# **Liquefied Natural Gas Limited**



## **COMPANY UPDATE** 7 OCTOBER 2013



### **Corporate Overview**



#### **Corporate Profile**

ASX Code	LNG.AU
Shares on Issue	311 million
Share Price (7 Oct 13)	\$0.26
Market Capitalisation	\$81 million
Cash (7 Oct 13)	\$8.4 million
	Directors: 6.9%
	HQC*: 17.3%
Key Shareholders	Copulos Group: 8.3%
	Top 20: 55.5%
	*(CNPC Technology & EPC arm)

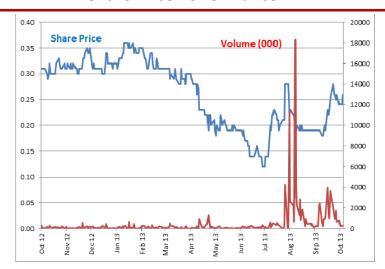
#### Asset Portfolio (100%)

Magnolia LNG USA (Louisiana, USA)	Under development Pre-filing (FERC)	
Fisherman's Landing LNG (Gladstone, Australia)	On hold pending gas supply	
OSMR® LNG liquefaction Process	Patent applications for OSMR® and Boil-off gas handling already granted in many jurisdictions	

#### **Board & Management**

Richard Beresford	Chairman
Maurice Brand	Managing Director & Joint CEO
Yao Guihua	Executive Director & Joint CEO
Leeanne Bond	Non-executive Director
Zhang Gaowu	Non-executive Director
Paul Bridgwood	Executive Director & CTO
Norman Marshall	Executive Director & CFO

#### **Share Price Performance**



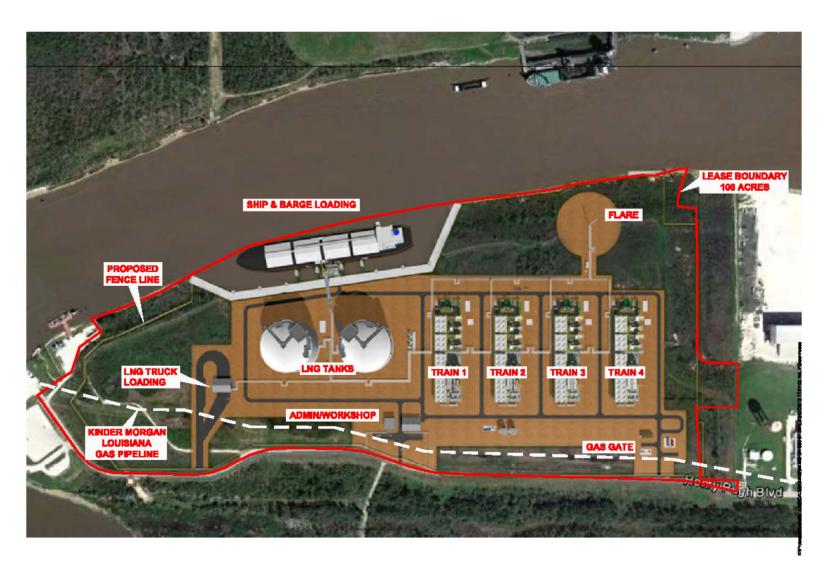
### **Investment Highlights**



Early mover advantage	<ul> <li>Magnolia LNG (MNLG) strategically located in Louisiana USA for exposure to dynamic export LNG sector.</li> <li>US government support for export LNG demonstrated with recent DOE approvals for 3 projects.</li> </ul>
on dynamic US Export LNG	<ul> <li>US is set to become a dominant LNG export country due to its significant uncommitted gas resource and extensive integrated gas pipeline network.</li> </ul>
	► MNLG has targeted to be in the top 5 LNG export projects .
Low risk path to development	► Availability of US gas abundant based on forecast gas production reaching 25 tcf by 2020.
	▶ Direct access to Kinder Morgan pipeline onsite and 11 major gas transport corridors to facilitate supply.
	▶ DOE approval received for FTA export up to 4mtpa with strong significant regional community and government support received.
	▶ Transfer of engineering IP from Gladstone creates credibility and saved significant time and cost.
Magnolia LNG fast tracked for robust FID	► Project site secured for 70yrs suitable for 8mtpa (vs base case of 4mtpa).
	▶ FERC Pre-filing granted in March 2013 supports timetable for FID mid 2015.
	► Tolling agreements underway for first two trains to underwrite base case (Gunvor & Gas Natural).
	► Strategic alliance with Stonepeak Partners LP for 100% of project construction equity (US\$660 million).
	▶ 4mtpa name plate capacity generates EBITDA of circa US\$380 million pa for 20yrs.
Fisherman's Landing	► Gas supply potential either through PetroChina Australia letter of Intent or directly under Gas Sales Agreements /Tolling Agreements with third parties.
provides optionality	<ul> <li>Upside for LNG through gas supply agreement secured or monetisation of the project.</li> </ul>
	► Low cost and highly efficient LNG process technology in its Magnolia LNG Project and Fisherman's
OSMR® LNG Process Technology (100%)	Landing LNG Project.
	<ul><li>Opportunities to licence the technology (for a Licence Fee) to third party LNG projects.</li></ul>

### **Magnolia LNG Project Layout**





**Final Layout Pending Approvals** 

### **Magnolia LNG Progress**



February	US DOE authorized 4 mtpa export to US FTA countries		
March	Exclusive Site Lease Option Agreement signed with the Lake Charles Harbour and Terminal District Authority (70 year lease term)		
March	FERC approved Pre-filing review process		
July	2mtpa Tolling Term sheet signed with Gunvor		
July	Strong support from state and federal legislators, governmental and business agencies and the local community		
July	Term Sheet signed with Stonepeak for strategic project development alliance and Stonepeak to provide project construction equity finance.		
August	Tolling HoA signed with GNF for up to 2mtpa		
August	Capital raised of A\$8.6m		

### Magnolia LNG Site Description

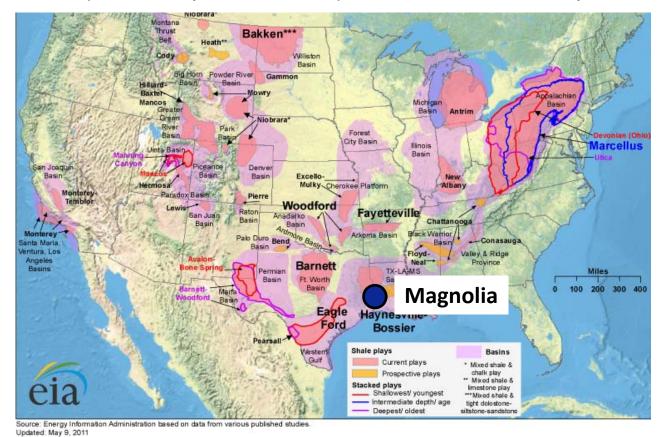


- The 108 acre site is PLC Tract 475 Industrial Canal off the Calcasieu Shipping Channel and opposite existing Trunkline LNG Import Terminal.
  - The site is accessible by road/waterway.
  - Major fabrication facilities nearby.
- The Project site is well positioned to provide access for the loading of LNG onto:
  - LNG Ships for export, which have access to deep water via the main channel and industrial canal.
  - LNG Barges for marine distribution to mini-LNG refuelling stations.
  - LNG Trucks for potential road distribution to LNG refuelling stations within Louisiana and other surrounding US states.
- Legally binding Option to Lease secured. Term of lease up to 70 years.
- ▶ The site is located within 3 miles of three major underutilized pipelines.
- Under-utilized Kinder Morgan Louisiana Gas Pipeline located on site.
- ▶ No environmental, community, construction or operational issues known.

### **Gas Supply and Shale Gas Production**



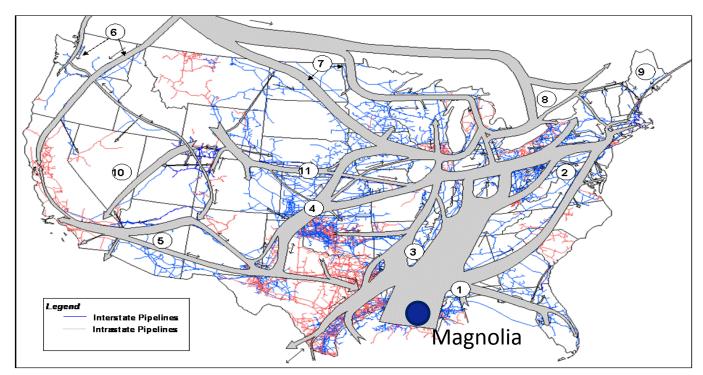
- Shale gas gas trapped within shale formations (fine-grained sedimentary rocks containing rich sources of petroleum and gas.
- US Energy Information Administration, in June 2013, identified several shale gas plays ~665 trillion cubic feet (tcf).
- ▶ MLNG requires 0.1 tcf/year for each 2mtpa LNG train or 2 tcf over 20 years.



### Major Gas Corridors will supply Magnolia LNG



- ▶ 11 major transportation gas "corridors" (illustrated below) mitigates infrastructure risks.
- Government and Industry installed capacity for the quantities of LNG that were expected to be imported into the US Gulf region.
- Kinder Morgan Louisiana Gas Pipeline located on the Magnolia LNG site.



Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, GasTran Gas Transportation Information System.

The EIA has determined that the informational map displays here do not raise security concerns, based on the application of the Federal Geographic Data Committee's Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns.

### **Permits and Approvals: Defined Process**

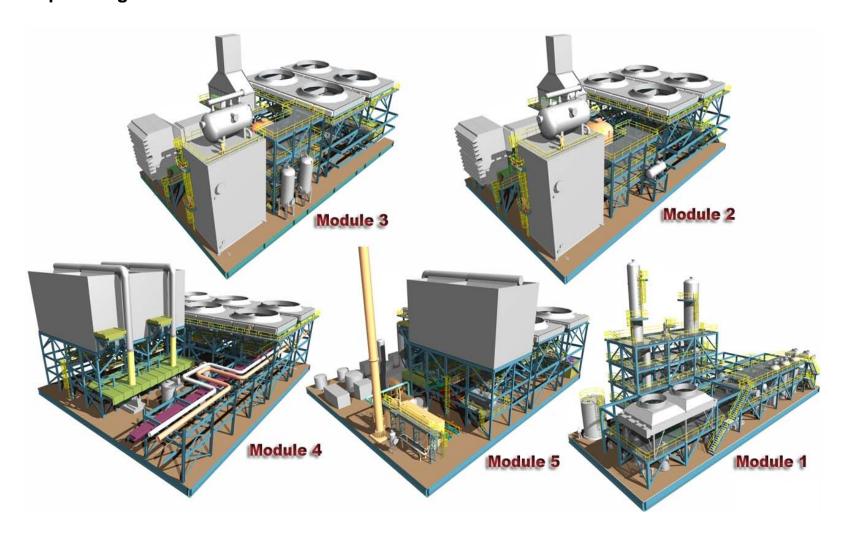


- Five main Federal agencies that regulate LNG Projects in the USA :
  - US Dept of Energy (DOE) authorization received in February 2013 for up to 4 mtpa to Free Trade Agreement (FTA) countries for 25 years
  - 2. Federal Energy Regulatory Commission (FERC) pre-filing granted in March 2013
    - Authorization from FERC for the construction and operation of the facility, and includes a comprehensive analysis of the environmental, operational and safety implications of the Project
    - Air Quality Permit, issued by the Louisiana Department of Environmental Quality, as detailed under the Clean Air Act
  - US Dept of Transportation (DOT) in progress
  - 4. US Coast Guard (USCG) in progress
    - Permit from US Army Corps of Engineers for discharge of dredged and fill material, under the Clean Water Act
  - 5. Maritime Administration (MARAD) of DOT in progress
    - Certification of compliance with the water quality standards (Clean Water Act)
    - A Coastal Use Permit issued by the Louisiana Department of Natural Resources

### **Modular LNG Plant: 2mtpa LNG train**



Based on detailed FEED completed for Gladstone LNG Project enabled fast-track to FERC pre-filing.



### **Gunvor - Tolling Term Sheet Signed**



- Parties to the Term Sheet: Magnolia LNG, LLC (MLNG) and Brightshore Overseas Ltd (Brightshore), an affiliate of Gunvor Group.
  - Firm LNG production capacity of 1.7 million tonnes per annum (mtpa), plus 0.3 mtpa of interruptible capacity, in total being equivalent to one LNG train.
  - Brightshore shall be responsible to deliver gas, including gas usage for the LNG plant, at its own expense.
  - Brightshore responsible for LNG marketing and provision of LNG ships.
- The Parties agree to work together with the intention to agree a legally binding Tolling Agreement. Key terms include:
  - 20 year term, plus a five year extension option at Brightshore's election.
  - US\$3.7 billion in Fixed Monthly Capacity payments to MLNG over the 20 year term.
  - Fixed and Variable Monthly Operating and Maintenance payments to MLNG US-inflation adjusted.
  - Fixed Monthly Bonus Capacity Fee payable to MLNG if DOE approval for countries with no-US Free Trade Agreement.
  - Brightshore foundation customer preferential rights.

### **Gunvor – LNG supply to Panama**



- Panama is a US Free Trade Agreement (FTA) Country with a LNG receiving terminal scheduled for start up in 2017.
- Gunvor has signed a HoA with LNG Group Panama as the aggregator and supplier of LNG.



### **Gunvor – Global Energy Player**



- One of the world's largest independent commodities trading houses by turnover.
- Principal commodities refined petroleum products (fuel oil, gasoil, gasoline, naphtha, and LPG), crude oil, coal, natural gas, LNG, biofuels, carbon emissions and grains.
- Strategic investments refineries, pipelines, storage, terminals and coal mining.

#### Key Financials (2012)

EBITDA: USD 575 million

• Earnings: USD 433 million

Volume: 130 million tons

Turnover: USD 93 billion

#### Key Metrics

- Sources crude oil from 35 countries
- > 1,600 employees worldwide
- > 60 global banking partners
- ~2.5 million barrels traded per day

#### Relevance to Panama...an FTA country:

- Gunvor HoA with LNG Group Panama as the aggregator and supplier of LNG to the first land based LNG terminal to be constructed in Panama - scheduled for start-up in 2017.
- Gunvor ownership ~17 percent of Petroterminal de Panama oil pipeline and Pacific and Atlantic coasts oil storage facilities (600,000 barrels per day).

### Gas Natural SDG, S.A. – Heads of Agreement



- Gas Natural SDG, S.A. part of the Gas Natural Fenosa Group (GNF)
  - Firm LNG production capacity of up to 1.7 million tonnes per annum (mtpa), plus interruptible capacity.
  - GNF shall be responsible to deliver gas, including gas usage for the LNG plant, at its own expense.
  - GNF shall be responsible for LNG marketing and provision of ships
- ▶ GNF leading multinational group in the energy sector (gas and electricity integration) with a presence in more than 25 countries and more than 20 million customers.
  - GNF has a natural gas and LNG supply portfolio of around 30 billion cubic metres and a fleet of LNG tankers.
  - Major global LNG operator in the Atlantic basin and the Mediterranean.
  - GNF has a stake in three regasification plants, two liquefaction plants and has a regasification terminal development project in Italy.
  - GNF is a foundation LNG buyer of the Sabine Pass LNG Export Project, also based in Louisiana, USA comprises four LNG trains with planned aggregate production capacity ~18mtpa.

# **Project Development Cooperation and Equity Term**Sheet Signed



- Stonepeak and MLNG to form a strategic alliance dedicated to the development, construction and operation of the MLNG Project.
- Stonepeak will to provide 100% of the MLNG Project equity finance from financial close estimated at ~ US\$660 million.
- ▶ The estimated capital cost of the initial development remains at US\$2,200 million.
- ► Financing Plan 70% Project debt financing and 30% Project equity financing by Stonepeak.
  - Success fee of 3% (~US\$66 million) of the total capital cost to LNGL at financial close.
  - Stonepeak will assist MLNG to secure long term Project debt financing (~US\$1,540 million) and to ensure that all material project agreements/documents are bankable.
  - Stonepeak to appoint one manager to the Board of Magnolia LNG, LLC no voting rights prior to financial close/commencement of Stonepeak's Project equity financing contribution.
- Definitive Agreements to be executed in October 2013.

#### **Stonepeak – Credentials for infrastructure investment**



- Stonepeak Infrastructure Partners invests in North American infrastructure assets with stable cash flows, inflation linkage, and high barriers to entry.
- Stonepeak manages capital on behalf of pension funds, insurance companies both in the US and internationally.
- Founding partners, Michael Dorrell and Trent Vichie, have a combined thirty years of infrastructure investing experience.
- ▶ Together they have invested over US\$2 billion of equity into North American infrastructure investments and formerly led the Blackstone Group (from 2008) infrastructure division prior to forming Stonepeak in 2011.
- Stonepeak manages over US\$1.2 billion of equity and has a strategic relationship with Teachers Insurance and Annuity Association – College Retirement Equities Fund (TIAA)\* in infrastructure projects.

<sup>\*</sup>TIAA had total assets under management of US\$520 billion as at 31 March 2013. In addition to TIAA, Stonepeak has a history of co-investing with its limited partners.

### Magnolia LNG – Robust Financial Returns



Key financial model assumptions for base case:

2 x 2.0 mtpa LNG Trains

4.0 mtpa nameplate LNG production capacity

3.4 mtpa guaranteed LNG sales volumes

**Development Costs of US\$30 million to Final Investment Decision** 

**Capital Cost of US\$2.2 billion** 

EBITDA: US\$ 380 million per annum for 20 years on 100% LNGL ownership

### **Milestones for 2013**



Q3 2013	Equity Funding Plan	
	Additional Tolling HoA for up to 2 mtpa	
Q4 2013	Submit application for US Export to non-FTA countries	
	Execute definitive project equity agreements	
	Advise Tolling HoA's for additional capacity	
	Select preferred EPC Contractor	
	Target Gunvor legally binding definitive Tolling Agreement	
	Permit pre-filing application to Federal Energy Regulatory Commission (FERC) to request formal filing in 2014	

### **Gladstone LNG Project Site**





### Fisherman's Landing: Path Forward



#### Gas Supply

- LNG Limited's major focus remains to secure adequate gas supply for the first LNG Train either through the PetroChina Australia Letter of Intent and/or directly under Gas Sale Agreements/Tolling Agreements with third parties.
- LNG Limited, in its own right, is continuing to directly pursue other potential gas supply sources.

#### Lease Agreement

Secured until 30 June 2014 with Gladstone Ports Corporation

#### EPC Contract with HQC

 Draft fixed price Engineering, Procurement and Construction (EPC) contract on hold pending gas supply



## **Appendices**

### Features of OSMR® LNG Technology



### Aero Derivative Gas Turbines Efficient Compressors

- ✓ Better fuel efficiency compared to Industrial Turbines.
- √ Higher reliability and availability.
- √Smaller foot print and weight.
- ✓ No gear box, no helper motor, singlestage (no inter-stage cooler/scrubber).
- ✓ Compact modular design reduces installation and commissioning time and ensures ease of maintenance.

Aero-Derivative
Gas Turbines
&
Efficient
Compressors

Combined Heat and Power (CHP) Technology

#### **Ammonia Refrigeration Plant**

- ✓ Driven by Steam Turbines from Waste heat powered CHP plant.
- ✓ Pre-cools single mixed refrigerant and feed gas streams to increase LNG production by 20%.
- ✓ Direct Cooling of GT inlet air to improve GT power output by 15%.

#### **Combined Heat and Power Plant**

- √Waste heat recovery using Once Through Steam Generators from Gas Turbine exhausts.
- ✓ Steam Turbine drivers for Ammonia Refrigeration Compressors.
- ✓ Steam Turbine driven power generation.
- ✓ Process Steam used for heating smaller heaters.
- ✓ Auxiliary boiler for startup also uses N2 rich end flash gas as fuel.

#### Why Ammonia?

**Ammonia** 

Auxiliary Refrigeration

- ✓ Ammonia is a commonly used industrial refrigerant.
- ✓ Superior refrigerant properties allow smaller air-cooled condensers, exchangers and plant size.
- ✓ Smaller overall plant foot print compared to a Propane system.

#### **OSMR®** vs Conventional LNG Plants



	APCI – C3/MR	CoP- Cascade	OSMR
Train Size (mtpa)	4.1	3.9	1.9
Refrigeration Power  •Gas Turbine (x Nos)  •Steam Turbine (x Nos)	85 MW Frame 7 (x2) n/a	32 MW LM2500 (x6) n/a	32 MW LM2500 (x2) 8 MW (x2)
Plant Power Generators  •Installed •Running	Gas Turbine Driven 70 MW 30 MW	Gas Turbine Driven 30 MW 25 MW	Steam Turbine Driven 8 MW 6 MW
Plant Fuel Usage (% of Feed Gas)	9-11 %	8-9 %	6%
Heat Exchanger Types  •Pre-cooling (x Nos)  •Main Cooling (x Nos)	C3 Tube in Kettle (x3) MR Spiral Wound (x1)	Brazed Aluminum C3 Core-in-Kettle (x2) C2, C1 Cold Box (2+2)	Brazed Aluminum NH3 Core-in-Kettle (x2) MR Cold Box (x2)
CAPEX (\$/tpa)	1000-1200	1000-1200	500-600

- LNGL's OSMR® process provides an alternative which is simple, efficient, low cost and uses proven conventional technologies
- ▶ Smaller Train sizes allows easy modularization and economic project development

### **OSMR®** Technology Reviews/Reports



#### Market the OSMR® LNG liquefaction Process

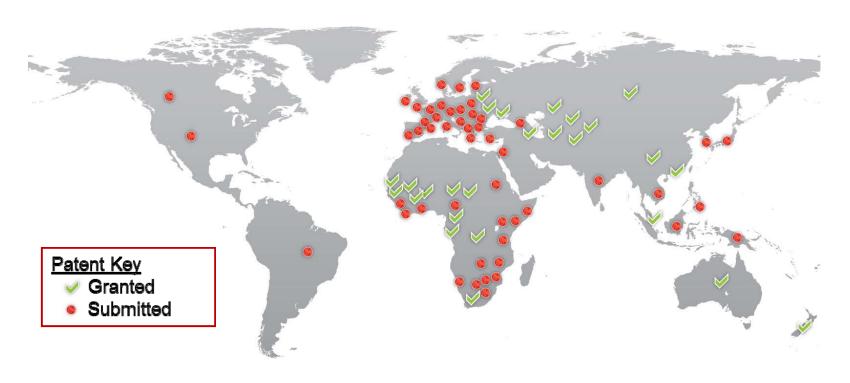
- ~ 50% Lower capital cost
- ~30% Improved energy efficiency
- ~ 25% Shorter development and construction schedule
- ~ 30% Lower carbon emissions
- Patent applications for OSMR® and Boil-off gas handling already granted in many jurisdictions

#### ▶ Recognised Independent Engineer's Technology Reviews/Reports include:

- LNG Industry Article (March 2010)
- Foster Wheeler Gladstone LNG OSMR Study Report (June 2009)
- CHIV Evaluation of OSMR LNG Process (October 2008)
- Arrow-WP Interim Review of Fisherman's Landing LNG Plant (December 2009)
- Evaluation Report of LNGL's OSMR Gas Processing and Liquefaction Technology I. Aoki
- SKEC Evaluation of the OSMR Process for Gladstone (June 2009)
- Technical Review Group (TRG) Final Report (August 2009)

# OSMR® Process Technology Patent Application Submitted / Granted





#### **Patents Granted**

OSMR® Process patents have been granted in Australia, China, OAPI, Eurasia, Hong Kong, New Zealand, Singapore, South Africa and Ukraine;

BOG Treatment Process patents have been granted in China, OAPI, Eurasia, Hong Kong, New Zealand, Singapore, South Africa and Ukraine.

### **MNLNG Proximity to Trunkline LNG Terminal**





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#### **Australia and All Jurisdictions**

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#### **Our Logo:**

We chose the red ant as our logo because it is distinctive and bold and represents strength, energy, hard work and perseverance – characteristics we aim to make trademarks of our corporate culture.