

Coal Bed Methane (CBM) in Indonesia: A comparative analysis of Net Production Sharing Contract (PSC) and Non Cost Recovery Gross PSC Sliding Scale

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ABSTRACT

Case Study

Purpose

With 453TCF potential reserves of Coal Bed Methane (CBM), Indonesia signed the first CBM PSC (Net PSC) in 2008. There have been 54 CBM PSC signed to this date. Before starting production, the CBM investor shall propose a Plan of Development which includes an economic evaluation of the project. An evaluation of the current PSC shows that projects are not economically viable at current domestic gas price (US\$6/mmbtu, 2016). A consortium of CBM investors have proposed a new contract, the Non Cost Recovery Gross PSC Sliding Scale to amend the current CBM PSC.

This paper shows the fundamental differences between the two fiscal regimes in Indonesia's CBM industry, and its fiscal impacts on both of Government and Investors.

Design/methodology/approach

Quantitative analysis is used to evaluate the impact of the two fiscal regimes. A qualitative analyses of the regimes will be supported by literature review. A sensitivity analysis is conducted to test the robustness of key determinants in the fiscal regime. It also seeks to understand the influence of other parameters such as the domestic gas price and the impact of the inflation.

Findings

The current PSC was developed for conventional hydrocarbon projects and needs to be modified. It is inadequate if applied to CBM projects. However the proposed modification, the non-cost recovery gross PSC sliding scale, will not always be the superior option for every CBM development.

Practical implications

The Government should establish a model fiscal regime from which to start negotiations with CBM investors. The objective is to attract more investors by applying the new fiscal regime and increase the exploration for CBM in Indonesia to better fulfil the domestic needs.

Originality value

This paper provides new insights for CBM investors on the current fiscal regime applied in Indonesia. Further study of Indonesian CBM fiscal regimes needs to be conducted. This paper demonstrates that technical and geological aspects can influence how effective the CBM fiscal regimes can be.

Keywords: *Production Sharing Contract (PSC), Sliding Scale, Coal Bed Methane (CBM), Fiscal Regime.*

INTRODUCTION

CBM in Indonesia

Indonesian's CBM is located in the archipelago basins. Approximately 85% of these basins contain low-rank coal (lignite to subbituminous) and 15% is hard coal (bituminous to anthracite) (Flores 2014:568).

Two main CBM basins are South Sumatra Basin and East Kalimantan (Kutai Basin). Wood Mackenzie (2013) researched and stated Indonesia has CBM reserves in place amounted 453 tcf (Figure 3). Kutai Basin has a higher gas content in comparison with South Sumatra Basin (Bowe et. al, 2015). Gas content in a basin is much related to the depth of the coal (Moore et al., 2014). It was mentioned in the report of Energy Studies Institute that there has been optimism about CBM long term opportunities and development in Indonesia.

CBM Production Sharing Contract

Indonesia has applied the Net PSC for its CBM contract since 2008 (SKKMigas, 2016; Boger et. al, 2014). The PSC is the one that is applied for the conventional hydrocarbon. The entitlement of the resources and the sharing between the Government and the Contractor after cost recovery are two things that distinct the PSC from other systems. The difference between the CBM Net PSC and the conventional PSC is the shares split between the government and the contractor. In the CBM Net PSC, the shares are 55:45 for the government and contractor respectfully. A bigger shares for the contractor compared to the conventional Net PSC is to attract investors in the industry.

Cost recovery is a concept where the contractor can recover all the cost incurred from the industry's activities. Cost recovery includes the capital expenditures, operating expenditures and the depreciation expenditures. The cost starts to be recovered whenever the contractor starts the production and making revenue. There is no cost recovery ceiling applied in the current CBM PSC in Indonesia but it has First Tranche Petroleum (FTP). FTP is a percentage taken from the gross revenue before the cost recovery and taxes. Therefore, the cost recovery is actually capped as amounted of FTP percentage (Johnston, 1994). The first CBM PSC has non-shareable 10% FTP, but the latest CBM PSC has shareable 20% FTP.

A consortium of CBM investors proposed to the Government a new fiscal regime, which is called a Non-Cost Recovery Gross PSC Sliding Scale. This has been approved and regulated in the Ministry Regulation No. 38/2015.

Non-Cost Recovery Gross PSC Sliding Scale (NCR Gross PSC SS)

In the non-cost recovery gross PSC sliding scale, gross production is split even before the cost deduction. All the costs spent for the activities are not recovered by the government. The sliding scale is based on the gross production. Below is the sliding scale table for the shares based on the gross production.

Table 1: Sliding Scale Table NCR Gross PSC SS

Annual Production	Government's Shares	Contractor's Shares
< 5 bcf	5%	95.00%
5 - 20 bcf	15%	85.00%
20 - 50 bcf	17.5%	82.50%
50 - 100 bcf	20%	80.00%
> 100 bcf	25%	75.00%

Source: National Exploration Committee (NEC), 2015

FTP is not applied in this fiscal regime. The FTP in this type of fiscal regime is the government split (taken on the top). The inexistence of the cost recovery frees the CBM contractors from all the regulations related to the cost recovery items and this is expected to give more spaces for the contractors to manage their budget and expenditures. The contractor bears all the risks of the projects. The Government will eventually impose the tax whenever they make profits.

DATA AND ASSUMPTIONS

Data is taken from one of CBM basin in Indonesia, Kutai Basin which is located in East Kalimantan. As in based case, the gas price used in both models is US\$6/mmbtu which is based on the domestic gas price set by the GOI on President Regulation No. 40/2016. To scrutinize the impact of the price, three price scenarios have been used; the low price, high price and the price used by the consortium when proposing the fiscal regimes to the Government. Prices being used are US\$4/mmbtu and US\$8/mmbtu as the low price and high price. The price used by the consortium in 2015 was US\$14/mmbtu. Whilst, the cost as in based case is US\$3M/development well. A US\$2M and US\$4 per development well have been used as its low cost and high cost case respectively. The project is expected to start production at year 8 after plan of development approved. The production incurred during exploration phase is shared between the government and contractor using the model being applied. There is 2% escalation on prices and no escalation on development costs (capex) as it is assumed that the costs have been determined in the contract for building the facilities. Decommissioning and abandonment costs are given. The discount rate used is 10%. There is no DMO applied to this fiscal regime since the production supports the domestic needs.

The total production during the project life is expected to be 1.5 TCF by drilling 2,348 wells, including pilot and corehole wells. The peak production rate for each wells is expected to be 200MSCFD for 3 years. Total capex and operating expenditures during the project life is US\$7,747MM and US\$4,900MM respectively.

RESULTS AND ANALYSES

Project Economics

The economic model results in economic indicators using the net current PSC and non-cost recovery gross PSC Sliding scale. The indicators exposed in Figure 4 comprise project IRR,

contractor IRR, project NPV, Government NPV, and contractor NPV. With the current situation, a low gas price and high cost on CBM activities, the project is not economic viable both in net current PSC neither in non-cost recovery gross PSC SS.

The sliding scale in the NCR Gross PSC SS is based on the gross production. In the initial production, the government's share is much lower than the contractor's share. The contractors expect to get the money earlier (pay back period) since they are not able to recover their costs. The NCR Gross PSC SS was proposed in 2015 when the gas price was forecasted to reach US\$14/mmbtu. In that case, the NCR Gross PSC SS seemed to catch both the economic rent and the economy of the project.

Figure 4 presents the based case project's economic indicators from both sides in two fiscal regimes. Whilst Figure 5 shows the Government NPV and Contractor's NPV in both fiscal regimes with 6 different scenarios. The Government NPV in both of fiscal regimes are slightly sensitive with the changes in cost. The current net PSC is more effective to capture the economic rent when the price is low but capture less rents when the price is high. Figure 5 also shows the comparison of contractor's NPV between the two fiscal regimes. The contractor's NPV is more sensitive with the changes in cost both in the fiscal regimes compared to the government's NPV.

In this low price situation, the NCR Gross PSC SS is worse than the net PSC. It only gives the contractor a better NPV whenever the price is high enough to give a positive NPV to the contractor. The changes in price has a significant impacts on both government and contractor's NPV. This demonstrates that the effectiveness of fiscal regime is very attached with the current price and slightly with costs.

Figure 8 exhibits the annual production profile and the cumulative production profile of CBM during the project life. It also shows the Government production share in both fiscal regimes. To be clearer, Figure 9 describes the government production shares in both fiscal regimes annually and cumulatively. Government obtains a higher production (in kind) shares with NCR Gross PSC SS compared to net PSC.

Sensitivity Analysis

A sensitivity analysis is conducted to test the robustness of key determinants in the fiscal regime. Figure 6 and 7 describe sensitivity charts for contractor's IRR and NPV in both fiscal regimes. They are most influenced by production, price and costs. These three have been found as the key determinants of the project economy (Asmoro, 2016).

Analysis

Sliding scale system as applied in the new fiscal regimes for CBM makes the fiscal regimes progressive. The government shares percentage increases as the production increases. A new fiscal regime with sliding scale system for CBM was proposed to the government by the consortium of CBM investors in 2014 when the oil and gas price were high. This fiscal regime was approved in late 2015 and the government has enacted a CBM regulation, Ministry Regulation No. 38/2015 about the acceleration of non-conventional hydrocarbon.

However, this study proves that both fiscal regimes are not attractive for the investors due to the low price. Both of them have negative NPV and a very low IRR. However, the NCR Gross PSC SS has a better offer for the investors.

The new NCR Gross PSC SS has both upsides and downsides for the investors as follows:

1. Provide the freedom for the investors to spend their expenditures. This also reduce the complexities in terms of budget approval. This is due to the new fiscal regime does not apply the cost recovery.
The Government has no right to control the project expenditures which also means there is a risk of inefficiency by the investors that the Government might not be aware of it.
2. Provide a better offer for the investors when the production is low and as the production increases, they are offered less shares but still acceptable. An upside for the investors, but for the Government this is a downside. When the production reaches its peak, the Government will immediately start to get a lower shares again for the second time. However, it is important for the investors to maintain its production level.
3. Effective only when the price is high and the project is positive (see Figure 5). Investors need to be aware about the price agreed in the Gas Sales Agreement (GSA). In the contrary, the Government gets a better offer when the price is low.

Implementing this new fiscal regime will have its challenges in both parties, the government and the investors. The Government will have less control on the projects and the risk of having lack of information about the project increases. Nevertheless, the resources belong to the Government, however they have right to know about the resources and the project. The Government needs to establish a tool to supervising the investors doing the projects.

CONCLUSION

Apart from the regulation and the terms applied to both fiscal regimes, a further study on CBM fiscal regimes in Indonesia needs to be performed. The volatility of the prices has shown that the fiscal regime applied is not always attractive.

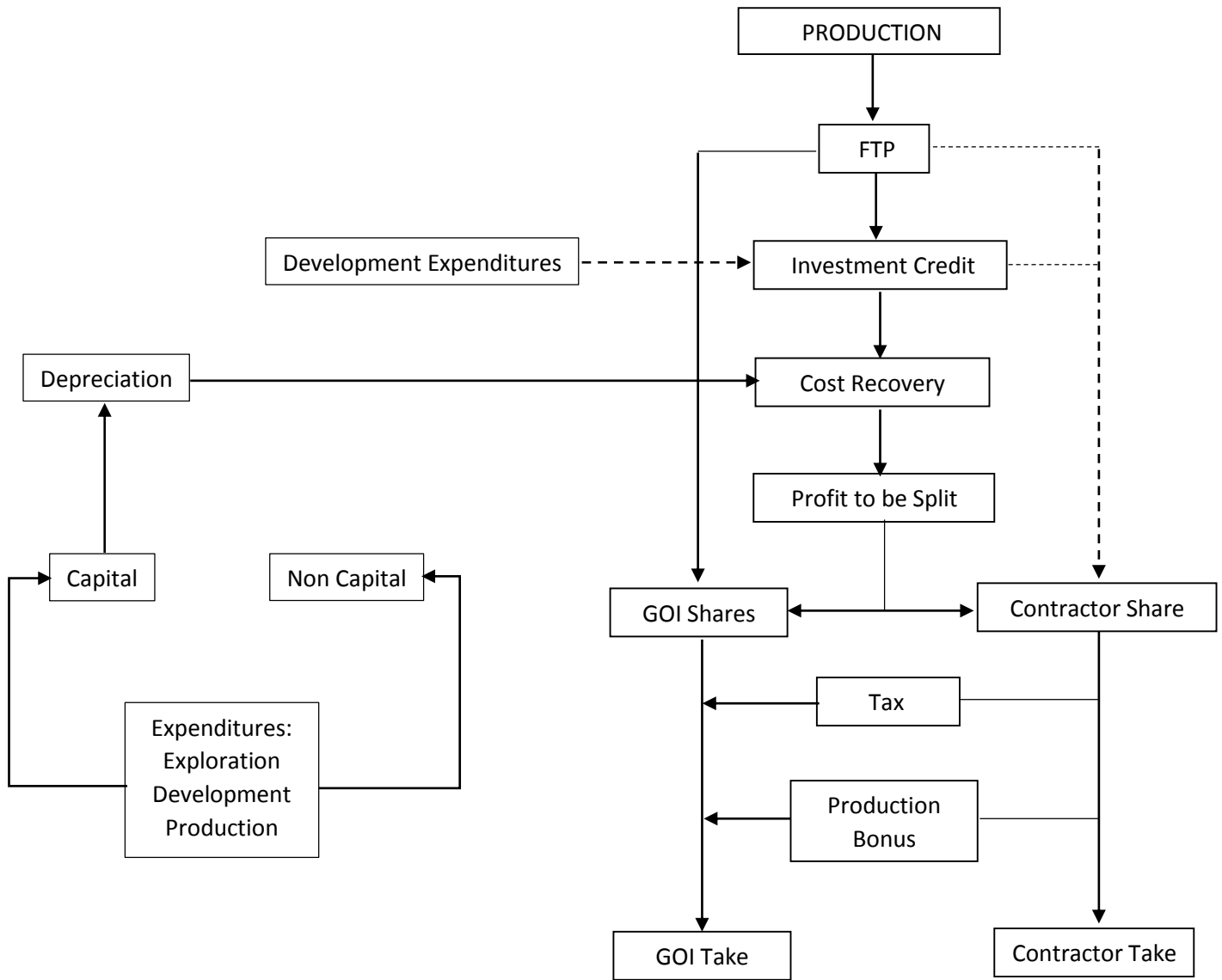
Fiscal regime is very attached to the price and cost of a project. Each CBM project has different geological condition and it is technically different. The Government needs to consider to have a basic fiscal regime concept that give a flexibility to the investors regarding to its geological condition. This means that in this project, the government is being opened for negotiations.

However, a sliding scale system is a good start to attract the investors. In fact, it balances the risk and reward between both parties, Government and investors. An R factor sliding scale need to be considered as a new term on fiscal regime and a further study needs to be done to see the impacts on the project economy.

ACKNOWLEDGEMENT

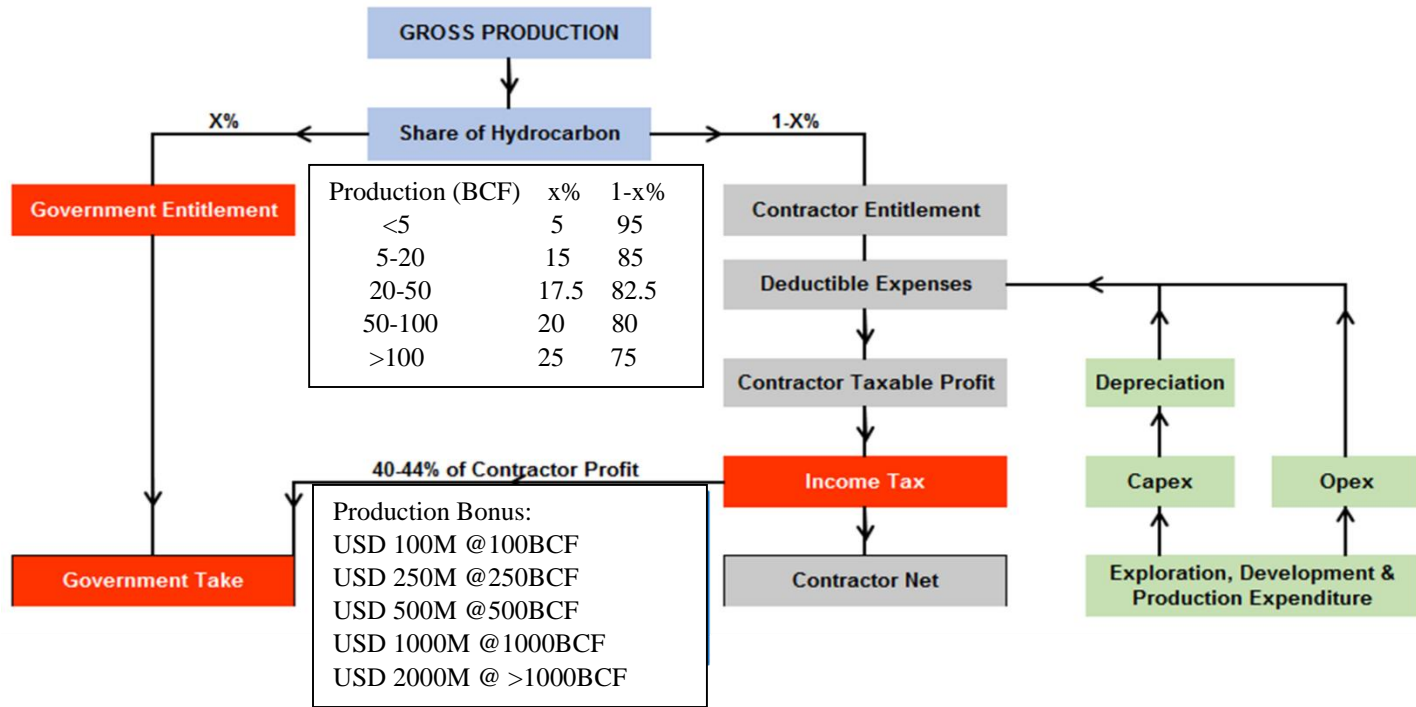
1. Dr. E.Ariel Bergmann, my Supervisor in my PhD.
2. Aberdeen Business School
3. Family and friends
4. Indonesian National Exploration Committee
5. The Ministry of Energy and Mineral Resources of Indonesia

Figure 1: Current Net CBM PSC



Source: FGD with Directorate General of Oil and Gas, Ministry of Energy and Mineral Resources, 2011

Figure 2: Non-Cost Recovery Gross PSC Sliding Scale



(SKKMigas, 2015)

Figure 3: Indonesia's CBM Potential

Areas	CBM Potential
North Sumatera	52.50 TCF
Ombilin	0.50 TCF
South Sumatera	183.00 TCF
Bengkulu	3.60 TCF
Jati Barang	0.80 TCF
Kutai	80.40 TCF
Barito	101.60 TCF
Pasir & Asem-Asem	3.00 TCF
North Tarakan	17.50 TCF
Berau	8.40 TCF
Sulawesi	2.00 TCF
Total	453.30 TCF

(www.wkmigas.com, 2016)

Figure 4: Project's NPV Current Net PSC VS Non-Cost Recovery Gross PSC SS

Economic Indicators	Current Net PSC	Non-Cost Recovery Gross PSC SS
Project NPV	(708,710)	(708,710)
Government NPV	134,565	195,928
Contractor NPV	(843,193)	(904,556)
Contractor IRR	-1.26%	-2.42%
Project IRR	0.95%	0.95%

Figure 5: Government's NPV and Contractor's NPV

Based Scenarios:

Based Cost: Development Cost/Well US\$3M

Based Price US\$6/mmbtu

Low Price US\$4/mmbtu

High Price US\$8/mmbtu

Low Cost Development Cost/Well US\$2M

High Cost Development Cost/Well US\$4M

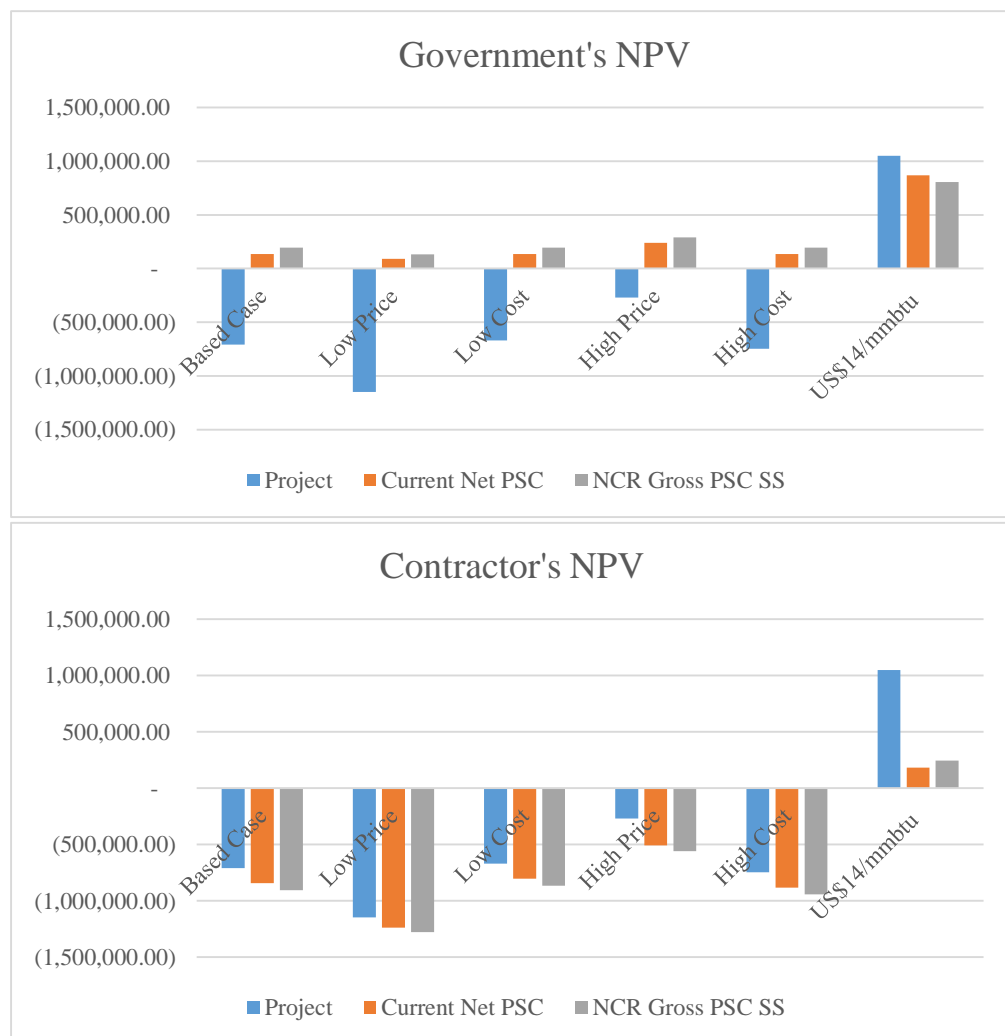


Figure 6: IRR Sensitivity on Net PSC and Non-Cost Recovery Gross PSC Sliding Scale

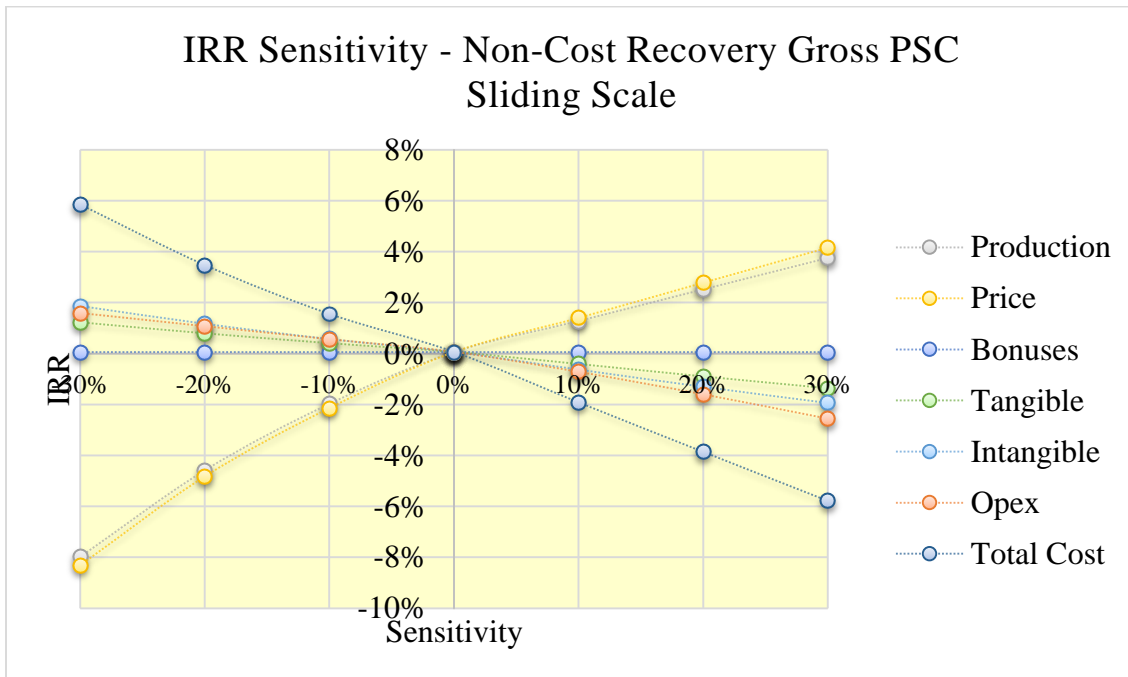
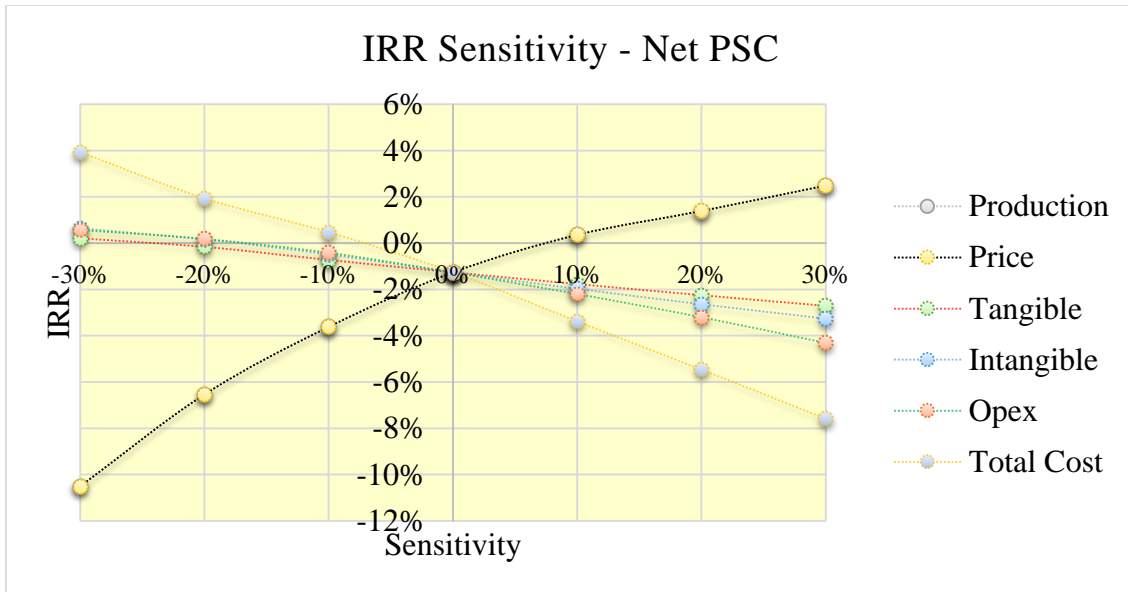


Figure 7: NPV Sensitivity on Net PSC and Non-Cost Recovery Gross PSC Sliding Scale

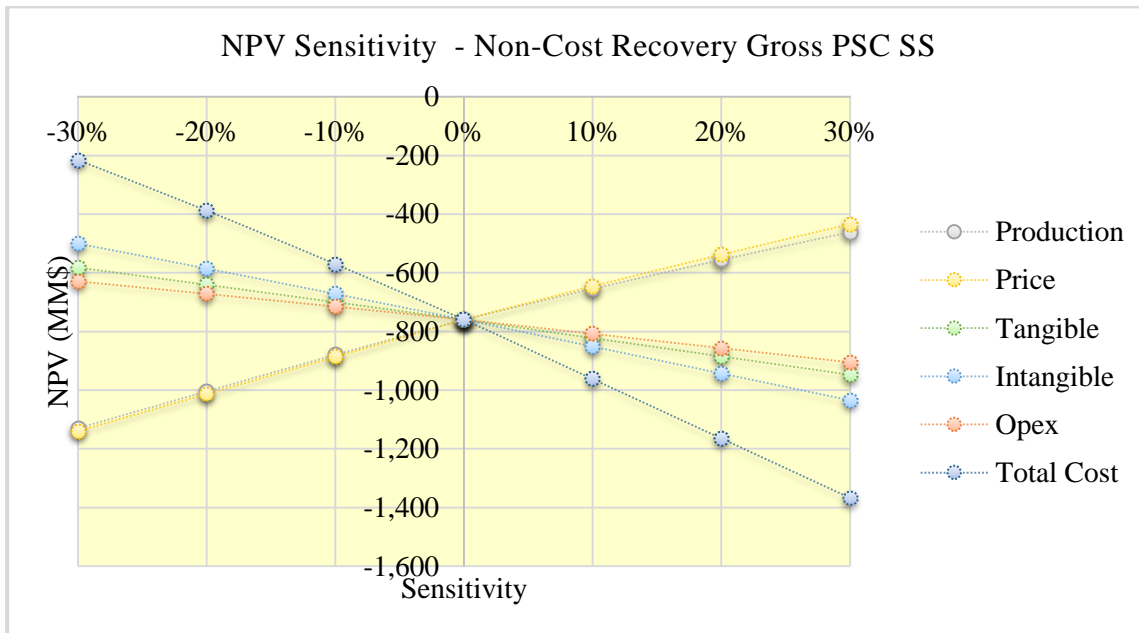
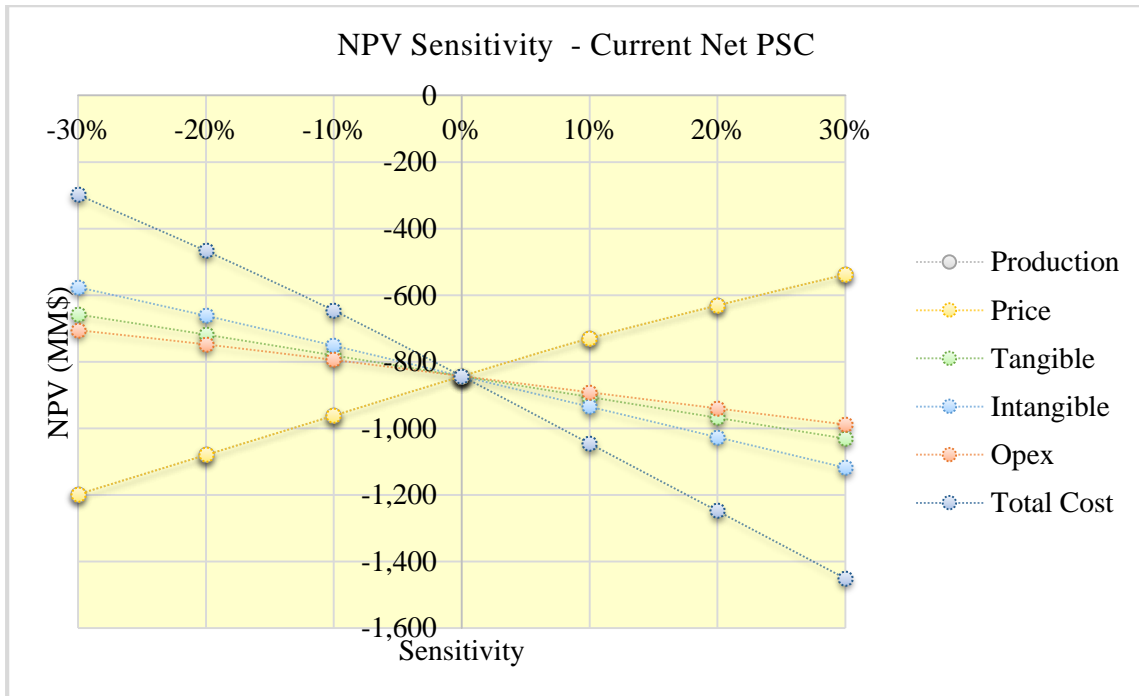


Figure 8. CBM Production Profile

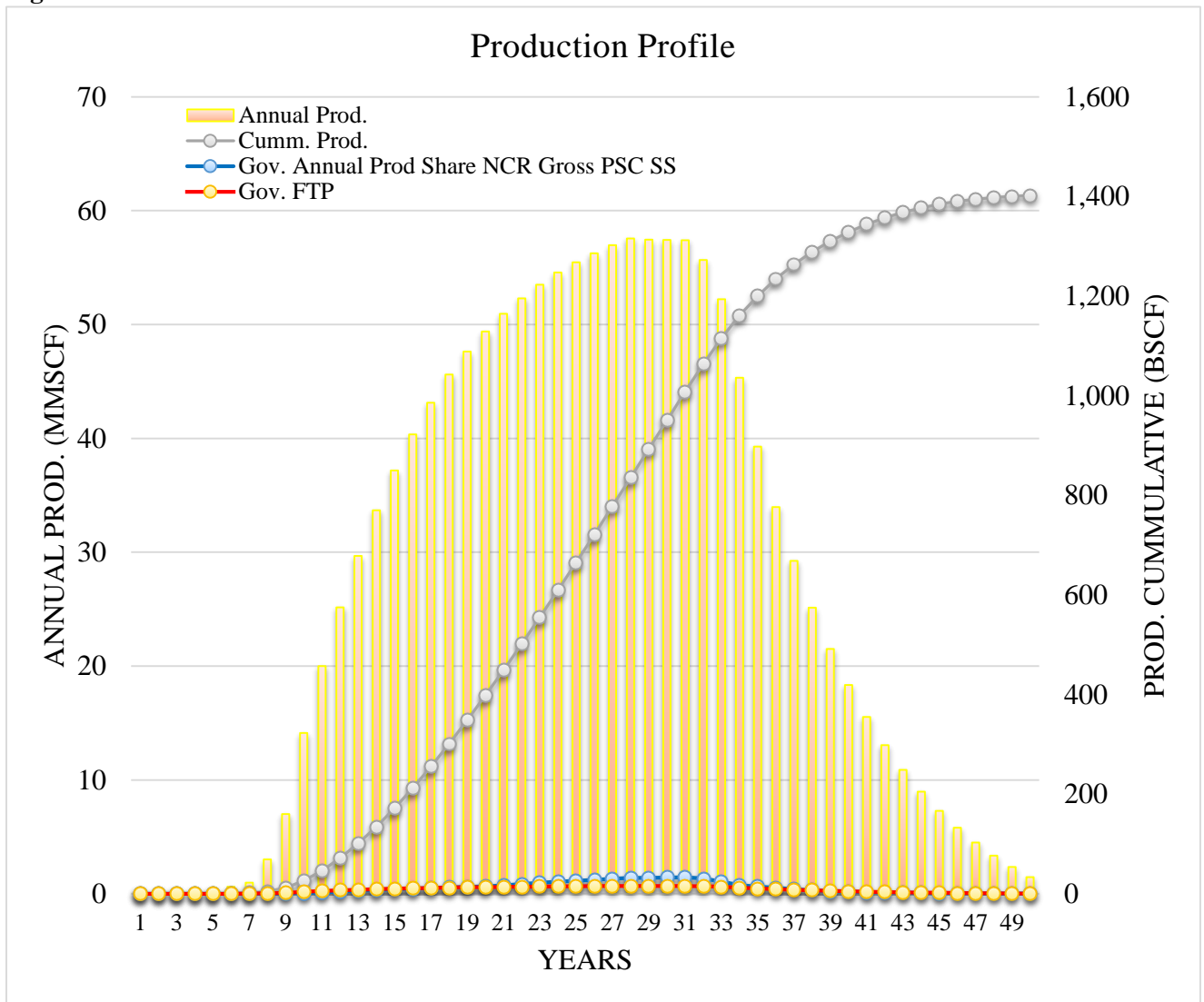


Figure 9. Government Production Shares

