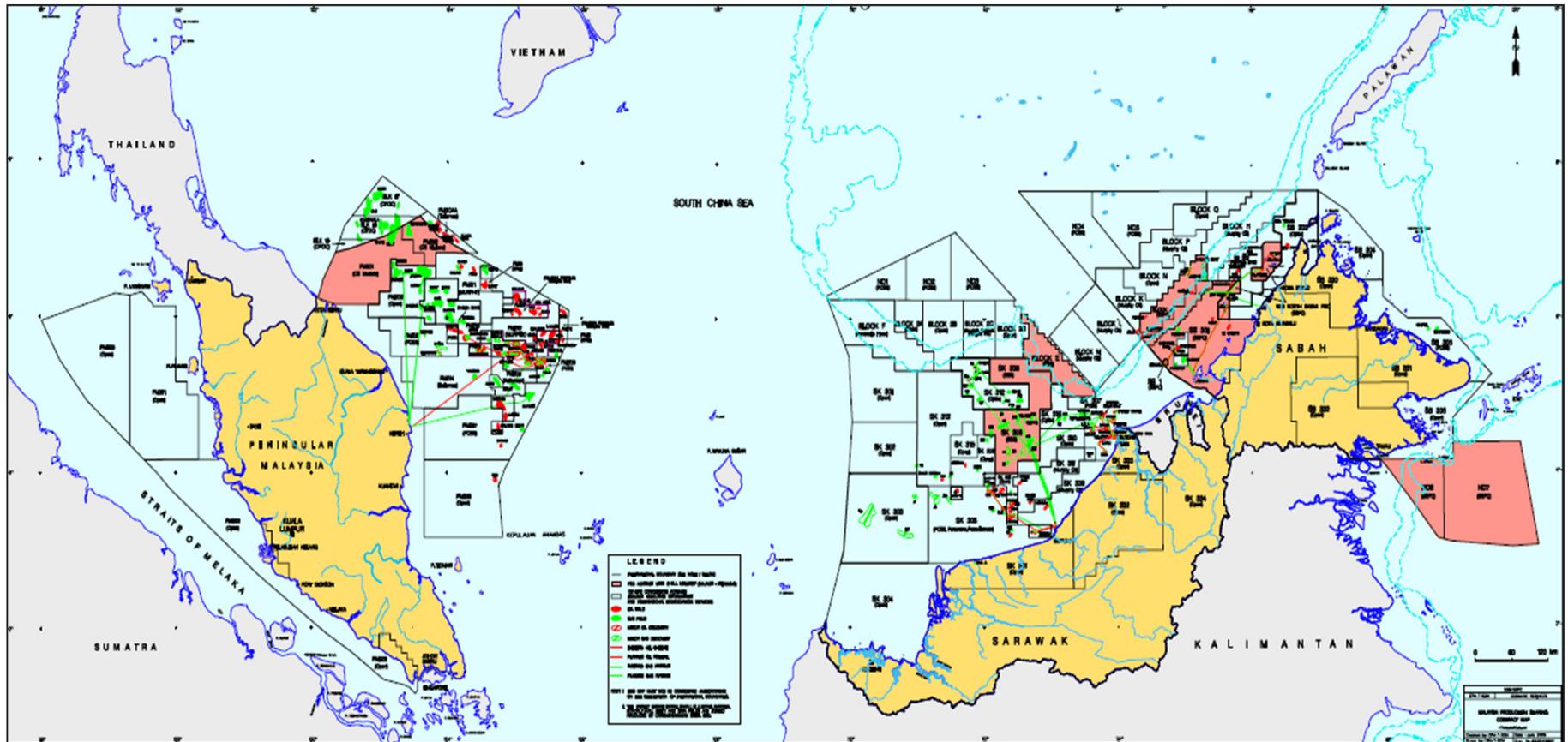




Topic: Journey into the Gas Industry
Speaker Name: Teh Yat Hong
Session Date/Time : 5th June, 09:00



Oil and Gas Locations in Malaysia



- Peninsular Malaysia and East Malaysia
- Terengganu, Sarawak and Sabah

In the beginning...Oil



- Oil was discovered in Miri, Sarawak by Shell and offshore Peninsula Malaysia by Exxon
- The 1973 oil shock awakened the need for Malaysia to set up a National Oil Corporation, PETRONAS, to exercise its sovereign right to the hydrocarbon resources
- Associated gas produced with oil was “wastefully” vented/flared

In the beginning...Gas



1st Gas Discovery
by Shell

1971



1st Gas Discovery
by Exxon

1973

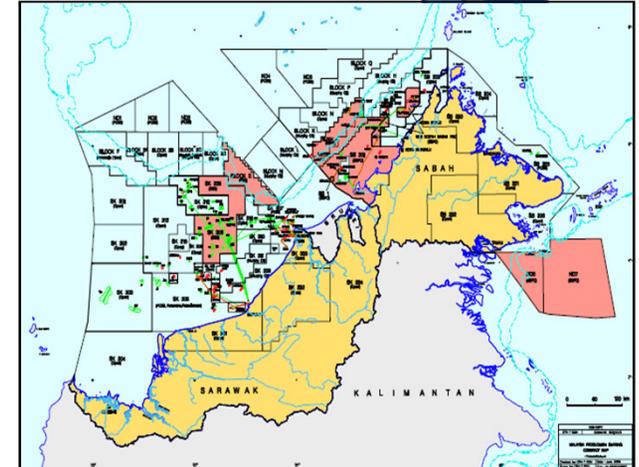


PETRONAS
Carigali
formation

11 May 1978

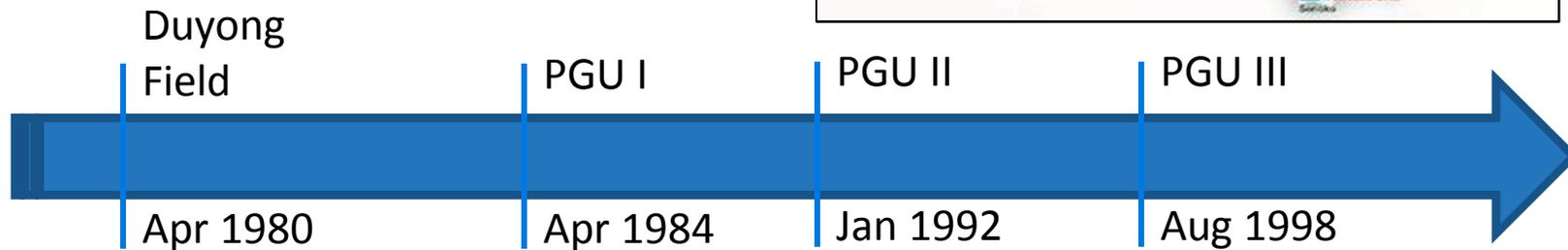
- The 1973 oil shock also highlight the need to diversify energy resources
- Major gas discoveries occurred in 1971 in Sarawak and 1973 in Peninsula Malaysia
- Malaysia diversification policy targeted the Sarawak gas find for export and earn foreign exchange
- PETRONAS Carigali was incorporated in May 1978 to undertake exploration and production activities

The MLNG Debut and Expansion



- Malaysia endowed with gas reserves four times more than oil
- Conveniently near and hungry market in Japan, Korea and Taiwan
- First shipment of LNG was flagged off from Bintulu, Sarawak, bound for Japan
- Malaysia joined the scarce ranks of LNG plants worldwide – Alaska, Algeria, Abu Dhabi, Brunei and Indonesia

The Domestic Front



- First landing of offshore natural gas in Peninsular Malaysia from Duyong field
- PGU a 1,700 km gas transmission pipeline system in Peninsular Malaysia was build to fuel the industrial and power industry
- PGU II was the first Asian export of gas from Malaysia to Singapore power station while PGU III took the gas northwards and link to the Trans Thai Malaysia pipeline using gas from the JDA area

The Domestic Expansion



SMDS Plant

NGV fuel

GDC

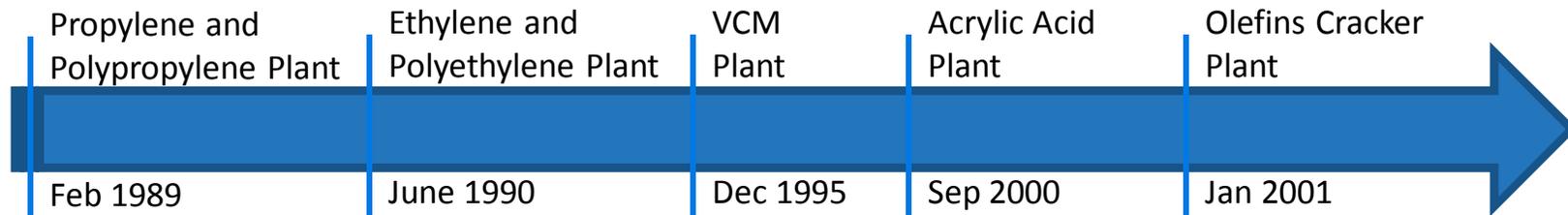
May 1993

May 1992

Oct 1994

- A world first Shell Middle Distillate Synthesis plant in Sarawak to produce 12,000 bopd of middle distillate fuels, along with specialty chemicals converting 100 MMscfd of natural gas
- NGV fuel was launched for taxis with the new refueling station at in high density urban cities
- Introduced natural gas an energy source to produce chilled water for air conditioning and electricity through GDC in KLCC, Twin Towers and Putrajaya

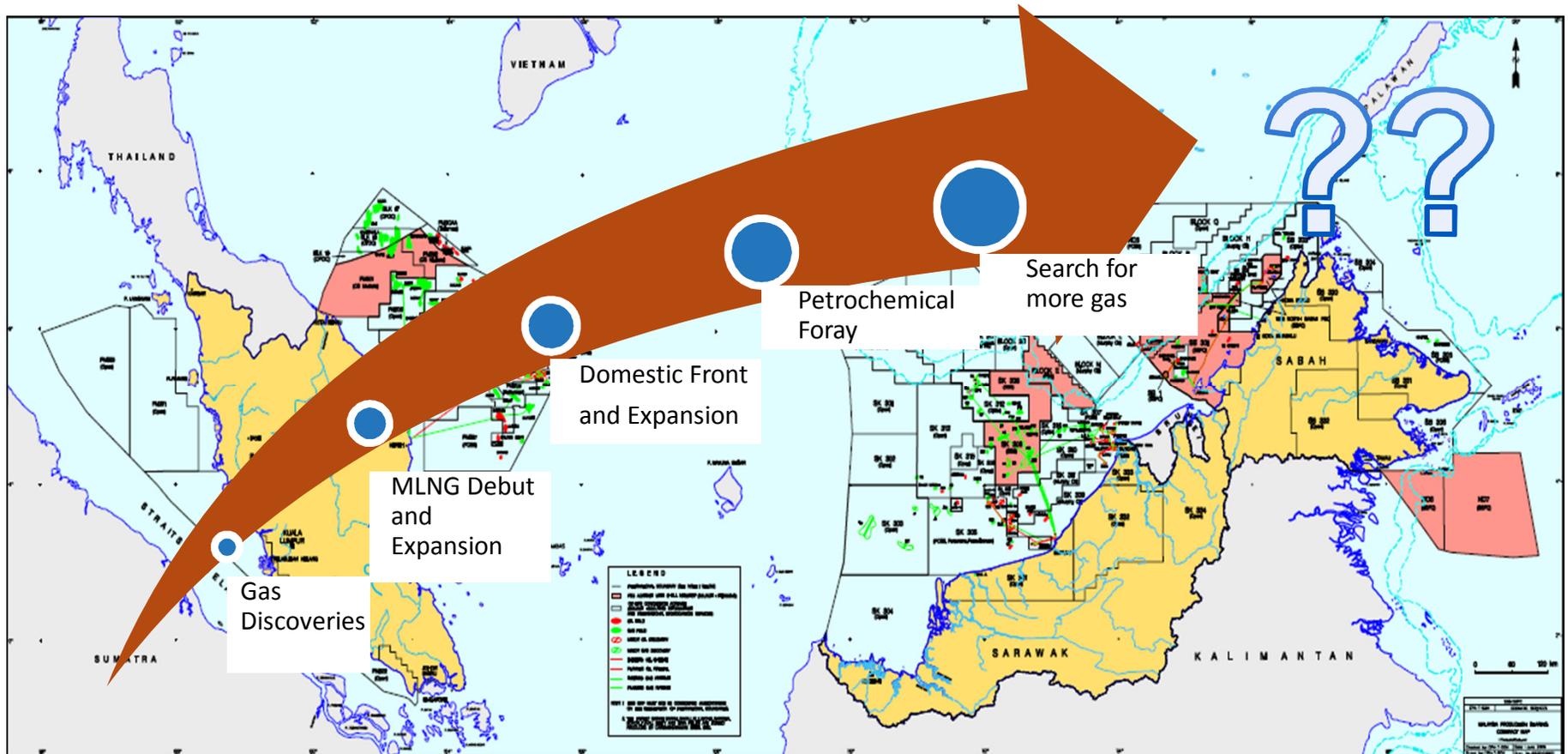
The Petrochemical Forays



- Petrochemical sector is a strategic, value adding industry to maximize returns on the nation's hydrocarbon resources
- The area designated for a world class petrochemical industry was the east coast of Peninsula Malaysia where there is abundant gas-based feedstock
- Products produced includes VCM (vinyl chloride monomer), PVC (polyvinyl chloride), acetic acid, aromatics, olefins, polymer, ethylene oxide/glycol and other petrochemical derivatives

Search for More Gas Continues..

- Malaysia is ranked No. 15 in terms of gas reserves at 83 Tscf while total production of natural gas averaged 7.01 Bscf per day



Discussion Statements



- How would the journey in other Countries differ from the Malaysian journey?

Discussion Statements



- How do you match the Government's aspiration with PETRONAS outlook?

Looking into the Crystal Ball...



- Malaysian Government Aspirations
 - To sustain domestic demand and strengthen consumer and investors confidence, promote private sector activities in manufacturing and services and increase expenditure for expansion of transportation network and infrastructure
 - Need more energy as the economy grows
 - Currently, the energy supply mix in the country is made up of gas (70 %), coal (22 %), oil (2 %) and hydro power (6 %)
 - Consumption of electricity has grown steadily to 110 gigawatt hours driven by growing population and the industrialization of the nation
 - Positive growth outlook for the domestic gas market and increase volumes of gas is needed by existing gas consumers
 - With the recent growth in energy consumption, Malaysia has experienced high growth in greenhouse gas (GHG) emission levels, compared with peers; Malaysia has ratified the Kyoto Protocol and has committed to mitigate climate change and reduce GHG emissions

Looking into the Crystal Ball...



- PETRONAS Outlook

- It is unlikely that domestic oil and gas production will grow substantially beyond current levels, as the oil and gas discoveries from the mature basins are, on average, smaller than in the past
- Despite a stable number of exploration wells being drilled, the size of discovered resources is declining
- Future gas fields have high CO₂ content ranging from 12% to 40%, stranded and would require high cost for development
- Without significant efforts being made in upstream exploration, development and production, we expect oil and gas production in Malaysia likely to decline in the coming decade