History of Indonesian Oil and Gas

Ananda IDRIS
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Early records of utilization of oil in Indonesia

**8th Century AD**
Middle eastern merchants recorded use of black mud for torch burning in North Sumatera

**10th Century AD**
Chinese scholars recorded gifts from Sriwijaya Kingdom of large vases filled with black mud to cure skin disease and rheumatism

**16th Century AD**
Portuguese Admiral Alfonso D’Albuquerque reported of petroleum product utilization in Indonesia whereby “...our merchant fleets were pushed back to sea in the Malaka Straits by Aceh fisherman with fireballs...”
History of Oil

1869
Just 10 years after Colonel Drakes commercial discovery in the US, the Dutch Colonial Government made surveys and recorded 53 locations of oil pools in their administration area.

1872
First drilling for oil by the Dutch administration at Cibodas, West Java. A depth of 22 m was reached producing a record of 108 kg per day. Production lasted only several months.

1883
First petroleum exploration rights signed in Deli, North West Sumatra between tobacco planter AJ Zijkler and the Sultan of Langkat.

1885
Discovery of the first commercial oil well in Indonesia - The Telaga Tunggal I in Langkat. Depth 121m and would produce for more than 50 years around 7 million barrels of crude oil.
**History of Oil**

**1888**
The Dutch Colonial Government signed an agreement with the Sultan of Kutai in East Kalimantan first for coal exploration rights then for oil exploration rights at the Sangasanga field.

**1890**
Sudden death of AJ Zijkler. A company was established to continue his work - The Royal Dutch Petroleum Company.
Construction of the first oil refinery in Indonesia in Wonokromo, near Surabaya, East Java by Adrianus Stoop, a former associate of Zijkler

**1892**
The Royal Dutch Company built a refinery at Pangkalan Brandan near Telaga Said. Oil from Telaga Said was, among others, processed to kerosene and exported.
History of Oil

1893
The British company, Shell Transport and Trading Co. also obtained rights to explore oil at Sangasanga and eventually constructed the third refinery in the colony at Balikpapan.

1907
Royal Dutch Petroleum Co. and Shell Transport and Trading Co. merged with a 60/40 equity split. This structure is still conserved to this day under The Royal Dutch Shell Group.

1910
The Balikpapan refinery produced 10,000 barrels per day.

1911
Royal Dutch Shell Co. acquired all 44 exploration concessions in Sumatera, Java and East Kalimantan virtually eliminating competition in the industry.

1912
Standard Oil of New Jersey (now ExxonMobil) through its affiliate NKPM (Nederlandsche Koloniale Petroleum Maatschkappij) obtained concessions in Indonesia. Subsequently NKPM became SVPM (Standard Vacuum Petroleum Maatschkappij) then PT Stanvac Indonesia and today part of the Medco Group.
History of Oil

1921
NKPM discovered the Talang Akar field in Pendopo, South Sumatera. Biggest find in the country before WW-II.

1924
BPM (Bataafsche Petroleum Maatschkappij), an affiliate of the Royal Dutch Shell Group joined with the colonial government to create NIAM (Nederland Indische Aardolie Maatshkappij) who subsequently signed concessions in Jambi, South Sumatera and Bunyu in East Kalimantan.

1936
Standard Oil of California (then became Mobil Oil) joined with Texaco to create Caltex. Caltex discovered and identified the Minas fields, Central Sumatra. The colonial government reported a production of 65 million barrels per day.

1942
Japanese invasion. Retreating Dutch forces destroyed oil installations.

1944
Under Japanese administration, the first Minas wells tested with success. Balikpapan refinery operated by the Japanese to fuel the Pacific war fleet was bombed by the Allies.
History of Oil

1945
Declaration of Independence. 1945 Constitution (Art 33)

1947
Creation of small companies by former nationalist freedom fighters in various provinces, mainly in North Sumatera. The first real Indonesian oil company created was Permiri (Perusahaan Minjak Repoebliek Indonesia) which operated concessions in South Sumatera and Jambi. Then PTMN was created in North Sumatera and Cepu.

1949
After four years of physical clash, Holland finally recognized the sovereignty of Indonesia but put forth the condition that the Indonesian government returns to BPM Shell concessions it had before the war.

1952
Merge of nationalist companies through the oil workers union. Creation of PTMRI which became PT EMSU (Eksploitasi Minyak Sumatera Utara)

1956
Government refused to honor the 1949 agreement and nationalized BPM assets. North Sumatera operations put under military control and PT EMSU became a wholly state owned company.

1957
EMSU became Permina under Colonel Ibnu Sutowo. This moment is considered as the birth year of present day Pertamina.
History of Oil

1960
Law No 44 1960 replaces the 1899 Colonial Oil Legislation to establish principles for relations between the State and operating companies

1961
Creation of PT Permigan (Perusahaan Minjak dan Gas Negara) which took over Shell’s assets in Java to balance the Army’s role in the industry and accommodate the growing influence of the PKI (Indonesian Communist Party) in rural areas through its unions (Perbum). Shell surrendered 50% of its share to the Government who created PN Pertamin

1963
New status of contracts defined by the new law, the big three had to abandon their concession right: Shell became contractor of Permigan. Stanvac became contractor of Pertamin. Caltex became contractor of Permina.

1965
Abortive coup allegedly masterminded by PKI suppressed by the Army. Shell sold all its assets to Permina for USD 150 million including the Balikpapan refinery.
History of Oil

1968
Fall of President Soekarno, the new Soeharto Government installed now Lt General Sutowo as the new Oil and Gas Minister while retaining the Directorship of Permina. First PSC as we know it today signed between Permina and IIAPCO, Refican and Japex.

Pertamin and Permina merged to become PN Pertamina.

Permigan dissolved as the unions were suspected to be involved in the aborted coup, all its asset taken over by PN Pertamina.
PN Pertamina signed 14 new PSC’s with foreign companies including Arco (Ardjuna), Total (South Jambi), Mobil Oil (Arun), Huffco (Badak) and Union Oil (Attaka). Caltex and Stanvac continued their operations under a contract of work.

1971
Law No 8 /1971 chartered details of PN Pertamina’s new organization and responsibilities giving it full authority to implement Article 33 on behalf of the Government.

1975
PN Pertamina could not meet repayment of certain maturities forcing the State to interfere and bailed PN Pertamina out of a 10 Billion USD debt.

1976
Lt Gen Sutowo and other Pertamina Directors were discharged and replaced with a new team under Finance Director Maj Gen Piet Haryono. Pertamina abandoned activities too far from its core business.
Chronology of The Birth of Pertamina

1945
PT MNRI, North Sumatra

1950
PT MRI, North Sumatra

1954
TMSU

1957
PT ETMSU

1959
PT PERMINA

1961
PN PERMINA

1968
PN PERTAMINA

1971
PERTAMINA

Disbanded

NV NIAM

PT MRI, North Sumatra

DISBANDED

PERMIRI, South Sumatra, Jambi

PT MN, Cepu

PT MRI, CEPU

PN PERTAMIN

PN PERMIGAN

Disbanded

PT PERMINDO

PT PERMINDO

PT MR, South Sumatra, Jambi

PT MN, Cepu
History of Gas: From Flare to LNG

Non Commercial use of Natural Gas

(1885 - 1958)
Associated gas flared or fuel oil production operations.

1927
SVPM injected associated gas to maintain pressure and recover oil at the Jirah Field, South Sumatra. First real gas utilization project in Indonesia and the first in the world, the operation continued until 1956.

1950
A gas lift process was applied by the Shell Group in Prabumulih using non associated gas.

1958
To conserve excess gas, Shell laid a 10 km 8” pipeline from Prabumulih to the Plaju refinery.

First economic use of natural gas in Indonesia as fuel.
History of Gas: From Flare to LNG

Commercial use of Natural Gas

Phase I: 1958 - 1971

- The government issued an order to utilize natural gas more intensively and encourage large scale gas projects.

- Law No. 44/1960 stipulates that gas is as precious as oil. Flaring is only accepted if it is deemed non-commercial.

- PT Stanvac delivered gas in 1964 to the Pusri Fertilizer Plant in Palembang, South Sumatra.

- LPG production from Sungai Gerong Refinery (Stanvac) and Plaju Refinery (Shell).
History of Gas: From Flare to LNG

**Phase II: 1971 - Present Date**
*(LPG and Domestic Gas)*

- LPG from Rantau Plant exported to the Philippines (1971).
- Arjuna associated gas produced by Arco is exported as refrigerated propane (1977).
- Long term refrigerated LPG sales sold from the Arun and Bontang LNG Plants (1988).
- Development of city gas in Medan, Jakarta and Surabaya, financed by ADB and the World Bank.
- Arun gas piped to PT Pupuk Iskandar Muda and PT Asean Aceh Fertilizer Plants.
History of Gas: From Flare to LNG

Commercial Use for Natural Gas
Phase II: 1971 - Present Date (LNG)

• Discovery of Arun Field (1971) by Mobil Oil Indonesia then of Badak Field (1972) by Huffco Indonesia.

• First LNG contract signed with Japanese Utility Companies (December 73)

• First LNG Contract with Korean Utility Company KOGAS (April 83).

• First LNG Contract signed with Taiwan Utility Company - CPC (May 87).
Indonesia in the International LNG Scene

• Indonesia has, for many years, been the largest exporter of LNG in the world before Qatar overtook the position in 2008

• Indonesia has three producing LNG Plants, Arun, Bontang and Tangguh

• Natural gas is transported through pipeline from the gas producing fields to the LNG plants.

• With gas reserves on the decline in North Sumatera and East Kalimantan, major gas sales have not been extended. New giant gas reserves (Natuna, Masela, Donggi Senoro) has yet to be developed into major LNG ventures.

• LNG remains a national strategic energy commodity for exports or domestic consumption
But ... what is LNG?

• Natural gas cooled at very low temperature (cryogenic temperature) of -160º C

• At this temperature gas condenses and shrinks to 1/600th of its normal volume

• As a liquid, gas can be safely transported in very large volumes through long distances between producers and consumers who cannot be connected by pipeline
Constituents of Natural Gas

- Methane - CH$_4$
  - ±75% - 88%
- Ethane - C$_2$H$_6$
  - ±3% - 7%
- Propane - C$_3$H$_8$
  - ±2% - 4%
- Butane - C$_4$H$_{10}$
  - ±1% - 2%
- Nitrogen - N$_2$
  - ±3% - 13%
- Carbon Dioxide - CO$_2$
- Water - H$_2$O
  - ±3% - 13%
- Condensate - C$_{5+}$
  - ±0.2% - 0.6%

- Liquefied Natural Gas - LNG
- Natural Gas Liquids - NGL
- Condensate - C$_{5+}$
- Methane - CH$_4$
- Ethane - C$_2$H$_6$
- Propane - C$_3$H$_8$
- Butane - C$_4$H$_{10}$
- Nitrogen - N$_2$
- Carbon Dioxide - CO$_2$
- Water - H$_2$O
The LNG Chain

The process to produce, to liquefy, to transport and re-gasify natural gas from a producer to a consumer

- Pipes, tanks and equipment should be made of materials capable of maintaining their strength in extremely low temperature
- Before being liquefied, wellhead gas needs to be purified to prevent contaminants from freezing and damaging the installations
- Refrigeration is costly and requires massive compressors driven by large steam or gas turbines as well as giant heat exchanger
- Heavy insulation during transport and storage
The LNG Chain is Costly
The LNG Chain is Rigid

• Each contract is negotiated on a case by case basis.

• Each contract is dedicated to meet unique needs of Buyers and Sellers

• Contracts are for long term as guarantees are needed for banks to finance huge investments

• Big clients looking for source of long term energy supply
The LNG Chain is Complex

1973 CONTRACTUAL SCHEME
Supporting Agreements For Bontang Portion Only to Jan 1, 2000

TOTAL GROUP
- Supply Agreement
- Construction Contract

VICO GROUP
- Supply Agreement
- Processing Agreement

PERTAMINA
- Use and Operating Agreement

BANK INDONESIA
- Loan Agreement

BANK AMERICA INTERNATIONAL

PT BADAK

ENERGY TRANSPORTATION CORPORATION

BURMAH GAS TRANSPORT

FAR EAST OIL COMPANY

NISSHO IWAI

NKKK

WESTERN BUYERS

JAPANESE GVT AND COMMERCIAL BANKS

INDUSTRIAL BANK OF JAPAN

JILCO

BECHTEL

TPAA

Bank Indonesia

Processing Agreement

LNG Service Agreement

Processing Agreement

Supply Agreement (*)

Charter Agreement

Use and Operating Agreement

Flow of Proceeds

Debt Repayment

Guarantees

Processing Agreement

Loan Agreement

Processing Agreement

Loan Agreement

Loan Agreement

Loans Agreement

Processing Agreement
But …

• LNG is a premium class fuel, almost pure methane and ethane with no contaminants at all

• LNG is environmentally friendly - very important for industrialized North Asian countries where pollution and nuclear safety is a concern

• Many power plants, at present, burn coal and use nuclear fusion

LNG is a cleaner than coal or oil and safer than nuclear.
CHINA, INDIA & PHILIPPINES are new markets where LNG imports has yet to begin.
Indonesian LNG Sales Contracts

For the past 30 years Indonesia have been consistent with the form of its contracts ...... this may change

- LNG price is linked to the price of the Indonesian basket of realized export price (REP) of crude oil
- What is really sold is the heating value of the LNG (not the weight neither the volume)
- Seller is committed to deliver
- Buyer is committed to take (or pay)
- Indonesia has always been flexible for off take issues
- For a specific trade specific vessel or vessels are dedicated
- FOB Sales : Buyers in charge of shipping - custody point at LNG plant outlet
- Ex-ship sales : Seller in charge of shipping - custody point at buyer's receiving terminal
- Certification of reserves by independent international company (DGMN)
Organization of Indonesian LNG Business

• The State has rights over gas and LNG
• Pertamina, in the past, sells LNG on behalf of State
• PSC’s have supply agreements with Pertamina / BPMigas to supply gas to LNG plants
• LNG Plants are owned by Pertamina and operated by a non profit operating companies on behalf of Pertamina and the gas producers
• Pertamina now mandated by BPMigas to market gas for new LNG sales Pertamina and PSC’s form a marketing team to negotiate LNG sales
• PSC’s and the State receives proceeds from LNG sales through an overseas trustee account
• Operational management of LNG sales contracts is done through a Joint Management Group (JMG) based in Jakarta
LNG Marketing

Pertamina and its PSC’s have, in the past, been very successful

- Nine long term sales contracts have been concluded with Japanese, Korean and Taiwanese buyers since 1973
- First two source contract (1973)
- First FOB contract in Asia (1981)
- Indonesia exports 25% of the world’s LNG trade
- Indonesian pricing formula was used as a reference in the international LNG trade
- Innovative sales (MCGC, Boston)
LNG Marketing

Present market has been depressed lately

• 1997 Economic crisis -> revision (unclear) of energy demand -> moderate growth rate.

• Abundance of gas sources in Indonesia, Malaysia, Qatar and Australia

• Growing desire for importing countries to diversify

• Fierce competition of countries already engaged in low cost expansion of its LNG plants

• Deregulation in importing countries create
LNG Marketing

Consequences

• Buyers request competitive and predictable price structure less linked to the vulnerability of crude price in order to incorporate LNG to mid and long-term planning vis a vis coal, nuclear and hydro energy sources.

• Buyers request bigger flexibility in order to cope with deregulation and volatility of nuclear power availability.
LNG Marketing

Indonesia's LNG Exports - MMTY

Indonesia LNG Market Share

Taiwan
Korea
Japan
LNG Marketing – What Lies Ahead

• Maintain commitments and seek extension of existing sales contracts to fill the LNG Plant for the future

• Government to finalize development plans for new grass root plants (Natuna, Masela and Donggi) ➞ diversification, regional development

• Consider LNG deliveries to Java ➞ other producers? Economics ??? Gasification Terminal and gas distribution infrastructure.

• Shutdown progressively the Arun plant

• Buyers demand shorter terms and more flexible contracts (price review, seasonal off take issues, rerouting ...etc)

• Potential new buyers to take advantage of the situation (China, Philippines, India, US West Coast)

• Government pressure to use gas for domestic consumption
Previous Oil and Gas Contractual Framework

a. 1945 Constitution

Article 33

Land, water and natural riches shall be controlled by the State and exploited for the greatest welfare of the people.

b. Law No. 44 of 1960

Article 3

Petroleum and natural gas as national resources are controlled by the State and can only be exploited through state enterprises.

c. Law No. 8 of 1971

- State enterprise as stipulated in Law No. 44 of 1960 is Pertamina.
- Pertamina has the exclusive authority to mine for oil and natural gas throughout the statutory mining territory of Indonesia.
- Pertamina may cooperate with other parties in the form of Production Sharing Contracts.
Production Sharing Contract - Summary

Basic Principles

- A contract between a Government and a foreign oil company for oil and gas exploration and exploitation activities which defines how to share the production if a commercial discovery is made.

- The company carries all exploration and development costs and is entitled to recuperate its costs before the profit is shared with the government.
PSC Oil Revenue Split Structure

Domestic Market Obligation Share

- 28.85% (25%)
- 71.15% (85%)

Oil Production

- 25%

Profit

- 75%

STATE Share

COST

Share in %

Lifted by contractor
### PSC Gas Revenue Split Structure

**Total Gas Produced**

- **Transport Cost**
- **Plant Op. Cost**
- **Debt Service**

**Net Back to Fields**

- **Plant / Field Use and Boil Off**
- **Fuel, Flare & Shrinkage**

**Share of Net Back to Fields for PSC Gas**

- **PSC Cost Gas**
  - PSC Net Profit
  - PSC State Share
  - State Gas Share

**Gas Exported = Revenues**

**Gas Used**

**Profit Gas**

**Variable**

**Condensates (Oil PSC)**
Oil and Gas Law No 22 / 2001

Effective since 23 November 2001

• **Upstream**: Still a State monopoly and creation of a new Supervisory Body: BPMIGAS instead of Pertamina.

• **Downstream**: opening to competition.

• **Separation of Upstream and Downstream activities**.

• **Change of the role of Pertamina which becomes an oil company owned by the State**.

• **The existing contracts stay in force**.
Why a New Oil and Gas Law?

Basic Concepts:

1. To create a competitive and transparent business environment.

2. To create fair and equal treatment to all stakeholders in the industry.

3. To follow on the anticipated new post-Suharto legal framework:
   - Law no. 5/1999 on restrictions to monopolistic business practices and unhealthy competition.
   - Law no. 22/1999 regarding Regional Autonomy.
   - Law no. 25/1999 regarding Inter-Government Financial Balance.

The philosophy is still based on Article 33 of the Constitution.
2001 Oil and Gas Law - Upstream

• Operations delegated for each acreage to an Indonesian or foreign company through a Cooperation Contract - A PSC type.

• PSC to define fund expenditure obligations and production share assigned to State.

• PSC implementation to be supervised by a new State agency - BPMIGAS responsible to:
  – sign the PSC,
  – approve development plans and work program/budget,
  – appoint the seller of the State production share.

• BPMIGAS Chairman to be appointed and dismissed by President after consultation of the Assembly. Chairman reports directly to President.
2001 Oil and Gas Law - Downstream

- Downstream activities = oil and gas Processing, Transport, Storage and Sale of products.

- Downstream is open to competition but only to companies incorporated in Indonesia. Pertamina will not be a monopoly any more.

- Each activity requires a Business License.

- Downstream Activities to be supervised by a new state entity being a Regulatory Body

- Regulatory Body Chairman and its 8 members appointed and dismissed by the President after approval of the Assembly.
Regional Autonomy

- Enactment of two new laws:
  - Laws 22 et 25 of 1999
  - Government Regulations 25 of 2000

Implementation effective since 01/01/2001

Principles:

Authority given at the regional level for investments, licenses, land rights, etc (incl. industrial and mining sectors) except:

- Religion, Defense, Money, International Affairs,
- Strategic Resources (Oil, Gas, Electricity, ...),
- Human Resources (part of education, ...).

Transfer of authority associated with the transfer of the State revenues.
New Laws on Regional Autonomy

Oil & Gas - One Exception:

- Authority remains with Central Government.

- State share of the profit oil and gas dedicated to be partially allocated to local authorities as follows:

<table>
<thead>
<tr>
<th></th>
<th>Local</th>
<th>Province</th>
<th>Districts/Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>15%</td>
<td>shared</td>
<td>3 %</td>
</tr>
<tr>
<td>Gas</td>
<td>30%</td>
<td>shared</td>
<td>6 %</td>
</tr>
</tbody>
</table>

- Government could propose to associate local authorities to new PSC’s or to current ones when they expire.
Regional Autonomy Laws

A new law not easy to apply:

- Transfer of revenues to be important for some small local communities - Tension between rich and poor provinces.

- Local authorities not yet prepared to exert their rights and obligations and not prepared in terms of competent manpower

- Temptation for the Provinces to challenge the existing mining contracts. Certain Operators (coal, mining) might be reluctant to sign new contracts with Provincial Governments.

- Potential tensions to define the exact border limits of the land and of the relevant competence.
Regional Autonomy Laws

Impact on oil and gas operations

• Temptation for the local authorities to take advantage of not having Pertamina any more: land access, new taxes, ...

• More requests to be expected from local authorities to check/challenge validity of the information supplied to them by Central Government.

• Potential conflict between authorities -> operators might be in a sandwich situation
Conclusions

• New major Indonesian gas and LNG projects face multiple challenges
  – Technological
    Complexity of investment, CO₂ separation and storage, LNG technology, subsea pipeline technology
  – Commercial / regulatory
    Commercial feasibility, financing, PSC terms, global LNG market outlook, domestic market obligation and price, value chain organisation

• Success requires
  – Willingness to develop and implement new technology
  – Willingness to cooperation between producers with complementary skills
  – Political and regulatory pragmatism to reach feasibility
  – International cooperation between seller and buyer countries
Conclusion

• The Indonesian Oil and Gas industry in Indonesia is a mature industry dating back to more than 125 years.

• The Industry follows, makes or is a consequence of major political, social and economic happenings in the country.

• As such it is very often used by governments or special interest groups to support their objectives not necessarily benefiting the country or the people as mandated by the Constitution.

• At some points the industry can be considered as one of the most corrupt heritage the country has. But after the fall of Suharto in 1998, lessons have been drawn and the strong drive against corruption is strongly felt in the industry.

• Since the enactment of the new oil and gas law in 2001, government and stakeholders are still seeking the best model to optimize investment and manage the industry by striking a balance between fuelling energy to the national economy at an affordable price and responding to a global economic investment challenge.

• There are still many problems and the issues will not be resolved overnight.

Our challenge is to face the reality and be pragmatic
Thank You
Terima Kasih
“One doesn’t discover new lands without consenting to lose sight of shore for a very long time …..”

“(Bila berlayar) kita tidak akan menemukan daratan bila tidak menerima kenyataan bahwa kita tidak akan melihat garis pantai untuk waktu yang cukup lama …..”

André Gide (French writer and philosopher)

“You must learn from the mistakes of others. You can’t possibly live long enough to make them all yourself …..”

“Kita harus dapat belajar dari kesalahan orang lain. Kita tidak akan mungkin menghabiskan hidup kita untuk melakukan kesalahan yang sama …..”

Sam Levenson (American humorist, writer and television personality)

History of Indonesian Oil and Gas

Ananda Idris
GM Government and Public Affairs
shii@statoil.com, tel: +62 21 2758 8431
www.statoil.com

Terima Kasih
Thank you