average for 2018) gas sales would add around 6% to revenues over the lifecycle of the project.

4.0 FISCAL CONCESSIONS IN THE 2011 RESOLUTION AGREEMENT

A substantial portion of the value of OPL 245 came from fiscal concessions embedded in the 2011 RA.[9]

Under Nigerian production sharing contracts, profit oil is allocated between the government and the company according to a sliding scale based on cumulative production. The government share is normally allocated to NNPC (the Concessionaire or Licence Holder) and the oil companies (the Contractor).

[8] Group Investment Proposal, Shell, 2008, p. 3.

[9] For a detailed review of fiscal terms for deepwater PSCs see Government Revenues from OPL 245, 2018.

The Shell valuation provides a comparison of the value of the Block under the terms of the PSC signed between NNPC and Shell in 2003 with the value to Shell ad Eni under the terms of the 2011 RA.[10]

As shown in Table 2, under the terms of the 2003 PSC, NNPC would receive the Licence Holder's share of profit oil, while under the terms of the 2011 RA, Shell and Eni are allocated both the Contractor and the Licence Holder's share of profit oil and the NNPC is excluded.

Table 2: Shell Valuation: Contractor and Licence Holder Values (USD millions)

	$60/bbl	$80/bbl
2003 PSC (Shell & NNPC)		
NNPC (Licence Holder) NPV	791	1,292
Shell (Contractor) NPV	827	1,946
Total (Contractor and Licence Holder NPV)	1,618	3,238
2011 RA / 2012 PSA (Shell and Eni)		
NNPC NPV	0	0
Shell (50% Contractor + 50% Licence Holder) NPV	809	1,619
Eni (50% Contractor + 50% Licence Holder) NPV	809	1,619
Total (Contractor and Licence Holder Value)	1,618	3,238

According to the Shell valuation, the rights to the Licence Holder's share of profit oil were $791 million ($60/bbl) and $1,292 million ($80/bbl).

5.0 Economic Analysis of the Resolution Agreement

As part of the 2011 RA, Shell and Eni paid a total of $1.3 billion. Shell and Eni approached the RA differently: for Shell it was the settlement of an outstanding claim on the Block, while for Eni it represented the acquisition of a new asset. Their relative contributions reflected this difference of perspective.

5.1 Shell

For Shell, the 2011 RA was viewed as a settlement of their outstanding claim to OPL 245. The Shell share of the $1.3 billion total payment was $319.5 million. Shell released the existing signature bonus of $209 million that had been held in escrow. This was paid directly to the Government of Nigeria. Shell also transferred $25.5 million in accumulated interest on the signature bonus and an additional $85 million to Eni.

In addition, Eni agreed to repay Shell for historic exploration and pre-development costs. Specifically, the PSA between Eni and Shell provides for an additional profit oil allocation to

[10] The Heads of Terms for the PSA were agreed 13 October 2010. The PSA itself was not agreed until 2012.

Shell in the first two years of production amounting to 335.6 million.[11] According to the Shell valuation, the repayment of past costs would be worth $130 million discounted over 10 years.

Shell's NPV of their 100% of the Block under the terms of the 2003 PSC was $827 million ($60/bbl). After taking into account the various payments, Shell's NPV holding 50% of the Block under the terms of the 2011 RA was $862 million. The allocation of NNPC's share of profit oil to Shell and Eni in the 2011 RA allowed Shell to increase its NPV slightly even while its stake in the Block was cut in half.

Table 3: Shell NPV: 2003 PSC v 2011 RA – With Payments (USD millions)

Oil Price	$60/bbl
2003 PSC	
100% Contractor Value	**827**
2011 RA	
50% Licence Holder	395
50% Contractor	414
Minus additional payment	-85
Plus repayment of costs	+130
2011 RA with payments	**854**
Overall Impact of 2011 Deal	**+27**

5.2 Eni

For Eni, securing a 50% stake in OPL 245 was cast as an acquisition from the Government of Nigeria. Eni's direct contribution was $980.5 million. Eni also committed to make a future payment to Shell as compensation for historic costs that Shell valued at $130 million.

Table 4: Eni Acquisition NPV – With Payments (USD millions)

Oil Price	$70/bbl
Eni share of OPL 245 NPV	1,757
Eni Payment	-980.5
Repayment of Shell Past Costs	-130
Eni NPV after Payments	**646.5**

After taking into account Eni's payment ($980.5 million) and the repayment of past costs ($130 million) the remaining NPV would be $646.5 million ($70/bbl).

5.3 Government

In Nigeria's production sharing contracts, government revenues come from three main sources: royalties, taxes and a share of production.

Until 2005, royalty rates for deep water blocks were set at 0%. While an 8% royalty applied to OPL 245 following the Malibu reinstatement in 2006.[12] The royalty rates for the 2003 PSC and the 2011 RA was 0%.

[11] Production Sharing Agreement: Article 13.2.3.

Oil producing projects pay two kinds of government taxes: a 2% education tax and a 50% Petroleum Profits Tax. Both of these taxes apply to OPL 245 under all of the scenarios considered. Neither the Shell nor the Eni valuations, however, report separately on the present value of taxes to be paid to Nigeria.

The centrepiece of a production sharing fiscal regimes is the share of profit oil that is allocated to the government after the contractor has recovered its costs. In Shell documents, the value attributed to the Licence Holder (NNPC) is the government share of profit oil. Under the 2003 PSC, Shell concludes that the government share of profit oil is valued at $791 million at $60 per barrel and $1,292 million at $80 per barrel. Under the terms of the 2011 RA, however, the Lience Holder share of profit oil is allocated equally to Eni and Shell.

Table 5: Shell Valuation: Licence Holder (NNPC) Values (USD millions)

	$60/bbl	$80/bbl
2003 PSC (Shell & NNPC)		
NNPC (As Licence Holder) NPV	791	1,292
2011 RA / 2012 PSA (Shell and Eni)		
NNPC (With Shell and Eni Licence Holders) NPV	0	0

The government's principal objective in allocating oil blocks is to maximize revenue while minimizing risk. OPL 245 is attractive to companies because of the substantial upside in both exploration prospects and natural gas revenues. It is attractive to government for the same reasons. The loss of future government revenue due to the allocation of the Concessionaire or Licence Holder rights was among the reasons why the Resolution Agreement was opposed by the NNPC and the Department of Petroleum Resources (DPR).[13]

6.0 Company Responses

Shell and Eni were asked for their comments on the findings of this analysis.

Shell did not comment on the specific points saying, "In line with correct legal process, many of these issues will be considered by the court and we do not wish to interfere with those proceedings". They added that "We acted in good faith, in trying to unlock what had become a decade–long, intractable dispute, resulting from the FGN's allocation of the block to two parties - Shell and Malabu. The FGN of course had its own interest in resolving the disputes, which had hampered development of the block for many years, therefore preventing Nigeria from benefiting from any economic activity from OPL 245." Shell has also denied all allegations of criminality or wrongdoing in the deal.

Eni claimed in light of their ongoing trial Eni is "unable to disclose… information relevant for the pending proceedings, nor is it otherwise willing to publicly disclose data that are sensitive in

[12] Letter from Edmund Daukoru, then-Minister of State for Petroleum, to Malabu Oil and Gas Limited, 2 December 2006.

[13] See W. A. Obaje, Letter from the Department of Petroleum Resources to the Attorney General and Minister of Justice Regarding the OPL 245 Resolution Agreement, 1 April 2011.

nature." They noted that Eni appointed experts in court will "cover the significant benefits for Nigeria" from the deal and that it will be shown to be "transparent, lawful and beneficial for Nigeria".

7.0 Conclusions

Company valuations of Block 245, under the terms of the 2011 RA, ranged from $1.6 billion to $3.5 billion: Shell valued the Block at $1.6 billion at $60/bbl and $3.2 billion at $80/bbl; Eni valued the Block at $3.5 billion at $70/bbl.

There is no simple answer to the question of whether the $1.3 billion paid was "reasonable." In our view, there is always some differential between value and price. Upsides including exploration prospects and natural gas could be expected to reduce this differential.

According to Shell's valuation, from the perspective of 2010, the future value of NNPC's share of profit oil alone was $790 million at $60/bbl and $1,292 billion at $80/bbl.

The fiscal concessions contained in the 2011 RA were not tangential to the deal, they were the essence. Securing agreement from the parties to the RA required around $1 billion in value. That value came from the Concessionaire / Licence Holder's share of profit oil held by NNPC under the 2003 PSC but allocated to Eni and Shell under the 2011 RA.