Emerging Gas Utilisation Technologies

Possibilities and Barriers with Small-scale LNG

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Possibilities and Barriers

1. Possibilities:
   1. Healthy profits last couple of years, coupled with a suppliers market with surplus capacity.
   2. Technology available for a range of conceptual cases.
   3. Commercial feasibility

2. “Barriers”:
   1. Contracting strategy
   2. Global flare and venting data.
1 ton/ day test plant
(365 tons/year)

• Fully instrumented
• Liquefaction of methane in a closed circuit
• Production: 1 ton LNG/day
• In operation since October 2003
• Long term test during autumn 2004 successful with 2 months of continuous 24-7 fully automated operation
15 tons/ day containerized
(5,500 tons/ year)

2008
21 000 tons/year - 2003
44 000 tons/year - 2006

20 gas trials completed so far…….

Development of dynamic simulator
Hamworthy supervision during installation
N2 cold test in all yards on 1st vessels
MC activities
- Successful reliquefaction during 1st start
- Stable reliquefaction for all operational modes typical after 9 days
Training of crew by Hamworthy and our personell present on maiden voyages
84 000 tons/year - 2007
Floating LNG Production

Modularized and configurable FLNG systems, typically 1.0 MMTPA production/ train

Offloading, power generation, process control, accommodation etc

Liquefaction Modules, typically 20-60 tons LNG /hour each

Gas reception via riser/swivel

Cargo machinery / electrical room

Gas pre-treatment plant incl filtration, pressure regulation, sweetening, dehydration etc
Contracting Strategy

- Drive from operators for EPCIC contracts
- Technology providers often do not have the balance sheet to take on such commercial exposure.
- Subcontracting perceived as IPR- and general business risk.

- Opportunity: Review contracting strategies to enable use of new technology
Not one universal FIX!
Summary

• Where there’s a will, there’s a way!
• Think big, but
• Start small, and evolve!
• Small scale LNG technology available
• Commercially feasible
• No show stoppers