Why ASEAN?
Opportunities for Australian Oil and Gas companies
Vietnam market
Hoa Nguyen
Key facts

- **Oil production** ranked 4th in ASEAN: 336 thousand bpd (2015)
- **Gas production** ranked 5th in ASEAN 10.7 bcm/day (2015)
- **PetroVietnam** NOC covers from upstream to downstream
- Boosting oil & gas exploitation to **28 million toe** in 2016 to compensate revenue loss due to low oil price.

More than 80 million tons of crude oil production in period of 2011-2015

Total Gas production around 44 bcm in the period of 2011-2015
Develop deep-water fields and large scale projects to boost production

Further develop domestic gas market, invest in new gas infrastructure, import LNG to supply for power plants

Develop power sector for both coal-fired & combi-cycle power plants

Improve technical services capabilities of Vietnamese O&G companies

Gas pipelines to connect offshore fields to power plants & onshore gas distribution systems in Southern region

Increase refining capacity: three-fold growth over the next five years.

Strengthen R&D capabilities, apply cutting edge- technologies to optimise operation and minimise costs

Enhance calibre of human resources through training & development
**VIETNAM KEY UPCOMING PROJECTS - UPSTREAM**

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**Ca Voi Xanh (Blue Whale) gas field - Water depth: 317m**

- *Estimated COD: 2021 | Current status: ODP*
- *Estimated reserve: 150 bcm of natural gas | Investor: Exxon Mobil & PVN*
- **Project scope:** wellhead platform to handle the offshore separator, underground mining clusters, gas processing plant and four power plants of 3,000 megawatts

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**Block B – O Mon Gas Field**

- *Estimated COD: 2020 | Current status: FS*
- *Estimated reserve: 107 bcm*
- **Project scope:** 1 central technology platform and 46 operation platforms; 01 housing platform; 01 condensate vessel and about 750 production wells

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**Block B – O Mon Gas Pipeline – 431 km in total**

- Designed capacity of 20.3 mcm
- 295 km offshore segment transports gas from Block B to the landfall stations
- 102 km onshore pipeline supplies gas to power plants
### Thi Vai LNG Terminal (3 mtpa)

- **Timeframe:** 4 years, start in 2017
- **Scope of the project:** terminal, wharf, storage warehouse, re-gas facilities and pipeline system.
- To supply gas for Southeast region of Vietnam, which is estimated to be challenged with shortage of gas since 2018.
- Gas supply from this terminal will be mainly used to supply for industrial customers.
- **Investor:** LNG Vietnam JSC

### Son My LNG Terminal (3-10 mtpa)

- **Phase 1** (3.6 mn tonnes): include two power plants, Son My 1 and Son My 2 (total capacity 2,000 MW)
- **Phase 2:** increase capacity to 6 million tonnes per year
- **Phase 3:** increase capacity to 10 million tonnes per year

PV Gas will invest into and operate the terminal, import LNG and sell to Son My power plants.

- **Son My 1** invested by Sojitz, Pacific, GDF Suez consortium
- **Son My 2:** the information is not yet official.
Technologies to optimise E&P in deep-water fields, deep processing of natural gas (big data, digitalization)

Consulting services to establish competitive gas market

Supplying LNG

Investment opportunities in the two LNG terminal projects

EPC, consulting services for LNG terminal, gas pipeline system, and combi-cycle power plants

Services and equipment supplies to downstream sector including refinery and power plant

Technical training, corporate and executive training
Thailand market
Pannalak
THAILAND – KEY DEVELOPMENT (1)

- Thai energy market appears stagnant, it is not all so. Two key areas of opportunity exist:
  a) Diversifying gas supplies under a 5 year plan
  b) Decommissioning unviable infrastructure

- **Demand for LNG** - Imports in 2016 are expected to be 3 million tonnes and are expected to reach 5 million tonnes by 2017, 13.5 to 5.5 million tonnes by 2022. By 2036, LNG will be imported at 31.3 million tonnes per year; an increase as a proportion of LNG to total gas supply from 7% to more than 70%.

- A 5-year gas plan focused on **building national gas infrastructure**
  - Natural gas transmission pipeline no. 5 from Rayong to Wangnoi – Prahakorn Nur/Pranakorn Tai natural gas pipeline system by PTT
  - Onshore natural gas pipeline from natural gas compressor station Ratchaburi-Wangnoi no.6 (RA#6) to Ratchaburi province by PTT
  - LNG Receiving Terminal phase 1 extension by PTT
  - New LNG Receiving Terminal (no. 2) at Rayong by PTT
  - Floating Storage Regasification Unit (FRSU) projects in Upper part of the Gulf of Thailand studied by EGAT
On going operation with an aim to extend life of assets and employing flexibility to leveraging existing equipment. Operation is characterised as shallow water drilling:

- Enhanced oil recovery (EOI)
- Water Quality Improvement
- Mobile production & testing facilities for marginal wells
- Flare Gas Recovery
- Oil booster pump
- Low cost flowline

*Note*: 80% of oil is produced from the Gulf of Thailand. The largest producer is Chevron, followed by PTT (NOC), Total and BG Group.

Decommissioning - Ministerial act announced in February 2016 requiring petroleum upstream operators to submit decommissioning plans for structures:

- Not used for more than one year
- Remaining proven reserve is less than 40% of the total accumulated production and remaining proven reserve
- Remaining concession year of operation is less than 5 years
- Concession owner would like to withdraw platforms/structures
Opportunities exist for suppliers in the value chain of pipelines, LNG receiving terminal design & construction, EOR, and cost saving technology for both upstream and downstream.

Austrade is able to connect you with oil and gas companies, EPC companies, major active players and guide you through the vendor registration process:
- At early stage to conduct feasibility study, at pre-development stage to provide technical consultant- FEED and preparing bidding instruction.
- Australia could partner with existing consortium to increase strong credentials and financial strength as most of the LNG and recent gas pipeline projects have capital-intensive investment.

Decommissioning is quite receptive. We recommend coming early to the market to establish a position. We could engage you directly with O&G companies as well as identify local environmental consultant partners.
- In the short term working as a technical consultant to develop technical decommissioning plans for upstream operators
- For medium term, as an onshore dismantling/ decommissioning company
- A unique characteristic and issue within the production in the Gulf of Thailand is Mercury contamination
Myanmar market
Danny Kyaw
Myanmar produced 24.7 million barrels of petroleum and 2,085.57 million cubic feet of natural gas between 2011 and 2015, from both onshore and offshore projects.

Myanmar’s fuel consumption is forecasted to increase at an average of 6% yearly for four years (2016-2020).

The unprecedented growth in Myanmar offers untapped opportunities to foreign investments and led to sharp rise in petroleum products demand.

Close to 40 blocks were awarded to IOCs and their local partners in past bidding rounds in 2013 and 2014.

Various activities (such as EIA and surveys) and negotiation of production sharing contracts with the state – owned Myanmar Oil and Gas Enterprise (MOGE) are going on.
• Italian – Thai firms in discussion to build a $500 million LNG import terminal at Dawei, southern Myanmar.
• International companies have now started surveys at almost half of all blocks awarded in the 2013 bidding round.
• Production remains steady at Myanmar’s existing offshore gas fields – Yadana, Yetagun, Shwe and Zawtika
• Woodside – 2017 drilling program accelerating options for commercialisation
MYANMAR - OPPORTUNITIES

• Supply of equipment, technology and services
  › Onshore
  › Shallow water
  › Deep water
• Environmental and social impact assessment
• Skills development and training
  › Project management and delivery
  › Technical
  › Back office
  › Health and safety
• Design and delivery of CSR programs
Indonesia market
Ady Delnov
Indonesia is both a producer & consumer.

### 2015

<table>
<thead>
<tr>
<th>Category</th>
<th>Production</th>
<th>Import</th>
<th>Consumption</th>
<th>Annual Consumption Growth</th>
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</thead>
<tbody>
<tr>
<td><strong>CRUDE OIL</strong></td>
<td>830,000 BOPD</td>
<td>770,000 BOPD</td>
<td>1.6 million BOPD</td>
<td>3%</td>
</tr>
<tr>
<td><strong>LPG</strong></td>
<td>2.27 million MTonnes</td>
<td>4.3 million MTonnes</td>
<td>6.57 million MTonnes</td>
<td>13%</td>
</tr>
<tr>
<td><strong>GAS</strong></td>
<td>8,113 MMSCFD</td>
<td>3,048 MMSCFD</td>
<td>3,703 MMSCFD</td>
<td>2%</td>
</tr>
</tbody>
</table>

Gas export & consumption as of October 2015
INDONESIA MARKET

Oil & Gas Investment Realization 2010 – 2016

Total Investment (2010 – 2016) 120.25 billion USD
Upstream Oil & Gas in Indonesia

**Indonesia Oil & Gas Reserves**

**OIL RESERVES**
- Proven: 3,602.53 MMSTB
- Potential: 3,702.49 MMSTB
- Total: 7,305.02 MMSTB

**GAS RESERVES**
- Proven: 97.99 TSCF
- Potential: 53.34 TSCF
- Total: 151.33 TSCF

**Production**
- Oil: 830,000 BPD
- Gas: 8,113 MMSCFD

**Working Acreage**: 320 PSCs
- Exploration: 240 PSCs
- Exploitation: 80 PSCs
INDONESIA - OPPORTUNITIES

• **Energy sectors reform**
The BKPM (Investment Coordinating Board)-led campaign of Reduction in red tape could provide regulatory and investment certainty

• **Fuel refining technology providers**
To meet the population fuel needs, Indonesia will have to build more of its own fuel refining capacity.

• **Oil and gas service/equipment providers**
Extraction, transportation, safety and storage aspect is the areas that are promising for Australian companies

• **On-site/Off-site skill upscaling**
Australian capabilities within the oil and gas industry is well-known and are continue to become one of Indonesian oil and gas industry partner to support the human resources development within the industry.
Philippines market
Tata-Corpuz
OIL & GAS PRODUCTION AND IMPORTATION IN THE PHILIPPINES

<table>
<thead>
<tr>
<th>Fossil Fuels</th>
<th>Production</th>
<th>No of Contracts Monitored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil (in MMB)</td>
<td>2015: 2.37</td>
<td>1H2016: 1.04</td>
</tr>
<tr>
<td>Gas (in BCF)</td>
<td>2015: 126.19</td>
<td>1H2016: 73.67</td>
</tr>
<tr>
<td>Condensate (in MMB)</td>
<td>2015: 3.73</td>
<td>1H2016: 2.19</td>
</tr>
</tbody>
</table>

25 Service Contracts

Malampaya Gasfield
- extracted 1.8 bcf since inception in 2001
- remaining reserves is 3.2 tcf
- depleted by 2024

Galoc oil field
- extracted 18.3 mmbbl
- remaining reserves at 6.3 mmbbl

Nido Matinloc
- brownfield
- marginal production at 100,000 bbl

Crude oil imports
- up by 20% in 2015; mostly from the Middle East

Petroleum imports
- up by 12% in 2015; mostly naptha and condensate

Local refiners - Petron and Pilipinas Shell
- Petron and Pilipinas Shell accounted for 13.7% of total product imports; 83% by direct importers

Direct importers of petroleum products
- Chevron, Seaoil, Phoenix, Unioil...

Sources: Department of Energy; Nido Petroleum; Philodrill Corporation

Israel’s Ratio Oil Exploration Ltd bidded for Area 4, 416 thousand hectares East of Palawan

Colossal Petroleum Corporation for Area 5, 576 thousand hectares in waters of East of Palawan

Coal Asia Holdings, Inc. for Area 7, 468 thousand hectares within the disputed Reed Bank in the West Philippine Sea

Yulaga Oil Exploration Entreprises for Area 1, 424 thousand in Southeast Luzon, DISQUALIFIED due lacking in financial, technical and legal documents.
OIL & GAS INDUSTRY PLAYERS IN THE PHILIPPINES

Regulator

Operators
Service Contractors

Main (Umbrella) Contractors

Sub-Contractors

Specialist Consultants, Vendors, Agents, ..
OPPORTUNITIES IN THE PHILIPPINES

• Upstream
  • SC14C two additional wells in Galoc deep water by Nido Petroleum in 2017.
  • SC49 drilling activities in Southern Cebu by China Intl Mining and Petroleum
  • SC37 ongoing geological and geophysical activities in Cagayan by PNOC-EC
  • SC58 West Calamian Block of Nido Petroleum. Environmental Assessment is positive.
  • DOE is monitoring 25 Petroleum Service Contracts and 78 Coal Operating Contracts

• Downstream
  › Nine natural gas pipeline projects by the government from 2017-2022
    - Batangas-Manila 105 kms (2017)
    - Bataan-Manila 40 km undersea
    - Bataan-Cavite 35 kms.
    - Subic Pipeline 40 kms (2021)
    - Clark Pipeline 25 kms. (2022)
    - Sucat-Malaya 35 kms (2017)
    - Sucat-Fort Bonifacio 15 kms (2017)
    - Sucat-Quirino
    - EDSA-Taft Gas Pipeline –citygas distribution network
  › First Gen will build an LNG import terminal. Construction by 2017
  › Pipeline management
  › LNG import
  › O&M for refineries and petrochemicals
  › Storage and logistics for independent players, shippers and traders of crude oil and petroleum products
OIL & GAS LANDSCAPE IN MALAYSIA

Quick Facts

Oil & Gas Industry 2015:

- 104 PSCs and 5 RSCs
- 85 producing oil fields
- 60 producing gas fields
- 603kboed liquid production
- 6,120 mmscfd natural gas production
- 8,467 km pipeline
- 22.6 bil boe discovered resources
- 24 production enhancement projects underway in Malaysia
- 332 platforms
- 39 rigs end of 2014

Courtesy of Petronas, MPRC
## UPSTREAM TRENDS

### Enhanced Oil Recovery
- Boost oil recovery from mature oil fields in Malaysia through enhanced technologies
- PETRONAS will roll out its EOR programme in phases over the next decade to revive flagging production from mature and depleting oil wells

### Marginal Field
- A significant proportion of Malaysia’s remaining reserves lie in marginal fields = technically challenging and capital intensive
- Introduction of Risk Sharing Contracts (RSC) to attract operators with expertise in marginal field development to collaborate with industry players

### Deepwater Development
- New discoveries to maintain Malaysia’s oil and gas production
- Requires geological studies and testing of new exploration methods

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Source: Petronas
RAPID ($16bn) projects

- PMC – Technip JV Fluor Corp
- 14 packages awarded to EPCC contractors: Sinopec, Technicas Reunidas, Petrofac E&C, Toyo Engineering, MMC Engineering & Punj Lloyd
- Others remaining related to infrastructure and utilities supply
- RAPID’s refinery start-up is scheduled to take place by early 2019
- Pengerang projects
  - Petroleum Terminal
  - Tanjung Langsat Terminal
  - Tanjung Bin terminal
  - Integrated Complex
  - Support services hub
Downstream

- Operations and maintenance for refineries and petrochemicals
- Digital technologies in the oil and gas value chain (pump/reservoir/autonomous control/downtime management/intelligent production systems/predictive maintenance/facility security)
- Storage and logistics for independent players and shippers as well as traders of crude oil and petroleum products.

Upstream

- Enhanced oil recovery (EOR) techniques to boost oil and gas output
- Facilities rejuvenation for life extension
- Innovative solutions providers for small fields
- Partnerships for under-explored deep-water potential
- Decommissioning
- R&D and Innovation
- Training – asset integrity; multiskilling and upskilling

Australia-Malaysia Oil & Gas Working Group

1. Explore ways to develop productive partnerships for projects in Malaysia & Australia
2. Bring awareness of Australian solutions and technologies to the marketplace
3. Create a tangible framework to address challenges faced by the industry
4. Build a useful network within the industry and strengthen relationships between Australian and Malaysian oil and gas companies
Brunei market
Josie Abdullah
Quick Facts

- Exploration and Production of the oil and gas resources of Brunei Darussalam
- Over 4,500 reservoirs
- Over 244 offshore structures
- Over 1,000 producing wells
- Over 1,600 pipelines stretching over 5,000km
- Seria export Oil Terminal
- 10,000 bbl/day Oil Refinery
- Supply of gas to Brunei Darussalam for electricity generation and domestic fuel

Source: BSP Sdn Bhd
The Brunei Shell Joint Venture Companies (BSJV) are playing an active role in developing the capacity and capability of Bruneiian businesses for the sustainable development of Brunei Darussalam. This is aligned with His Majesty the Sultan of Brunei’s vision, Wawasan 2035.

Vendors must register through the Vendor Online Registration System (VORS) to be part of the BSJV.

The BSJV Tender Process is a structured Contract Procurement Process to effectively manage the purchase of goods and services from third parties.

This process is divided into three main stages:

1. Pre-Award Stage
2. Tender Stage
3. Post-Award Stage

Source: BSP Sdn Bhd
BRUNEI - OPPORTUNITIES

Source: Petroleum BRUNEI

• Engineering, Procurement, Construction, Installation & Commissioning (EPCIC) services

• Domestic & International LNG Opportunities

• Developing local capabilities in shipping industry – marine transportation for methanol

• Tender opportunities listing and call for expression can be found on the websites:
  – www.shell.com
Singapore market

Irene Tay
Singapore - Market Overview

**Asia’s largest / world’s third largest oil refining centre**

**Two world’s largest oil rig builders**
70% world production
Keppel and Sembcorp Marine

**Major trans-shipment port**
Presence of upstream and downstream oil & gas players
Major oil & gas specialist equipment companies - Regional HQ

**Singapore’s supporting industries**
Offer critical turnkey manufacturing support and ancillary services to international companies.
global standards and practices.
Singapore’s supporting industries offer a myriad of activities ranging from precision engineering, EPC services, special processes, system integrators and equipment/components production.

**Singapore imports all of its natural gas**
Mainly used for power generation and petrochemical production, exclusively via pipelines.
LNG Receiving Terminal – 2nd in the plan
Home to 3 LNG storage tanks with a capacity of up to 6.0 million tonnes
SINGAPORE – MARKET OVERVIEW

A DIVERSE & COMPREHENSIVE CLUSTER

Classification Societies/Subsea
- DNV·GL
- LR
- ABS
- WO
- Technip

Shipyards
- Keppel Offshore & Marine
- ST Marine
- Sembcorp Marine

Oilfield Services & Seismic Survey
- Schlumberger
- Halliburton
- COSL
- Weatherford
- CGGVeritas
- Fugro
- Petroleum Geo-Services

Oil & Gas Equipment
- Cameron
- NOV
- FMC Technologies
- Aker Solutions
- DrilQuip
- GE Oil & Gas
- Oceaneering

EPCM
- Aibel
- KBR
- Seadrill
- Transocean
- WorleyParsons
- Aker Solutions
- Prosafe Production

Source: EDB SINGAPORE
Halliburton opens technology and manufacturing center in Singapore

SINGAPORE – Halliburton (NYSE: HAL) has opened its newly constructed Completion Technology and Manufacturing Center in Singapore.

“This new facility will allow us to deliver a broad portfolio of completion products and will also allow us to respond more quickly to our customers’ needs,” said Jerry Wauters, vice president of Halliburton Completion Tools. “The expansion in Singapore is part of our global strategy to increase our overall capacity to meet our customers’ growing demands.”

FMC Technologies Celebrates Benoi Sector Facility

FMC Technologies announced the opening of a new facility in Benoi Road. The new facility will house the consolidated regional HQ, manufacturing, test and assembly of FMC’s Surface business. It will also be the site for the company’s Subsea System Integration Tests (SIT). The expansion of FMC’s manufacturing and engineering activities reinforce Singapore’s role as company’s home in Asia-Pacific and Middle East region for both its Surface and Subsea businesses.

Lloyd’s Register joins forces with A*STAR in Singapore to support research & development and promote technical innovation in the energy and marine sectors

Long-term collaborative agreement brings together business, academia and public R&D agencies

Lloyd’s Register has established a world-class Group Technology Centre (GTC) in Singapore to deliver innovation and solutions to the energy and maritime sectors. It has also reached an agreement with the Agency for Science, Technology and Research (A*STAR) to collaborate on R&D projects as a key part of the centre’s activities.
Singapore - Opportunities

1. IOCs with regional office in Singapore
2. Global oilfield services companies with Regional headquarter in Singapore
3. International EPCM companies with regional procurement office
4. Partnering with Singapore SMEs in offering complementary services and developing capabilities

Opportunities exists for suppliers in LNG infrastructure and maintenance services, cost reduction and productivity improvement for both downstream and upstream projects
OSEA 2016 - The Catalyst for Asia's Oil and Gas Industry

Date: 29 November – 2 December 2016
Venue: Marina Bay Sands, Singapore
Australian Companies exhibiting: 25
Visitors: International, majority from ASEAN

Austrade - Industry Business Networking Event (BY INVITATION ONLY)
Date: 30 November 2016 6.30pm
Venue: Australian High Commission, Singapore

For more information: www.osea-asia.com or contact: Irene Tay at Irene.tay@austrade.gov.au
How Austrade Helps Export-Ready Companies

- Market insights & advice on market entry
- Connections with key influencers and decision makers
- Export Market Development Grants (EMDGs)
- Participation in market initiatives and events
- Referrals to professional and business service providers
<table>
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