Golar LNG

Delivering the World’s First
Floating Storage and Regasification Units

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Golar LNG Energy

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Regas trains with HIPPS and Gas Metering
New Lower Pressure In-Tank Pumps
LNG Loading Arms
Mooring System
Turbo Generators
Seawater Pumps
High Pressure Gas Manifolds

Floating Storage and Regasification – The Building Blocks

Source: Golar LNG

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Floating Storage and Regasification – The Building Blocks

Source: Golar LNG
Golar Spirit – World's First FSRU - Pecem, Brazil
Golar Winter – World’s Second FSRU – Guanabara Bay, Brazil
In 2004, potential LNG Floating LNG storage and regasification projects were a new concept…
...but by 2009, 7 projects were operational, a further 4 had been formally sanctioned, and many more had been proposed.
Economic, accepted, and flexible: the business case for floating storage and regasification is compelling

- Low cost / fast start-up
- Rapid access to high value gas markets
- Interim solution

- Proven / improved technology
- Accepted / promoted by Oil Majors
- Avoids local opposition (NIMBY)

- Seasonal / intermittent markets
- Can be relocated
- Possible flexibility as LNGC and/or FSRU at other location

Source: Golar LNG

Floating Regas – Economic, Accepted, and Flexible
LNG importers are seriously considering floating storage and regasification as an import solution

- A solution in 2 years rather than 3 to 5 years from FID
- Less risk of delays related to land acquisition
- Reduced challenges with permitting
- More difficult in the current world economy to obtain extra funding (~$200-300M USD)
- FSRU Owner responsible for operations
- Industry estimates suggest FSRU terminal up to ~50%-75% less expensive
- Recent 3 MTA onshore Singapore Terminal estimated to cost $750M to $1 Billion USD\(^{(1)}\)

Source: Golar LNG

\(^{(1)}\) Wood Mackenzie / Reuters
75% of global GDP is OECD but decreasing as the emerging and transitional countries increase their share

Non-OECD LNG Demand is no exception to this trend…
The number of LNG importing countries is forecast to grow rapidly, with many of the new importers being Non-OECD.

In 2009, there were 22 countries importing LNG, this is expected to increase to 42 by 2020.

In 2009, Non-OECD members accounted for 13% of Global LNG demand. This is forecast to increase to over 22% in 2020.

Non-OECD countries increasing LNG demand and faster than OECD.
Of the 20 future LNG importing countries, 14 are non OECD, 10 of which have already committed to, or are planning, floating solutions.
The characteristics of FSRU projects make them well suited to both OECD and non OECD countries

- A more cost effective way to meet low demand or to ‘grow into’ LNG
- Can be relocated if demand is not sustainable over the long-term
- Reduced financing requirement; no need to build storage tank
- More suitable to less stable environments; Can mitigate security concerns
- Quicker to develop than land based facilities
  - This can be beneficial where a short to medium term opportunity exists
  - This may be particularly beneficial in this environment where surplus supply exists
- Can support LNG trading strategies – low cost option to access a market

Source: Wood Mackenzie / Golar LNG

Floating regasification – Strong fit in developing markets
FSRU projects to date have been focused on tailoring converted LNGC to customer requirement

- Moss Containment
- 5.0 bcm / year
- Offshore
- Side by side LNG transfer
- Gas risers to subsea pipeline
- Open Loop

Petrobras – Pecem (Golar Spirit)
- Moss Containment
- 2.5 bcm / year
- Near Shore (Existing Pier)
- Over jetty LNG transfer
- HP arms on pier
- Closed Loop

Petrobras – Rio (Golar Winter)
- Membrane Containment
- 5.1 bcm / year
- Near Shore (New Pier)
- Over jetty LNG transfer
- HP arms on jetty
- Open / Closed Loop

OLT-O – Livorno (Golar Frost)

DUSUP – Jebel Ali (Golar Freeze)
- Moss Containment
- 4.0 bcm / year
- Near Shore (New Pier)
- Side by side LNG transfer
- HP arms on jetty
- Open Loop

Client Defined- No such thing as a generic FSRU

Source: Golar LNG
• **A Clear Mandate / Strong Support Base**
  – Clear project drivers / Support of government and/or strong energy partner

• **Project Functional Requirements Definition**
  – Regas Rate / Vaporization / Storage / Availability / Permitting / Emissions

• **Siting of Vessel**
  – Infrastructure requirements / Environmental conditions (including sea state, wind, etc)

• **Full Chain Project Development Capability**
  – Scope may include LNG Sourcing + FSRU + Downstream Infrastructure + Gas Sales

• **The Gas Offtaker – Establishes Foundation**
  – Sets ‘bearable LNG price’ / Normally key to successful project financing

**Source:** Golar LNG

FSRU – Simple in Principle – Complex in Execution
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FSRU Provider – Simple in Principle – Complex in Execution
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The only company to deliver a floating regas projects based on converting an LNGC

- Spirit – operating; Winter – operating; Freeze – conversion
- Dubai Government selected Golar for sole source award
- Track record of delivering projects on time (~ 20 to 24 months from FID)
- Golar approach based on tailoring solution to the customer requirements
- Accepted solutions: Class Society; Banks; Petrobras; Shell
- Full chain participant: Liquefaction; Shipping; FSRUs
- Supported by Fredriksen Group: financial capability; partners; technology; speed
Our success in FSRUs has helped provide a platform for growth for our longer term ambitions as a midstream LNG player. A restructure improves focus/execution.

- 2 LNG carriers and 3 FSRU units on long term charter
- Fwd revenues of $1.9 billion
- Limited Capital Expenditures
- High dividend capacity

Golar restructured to create a strong platform for future growth.
Golar LNG Energy and partners have made material progress on the world’s first coal bed methane based LNG project

- LNG Ltd.; Golar LNG Energy, and Arrow Energy JV
- Land based liquefaction at Fisherman’s Landing, Gladstone, Queensland, Australia
- Small scaleable LNG plant (~1.5 MTA) provides fast start up and low capex
- Significant expansion opportunities; first mover advantage in prime location
- Gas supply HOA with Arrow – 12 years’ at full capacity
- Golar LNG Energy HOA for 100% of LNG offtake - HOA signed with Toyota
- Two LNG carriers for transportation

Source: Golar LNG
Implementing the Midstream Strategy

GLADSTONE LNG PROJECT
FISHERMAN'S LANDING

Source: Golar LNG / Copyright LNG Ltd
Golar LNG Energy is progressing plans in Floating LNG production (FLNG) to capture value of underdeveloped and stranded gas reserves

- JV with Thailand’s PTT Exploration and Production
- Global cooperation on FLNG / Share risk and reward
- PTTEP acquired Coogee Resources in Q1 2009 with gas fields off NW Australia
- Joint Study agreement (FEED) and HOA signed
- Circa 1 mtpa – 1.5 mtpa

Source: Golar LNG
Thank You
### Small Scale Liquefaction - Access to Molecules provides further upside

**Source:** Golar LNG

<table>
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<th>Ship</th>
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Intention to exercise option to acquire Golar Freeze from Golar LNG Energy after conversion.

Options | Spot | Yard Conversion | Held for Conversion

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*Source: Golar LNG*