The Indonesian Upstream Oil and Gas Business

Trends, Insights, Challenges & Opportunities

Todays Discussion

- Energy Overview
- The Changing Role of Oil & Gas in the Economy
- Major Upstream Trends
- Expiring PSC and implications for all stakeholders
- M&A Trends
- Fiscal and Regulatory Changes
- Upstream Opportunities and Challenges
- The Downstream
Indonesian Energy Overview

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Indonesian energy facts

- Indonesia, a former founding OPEC member, became a net oil importer in 2004 and will potentially become a net gas importer in the early 2020’s.
- Massive coal exports means Indonesia remains a net energy exporter in energy terms but not in financial terms.
- Key statistics:
  - World’s largest coal exporter.
  - World’s fifth largest LNG exporter after 3 decades as the world’s largest before being replaced by Qatar in 2006.
  - World’s largest bio fuel producer
  - Largest regional (SE Asian) gas producer and exporter.
  - Second largest regional oil / products importer.

IEA Synopsis

- Amid dwindling oil and gas reserves and production, a lack of exploration, and ageing refineries, Indonesia is increasingly dependent on imported oil supplies and has become the second-largest oil importer in the region.
- The country is faced with a considerable bill to finance still subsidised end-consumer prices, which are a legacy of its times as a net oil exporter and political failure.
- Indonesia’s economic success, rising living standards, population growth and rapid urbanisation have increased energy consumption rapidly. IEA projections predict this trend to continue. Hence, energy security and meeting expected energy demand growth are the key challenges for Indonesia’s energy policy.
National Energy Plan sees energy demand more than doubling between 2013 and 2025

NEP-14 planning basics

- Planning horizon:
  - 2025 and 2050

- Economy:
  - Declining population growth, strong rise in GDP/capita

- Scenarios. Two:
  - Business as usual (BAU)
  - Efficiency

- Main differences. Efficiency scenario has:
  - Stronger reductions in energy elasticity and intensity driving lower consumption.
  - Much greater uptake of renewables, particularly biofuels.

Primary Energy Consumption

Source: MIGAS NEP14, Risco Energy analysis

The Changing Role of Oil & Gas in the Economy

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As the Indonesian economy has grown the role of oil & gas has fallen, exacerbated by declining investment attractiveness & recent oil price falls.

Oil and Gas Contribution to National Economy

- % of oil and gas contribution to national economy from 2000 to 2016
  - Consumption
  - State finance

Oil and Gas Contribution to State Revenue

- State revenue from oil and gas from 2000 to 2014
  - Oil and Gas
  - Other Natural Resources

Source: Statistics Indonesia, BKPM, BP Statistical, skkmigas

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Production is now gas dominated

Oil and Gas Production

- Oil and Gas production from 1990 to 2016

Source: skkmigas

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Indonesia is a substantial net oil importer

Indonesian Oil Production & Consumption

![Graph showing Indonesian oil production and consumption from 1970 to 2014.](source: skkmigas)

Domestic gas sales now 60% of total sales

Gas Production and Utilization

![Graph showing gas production and utilization from 1970 to 2015.](source: MIGAS)
2016 gas utilization trends

**2016 Gas Utilization**
- Industry: 21.92%
- Electricity: 18.62%
- Fertilizer: 9.58%
- Petrochemical: 3.34%
- LPG: 2.58%
- Oil lifting: 2.79%
- City Gas: 0.50%
- Transportation: 0.02%
- Domestic LNG: 6.17%
- Export Righthand Gas: 11.55%

Total = 6,989 BBTUD

**2012 - 2016 Domestic Gas Utilization Trends**

Rising domestic demand potentially sees Indonesia become a net gas importer in the early 2020’s

**Gas Supply and Domestic Demand Scenarios**

Source: MIGAS, Risco Energy Analysis, Pertamina
Indonesian Oil & Gas Industry Trends, Insights, Opportunities & Challenges

Combined oil and gas production outlook

Domestic Oil and Gas Production History & Outlook (From Existing Discoveries)

Imports put the trade account under pressure

Oil & Gas Exports and Imports

US$ - RP Exchange Rate
Policy changes and lower oil price means lower energy subsidies

Energy Subsidies

- Fuel
- Electricity
- ICP

LPG now the main subsidised fuel although many x-subsidies remain

Source: Bank Indonesia, MoF. MIGAS

Major Upstream Trends

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Licensing activity has fallen to historic lows as investors shun new blocks

![Graph: Indonesian Upstream Licensing Activity](source: MIGAS, Risco Energy Analysis)

Number of active blocks is in decline and will continue

![Graph: Active Blocks At Year End](source: skkmigas)
Exploration activity and investment, the industry’s future, at decade lows

Exploration Activity Vs Expenditure

Development drilling is at 30 years lows

Exploration and Development Wells Drilled
Indonesian oil & gas industry trends, insights, opportunities & challenges

Indonesian exploration continues to underperform and is losing global capital allocation share

Both oil and gas reserves and resources are in decline. Proven gas nearly 5x proven oil
New developments declining, getting smaller and are gas dominated

1H 2016 new development statistics

<table>
<thead>
<tr>
<th>1H 2016 Development Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>New POD’s Approved</td>
</tr>
<tr>
<td>Oil Reserves</td>
</tr>
<tr>
<td>Gas Reserves</td>
</tr>
<tr>
<td>Total Reserves</td>
</tr>
<tr>
<td>Average Size</td>
</tr>
<tr>
<td>Total Capital Investment</td>
</tr>
<tr>
<td>Average Investment</td>
</tr>
</tbody>
</table>

Source: skkmigas, Risco Energy Analysis
© Chris Newton, 29 March 2017

© Chris Newton, March 2017, Singapore
Top 10 of 57 producing blocks responsible for 85% of oil production

Oil Production By Block

- Total Mahakam
- BP Tangguh
- Conoco Phillips South Sumatra
- Pertamina - Medco Tomori
- Petrochina Jabung
- Premier Natuna
- EMP Kangpar
- Vico East Kal
- Pertamina OWWII
- CNOOC SE Sumatra
- Pertamina NSU/NBG
- Pertamina West Madura
- Chevron Natuna
- Petronas Muria
- Pertamina - Talisman Jambi Mentang
- Masabadi - Daily
- Santos Sampang
- Medco Lembang
- Santos Menara
- 14 Other Blocks

Source: skkmigas

© Chris Newton, 28 March 2017

Top 10 of 54 producing blocks responsible for 81% of gas production

Gas Production by Block

- Total Mahakam
- BP Tangguh
- Conoco Phillips South Sumatra
- Pertamina - Medco Tomori
- Petrochina Jabung
- Premier Natuna
- EMP Kangpar
- Vico East Kal
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Source: skkmigas

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Oil price fall exacerbated by ICP – Brent differential increase

Brent and ICP Prices and Differentials

Falling oil prices have narrowed the gap between domestic and export gas and LNG prices
Declining investment plus cost cutting now driving down total expenditure

Government and contractor revenues have plummeted with oil prices
With cost largely fixed and revenue falling, cost recovery has become a political polemic.

**Revenue Split**

- Gross Revenue (GR)
- Indonesia Share
- Cost Recovery % of GR
- Contractor Share (post CR)

Source: skkmigas, Risco Energy Analysis

**2016 cost recovery by 15 largest producers**

<table>
<thead>
<tr>
<th>Company</th>
<th>Cost Recovery /BOE (US$/ Boe sales)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPI Natura</td>
<td>$36.0</td>
</tr>
<tr>
<td>Pertamina Madura</td>
<td>$34.4</td>
</tr>
<tr>
<td>Petrosea Kaliapang</td>
<td>$31.9</td>
</tr>
<tr>
<td>EMP Kanggal</td>
<td>$30.4</td>
</tr>
<tr>
<td>Chevron East Kal</td>
<td>$30.2</td>
</tr>
<tr>
<td>CNOOC SES</td>
<td>$28.0</td>
</tr>
<tr>
<td>Pertamina ONWJ</td>
<td>$26.6</td>
</tr>
<tr>
<td>Caltex Rokan</td>
<td>$23.6</td>
</tr>
<tr>
<td>Vico Sang Sanga</td>
<td>$22.0</td>
</tr>
<tr>
<td>Pertamina EP</td>
<td>$22.0</td>
</tr>
<tr>
<td>Premier Natura</td>
<td>$19.8</td>
</tr>
<tr>
<td>Petrochina Jabung</td>
<td>$19.5</td>
</tr>
<tr>
<td>Total Mahakam</td>
<td>$11.6</td>
</tr>
<tr>
<td>COPI Corridor</td>
<td>$11.6</td>
</tr>
<tr>
<td>Exxon Cepu</td>
<td>$4.4</td>
</tr>
</tbody>
</table>

2016 Weighted Average US$18.26 / boe

Source: skkmigas
Expiring PSC’s

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PSC’s expire after their 20 year production period and there is no automatic extension right

- Indonesian PSC’s have a 10 year exploration period and a 20 year exploitation period.
- PSC’s that went into production in the 1970 and 1980’s started to expire in the 1990’s.
- The production sharing contract gives contractors no automatic right of extension.
- In the 1990’s as the first blocks expired most were renewed on favourable terms.
- As resource nationalism increased and the value in the expiring PSC’s was recognised, government came under pressure to change the policy.
- A period of political indecision and uncertainty followed that drove under investment in expiring blocks.
- New regulations now make it clear that the NOC, Pertamina, will have priority access to expiring blocks.
- This is consistent with Pertamina strategy to add reserves, production, cashflow and capability at home.
- These producing PSC’s are the lowest cost acquisitions Pertamina can make.
- New policy consistent with government policy for energy security and energy independence.
- The key issues for Pertamina and GoI is that there is now no incentive for contractors to maintain investment in expiring PSC and “blow down” becomes the best strategy for contractors.
- The new Gross Split terms also do nothing to stimulation exploration investment.
Over the next decade 35 PSC’s will expire currently producing over 1.0 MMStboe/d

The blocks expiring pre 2025 currently hold over 4 billion boe’s of producing reserves
**Current value in PSC’s expiring over the next decade exceeds US$10 billion**

**Current Value in Expiring PSC’s**

<table>
<thead>
<tr>
<th>Block</th>
<th>Partners</th>
<th>Expiry Date</th>
<th>2016 Production (MBOPD)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONWJ</td>
<td>Pertamina, Kufpec</td>
<td>Jan-17</td>
<td>36</td>
<td>Awarded 100% to Pertamina. Other JVs partners could negotiate with Pertamina on a 50/50 basis. Poor cashflow for API. Participation unlikely to participate.</td>
</tr>
<tr>
<td>Mahakam</td>
<td>Total EMB, Kufpec</td>
<td>Dec-17</td>
<td>385</td>
<td>Awarded 100% to Pertamina. Other JVs partners could negotiate with Pertamina on a 50/50 basis. Transition arrangements and Pertamina production levels unlikely to increase. Participation unlikely to participate.</td>
</tr>
<tr>
<td>Jambi</td>
<td>Total EMB, Kufpec</td>
<td>Apr-17</td>
<td>11</td>
<td>Awarded 100% to Pertamina. Participation unlikely to increase.</td>
</tr>
<tr>
<td>Sanga</td>
<td>Exxon</td>
<td>Aug-16</td>
<td>16</td>
<td>Exxon sold out to Pertamina in 2016.</td>
</tr>
<tr>
<td>Sanga &amp; East Kalimantan</td>
<td>CNOOC, Pertamina</td>
<td>Aug 18 &amp; Oct 18</td>
<td>&gt;15 &amp; &gt;15</td>
<td>To be awarded to Pertamina and integrated with Mahakan block Operations.</td>
</tr>
<tr>
<td>Tuban, Lelu, Ogan, Benoa, Ndu, Ata &amp; Bere</td>
<td>Pertamina &amp; Total EMB</td>
<td>2017-2018</td>
<td>&gt;30 &amp; &gt;30</td>
<td>To be awarded to Pertamina &amp; Total EMB.</td>
</tr>
</tbody>
</table>

**Status of PSC expirations to date**

**Pertamina Priorities**
- Material reserves, production and cashflow
- Operating capability
- Growth
- Synergies with existing operations

**Less Attractive**
- Lacks materiality
- Cashflow negative/development Capex
- Limited development capability
- No clear synergies

Source: Wood Mackenzie, © Chris Newton, 28 March 2017
M&A Trends

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Upstream M&A activity remains subdued

Transactions Involving Indonesian Oil & Gas Reserves
Annual Deal and Asset Frequency

Source: Chris Newton Indonesian M&A Transactions Database

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Volumes transacted remain gas dominated

Indonesian Oil and Gas 2P Reserves Transacted

Aggregate transaction values off 2015 lows

Annual Aggregate Transaction Values

Source: Chris Newton Indonesian M&A Transactions Database

© Chris Newton, 28 March 2017
Transaction metrics driven by oil prices and asset life cycle

Weighted Average Annual Transaction Metrics
US$/2P BOE

Oil Price ($/Bbl)

Source: Chris Newton Indonesian M&A Transactions Database

Asian and local companies the dominant acquirers

Indonesian Transactions by Acquirer

Source: Chris Newton Indonesian M&A Transactions Database
Existing industry participants are dominating the M&A market

% of Total Indonesian Acquisitions by New Entrants

Source: Chris Newton Indonesian M&A Transactions Database

Buyers geographically concentrated while internationals exiting

Acquirers - 2010-2016

Sellers - 2010-2016

Source: Chris Newton Indonesian M&A Transactions Database
Oil-gas mix and development status are key value drivers next to margins and upside

Indonesian 2P/ BOE Transaction Values by Product Type and Asset Maturity (2010- 2016)

Fiscal & Regulatory Changes

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Lack of regulatory clarity, consistency & certainty remains an impediment to investment

Key recent regulator changes

**Introduction of Gross Split PSC**
- An effective “Tax-Royalty” regime with no cost recovery to replace PSC in expiring and new blocks.

**Multiply changes to Domestic Gas Pricing Policy**
- With falling oil prices and infrastructure constraints, gas has become less competitive and government is trying to increase gas affordability.

**Changes to abandonment / restoration obligations**
- Old contracts have no abandonment obligations as the State owns the assets. Retrospective changes to old PSC’s being drafted.

**Changes to GR79 (2010) on cost recovery and other taxes**
- Changes planned as GoI recognizes tax impositions impeding investment.
- MoF remains the problem, and changes likely to disappoint.

**Pending New Oil & Gas Law**
- Long awaited and now being drafted by parliament for promulgation in 2018. Needs to balance populism, contract sanctity and need for foreign investment.

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The gross split PSC terms are applicable to new contracts and contract extensions

<table>
<thead>
<tr>
<th>Changes</th>
<th>Investor Pros</th>
<th>Investor Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost recovery and production sharing replaced by what is effectively a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>regressive tax royalty regime.</td>
<td>Potentially greater operating and procurement flexibility will drive</td>
<td>Regressive fiscal system that taxes revenue and not profits.</td>
</tr>
<tr>
<td>Base revenue split to Contractor is Oil 43% and Gas 48%.</td>
<td>efficiency and lower costs</td>
<td>High “royalty rate” means contractors have to lower cost structure in</td>
</tr>
<tr>
<td>Incremental additional splits of up to 16% available based on field</td>
<td>Greater incentive for cost effectiveness.</td>
<td>existing producing assets by 30% to achieve the same outcome as existing</td>
</tr>
<tr>
<td>costs / complexity.</td>
<td>Terms adjust with oil price</td>
<td>fiscal terms.</td>
</tr>
<tr>
<td>Incremental split based on oil price realisations. +/- 7.5% based</td>
<td>DMO oil priced at market.</td>
<td>Tax royalty regime where there remains material uncertainty on a host of tax</td>
</tr>
<tr>
<td>on oil price above of below base of US$70-85 / bbl</td>
<td>20-30% cost savings for offshore oil exploration potentially improve full</td>
<td>issues</td>
</tr>
<tr>
<td>No cost recovery could mean lighter handed regulation and greater</td>
<td>cycle exploration economics</td>
<td>Increased fiscal deterrence means more fields will remain undeveloped.</td>
</tr>
<tr>
<td>contracting flexibility leading to lower cost structure</td>
<td></td>
<td>Onshore and Deepwater exploration unattractive even with deep costs cuts as</td>
</tr>
<tr>
<td></td>
<td></td>
<td>revenue share and payout times just too long.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is a regulatory shift from micro management to light handed regulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>achievable!</td>
</tr>
</tbody>
</table>

Terms very unlikely to attract investors or stimulate reinvestment in expiring PSC’s
Domestic gas pricing controls increased and are way short of the market driven pricing necessary to promote supply

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<th>Investor Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presidential decree 40/2016</td>
<td>• Adjusted priorities for gas allocation into downstream value add such as fertilizer, petrochemicals and steel</td>
<td>• Implementation uncertainty and complexity frustrating all participants</td>
</tr>
<tr>
<td>• Cap gas price a US$6.0 MMbtu for priority industries by adjusting government share and keeping contractors whole</td>
<td>• Improved competitiveness of domestic gas should drive demand</td>
<td>• Not always achievable</td>
</tr>
<tr>
<td>• Presidential decree 40/2016</td>
<td>• Cap gas price a US$6.0 MMbtu for priority industries by adjusting government share and keeping contractors whole</td>
<td>• Erosion of the value of a long term GSA given ministerial price &quot;reviews&quot;</td>
</tr>
<tr>
<td>• MEMR regulation 11/2017</td>
<td>• Move towards oil price indexation</td>
<td>• Gas price capped at 8.5% of ICP at wellhead or 11.5% of ICP at plant.</td>
</tr>
<tr>
<td>• Regulates domestic gas and LNG prices for power generation, prioritises domestic gas over imports and regulates when and how imports can be done</td>
<td>• Increasingly linkage of domestic markets to international markets</td>
<td>• Pipeline gas price discount vs domestic LNG</td>
</tr>
<tr>
<td></td>
<td>• Gas price can exceed caps if import prices higher than 11.5% FOB</td>
<td>• Gas prices always capped at a regulated return on individual field development economics</td>
</tr>
</tbody>
</table>

Upstream Opportunities and Challenges
Multiple opportunities for those with the skills, insight, patience and relationships to manage the challenges.

**Opportunities**
- Upstream oil and gas supply imperative to support economic growth, energy security and energy independence.
- Mid and downstream infrastructure investment for petroleum product, crude gas / LNG import, storage, transmission, processing & distribution.
- Growing demand for CNG and LNG infrastructure in transportation sector to replace imported petroleum products.
- Funding of undercapitalised local and regional companies, with good assets.
- Counter cyclical upstream investment leveraging declining service sector costs and diminishing buy-sell spread in M&A.
- Massive investment needs for gas in power generation and crude oil refining.
- Low cost operators to exploit late life production and opportunities with new gross split PSC's.
- Low cost abandonment specialists.

**Challenges**
- Investing with a government that recognises the necessity of enhanced investment competitiveness while often doing the opposite in the face of compelling priorities around short term revenue needs and resource nationalism.
- Pervasive regulatory uncertainty and more to come until new oil and gas law and regulations finalised.
- Poor coordination between Ministries regulating oil and gas activities.
- Navigating the over regulated domestic gas market problems while positioning for international gas market convergence.
- Downward pressure on gas prices, even in signed contracts.
- Will upstream regulator really relinquish command and control and micro management mind set for promised flexibility and efficiency in new fiscal regime?

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**The Downstream**

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With 50% of petroleum product consumption imported there is a strong desire for additional refining capacity and storage

Petroleum product consumption falling after subsidy removal eliminates smuggling incentive

Downstream petroleum investment requirements

**Operational Storage**
- Increase operational storage to 30 days from current 22 days
- Products, LPG and crude oil storage investment needed
- **US$8 billion needed asap**

**Energy Buffer Reserve**
- Add 30 day reserve buffer from zero currently to enhance supply security
- Products, LPG and crude oil storage investment needed
- **US$9 billion needed by 2025**

**Additional Oil Refining Capacity**
- Petroleum products consumption >2x current refining capacity
- Additional 1.2 Million bopd refining capacity
- 2 new grass roots mega refineries
- Expansion of excising 5 refineries
- New mini refineries
- **US$20 + billion**
Gas infrastructure road map sees US$48 billion investment needed by 2030

Cumulative Infrastructure Investment Requirement (2016 – 2030)

EXEMPLARY

Existing

Source: MIGAS

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Where are we in the Oil Price Cycle?

We are 32 months into a major supply side shock