Developing and Implementing Floating Regasification and Liquefaction Projects

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19 April 2013
Presentation Outline

Floating Regasification
- Why floating regasification?
- Project objectives
- Key risks and mitigants – construction and operation
- The golden rules

Floating Liquefaction
- Project objectives and golden rules
- Project Structures
- Key legal issues
Floating Regasification
Why Floating Regas?

- **Time factors**
  - Fast track solution
  - use of existing assets (conversion)
  - shorter construction period (new build)
  - easier permitting
  - greater predictability

- **Cost factors**
  - less costly than:
    - land-based terminal (shipyard vs. local market issues)
    - developing alternative infrastructure (e.g., pipeline)
    - energy substitute (oil)
  - greater predictability re costs (capex)

- **Greater flexibility**
  - seasonality and trading
  - general gas supply or dedicated facility
Floating Regas: Project Objectives

- Secure safe, reliable and economical use of Vessels on a long-term basis

  - Specifically to:
    - Manage vessel construction/conversion cost and risk
    - Manage capital commitment
    - Maintain alignment with owner/operator
    - Manage vessel operating risk and cost
    - Ensure compliance with HSSE and other applicable laws
    - Maintain project flexibility

- So that the vessels are available as and when required, and perform in accordance with specifications

- Energy security
Floating Regas: Vessel Construction Risk

- **Risk that the vessel will not:**
  - Be completed according to design
  - Be completed on time and on budget
  - Perform according to agreed specifications

- **Relevant factors include:**
  - Design selection
  - Technology utilised
  - Experience of contractors
  - Legal and financial issues
    - financial and performance guarantees, bonds and hold-backs
    - project structure
Floating Regas: Vessel Construction Risk

- **Mitigants**
  - Lump Sum Turnkey contracts (fixed cost and scope)
  - Experienced/creditworthy shipbuilder and owner/operator
  - Engineering studies and proven design/technology
  - Completion and delivery tests
  - Experienced management of the process
  - Performance bonds/retainage/LOCs/guarantees etc.
  - Liquidated damages + performance warranties

- **Shipbuilders' Direct Agreement**
  - Tripartite agreement between Shipyard, Owner and Charterer
  - Protects "project interest" of Charterer
  - Essential project financing device
Floating Regas: Vessel Operating Risk

- Risk that the vessel will not, when completed:
  - perform according to its design and agreed specifications

- all risks inherent in operating LNG regas vessels
  - delivery and testing
  - loading, berthing and operating the vessel (including trading)
  - ship-to-ship (or across pier) cargo transfers
  - LNG storage, regasification and gas send-out
  - navigation and crewing
  - vessel management and flagging
  - HSSE
  - permitting
  - compliance with all laws
Floating Regas: Vessel Operating Risk

- **Mitigants**
  - Experienced/creditworthy owner/operator (OO)
  - Clearly defined operating standards
    - with (at least) consequences for under performance
      - performance warranties
  - safety, security and environmental safeguards
  - Alignment of interests between OO and charterer
  - LDs + performance warranties
  - insurance

- **Shipbuilders' Direct Agreement**

- However, risk allocation and mitigation is also a factor of the chosen shipping arrangements
<table>
<thead>
<tr>
<th>Type of Contract</th>
<th>Bareboat Charter (Demise Charter)</th>
<th>Time Charter</th>
<th>Transportation Agreement</th>
<th>Charter Voyage Agreement</th>
<th>Contract of Affreightment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vessel</strong></td>
<td>Specified</td>
<td>Specified</td>
<td>Specified</td>
<td>Specified</td>
<td>Any Vessel with restrictions</td>
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<tr>
<td><strong>Transported Quantity</strong></td>
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<td>N/A</td>
<td>Agreed quantity</td>
<td>N/A</td>
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<td><strong>Remuneration</strong></td>
<td>Bareboat Hire, based on period</td>
<td>Hire, based on period</td>
<td>Freight-based on loaded quantity (in principle), includes fee for 3rd party transportation manager</td>
<td>Spot rate per voyage, Charterer takes risk of transportation price fluctuation</td>
<td>Freight-based on loaded quantity (in principle)</td>
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<tr>
<td><strong>Vessel Manager</strong></td>
<td>Charterer</td>
<td>Owner</td>
<td>Transporter</td>
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<tr>
<td><strong>Operator</strong></td>
<td>Charterer</td>
<td>Owner</td>
<td>Transporter</td>
<td>Transporter</td>
<td>Transporter</td>
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<tr>
<td><strong>Trading Route</strong></td>
<td>Within agreed area</td>
<td>Within agreed area</td>
<td>Agreed loading/discharging ports. Change subject to Transporter's consent</td>
<td>Agreed loading/discharging ports. Change subject to Transporter's consent</td>
<td>Agreed loading/discharging ports. Change subject to Transporter's consent</td>
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<td><strong>Capital Cost</strong></td>
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<td><strong>Vessel Cost</strong></td>
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<tr>
<td><strong>Operating Cost</strong></td>
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<td>Charterer</td>
<td>Transporter</td>
<td>Transporter</td>
<td>Transporter</td>
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<td><strong>Vessel Performance Risk</strong></td>
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<td><strong>Off-Hire Risk</strong></td>
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<td><strong>Loss of the Vessel Risk</strong></td>
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<td><strong>Arrangement of Substitute</strong></td>
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<td>Charterer</td>
<td>Charterer</td>
<td>Charterer</td>
<td>Transporter</td>
</tr>
</tbody>
</table>
Floating Regas: The Golden Rules

- The successful development and operation of any project is dependent upon the following:
  - alignment of interests across the value chain
    - encouraging good/expected behaviour
    - discouraging bad/unexpected behaviour
      - legal and commercial coordination across all project contracts
      - legal devices include: performance warranties (with consequences), deliver-and-pay, take-or-pay, LDs, FM, guarantees, indemnities and certainty of contract(!)
  - allocate risks to those stakeholders best able to manage or mitigate them
  - proven technology and designs
  - experienced, creditworthy participants
  - sound, commercial (pragmatic) structuring
Floating Liquefaction
Floating Liquefaction: Project Objectives

- Secure safe, reliable and economical use of LNG FPSOs on a long-term basis
  - Specifically to:
    - Manage vessel construction/conversion cost and risk
    - Manage capital commitment and cost
    - Maintain alignment with owner/operator
    - Manage vessel operating risk and cost
    - Ensure compliance with HSSE and other applicable laws
    - Maintain project flexibility

- So that the vessels are available for use as/when required and perform in accordance with their specifications

- Also remember the Golden Rules
Floating Liquefaction - Project Structures

- **Three primary project structures for LNG liquefaction projects:**
  
  - **Integrated Upstream Model**
    - Participants own gas supply and LNG FPSO, and market own LNG
  
  - **Merchant Model**
    - Project company that owns the LNG FPSO purchases natural gas from 3rd party and sells LNG to offtakers
  
  - **Tolling Model**
    - LNG FPSO owner does not take title to natural gas feedstock or LNG produced, but provides liquefaction, processing, storage and marine services
Floating Liquefaction - Integrated Model

Physical Assets
- Upstream Oil and Gas Assets
  - Gas
- LNG FPSO
  - LNG
- LNG Offtake

Ownership
- Gas Producers
- LNG Buyers

Leases/Licenses
- Joint Operating Agreement(s)
- EPC Contracts
- Joint Marketing Agreement
- LNG Sale and Purchase Agreement(s)
Floating Liquefaction - Integrated Model

- **Benefits:**
  - Alignment of interest throughout value chain
  - May have tax and accounting benefits (may be able to use early losses from LNG FPSO construction to offset revenues from natural gas or liquids production)
  - Promotes financeability by reducing cross-default risk
  - Each gas supplier may control its own marketing

- **Risks:**
  - Requires identical ownership of upstream and downstream assets
Floating Liquefaction - Project Model

**Physical Assets**
- Upstream Oil and Gas Assets
- LNG FPSO
- LNG Offtake

**Ownership**
- Gas Producers
- Project Company
- LNG Buyers

**Contracts**
- Lease/License/JOA
- Gas Sales Agreement(s)
- EPC Contract
- LNG Sale and Purchase Agreement(s)
Floating Liquefaction - Project Model

- **Benefits:**
  - Allows Project Co. to generate potentially higher returns based on value of LNG/gas price spread
  - Allows Project Co. sponsors greater control in sourcing gas and marketing LNG

- **Risks:**
  - Project Co. assumes market and counterparty default risks both upstream and downstream
  - Requires Project Co. to obtain finance for LNG FPSO based on LNG sales and project revenues
Floating Liquefaction - Tolling Model

**Physical Assets**
- Upstream Oil and Gas Assets
- LNG FPSO
- LNG Offtake

**Ownership**
- Gas Producers
- Tolling Company
- LNG Buyers

**Contracts**
- Leases/Licenses
- Joint Operating Agreement(s)
- EPC Contracts
- Liquefaction Tolling Agreement(s)
- LNG Sale and Purchase Agreement(s)
Floating Liquefaction - Tolling Model

**Benefits:**
- Avoid commodity price and marketing risks
- Allows flexibility in ownership -- does not require that all upstream parties be owners of LNG FPSO
- Reduced risk can help project financing of LNG FPSO, if the tolling customers have sufficient creditworthiness

**Risks:**
- Sponsors do not profit from LNG sales
- If the gas supplier (toller) is an affiliate of sponsor, security and cross-default issues can affect financing
Floating Liquefaction - Select Legal Issues

- Upstream issues that may impact structure

  - Will the cost (capex and opex) of LNG FPSO be cost recoverable under the relevant granting instrument?
  - Do local laws prohibit any aspect of the above project structures?
  - Will production allocations influence marketing strategies?
  - Where does title to the gas pass to stakeholders? Will title pass as LNG?
  - Are there any domestic supply obligations?
  - What is the basis for valuing production entitlement?
Floating Liquefaction - Select Legal Issues

- Construction issues

  - EPCIC contract – likely amalgam of FPSO and LNG EPC and shipbuilding concepts
  - Contract structure given relatively separate aspects of construction:
    - hull, topsides and tanks
    - overall contractual responsibility – avoiding “finger-pointing”
    - integration risk – construction, components and modules
  - Staged of completion and delivery process
  - Responsibility of contractor group – EPC IC
    - Testing procedures
    - Performance warranties
Floating Liquefaction - Select Legal Issues

- Operating issues
  - maintaining operating activities potentially far from land for 20+ years, where any operating failure potentially results in a shut-in

- Developing an operating strategy involves:
  - Aligning interest of all stakeholders (LNG value chain philosophy)
  - Careful allocation of risks among industry specialists
  - Reasonable and proportionate balance of risks and rewards
  - “partnering” risk and costs to manage the unknowns
  - Pragmatic KPI basis for reviewing activities
  - The golden rules
Floating Liquefaction: The Golden Rules

- The successful development and operation of any project is dependent upon the following:
  - alignment of interests across the value chain
  - allocate risks to those stakeholders best able to manage or mitigate them
  - proven technology and designs
  - experienced, creditworthy participants
  - sound, commercial (pragmatic) structuring
Thank You