Critical Success Factors for a FLNG Project

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Agenda

• Natural Gas and LNG

• Changes in the LNG Supply Chain

• FLNG – State of the Art / Risks

• Findings about the CSF for FLNGs so far

• The next step
Is there a future for Natural Gas?

• 8.7 Billion people by 2035

• China and India will grow 5.5 % (average) until 2035

• World’s GDP/capita estimated to increase 75%

• Demand for Natural Gas will grow 1.9 % / year

• Transportation using natural gas will grow 3% / year

Source: BP Energy Outlook 2035 Report, February 2015
Demand is real... What about the supply?

Global LNG demand

Global LNG supply

Source: BP Energy Outlook 2035 Report, February 2015
Evolution of LNG Global Trade

Liquified Natural Gas – what is it?

• Between 87% mol to 99% mol of methane (CH₄)

• The liquefaction process involves removal of certain components

• Condensed into a liquid at close to atmospheric pressure by cooling it to approximately −162 °C

• Takes up about 1/600th the volume of natural gas in the gaseous state
Why LNG?

- LNG industry has supplied markets without gas from places with gas without a market
- Safe
- Possibility of storage
- Environmental friendly
LNG Industry – essential ingredients

- Sufficient gas reserves
- Long term commitments
- Access to Capital
- Strong relationships amongst all stakeholders
- External advisers
- Government regulations

Ironically, this happens with the simplest hidrocarbon molecule!
The problem is…

• Many potential reservoirs, but…

  -> too small / too far

  -> onshore `no-go zones’
Furthermore...

- Other entrants in the market, i.e.
- Other substitutes, i.e.
Changes in the traditional LNG Supply Chain

Source: FLNG—DETERMINING THE TECHNICAL AND COMMERCIAL BOUNDARIES, KBR
FLNG – What is it?

Floating, Production, Liquefaction, Storage, Offloading…

… the possibility to monetize undeveloped or stranded gas fields
Why is this topic relevant?

Source: KPMG Global Energy Institute, ‘LNG report series 2014’
FLNG Technology potentially reduces...

- Cost
- Environment footprint

No need for

- long pipelines to shore;
- compression platforms to push the gas to shore;
- nearshore works such as dredging and jetty construction;
- onshore development such as building roads, laydown areas and accommodation facilities.
**FLNG Prelude** - The largest facility ever built

**Length - 488 meters**

**Breath - 74 meters**

220 000 m$^3$ of LNG

90 000 m$^3$ of LPG

126 000 m$^3$ of Condensate

Source: www.perthnow.com.au
The Prelude FLNG project

Source: Prelude Floating LNG Project, Draft Environmental Impact Statement
Gas Treatment and Liquefaction

Source: Mokhatab (2014)
Technical risks

- Safety Aspect on Space Constraints
- Technology Risk/Uncertainty
- Ship Motions
- Offshore LNG Offloading
- Hull
- Fluid Management
Commercial Risks

• Contractor and Fabrication Competence
• Project Execution
• Availability
• Oil and Gas Prices
Is the design extrapolation from…

• An FPSO
• Onshore LNG project

… a slight deviation

or

… a completely new application?
The Critical Success Factors for FLNGs so far…

Critical Success Factors

- Interface Management
- PM and PMT
- Stakeholders
- Scope of Work
- Regulatory Framework
- FEED Planning
- Cost Management and Finance
The next step...

• Interview with experts across the value chain
The question remains....

...what are the critical success factors in a FLNG project?

Source: www.rigzone.com
Thank you
References


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