The Plan for the Export of Global Offshore Business Market

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1. What is Offshore Plant?
Resources and Offshore Plants

- Oil/Gas Production Offshore Plant
Energy and Offshore Plants

- Wave Energy Generator
Energy and Offshore Plants

- Current Energy Generator
Energy and Offshore Plants

- Wind Energy Generator
Energy and Offshore Plants

- Tidal Energy Generator
Service Vessels for Construction

Wind Turbine Installation Vessel

Submersible Heavy Lift Carrier

PSV (Platform Supply Vessel)

Offshore Plant Installation Vessel
2. Global Trend of Energy Supplies

Ultra-deepwater semisubmersible, West Eminence
IEA forecasts energy demands as 1.6%/yr until 2030
- Oil Demand increases 1.3%/yr
- Natural Gas Demand increases 2.0%/yr
- BRICs leading increasing demands
- As of 2010, 18% of increasing for 10 yrs

- In the sea, 24% of Oil and 43% of Gas
- As of 2007, 35% of Offshore Oil and 27% of Gas
- 2013, Offshore Oil will be over 40%
- Early 2011, oil price of 140$/barrel
Increasing of ordering Drilling Platforms

**Drillship**
- 2010, 9 ships, about $6.3B
  - Korea (Lead by SHI with 6 ships) (STX : 2 ships of hull)
  - China (COSCO) 1 ship
  - 90 ships operated worldwide

<table>
<thead>
<tr>
<th>Order</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
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<tbody>
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<td></td>
<td>12</td>
<td>19</td>
<td>2</td>
<td>9</td>
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**Semi-submersible**
- 2010, 1 ship
  - Less competitive price than Drillship
  - More expected in 2011 in North Sea market which has severe sea condition
  - 250 ships operated worldwide

**Jack-up**
- 2010, 23 ships, about 5.8B$
  - Singapore (Lead by Sembcorp, Keppel)
  - China (Offshore Dalian Shipbuilding Industry Com.) 4 ships, $380M
  - 500 ships operated worldwide
3. Analysis of Offshore Plant Market
Global Offshore Plant Market (2010)

- Before 2010, Korea 50%, Singapore 20$, China 17%
- 2010, global market of $27.2B
  - Korea ($14B)
  - Singapore ($6B)
  - China ($2.5B)
  - others ($1.4B)
- Engevix Engenharia in Brasil took 8 FPSO for hull only ($3.46B)
- 2004-2008, $50B
- After 2011, over $50B/yr for 5-10 years is forecasted.
Market segments (2010)

- Offshore Plant Installation Vessel is categorized in ships. It’s market is increasing, though.
- STX-Europe in Korea received 10 vessels. However Sinopacific Shipbuilding in China solely received 62 vessels of $1B which is 1/3 of world order. European countries also received several vessels.
- FPSO conversion is being lead by Singapore.
- Wind turbine installation vessel is ordered 8 vessels in 2010 by China, Europe, Mid-East countries. It’s expected as rapid increasing hereafter. (15-20 vessels until 2015, 25-30 vessels until 2020)
- In Korea, each DSME (2009) and SHI (2010) received 1 vessel.
- Large Offshore Plant Installation vessels and Pipelaying vessels are lead by Korea.

<table>
<thead>
<tr>
<th>Drilling</th>
<th>FPSO</th>
<th>FPSO conversion</th>
<th>Wind turbine installation vessel</th>
<th>Offshore Plant installation vessel</th>
<th>Offshore Plant Installation/Pipe laying vessel</th>
<th>etc</th>
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<tr>
<td>$13B</td>
<td>$12.5B</td>
<td>$700M</td>
<td>$1.5B</td>
<td>$3B</td>
<td>$1B</td>
<td>$500M</td>
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## Marketing strategies of other countries

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<tr>
<th>Country</th>
<th>Strategies</th>
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| **China** | - Building up producing facilities for domestic design and equipment of offshore plant.  
            - “Offshore Industry Facility Development Plan for 5 Years” has been set.  
            - $18B invested for 2006-2010, $45B planned for next 5 years.  
            - Shanhai Changxing offshore plant facility (World’s largest one): (44 crane operated along 12.5Km of shoreline)  
            - Governmental support for 15 ship builders to help their offshore plant business |
| **Japan** | - Own development of blocks : Inpex Corp. owns 90% of Indonesia’s Masela block.  
            - Mitsubishi Heavy Industry has developed two types of LNG-FPSO.  
            - Equipment companies cooperating with Chinese companies for Chinese market.  
            - Promoting eco-friendly product.  
            - IHI : Participating Petrobras FEED with Brasil local corporation. |
| **Brazil** | - Only allowing domestic building.  
               - Built 8 FPSO hulls : 70% of parts and equipment are from domestic manufacturing.  
               - Inducing foreign leading company’s local investment  
               - Governmental support targeting world’s second naval architecting and offshore related country. |
| **Singapore** | - World-leading Jack-up and FPSO conversion products.  
                  - Vigorously attracting foreign capital. |
## Organization of a FPSO project

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<tbody>
<tr>
<td>Portion</td>
<td>15%</td>
<td>25%</td>
<td>15%</td>
<td>45%</td>
</tr>
<tr>
<td>Tech. level</td>
<td>10%</td>
<td>15%</td>
<td>95%</td>
<td>50%</td>
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</table>

- Korea has $420M of a turnkey project ($1B)
- Particularly weak in FEED and Equipments.
- Designing and fabricating hull is second to none.
  - China, Japan, Singapore, Brazil’s rapid following up.
- Korea has world-class transport and installation technology, while its mooring and riser related technology are primitive.
Weak engineerings / Obstacles

- In the recession of ship market, major ship building companies are shifting to offshore plant with a great number of orders. However, equipment companies has less effect on the offshore market.
- Due to the lack of experience on turnkey projects, there are few professionals who can direct the whole project.
- Major oil companies are stingy with qualification.
- Lack of companies who can integrate packages, not a single unit.
- Immature technical documentation of products.
- Lack of special testing and certificating facility for high quality.
- Major oil companies is not willing to take any risk with new vendor.
- Lack of systematic and integrated marketing strategies.
4. Strategies for initial marketing
Current support from Korean government

- Major ship building companies has their own marketing ability without governmental support.

- Ministry of Land, Transport, and Maritime Affairs: Has a plan for a better service and education of operating manpower through forming a task-force team of offshore plant.

- Ministry of Knowledge Economy: Has a big project for domestic design and fabrication of offshore plant.

- Leading Industry Development for Eastsouth Region: Supporting R&D for 8 companies, Marketing, Training of employees, Internationalizations, Infrastructure of Korea Marine Equipment Research Institute (Offshore Plant testing and certificating center with 13 facilities)

- Systematic and overall support are needed.
1st: Equity of resource development

- Major oil companies and national oil affairs of leading countries (USA, Japan, Europe) has equity sharing on energy development of less developed countries.
  - They have a power with ordering drillship and producing facility.

- DSME E&R has equity on Papua New Guinea’s gas development. >> DSME received an order of LNG-FPSO.

- Korean consortium lead by Korea National Oil Corporation >> DSME received an order of 1 drillship in Kazakhstan’s Zhambyl oil field. (Sakhalin in Russia)

- Japan’s Inpex has a plan for Japanese type of LNG-FPSO with 90% equity of Masela field in Indonesia.

- Brazil and Russia can stick to domestic design and fabrication policy with their own resource fields.
2nd: Alliancing domestic companies with rolls

- Alliancing mid/small size equipment companies: Forming packages considering cons and pros
  - SYNOPEXGreenTech (Oil Pressure Cylinder) + Sam Jin Offshore Company (Offshore Facility design)
  - KHAN (Heave Compensator) + Eun Kwang Industrial (Derrck design)

- Mid size ship builder’s opening up offshore plant market: Several customized projects
  - Jack-up, FPSO conversion, wind turbine support vessel, offshore support vessels, etc.
  - Alliancing large and mid size ship builders - Technology from large company, and building in mid size company
  - Joining mid size companies causes positive effect on equipment companies

- Strengthen relation between large ship builders and equipment companies - Certification
  - Samsung Heavy Industries: Quality certification for partners
  - Hyundai Heavy Industries: Pursuing domestic offshore plant through task force team
  - Advises on quality and technology from large ship builders are required.
  - Domestic equipment has advantages in terms of logistics and delivering date even for large ship builders.
3rd: Cooperation with foreign leading co.

- Not easy to have certificate from major oil companies or foreign companies
  - SangKang M&T has been registered as EPC of Technip after long efforts.

- Attract foreign companies into Korea
  - Korea is favored with world largest manufacturer.
  - NOV has bought Hochang Machinery and manufacturing derrick in Korea.
  - This will stimulate global offshore facility companies to do business in Korea
  - Possible block of technology draining, but natural transfering of technology is expected.
  - Permitting procedure for foreign companies will be simplified.

- Cooperation with foreign companies
  - Connecting engineering of foreign companies and manufacturing technology of domestic companies.
  - Finding relation/equity with new producing countries, China and Brasil.
4th: Building up Offshore Plant Clust

- China: Shanhai Changxing offshore plant facility (The world largest one): 44 cranes along 12.5km of seashore

- Singapore: Loyang Offshore Base
  - About 330m²
  - Specialized in offshore support vessel
  - One Point All Solution
  - Most of major companies

- A base for the Arctic development

- Technology transfer from foreign leading companies

- One place for mid ship builders and equipment companies for offshore plant

- A part of national long term development plan
5th: Hosting Offshore Plant Tech. Expo

- Strengthen contacting with foreign companies
  - Direct contact: Alliancing, M&A, etc
  - Indirect contact: Participating offshore plant technology expo.

- International offshore technology expo
  - OTC in Houston: The world’s largest expo with biggest number of participants
  - Singapore APM: The biggest one in Asia
  - Germany Hamburg SMM: Naval and Ocean Expo with 50K people.
  - Brasil OTC: Planned for the world’s 2nd expo
  - China Shanghai Marinetec China, Kwangzou INMEX CHINA

- Korean offshore technology expo is necessary
  - Korea is the world’s biggest manufacturing country
  - P.R. for major oil companies to join is necessary
  - Efficient for marketing of domestic equipment companies
Korea keeps 1st position in manufacturing, but is mostly relying on foreign companies except design and small part of manufacturing.

Development of core technology of offshore plant and distributing it, performance testing, evaluation, supporting worldwide marketing, education, and infrastructure are urgent.

National control tower for strengthening competitiveness and promoting offshore plant industry is necessary.

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<thead>
<tr>
<th>C E N T E R S</th>
<th>Tech. Support</th>
<th>R&amp;D</th>
<th>Engineering</th>
<th>Test &amp; Certificate</th>
<th>Education</th>
</tr>
</thead>
</table>
| Tech. Support | - Support research and making offshore plant policy  
                - Marketing, international cooperation, and global business | - Support developing better performance of hull and equipment | - Technology for design, towing, and installation | - Evaluation of performance of equipment and test/certificate | - Educating professionals through contract with universities  
                - Programs for exploration, design, manufacturing, installation, operation, and management. |
Thank you