

OIL & GAS TECHNOLOGY

Chapter 5: The Oil and Gas Industry Value Chain in Malaysia

by

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Chapter Description

- **Aims**
 - The aim of this chapter is to understand the basic concept oil and gas industry value chain in Malaysia
- **Expected Outcomes**
 - Assemble information on oil and gas value chain
 - Understand the various of petroleum agreements related to oil and gas industry.
- **References**
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5.1 History of Oil and Gas in Malaysia

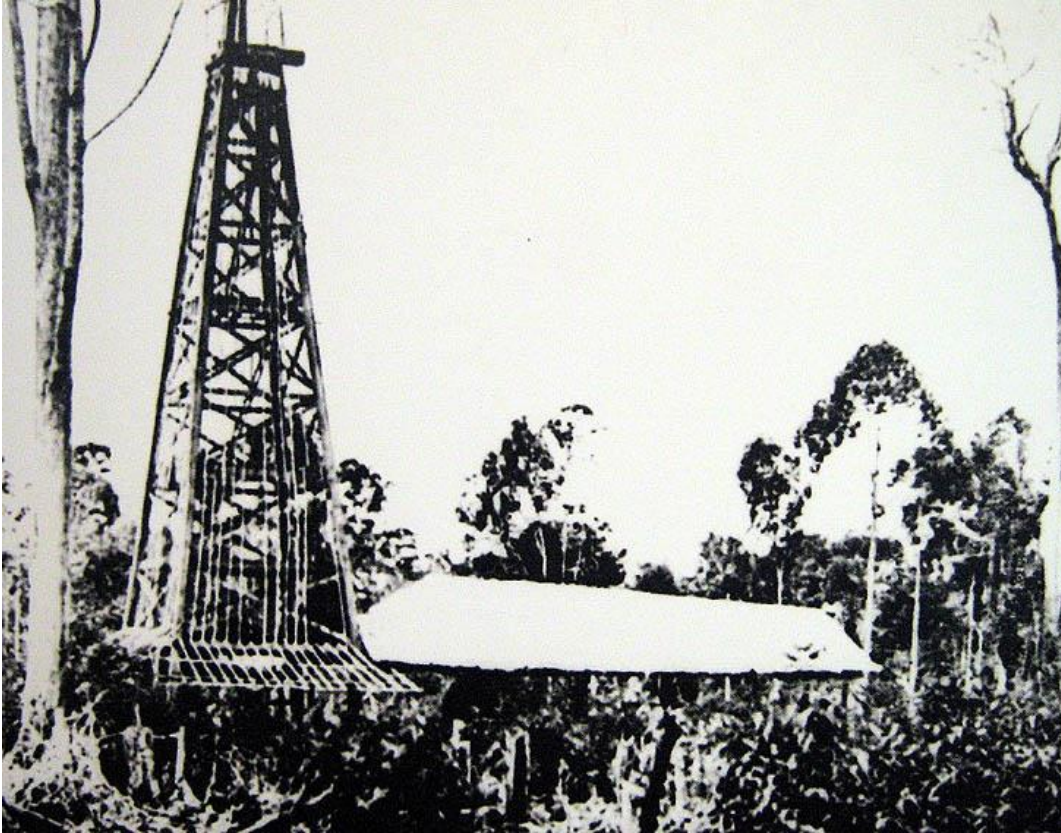


Figure 1: Malaysia's first oil well, Miri Grand Old Lady No. 1 in 1910

(Source:
[https://commons.wikimedia.org/wiki/File:The_first_oil_rig_in_Miri_\(Grand_Old_Lady\).JPG](https://commons.wikimedia.org/wiki/File:The_first_oil_rig_in_Miri_(Grand_Old_Lady).JPG))



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5.1 History of Oil and Gas in Malaysia

1910

- Shell discovered oil well
- Canada Hill, Miri, Sarawak

1914

- First oil refinery built by Shell
- Lutong, Sarawak

1963

- PD refinery built by Shell to cater demand in Peninsular Malaysia

1968

- Sarawak's first offshore field in Baram

1963

- Federal government explore offshore Terengganu

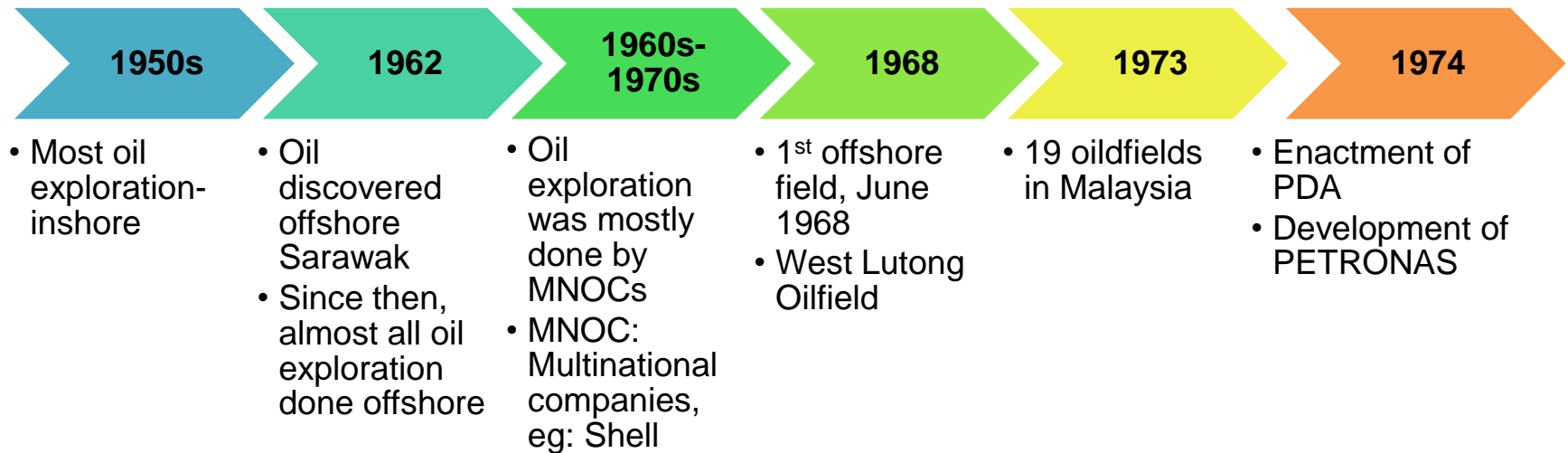
1974

- PDA enacted
- PETRONAS formed



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5.1 History of Oil and Gas in Malaysia



5.2 E&P projects by PETRONAS

- **PETRONAS:**
 - holds exclusive ownership rights to **exploration and production (E&P)** projects in Malaysia.
 - Foreign and private companies **must** operate through PSCs with PETRONAS.
- **Local Projects:**
 - **Kikeh block** :first deepwater discovery project, began operation in Jan 2008
 - Shell-operated **Gumusut/Kakap** deepwater fields, began production in 2010.
 - Shell-operated **Malikai** field is expected to begin its operation in 2012
 - Construction of Sabah Oil and Gas Terminal (**SOGT**) by PETRONAS in 2007
- **Overseas:** investing in 29 oversea countries
 - Syria, Turkmenistan, Iran, Pakistan, China, Vietnam, Burma, Algeria, Libya, Tunisia, Sudan and Angola.
- conducted by **PETRONAS Carigali.**



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continue...Downstream activities

- Oil is **exported** to Japan, Thailand, South Korea and Singapore.
- Malaysia had about 545 bbl/day of refining capacity at **6 facilities**.
- The facilities are operated by:
 - PETRONAS: operates 3 refineries at 259,000 bbl/day
 - Shell: operates 2 refineries at 200,000 bbl/day
 - ExxonMobil: operates 1 refinery at 86,000 bbl/day
- 3 largest refineries in Malaysia are:
 - Shell Port Dickson (capacity of 155,000 bbl/day)
 - Petronas Melaka I (capacity of 92,832 bbl/day)
 - Petronas Melaka II (capacity of 126,000 bbl/day)



continue...Natural gas discoveries in Malaysia

- Malaysia owns **12th largest gas reserves** as 2012 , volume of 83 trillion standard cubic feet(tscf)
- Many **gas reserves** are found in **Peninsular Malaysia**
- Most **gas production** are from **East Malaysia** esp. Sarawak
- Malaysia has 88 producing oil and gas fields by March 2008.
 - 61 are oil fields and 27 are gas fields
- 50% of these fields operated by PETRONAS Carigali.
- Most natural gas productions are operated by foreign companies through PSCs with PETRONAS.



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continue...LNG Plants

- Malaysia has **3 liquefied natural gas (LNG)** processing plants:
 - Malaysia LNG Sdn. Bhd.
 - MLNG Dua
 - MLNG Tiga
- located at a massive complex in **Bintulu**
- are supplied by offshore natural gas fields in Sawarak
- total liquefaction capacity = 22.7 MMt (1.1 Tcf)/ year
- PETRONAS holds majority equity stakes in all 3 LNG plants



continue...Export of Natural Gas

- Malaysia
 - 9th world's **leading natural gas exporter**
 - in 2005, majority shipment : to Japan, South Korea, Taiwan, small amount : to United States and Spain.
- LNG is primarily transported by **MISC.**
- MISC: Malaysia International Shipping Corporation
- owns and operates 23 LNG tankers.
- owns the single largest LNG tanker fleet in world by volume of LNG carried.
- 62% owned by PETRONAS



continue...E&P of Natural Gas

- The **largest** project: **Murphy's Oil deepwater Kikeh** field in offshore Sabah. Production rate : 120 MMcf/d
- **PETRONAS Carigali's Blocks SK-309 and SK-311** in offshore Sarawak.
 - produced combined 130MMcf/d of gas and the production began in early 2009.
- **Malaysia-Thailand Joint Development Area(JDA)**
 - administered by Malaysia-Thailand Joint Authority (MTJA)
 - Each country owns 50% of JDA's hydrocarbon resources
 - holds 9.5 Tcf of proved and probable natural gas reserves
 - divided into 3 blocks:
 - 1 block by the Carigali-Triton Operating Company (CTOC)
 - 2 blocks by Carigali-PTEP Operating Company (CPOC)



continue...E&P of Natural Gas (Overseas)

- **Egyptian LNG (ELNG) project**

- located in Egypt's Mediterranean coast.
- ELNG plant has total liquefaction capacity of 7.2 MMt/y (350 Bcf/y)
- 2 production trains: Train 1 & 2
- Petronas share 36% in Train 1 and 38% in Train 2

- **Dragon LNG project in United Kingdom**

- LNG receive and regasification terminal
- starts operating in 2003
- gives future market for LNG cargoes from Malaysia



5.3 PETRONAS' ROLES

PETRONAS



- is established after the enactment of PDA.
- a state-owned corporation under Companies Act 1965
- granted exclusive ownership and control Malaysia's petroleum resources including E&Ps.
- responsible to negotiate with companies that wants to operates in oil and gas fields in Malaysia under PSCs.



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continue...ROYALTIES

- The payments from PETRONAS to federal and state governments are in form of royalties.
- In return for ownership rights to the oil resources
- Royalties amount to 10% of gross revenue divided equally between the federal and state governments
- Sabah, Sarawak, Terengganu currently receives 5% royalties for their oil resources.



5.4 Petroleum Development Act 1974 (PDA)

- An act to provide a Corporation for exploration and exploitation of petroleum onshore and offshore.
- Given entire ownership and exclusive rights
- Has to control downstream activities and development
- Must follow control and direction of the Prime Minister
- The corporation is PETRONAS or the Petroleum Nasional Berhad
- Under this act, National Petroleum Advisory Council, is also established



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5.5 Petroleum Service Contracts (PSC)

- introduced due to amendment of PDA in 1974
- been successful in neighboring country, Indonesia.
- The 1976 PSC consists: 10% royalty, 20% cost oil ceiling, profit split 70:30
- Petronas and Petroleum Revenue Tax is 38% , paid by both PETRONAS and the contractor to the Government.
- 1985, the government adjusted its PSC regime in relation to cost ceiling and profit splits.
- 1993, a fiscal regime for deepwater oil fields because country's oil and gas reserves were turning to deepwater oil fields.
- 1997, Revenue over Cost (R/C) PSC was introduced
- 1998, there are only 5 PSC
- 2012, PSCs has increased to 83 and 100 deepwater PSCs by 2013.



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5.6 Risk Service Contracts (RSC)

- launched RSC in early 2011
- to stimulate the development of marginal oil and gas field
- increase recovery of hydrocarbon resources through innovative solutions.
- Under RSC, Petronas retains ownership while contractors are service providers.
- Contractors :
 - have equity share in the RSC
 - contribute the upfront capital investments according to their share and receive payment only upon first production
 - responsible for field development and operation
- The reserve size of each marginal fields is no more than 30 million barrels of oil.



Conclusions

1. Discovery of first oil well of Malaysia in 1910 led to more discoveries and exploration inshore and offshore of both Peninsular Malaysia and East Malaysia.
2. PETRONAS has done an excellent job in developing the petroleum and natural gas industries especially through PSCs and RSCs.
3. Oil and gas are proved the main sources of energy in Malaysia.
4. Oil and gas sector is a large contributors to Malaysia's economy over the years.



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THANK YOU.



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Authors Information

Credit to the authors:
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