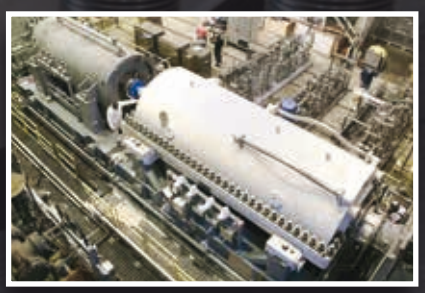
LNG INDUSTRY

September 2014



FMC Technologies invented the first offshore LNG loading technology. Today we are developing new solutions built on proven components. Our Articulated Tandem Offshore Loader (ATOL) safely performs high-velocity LNG transfers in severe conditions with waves up to 18 feet (5.5 meters). Our Offshore Loading Arm Footless (OLAF) side by side transfer solution accommodates massive new FLNG freeboards in the range of 82 feet (25 meters). And for tomorrow? We're practically there already.

www.fmctechnologies.com

FMC Technologies

We put you first.
And keep you ahead.

ISSN 1747-1826

CONTENTS

SEPTEMBER 2014

ON THIS MONTH'S COVER

Elliott Group has a long heritage of supplying large, efficient refrigeration compressors for LNG service worldwide.

LNG Industry is audited by the Audit Bureau of Circulations (ABC).
An audit certificate is available on request from our sales department.

BRONSWERK®
HEAT TRANSFER
Dynamic Heat Exchange Solutions

High Efficiency Cooling

More Power, less Energy

With the Whizz-Wheel®:

- Reduced energy consumption (up to 50%)
- Reduced plot space (up to 30%)
- 4-6 dB(A) reduced noise
- ROI time: 2 to 3 years
- Smaller installations; less material, weight and costs.

bronswerk.com

THE e ELEMENT

For us to be able to continue living on our planet "Earth", considerate use of our resources is essential. Bronswerk therefore strives for sustainable energy-efficient solutions. These solutions involve the most sustainable use of energy and material possible. Because every kilogram of material saved, means less harm to the planet, less energy in its production and therefore reduced CO_2 emission. We achieve this by actively innovating and through intensive research programs. The Whizz-Wheel® fan is the break-through development and ultimate connection between costs, materials, noise and energy.

CALLUM O'REILLY EDITOR

COMMENT

This month, the Scottish public will take to polling stations to vote on whether or not Scotland should become an independent country. In recent weeks, the 'Yes Scotland' campaign, led by Scotland's First Minister Alex Salmond, has gone head to head with the 'Better Together' campaign in an attempt to sway Scots before the 18 September vote.

The prospect of Scotland leaving the UK immediately conjures up a number of important questions. What would happen to the famous Union Flag? Would the EU have a new member? Would Scotland keep the pound?

Another key issue that would need to be addressed should Scotland vote 'Yes' to independence concerns North Sea oil and gas revenues.

Using the 'median line' principle, approximately 90% of the UK's oil and gas reserves would belong to an independent Scotland. And this, the 'Yes' campaign argues, is one of the key reasons why Scotland would prosper as an independent country. Scottish ministers have hailed Aberdeen as 'Europe's oil and gas capital', arguing that independence would allow Scotland to emulate the success that Norway has had with its energy reserves.

However, there is still uncertainty regarding how exactly North Sea oil and gas revenues would be allocated in the event of Scottish independence. A 'Yes' vote would likely result in a major tussle between Scotland and the rest of the UK over ownership of oil and gas from the North Sea.

Away from the British Isles, the significance of maritime border disputes can be seen the world over. One such conflict is highlighted in a Special Report from risk mitigation company AKE Ltd, prepared exclusively for LNGIndustry.com. AKE's Asia Pacific Specialist, George Martin, studies the long-term battle for maritime supremacy in the East and South China Seas between China, Japan and other countries in the region. The disputes centre on two key issues that are significant for the natural gas industry. Firstly, the potential hydrocarbon reserves under the seas – although the complex nature of the boundary disputes makes potential exploration in the region incredibly difficult. The second and more important reason for the seas' significance, according to Martin, "stems from their use as key shipping lanes for the regional powers' energy imports". As China and Japan battle to ensure their energy security, Martin suggests that control of the seas could be used by one country to prevent or delay energy shipments to another: "a new maritime 'great game' is on the cards [...] with natural gas supplies at the same time a potential prize, strategic tool and victim".

Returning to the Scottish referendum debate in the UK, similar 'games' are already underway, with both sides bickering over how much oil and gas is left in Scottish waters. The 'Better Together' campaign points to shrinking reserves – and a recent fall in revenues – as evidence that an independent Scotland would be overly dependent on this volatile and declining resource. In contrast, the pro-independence campaign is resolute that its oil must be seen as a blessing, not a curse.

It is now down to the Scottish public to show their hand. However, regardless of the outcome of the referendum, it looks certain that the political games between Scotland and the rest of the UK are set to continue for some time yet.

Without nailing our political colours to the mast on this particular debate, it's certainly true that some things in life are simply 'better together'. That's why *LNG Industry* is proud to be associated with Energy Global – home of the latest news and analysis covering the entire oil and gas industry. If you are interested in reading more about the potential implications of Scottish independence for the UK energy industry, keep your eyes on www.energyglobal.com over the coming weeks. And while you are there, you can also sign up for a free trial of our sister publications covering the global upstream (*Oilfield Technology*), downstream (*Hydrocarbon Engineering*) and pipeline industries (*World Pipelines*). **LNG**

Managing Editor
James Little
james.little@lngindustry.com

Editor
Callum O'Reilly
callum.oreilly@lngindustry.com

Editorial Assistant
Ted Monroe
ted.monroe@lngindustry.com

Advertisement Director
Rod Hardy
rod.hardy@lngindustry.com

Advertisement Manager
John Baughen
john.baughen@lngindustry.com

Production
Stephen North
stephen.north@lngindustry.com

Website Manager
Tom Fullerton
tom.fullerton@lngindustry.com

Website Editor
Callum O'Reilly
callum.oreilly@lngindustry.com

Digital Editorial Assistant
Katie Woodward
katie.woodward@lngindustry.com

Circulation Manager
Victoria McConnell
victoria.mcconnell@lngindustry.com

Subscriptions
Laura Cowell
laura.cowell@lngindustry.com

Office Administrator
Jo Repton
jo.repton@lngindustry.com

Publisher Nigel Hardy

LNG Industry Subscription rates:
Annual subscription: £50 UK including postage
£60/€85 overseas (postage airmail)
US$ 85 USA/Canada (postage airmail).
Two year discounted rate: £80 UK including postage
£96/€136 overseas (postage airmail)
US$ 136 USA/Canada (postage airmail).

Subscription claims:
Claims for non receipt of issues must be made within 3 months of publication of the issue or they will not be honoured without charge.

Applicable only to USA & Canada.

LNG Industry (ISSN No: 1747-1826, USPS No: 006-760) is published nine times per year: February, March, April, May, June, August, Septemer, October and December, by Palladian Publications Ltd, GBR and distributed in the USA by Asendia USA, 17B S Middlesex Ave, Monroe NJ 08831. Periodicals postage paid New Brunswick, NJ and additional mailing offices. POSTMASTER: send address changes to LNG Industry, 701C Ashland Ave, Folcroft PA 19032.

Uncaptioned Images courtesy of www.bigstockphoto.com

Editorial/Advertisement Offices, Palladian Publications Ltd, 15 South Street, Farnham, Surrey, GU9 7QU, ENGLAND,
Tel: +44 (0) 1252 718 999 Fax: +44 (0) 1252 718 992 Website: www.lngindustry.com

3RD ANNUAL

GAS
GAS ASIA SUMMIT

Conference and Workshop
Marina Bay Sands | Singapore
28 – 30 October 2014

A GASTECH REGIONAL EVENT

PART OF THE SIEW
SINGAPORE INTERNATIONAL ENERGY WEEK

Multilateral Cooperation to Connect Gas Markets

Tuesday 28 October

- Workshop: The Changing Asian LNG Market

Wednesday 29 October

- Keynote Addresses: Ministry of Trade & Industry, Republic of Singapore & Pavilion Energy Pte Ltd
- Energy Mix: What Role Does Gas Play in Energy Security?
- Panel: Gas Trade in Asia
- Unlocking Gas Demand in Liquid Fuel/Coal Dominated Markets
- New Supply Markets: An Overview of New Supply Players and How New Volume will Change Dynamics in Asia

Thursday 30 October

- Keynote Address: US Shale Gas Impact on Japan's LNG Dynamic of Supplies
- The Expected Rise of Import Volumes Required to Sustain Growth for Fast Growing Economies: Strategy and Opportunity
- Gas and LNG as an Alternative Resource for Power Generation
- Innovation and Technology Impacting LNG Markets
- Panel: Asia as a LNG Trading Hub

Hear from leading industry experts including:

Hiroki Sato, General Manager of Fuels Department, Head of Trading Business, **Chubu Electric Power Co., Inc**

Ken Koyama, Managing Director, Chief Economist, Charge of Strategy Research Unit, **Institute of Energy Economics, Japan (IEEJ)**

Naoyuki Takezawa, Project Manager, Mozambique LNG Project, **JGC Corporation, Ltd**

Nicolas Zanen, Vice President, Trading, **Cheniere Energy**

Mark Abbotsford, Country Manager, LNG Trading and Shipping, **Woodside Energy**

Amos J Hochstein*, Deputy Assistant Secretary for Energy Diplomacy, Bureau of Energy Resources, **U.S. Department of State**

Dr Anthony Barker, General Manager, **BG Singapore Gas Marketing**

Aaron Engen, MD of Investment & Corporate Banking and Co-Head of Power & Energy Infrastructure **BMO, Capital Markets (Bank of Montreal)**

Platinum Sponsor: PAVILION ENERGY
Legal Partner: HERBERT SMITH FREEHILLS
Silver Sponsors: BG GROUP, CHENIERE

Reserve your place at the key summit for the region's LNG and natural gas leaders. For more information or to book your place please contact **Shunker Goel** on **+44 (0) 7889 720 294** or **Andy Beales** on **+65 6422 1475**, or email **info@gasasiasummit.com**

Organised by dmg::events global energy

*Speaker schedule may be subject to changes

Gastech
Conference & Exhibition

Singapore | Singapore EXPO | 27 – 30 October 2015

28TH EDITION

Hosted by BG GROUP

85% OF EXHIBITION SPACE ALREADY RESERVED

Join your industry peers at the leading event for the international oil & gas industry

OFFSHORE TECHNOLOGY ZONE
- FLNG
- FSRU
- FPSO
- Upstream Technology

PORTS & MARINE ZONE

LNG FACILITIES & INFRASTRUCTURE ZONE

Exhibitors Include:

SAMSUNG HEAVY INDUSTRIES · KBR · KANFA aragon · BECHTEL · FOSTER WHEELER · DSME · Technip · Eni Saipem · SBM OFFSHORE · HYUNDAI HEAVY INDUSTRIES CO., LTD.

Limited exhibition space is available. Exhibit in your dedicated zone to meet buyers responsible for delivering the industry's most significant projects.

Contact Simon Ford to reserve your area in the Gastech Exhibition
T: +44 (0) 203 615 2847 | E: sales@gastech.co.uk

SUPPORTED BY: Energy Market Authority; ie Singapore – Driving Singapore's External Economy
IN ASSOCIATION WITH: SIEW; Singapore
ORGANISED BY: dmg::events global energy

www.gastechsingapore.com

LNG NEWS

Australia

APLNG completes LNG tank testing

Australia Pacific LNG (APLNG) has completed the hydro and pneumatic testing on its second LNG storage tank, a first for Curtis Island.

APLNG's two 160 000 m^3 storage tanks took two months to test and complete.

The LNG tanks were constructed by Bechtel and CBEtl.

It will take approximately three days to fill each LNG tank, once both of the LNG trains are in operation in 2016 and will take approximately 12 - 14 hours to load each LNG carrier.

The completion of testing of the LNG tanks plays a critical role in the delivery of first LNG exports in mid-2015, with gas from the Surat and Bowen basins delivered to Curtis Island through the pipeline system where it will be liquefied and shipped to Asia.

Page Maxson, APLNG CEO, said: "What sets the Australia Pacific LNG job apart is that the testing on both tanks was done back to back, and that in itself is a world-class achievement.

"We also undertook hydro and pneumatic testing simultaneously; a process that is usually conducted separately and has therefore saved us time."

LNG tank testing takes up to 26 days per tank and requires filling the tanks with water to test its integrity, quality and stability. Pneumatic testing is carried out to confirm the tank is 'gas tight', and to test the pressure and vacuum release valves.

Russia

GM&T's LNG carrier *Pskov* bunkers

Gazprom Marketing and Trading (GM&T) has announced that its newly delivered LNG carrier *Pskov* has received bunkers (heavy fuel oil and marine gas oil) at the port of Nakhodka, Russia. The bunkers were provided by GazpromNeft Marine Bunker. This is the first time that a GM&T time-chartered LNG carrier has bunkered in a Russian port.

Upon completion of the bunkering operation, *Pskov* proceeded to the port of Prigorodnoye where the Gazprom-majority owned Sakhalin-2 project's LNG terminal is located. After completing the gassing up and cooling down of her cargo tanks and loading LNG, *Pskov* will deliver her maiden cargo to a customer in Asia.

Nikolai Grigoriev, Managing Director of Shipping, GM&T said: "The port of Nakhodka is an increasingly important international bunkering hub which provides cost savings and voyage optimisation opportunities for companies operating in Asia. Bunkering our time-chartered [LNG carrier] *Pskov* at Nakhodka is a milestone for the GM&T group, as it signifies our expanding shipping capability and flexibility which is particularly relevant for our future projects in the region such as Vladivostok LNG."

Pskov is a state-of-the-art LNG carrier featuring membrane tanks with cargo capacity of 170 200 m^3 and Ice2 ice class and winterisation capability. It is powered by a tri-fuel diesel-electric propulsion system. The LNG carrier is on a long-term charter to GM&T from Sovcomflot and is the fifth in GM&T's fleet of Ice class vessels.

Estonia

US and Baltic states reinforce LNG cooperation

US President Barack Obama, Lithuanian President Dalia Grybauskaite, and Latvian President Andris Berzinš recently participated in a joint meeting hosted by Estonian President Toomas Hendrik Ilves in Tallinn. Their discussions emphasised the cooperation between the US and the Baltic states, highlighting ongoing collaboration in a number of key areas, including economic, energy and environmental cooperation.

The White House stated: "Lithuania is rapidly moving to reduce energy dependence on a single supplier. Its energy strategy aims to increase both energy efficiency and energy diversification through the development of nuclear, LNG, renewable, and unconventional energy. Lithuania is also working to promote competition, interconnection, and investment in the local and EU energy markets.

"This winter, Lithuania will inaugurate a new LNG import terminal at the port of Klaipeda. In 2015, electricity connections with Poland and Sweden are scheduled to come online. We are also working closely with Lithuania to share best practices in the sustainable development of unconventional hydrocarbon resources. Together, these projects will greatly enhance Lithuania's energy security."

LNGNEWS

Thailand

Rotary awarded IHI Corp. contract

Rotary Engineering has won a contract with IHI Corp. to work on two LNG storage tanks at an LNG terminal in Thailand.

This was one of many contracts won by the engineering, procurement, construction (EPC) and maintenance services company, which together are purported to be worth in the region of US$ 80 million.

Rotary will provide tankage works for two 160 000 m^3 storage tanks for the LNG receiving terminal's Phase II expansion project at the Map Tha Phut petrochemical plant, located in the Thai province of Rayong.

Roger Chia Kim Piow, the Chairman and Managing Director of Rotary, said: "We are excited about this new win [...] We are encouraged with the trust that our client has placed upon us. This is a reflection of Rotary's strong and good reputation, which it has built over the years. With this track record, we are now well positioned to participate in the other LNG projects in Singapore, Asia and the Middle East."

Rotary is seeking to expand its LNG value chain activities in Singapore and South East Asia as demand in the region rises. The company also reported a 70% increase in revenues for the first half of the year.

USA

LNG America selects Taylor-Wharton

LNG America has selected Taylor-Wharton to commence the front-end engineering and design (FEED) work for the cryogenic topside of the company's 3000 m^3 Gemini Class LNG bunker barge.

The LNG bunker barge is scheduled for delivery at the end of 2015.

With the selection of Taylor-Wharton, LNG America has assembled a top-tier team to support its LNG bunker barge programme. LNG America had previously announced Jensen Maritime as the naval architect for the project and ABS as its class society.

Keith Meyer, CEO of LNG America, said: "Taylor-Wharton has been actively engaged in the development process and instrumental in helping to develop the critical path time line for a late 2015 in-service date."

Eric Rottier, CEO of Taylor-Wharton, added: "LNG as a transportation fuel and a fuel for the marine market represents a step change in the way LNG is used and we are very pleased to be working on this exciting project with LNG America."

NEWS HIGHLIGHTS

- The future of Australian LNG exports
- Drewry: LNG shipping set for tough time
- Wood Mackenize: Malaysia LNG to challenge Qatar

Scan to visit the website

To read more about these stories go to: LNGINDUSTRY.com

SMART SOLUTIONS FOR THE ENTIRE LNG LIFE CYCLE

With an expansive range of technology and EPC capabilities, CB&I is uniquely positioned to support our customers in today's challenging LNG market.

As a trusted partner, we work strategically with you to ensure your venture's success at every level. We understand your business and the challenges you face. Our business model, range of capabilities and flexibility allow us to provide value-added services across the entire life cycle of a project — delivering consistent results anywhere in the world.

With recent awards and on-going projects in the U.S. Gulf Coast and Australia, our capabilities in the LNG life cycle have never been more evident. Contact CB&I to learn how our smart solutions can benefit your next LNG project.

ONSHORE BASELOAD LIQUEFACTION
OFFSHORE LNG LIQUEFACTION
ONSHORE LNG REGASIFICATION
ONSHORE LNG PEAK SHAVING
LNG STORAGE

CELEBRATING 125 YEARS OF EXCELLENCE

A World of **Solutions**
Visit **www.CBI.com**

CB&I

LNGNEWS

Australia

LNG projects help fund conservation

Nearly two-thirds of Curtis Island, near Gladstone, Australia, will be set aside for environmental conservation.

The scheme, which has received substantial funding from companies with LNG projects in the area, will attempt to ensure the protection of the island's unique ecology and heritage. It proposes to establish over 25 000 ha. of newly protected areas.

On behalf of the LNG projects, Australia Pacific LNG CEO, Page Maxson, welcomed the new conservation areas, saying that they "demonstrated the commitment of the industry to developing projects in an environmentally responsible way".

Significant funding from natural gas companies QGC, Santos GLNG and Australia Pacific LNG has made this achievement possible. Through a combined effort, the companies purchased a former grazing property and associated leases in order to transfer the titles to the State Government and remove cattle from the island, enabling the long-term restoration of environmental values.

The three LNG projects all received approval from the Queensland and Australian governments based on the requirement to provide environmental offsets for their developments.

Asia-Pacific

APEC ministers launch LNG Trade Facilitation

Energy Ministers from the 21 Asia-Pacific Economic Cooperation (APEC) economies have set in motion a number of new measures to strengthen security and sustainable development within the energy sector.

As part of these new measures, APEC ministers launched an LNG Trade Facilitation Initiative to boost supply through support for public-private partnerships and market-based pricing.

Actions to be undertaken by APEC economies are detailed in the Beijing Declaration that was endorsed by ministers in September 2014. The goal is to ensure economic growth in the Asia-Pacific region while relieving intensifying pressure on the environment.

"The Asia-Pacific region needs to transform the economic growth model and explore the diverse and conservation-minded development path featuring green and low carbon development," explained China's Vice Premier, Zhang Gaoli, during the APEC Energy Ministerial Meeting.

Collectively, APEC economies account for 55% of global energy production and 60% of total energy consumption. By 2030, fossil fuels will still make up 80% of the region's energy mix.

DIARY DATES

15 - 17 October 2014
9th Annual Global LNG Tech Summit
Barcelona, Spain
www.lngsummit.com

27 - 30 October 2014
Floating LNG USA 2014
Houston, Texas, USA
www.icbi-events.com/event/floating-lng-usa-conference

28 - 30 October 2014
European Autumn Gas Conference
London, UK
www.theeagc.com

28 - 30 October 2014
Seatrade Middle East Maritime
Dubai, UAE
www.seatrade-middleeast.com

10 - 13 November 2014
ADIPEC
Abu Dhabi, UAE
www.adipec.com

18 - 21 November 2014
15th World LNG Summit
Paris, France
world.cwclng.com

ATLAS COPCO RENTAL

Your partner for a total solution

Sustainable Productivity

We offer 100% oil-free air and nitrogen solutions at different pressures, flows and purities

- for leak testing & pressure testing
- for line blowing & cleaning
- for purging & inerting

of all LNG systems during the construction, pre-commissioning & commissioning phases of your project.

Contact us now!

E-mail: specialty.rental@be.atlascopco.com

Visit us at www.atlascopcorental.com

LNGNEWS

Singapore

Samsung C&T wins SLNG expansion contract

Singapore LNG Corp. Pte Ltd (SLNG) has awarded the Engineering, Procurement and Construction (EPC) contract for the Phase 3 expansion of the Singapore LNG terminal to Samsung C&T Corp.

The EPC contract, which is valued at approximately S$ 700 million, involves the further expansion of the LNG terminal to include a fourth LNG storage tank and additional regasification facilities. This expansion work will increase the LNG terminal's send-out capacity from the current 6 million tpy to approximately 11 million tpy.

The fourth LNG storage tank will be the largest in the world at 260 000 m^3. The LNG tank will be able to receive a full cargo load from a Q-Max carrier.

Other key facilities to be added include a new terminal substation, additional open rack vaporisers (ORVs) and LNG booster pumps, and equipment to allow the correction of Wobbe Index of regasified LNG, where necessary, to meet Singapore's gas specifications.

Construction of Phase 3 is scheduled to begin by the end of 2014. The regasification facilities are expected to be completed by 2017, while the fourth LNG storage tank is expected to be completed by 2018.

Belgium

TGE Marine signs contract for the world's first LNG bunker ship new building

TGE Marine Gas Engineering has signed an LNG bunkering contract with Hanjin Heavy Industries of South Korea.

TGE Marine won the contract for one firm and one optional vessel for the design and supply of the cargo handling system, LNG fuel gas system and LNG cargo tanks for the world's first 5100 m^3 capacity LNG bunker ship.

The ship was ordered by NYK/GDF SUEZ and is scheduled for delivery in 2016. The bunker vessel will operate out of the Zeebrugge port, Belgium. It will serve clients operating in the Emission Control Areas (ECA) of the North and Baltic Seas.

TGE Marine has worked with several potential clients on conceptual designs for all kinds of new generation bunker ships ranging from 2000 - 7500 m^3 capacity in size.

Manfred Küver, CEO of TGE Marine, said: "We are delighted to have been selected by Hanjin Heavy Industries and NYK/GDF SUEZ as supplier for the gas handling system.

"TGE Marine has worked for quite some years on the development of LNG bunker ships and we consider this new segment as a potential growth area for the future."

Sweden

Skangass granted permission to build a new LNG terminal

The Swedish government has granted Skangass permission to build and operate a new LNG terminal within the harbour in Gävle, Sweden.

Skangass aims to commence construction work during 2015. The permission covers an LNG storage capacity of 30 000 m^3 and a handling capacity of up to 500 000 tpy of LNG.

The planned LNG terminal is an important part of the expansion of LNG infrastructure in Sweden and the Baltic Sea.

The investment decision is likely to be made during spring 2015. The terminal will be developed in cooperation with Gävle Hamn, which invests in the building of infrastructure in the harbour area.

Big LNG expertise.
Also available in small LNG plants.

Air Products has contributed to the success of more LNG operations than any other company. And we bring our full capabilities to LNG projects of any scale, from peak-shaving plants producing less than 0.1 MMTPA to the largest base-load facilities, on land or off-shore. Our LNG team can help you get a plant up and running at the highest efficiency—on time, on budget, and in any climate. To learn more, call 1-800-654-4567 (US), 1-610-481-4861 (worldwide) or visit us online.

tell me more
airproducts.com/lngplant

DOWNLOAD OUR FREE
GAS WEIGHT & VOLUME
CONVERSION APP.

AIR PRODUCTS

Subbu Bettadapura, Frost & Sullivan, provides an outlook for the Japanese LNG industry.

Land of the rising .... lng imports

Japan, the world's largest LNG importing country, is forecast to have a strong demand for LNG during the period 2015 to 2020, thereby driving growth opportunities for various enterprises engaged in engineering, metals, equipment, construction, services and trading.

As the country becomes more dependent on LNG, the domestic LNG industry is poised to grow and also seek out global expansion opportunities.

Japan fostered the growth of the LNG industry in Asia by being the anchor market for exports from Brunei, Indonesia and Malaysia in the 1970s. It has relied on a diverse portfolio of nations for LNG while heavily banking on Southeast Asia to meet its requirements. Of late, Australia, Qatar and Russia are supplying up to 50% of Japan's imports, overtaking the Southeast Asian suppliers. Apart from these, Papua New Guinea and the US will be the other important sources for Japan's LNG supplies in the coming years.

High dependence on LNG

Japan has to import most of its natural gas in the form of LNG. Electric utilities Tokyo Electric, Chubu Electric, Kansai Electric, and city gas distribution companies, Tokyo Gas, Osaka Gas and Toho Gas, are among the country's largest LNG importers.

Japan has gas networks developed specifically for a service area. The city gas suppliers deliver gas to customers

through service area dedicated pipelines. With a view to avoiding duplication of facilities, a monopolistic market situation has been created in the city gas supply areas. These markets are regulated to take care of the interests of small volume consumers. The market is deregulated for consumers whose annual contracted volumes exceed 100 000 m^3.

Electric utilities account for 65% of the LNG imported into the country.

Japan imported 87.5 million t of LNG in 2013 to meet power generation and city gas needs. With nuclear power facilities shut down, the power generation segment has been heavily dependent on natural gas and coal for the past three years. Around 65% of the total demand for LNG is from the power generation sector when nuclear facilities are offline. The share of LNG in the power generation fuel mix jumped from 29% in 2010 to 41% in 2011 to compensate for the loss of nuclear power. The city gas supplies cater to industrial, commercial and residential segments.

Gas demand from the power generation segment will decrease as nuclear power is expected to make a very slow comeback in the power generation fuel mix from Q4 2014. However, plans to increase the installed gas power generation capacity to approximately 80 GW by 2020 from the current level of 65 GW is expected to drive up the gas demand.

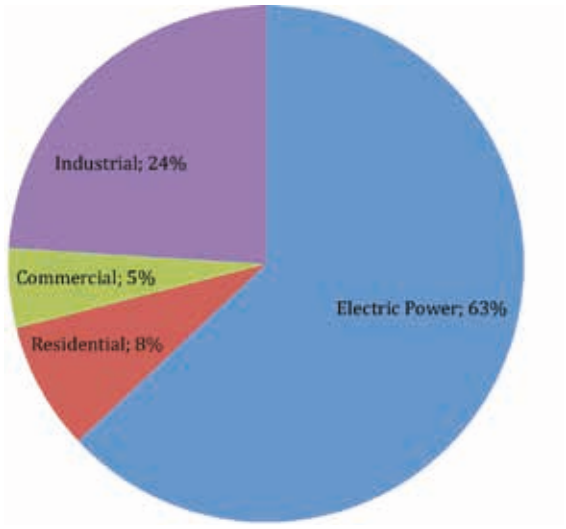


Figure 1. Japanese gas demand by end user segments, 2013 (Frost & Sullivan estimates).

Figure 2. LNG imports: Frost & Sullivan's base case scenario (Frost & Sullivan forecast. Historical data compiled by Frost & Sullivan from various industry sources).

Base case scenario for LNG imports

Frost & Sullivan's base case scenario forecasts project that Japan will need to import 88.1 million t of LNG by 2020. The demand for LNG is expected to show a slight decline up to 2016 before taking an upward trend up to 2020.

The base case scenario projects an increasing demand trend considering the following assumptions:

- Slow growth in electricity demand.
- Gradual re-entry of nuclear power into the grid from 2014.
- Progressive decommissioning of nuclear power plants older than 40 years.
- Gas power generation installed capacity addition.
- Increase in city gas demand.
- City gas demand sees increased demand from industrial and commercial segments but a decline from the residential segment.

Increasing LNG imports have taken the fuel's prices to new highs, creating trade deficits for the world's third largest economy. The country's strategy focus is towards making LNG imports secure and at the same time cheaper.

The electric utilities and city gas distribution companies import LNG into Japan, sourcing it from long-term contracts and spot purchases. Up until 2010, spot purchases were less than 5% of the total LNG procured. In the last three years, spot purchases have increased to over 20% of the total procurement.

Strategies for reducing LNG purchase price

Since electric utilities are the largest buyers of LNG from Japan, there is a growing consensus that instead of passing on increasing fuel costs to electricity consumers, the large LNG buying companies should work out strategies to reduce the LNG purchase price.

The LNG prices following the oil prices show a steadily increasing trend after 2010. Japan pays the highest average prices for LNG in the world, and these prices have increased, driven by Japan's dependence on spot market purchases after the Fukushima incident in 2011.

In the scenario where nuclear power is not brought online at all, Frost & Sullivan forecasts the LNG imports to reach a high of 102 million t. At the current purchase price levels, it would be unsustainable for the Japanese economy to import such high volumes, hence the focus is on strategies to reduce LNG purchase prices.

To meet this objective, various strategies are being adopted by the Japanese government and the LNG importing companies to reduce purchase prices.

LNG importers venturing into trading business

With an increase of LNG suppliers in the global market, LNG buyers are seeking flexible terms, such as options to resell.

Large LNG buying companies such as Tokyo Gas are intending to enter into the LNG trading business, reselling

THAT WAS A SAMPLE OF

LNG INDUSTRY

SEPTEMBER ISSUE

DON'T WANT TO MISS OUT?

You will need to register to read the full edition.
Please log in to www.lngindustry.com
or alternatively **click here** to register for free!

For more information about
LNG Industry, please contact us:

www.lngindustry.com
E: subscriptions@lngindustry.com
T: +44 (0)1252 718999