MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRECTORATE GENERAL OF OIL AND GAS

DEEP-WATER EXPLORATION & DEVELOPMENT IN INDONESIA

by:
Yunan Muzaffar
HEAD OF EXPLORATION DIVISION

Subsea Conference
October 3rd, 2012
AGENDA

- SHIFTING PARADIGM WITHIN OIL & GAS SECTOR
- DEEP WATER BLOCKS IN INDONESIA
- INDONESIA DEEP WATER EXPLORATION & DEVELOPMENT
- CHALLENGES AND OPPORTUNITIES
SHIFTING PARADIGM WITHIN OIL & GAS SECTOR
FROM REVENUE TO ECONOMIC GROWTH MACHINE (FEEDSTOCK-FUEL)

ROLE OF OIL AND GAS INDUSTRIES

OIL AND GAS INDUSTRY
- High Risk
- High Cost
- High Technology

INDUSTRIAL FEEDSTOCK
DOMESTIC FUEL
SOURCE OF STATE REVENUE
MULTIPLIER EFFECTS

SUSTAINABLE NATIONAL DEVELOPMENT
More reserves found and exploration activities occurred in the eastern part of Indonesia mainly deepwater project.

Discoveries in Jurassic Plays 1998-2008

Mostly Tertiary

Western part

Eastern part

Most of bidding acreage located in eastern side of Indonesia

Deep Water Area
FROM OIL TO GAS
Comparison of Accumulation Volume
Contract Domestic vs. Exports
status Nov 2011

EXPORT
6,11 TCF
24%

DOMESTIC
19,52 TCF
76%

Comparison of Accumulation Volume Contract Domestic vs. Exports During 2001 – Nov 2011
DEEP WATER BLOCKS IN INDONESIA
The distance between seismic line relatively far 20-50 km ideally for O&G bidding 5 km
PRESENT DEEP WATER BLOCKS OF INDONESIA

Status: September 2012
INDONESIA DEEPEWATER EXPLORATION & DEVELOPMENT
# DRILLING ACTIVITIES IN DEEP WATER BLOCKS OF INDONESIA

<table>
<thead>
<tr>
<th>No.</th>
<th>Block</th>
<th>Drilling</th>
<th>Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lhokseumawe</td>
<td>Plan to Drill 1 well on 2012</td>
<td>Ocean Monarch</td>
</tr>
<tr>
<td>2</td>
<td>Surumana Block</td>
<td>Drilled 1 well (Rangkong-1)</td>
<td>West Aquarius</td>
</tr>
<tr>
<td>3</td>
<td>South East Ganal I</td>
<td>Plan to Drill 1 well (2013)</td>
<td>Ocean Monarch</td>
</tr>
<tr>
<td>4</td>
<td>Pasangkayu</td>
<td>Drilled 4 Well (Bravo-1, Romeo-1, Romeo-B1, Romeo-C1)</td>
<td>GSF Explorer</td>
</tr>
<tr>
<td>5</td>
<td>Kuma</td>
<td>Drilled 1 well (Kaluku-1)</td>
<td>GSF Explorer</td>
</tr>
<tr>
<td>6</td>
<td>Karama</td>
<td>Drilled 2 Well (Gatotkaca-1 &amp; Anoman-1)</td>
<td>GSF Explorer</td>
</tr>
<tr>
<td>7</td>
<td>Mandar</td>
<td>Drilled 3 well (Sultan-1,Kris-1 &amp; Kris-1 St)</td>
<td>West Aquarius</td>
</tr>
<tr>
<td>8</td>
<td>West Sageri</td>
<td>Plan to Drill 1 well (2013)</td>
<td>Ocean Monarch</td>
</tr>
<tr>
<td>9</td>
<td>Sageri</td>
<td>Drilled 1 well (Lempuk-1)</td>
<td>GSF Explorer</td>
</tr>
<tr>
<td>10</td>
<td>Kofiau</td>
<td>Plan to Drill 1 well (2013)</td>
<td>Ocean Monarch</td>
</tr>
<tr>
<td>11</td>
<td>West Papua IV</td>
<td>Plan to Drill 1 well (2013)</td>
<td>Ocean Monarch</td>
</tr>
</tbody>
</table>

- Almost Seismic Commitment Fulfilled at whole deep Water Area
- Worldwide Deep Water Drilling Rig Availability is Limited
- Regional Autonomy should support & be partner in maintaining the investment for regional area of Indonesia
- More Petroleum system Studies in deep water are needed to determine potential estimates
- Successful exploration will require additional rig time to appraise discoveries
**Business Opportunity**
- The 7 companies have a combined 12 deepwater well commitments in the Makassar Straits
- Total drilling investment of over US$700MM

**The downside to all of this interest**

**Barrier:**
*Rig availability, contract length and day rates*

**Solution:**
- 7 companies working together, with one rig

**Deepwater Rigs**
(GSF Explorer)
DISCOVERIES IN DEEP WATER AREAS OF INDONESIA

JAMBU AYE UTARA FIELD, KRUENG MANE BLOCK

Pod I: 2012
Water Depth: 600 – 650 M
Gas Rate: 100 MMSCFD, plateau 3 years
On Stream: 2014

GENDALO & GEHEM FIELDS, UNITIZATION OF GANAL & RAPAK BLOCKS

Pod I: 2008
Water Depth: 1000 - 2000 M
Gas Rate: 120 - 600 MMSCFD
On Stream: 2013

UPCOMING DEEP WATER PROJECT (ABADI FIELD, MASELA BLOCK)

Pod I: 2010
Water Depth: 300 – 1000 M
Gas Rate: first stage 2.5 MTPA equal to 130 MMSCFD
On Stream: 2018
EXISTING DEEP WATER DEVELOPMENT IN INDONESIA

West Seno Field – Chevron Indonesia

- First Deep Water Operations in Indonesia
- 1st Oil and Gas was on August 2003
- Located in the Makassar Strait
- About 60 km offshore in +/- 1000 m of water depth

West Seno Field Chevron

Facilities consist of:
- Tension Leg Platform (TLP) supporting 28 Ultra Deep Water wells
- Floating Production Unit (FPU)
- Export Pipeline 2 x 12” x 62 Km
Gehem Hub
To deliver 420 mmscfd and 30,000 bcpd.
Facility built consist of Subsea wellhead and Umbilical Risser and Flow Lines (SURF) and Floating Production Unit (FPU), Export P/L

Bangka Field (tie in Existing West Seno FPU)
To deliver 150 mmscfd and 2,880 bcpd.
Facility built consist of Subsea wellhead and Umbilical Risser and Flow Lines (SURF) tie in to West Seno FPU

Gendalo, Gadang, Maha Field (Gendalo Hub)
To deliver 700 mmscfd and 20,000 bcpd.
Facility built consist of Subsea wellhead and Umbilical Risser and Flow Lines (SURF) and Floating Production Unit (FPU), Export P/L
Ganal PSC : Contract Signed February 24th, 1998
Rapak PSC : Contract Signed December 4th, 1997

- At 6,000 water depth in the Gehem Field, IDD has the deepest
  - Ship-shaped floating structure
  - Subsea production trees
  - Suction pile installation
  - Flowline installation
  - Export pipeline and SCR
- Largest offshore natural gas processing facility (700 mmcf/d)
- Largest single subsea umbilical order
- Longest mooring lines - 2.4 mi (3.9 km)
- Heaviest SCR load on a deepwater floating facility at 650 tons (590 metric tons)

- Front End Engineering and Design (FEED)
  - Contract for Floating Production Unit to PT Technip Indonesia
  - Contract for subsea and flowline system to PT Worley Parsons Indonesia
  - Contract for export pipelines to PT Worley Parsons Indonesia
  - Contract for onshore receiving facility to PT. Singgar Mulia

- Engineering, Procurement, Construction, and Installation (EPCI)
  After FEED, project team is still doing some scope and cost optimizations to address EPCI cost escalation – potential for unfavorable market conditions

- Final Investment Decision (FID) : Juni 2013
CHALLENGES AND OPPORTUNITIES
CHALLENGES IN OFFSHORE & DEEPWATER ACTIVITIES

- **Technical aspects**: (water depth, slope rugosity, high pressure, peculiar geological conditions)

- **Commercial aspects**: more time from discovery to first commercial production (8-10 years)

- Worldwide Deep Water Drilling Rig Availability is Limited *(service availability)*

- **Regional Autonomy** should support & be partner in maintaining the investment for regional area of Indonesia

- More **Petroleum system Studies** in deep water are needed to determine potential estimates
OPPORTUNITIES IN OFFSHORE & DEEPWATER ACTIVITIES

- BIG UPSIDE POTENTIALS
- STRONG GOVERNMENT SUPPORT
  - better PSC split for high risk block 65/35 (oil) and 60/40 (gas)
  - no exploration well in the firm commitment
  - exemption of import duty
- LESS COMPETITION
THANK YOU

www.migas.esdm.go.id