

Natural Gas Market Update – August 2014

NAB Group Economics



National
Australia
Bank

Key Points:

- Having fallen for much of the year, wholesale gas prices in the United States and Europe have begun to edge up slightly since July. With the northern summer now coming to a close, mild weather should keep prices in check until the onset of colder winter conditions sees gas use increase.
- LNG import prices for Japan, South Korea and China declined moderately in the June quarter, while sales volumes were mixed. South Korean demand fell on mild summer conditions while Japanese and Chinese demand increased. With Japanese nuclear reactors likely to remain idle into 2015, it is likely that strong import volumes will continue for the remainder of the year.
- Eastern Australian wholesale spot prices declined in the June quarter while retail prices held steady. Although spot prices have declined, reports suggest that new long term contracts are being written at much higher prices than previously as producers look to receive netback world parity (see *Need to Know*, page 10) ahead of LNG export capacity coming online in Queensland.
- The medium term outlook for international LNG prices remains clouded. While demand in East Asia remains strong, forthcoming LNG export capacity in Australia and other areas combined with strong US shale gas supplies could place downward pressure on prices.



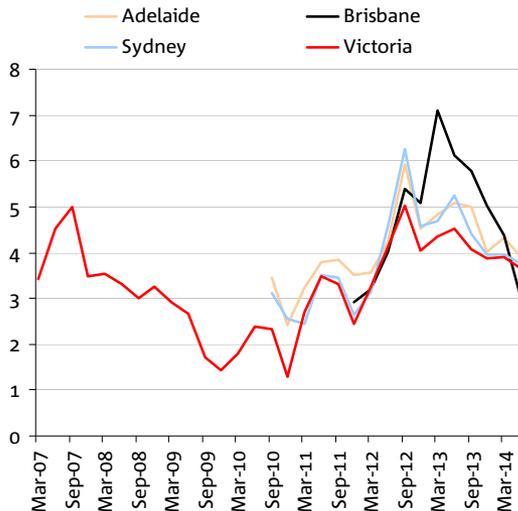
BG Group's QCLNG terminal, Curtis Island, Queensland

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Australia: price trends

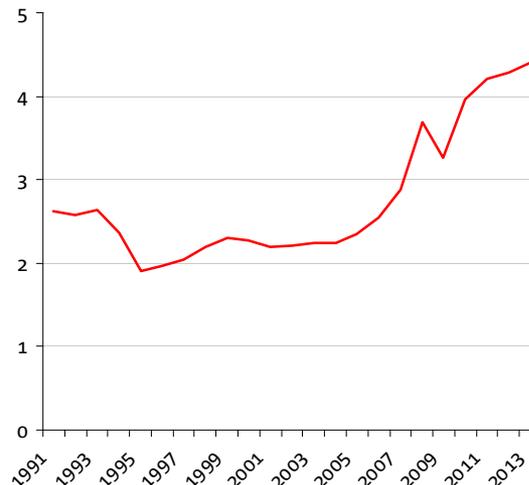
- Eastern States wholesale spot gas prices fell overall in the June quarter. Short Term Trading Market prices were down 5.3% in Sydney, 10.0% in Adelaide and 31.5% in Brisbane for the quarter, while Victorian wholesale prices were down 6.4%. Prices averaged below AU\$4/GJ in all four markets in the quarter.
- Most wholesale gas is sold under confidential long term contracts and is not directly visible on the spot market. Some reports suggest that new contracts are being written at much higher levels than previously.
- Western Australian domestic gas wholesale prices are reported annually by the Department of Mines and Petroleum. Prices rose 2.7% in 2013, the fourth straight year of hither prices.
- The Western Australian gas market is not physically connected with the Eastern States and is largely focussed on LNG export. However, international prices do not fully prevail in Western Australia on account of a government gas reservation policy which stipulates that 15% of gas be made available for domestic use.
- Residential gas prices were mostly flat in the June quarter, with the ABS gas and other household fuels index unchanged in Sydney, Adelaide and Perth, largely reflecting annual price cycles. The index was slightly lower in Brisbane and higher in Melbourne.
- The longer term trend is one of sharp increases however. In the last five years, the index has risen 51.7% in Sydney, 49.6% in Melbourne, 45.3% in Brisbane, 74.3% in Perth and 56.5% in Adelaide.

Figure 1: Eastern Australia quarterly gas wholesale price (AU\$/GJ)



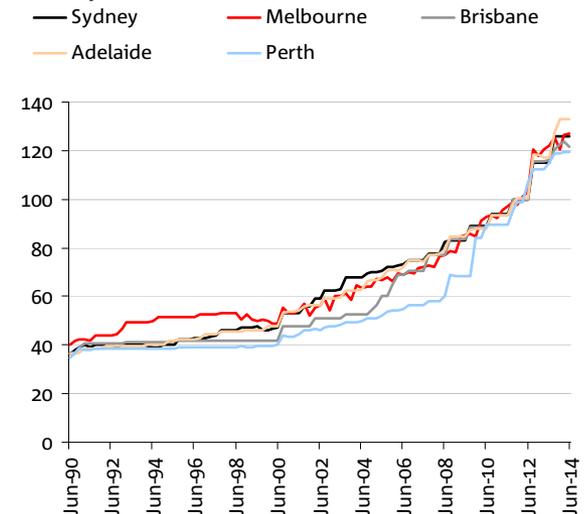
Source: Australian Energy Regulator

Figure 2: Western Australia annual domestic gas wholesale price (AU\$/GJ)



Source: Department of Mines and Petroleum WA
Price at injection into the Dampier-Bunbury Pipeline

Figure 3: Consumer gas and other household fuel price index



Source: Australian Bureau of Statistics

Australia

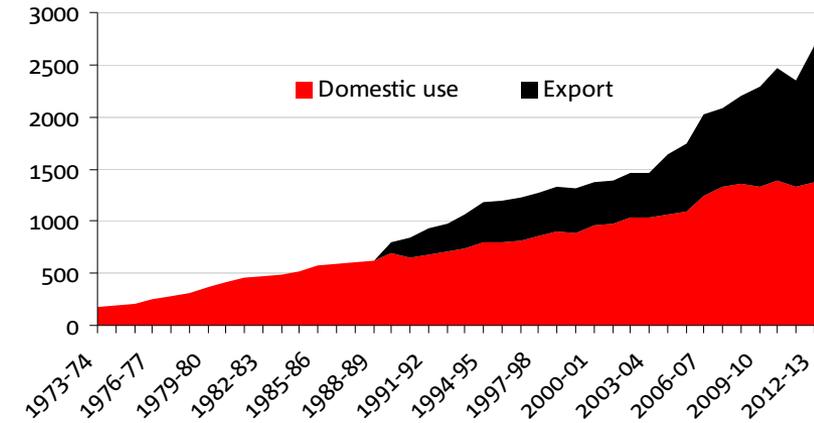
Domestic supply

- Eastern Australia has enjoyed relatively low natural gas prices for the last four decades, supplied by low cost fields in Bass Strait and Moomba, South Australia. Importantly, supply was too low to justify liquefaction and export from these fields, leaving eastern Australia as a gas island not exposed to world prices.
- However, the discovery of extensive coal seam gas reserves in Queensland and a lesser extent New South Wales has led to the construction of three LNG export terminals in Queensland which are scheduled to open by 2015. These terminals will allow conventional gas from eastern States basins (Cooper, Gippsland, Bass and Otway) to be sold internationally.
- Western Australia has exported LNG from the North West Shelf since the late 1980s and is expanding production and export capacity.

Domestic demand

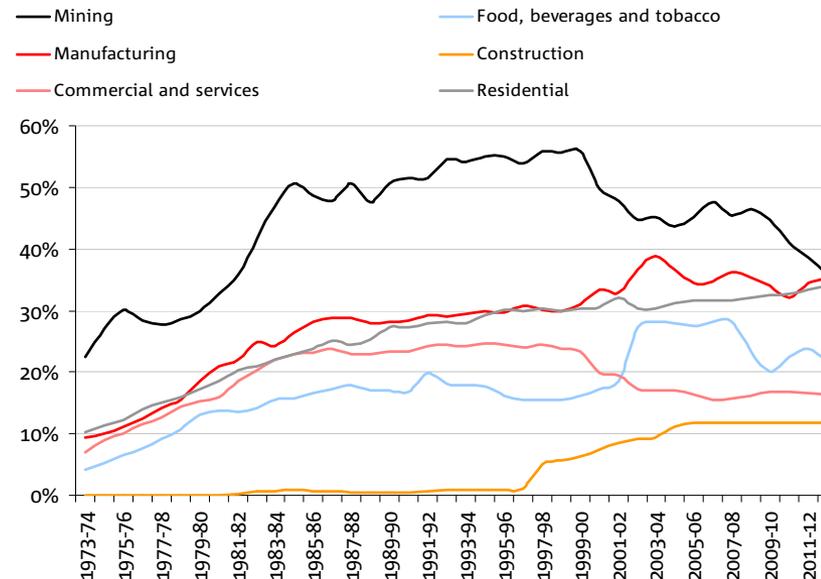
- Natural gas is an important fuel source for many sectors in Australia. It comprises around a third of total household, manufacturing and mining energy use, although its importance for the mining industry has declined as diesel use has increased.
- Gas is used as a fuel source for peak load open cycle gas turbines as well as intermediate load combined cycle and steam turbines. Gas powered generation's share of Australian electricity generation ranges from 6% in Victoria to 68% in the Northern Territory (see Figure 7). Western Australia, South Australia (53% market share) and Queensland (22% market share) are heavily reliant on gas to meet their electricity needs.

Figure 4: Natural gas supply and use – Australia (PJ)



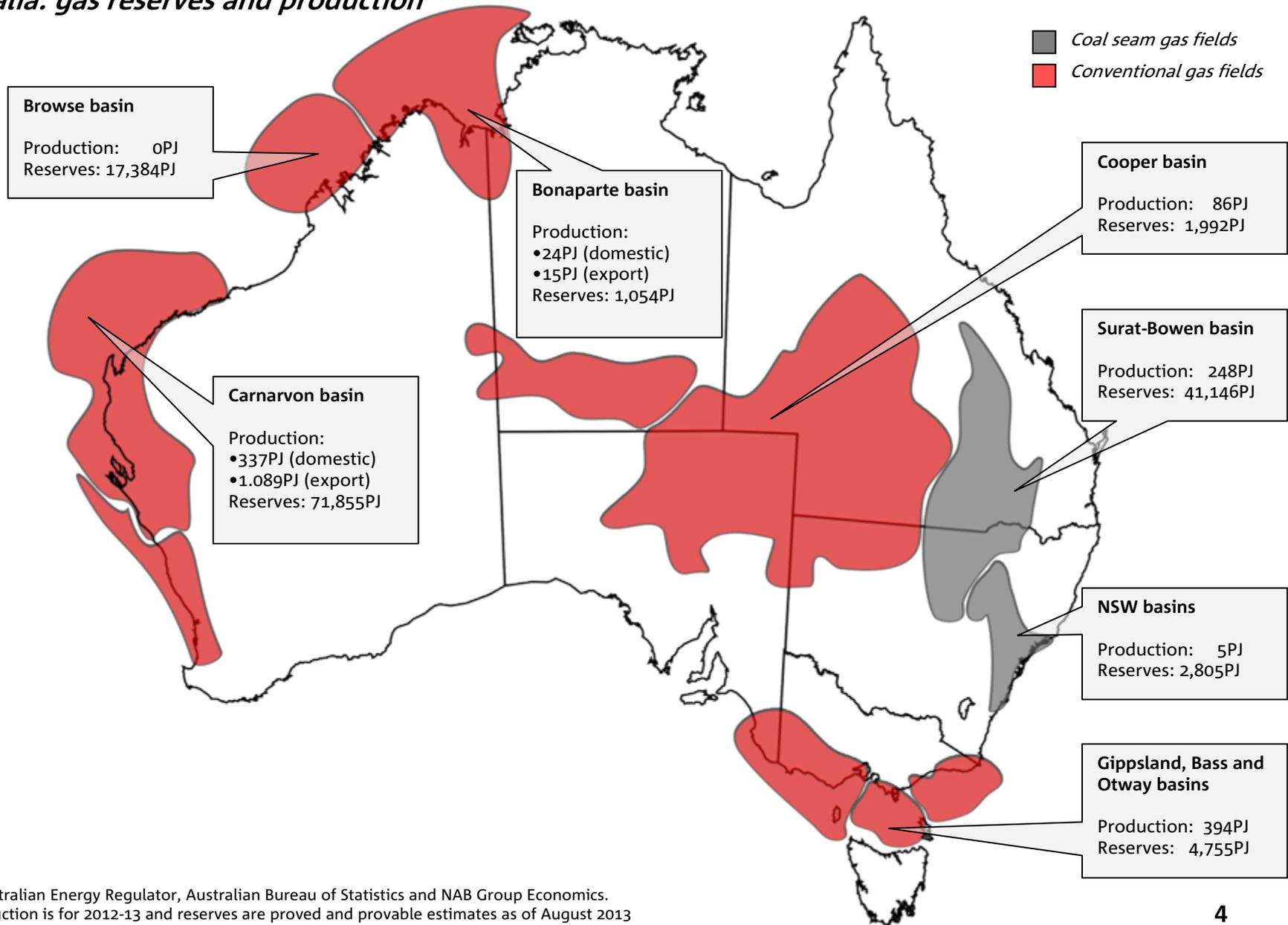
Source: Bureau of Resources and Energy Economics, includes Timor Gap imports

Figure 5: Natural gas as a proportion of total energy use (PJ) Australia



Source: Bureau of Resources and Energy Economics, NAB Group Economics

Australia: gas reserves and production



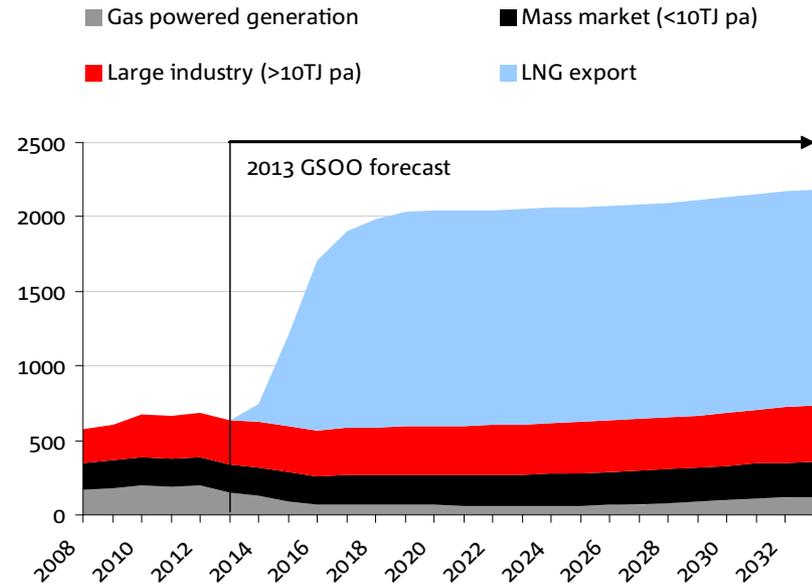
Source: Australian Energy Regulator, Australian Bureau of Statistics and NAB Group Economics.
 Note: production is for 2012-13 and reserves are proved and provable estimates as of August 2013

Australia

Future trends

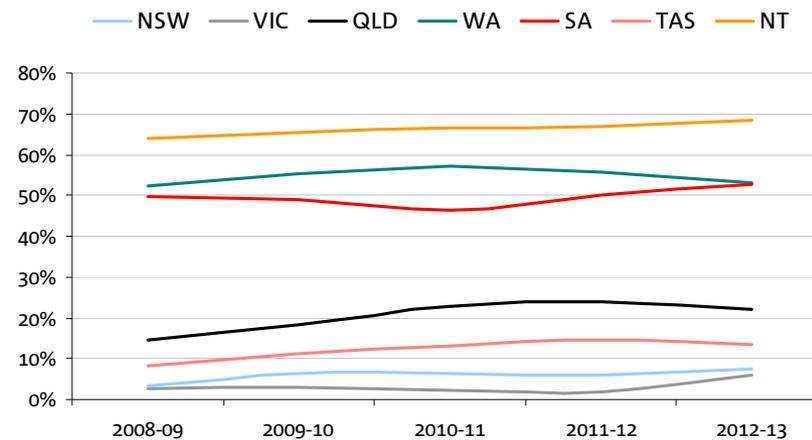
- The commissioning of Queensland LNG export terminals will see the Eastern Australian wholesale market exposed to netback parity prices for the first time. However, considerable uncertainty remains on the future price path of Australian natural gas. Reports suggest that new wholesale contracts could more than double from around AU\$4/GJ to in excess of AU\$9/GJ, leading to higher gas prices for residential consumers, industry and gas powered electricity generators.
- The effects of higher prices are already being felt by gas powered generators. These effects, combined with falling electricity demand and the removal of the carbon tax, may see a drop in gas demand for electricity generation. The Australian Energy Market Operator (AEMO) projects a considerable drop in gas consumption by gas powered generators following the commencement of Queensland LNG exports (Figure 6). The announcement in February that Swanbank E, a 12 year old 385MW combined cycle gas turbine in South East Queensland, will be mothballed for three years from October 2014 may be a sign of things to come.
- Conversely, it is possible that domestic gas price increases could be muted by changing international dynamics. While East Asian LNG demand has been increasing steadily for the past five years, nuclear restarts in Japan may dent demand. Likewise, LNG supply is set to increase as a result of booming US supply and a number of LNG export terminals in planning or under construction across the Pacific rim.
- There is some evidence that domestic market price expectations are divergent from international forecasts. Modelling undertaken for AEMO projects that new contract prices for combined cycle gas turbines (large gas customers with reasonably consistent load profiles compared to other gas generators) will steadily increase. However, the World Bank forecasts that Japan LNG import prices will fall moderately over the period.

Figure 6: Eastern Australia gas use (PJ): Australian Energy Market Operator forecast – 2013



Source: Australian Energy Market Operator

Figure 7: Gas powered share of total electricity generation



Source: Bureau of Resources and Energy Economics

East Asia

Japan

- Japanese LNG imports rose 14.9% in July to 7,838 kt, up 5.7% on the same time in 2013. Meanwhile, prices fell 5.7% for the month. LNG import prices are now 5.9% lower than the same time last year.
- Japan's nuclear reactors remain idle in the wake of the 2011 Fukushima Daiichi meltdown and it is unlikely that any reactors will be restarted before 2015. This points to strong Japanese LNG demand for some time to come as the country continues to rely on higher levels of gas generation.

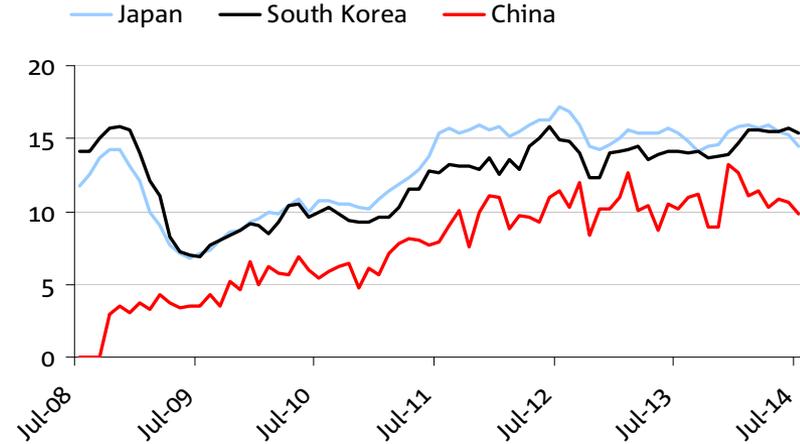
South Korea

- South Korean LNG imports fell slightly in July but are 9.7% lower than the same time last year as mild summer temperatures and economic uncertainty cut demand. Prices were down 2.2% for the month but are up 9% on the same time last year.

China

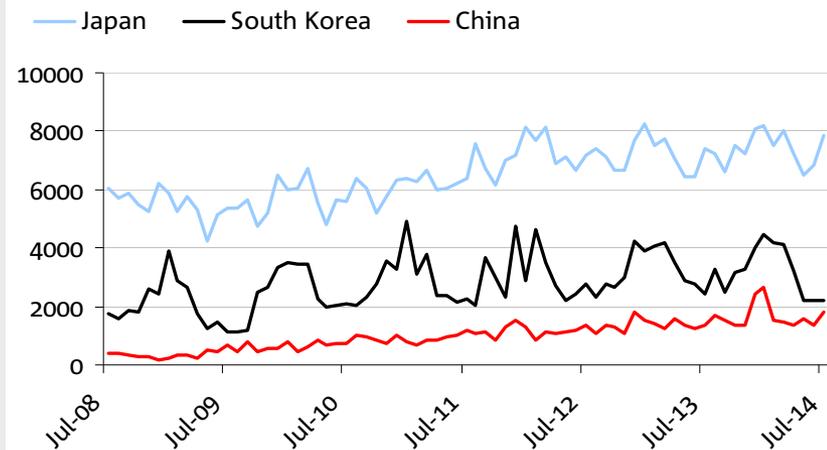
- Chinese LNG imports were up 36.6% in July while prices edged 8.1% lower. Recent disappointments in domestic shale gas production are likely to see LNG import growth remain strong. The Russia-China gas agreement, signed earlier this year, will see Russian gas flow overland to China from 2019. However LNG is likely to remain important as China looks to move away from coal fired generation.

Figure 8: LNG import prices (US\$/GJ)



Source: Korea Customs Service, World Bank, CEIC

Figure 9: LNG imports (kt)



Source: Korea Customs Service, CEIC, DXdata

LNG investment to supply Asian markets

- Major LNG importers
- Major new LNG projects in planning or under construction

Japan, South Korea and Taiwan

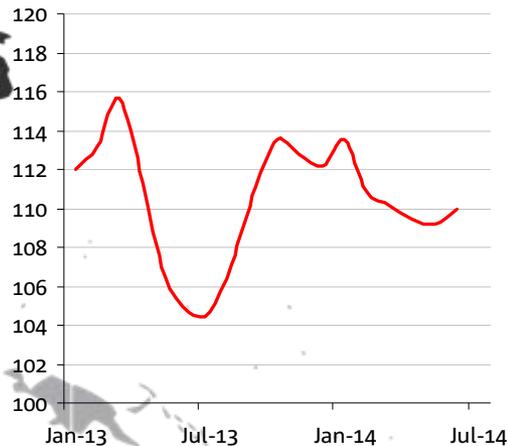
Most LNG contracts in Japan, South Korea and Taiwan are tied to the Japan Crude Cocktail (JCC), which measures the average crude oil import price to Japan. This mechanism has seen higher import prices compared to Europe, leading to a scramble to construct new LNG export capacity to supply these markets. There is increasing pressure in Asia to move away from contracts on this basis.

Mozambique and Tanzania

Future world prices of LNG may come tumbling down amid growing influence of East Africa's gas rich economy - approximately 45-70 trillion cubic feet of energy commodity has been discovered in Africa's offshore area 1 in Mozambique. Meanwhile in Tanzania, 35 trillion cubic feet of gas has been discovered.

With the amount of proposed projects in the pipeline globally, timing plays a significant factor - as more projects are approved, by the time exports hit the markets there could well and truly be a global glut with the downside risk on prices.

Figure 10: Japan Crude Cocktail (US\$/bbl)



Source: Petroleum Association of Japan

Australia

Global markets await Australia's seven new LNG plants to commence production, scheduled late this year with commitments spread over the following two years. LNG export capacity is set to quadruple (increasing to approximately 85 mtpa), generating annual export revenue in excess of \$US50bn. Markets are anticipating synchronisation between domestic and international price movements.

Canada

Canada's National Energy Board (NEB) has granted Chevron and Apache a permit to export approximately 10 mtpa of LNG to the Asia-Pacific markets. This project has the potential to be the largest Canadian LNG project to date, with a projected 5-7 shipments per month. The project is currently in the front end engineering and design phase. There are currently over a dozen applications with the NEB awaiting approval to join the LNG exporter bandwagon; Orca LNG Ltd being one of them - recently applying for a permit to export an estimated 24 million tons per annum (mtpa) from British Columbia.

United States

Cheniere's Sabina Pass Liquefaction project to export LNG and reconfigure its existing 94-mile Creole pipeline to a bi-directional system is currently under construction with the milestone liquefaction in-service target date estimated to be Q4 2015. Cheniere's proposal to add two more LNG trains is currently pending. The productive capacity of each train is estimated to be 4.5 mtpa.

In addition, Cheniere's Corpus Christi liquefaction project is estimated to produce approximately 13.5 mtpa. Construction is proposed to commence sometime during 2014/15.

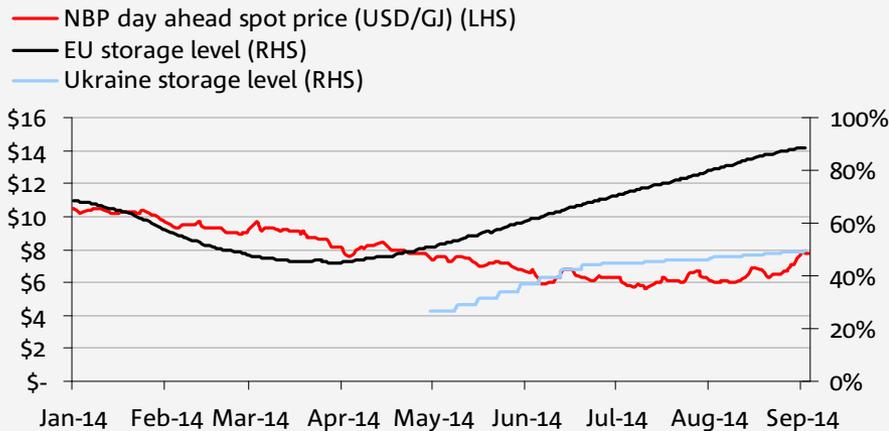
Meanwhile, the US Federal Energy Regulatory Commission (FERC) approved the Cameron LNG Export Project in June 2014 that is proposed to export up to approximately 14.95 million metric tons per annum. Sempra Energy's Cameron LNG project has been conditionally authorised to export natural gas to Japan, European nations and non-FTA countries. The estimated cost of the project is \$10bn. The increase in global supply may put downward pressure on prices.

Europe

European Union (EU) storage levels stand at almost 90% of capacity as a mild European winter left inventories higher going into spring and summer. Day ahead spot prices at the National Balancing Point have risen moderately since July but remain below US\$8/GJ as of early September.

While the crisis in Ukraine has not disrupted Russian gas supplies to the EU far, the dependence of a number of EU member States on Russian gas continues to weigh on the minds of policymakers and investors alike. Reports suggest that the EU may use its existing powers to ban the re-export of LNG from European terminals in the event that Russian supply is disrupted. Much of the LNG currently entering EU terminals is intended for re-export at higher prices; keeping these supplies within the EU, combined with high inventories could mitigate a winter shortage in the event of a Russian supply disruption.

Figure 11: European gas storage and National Balancing Point spot price



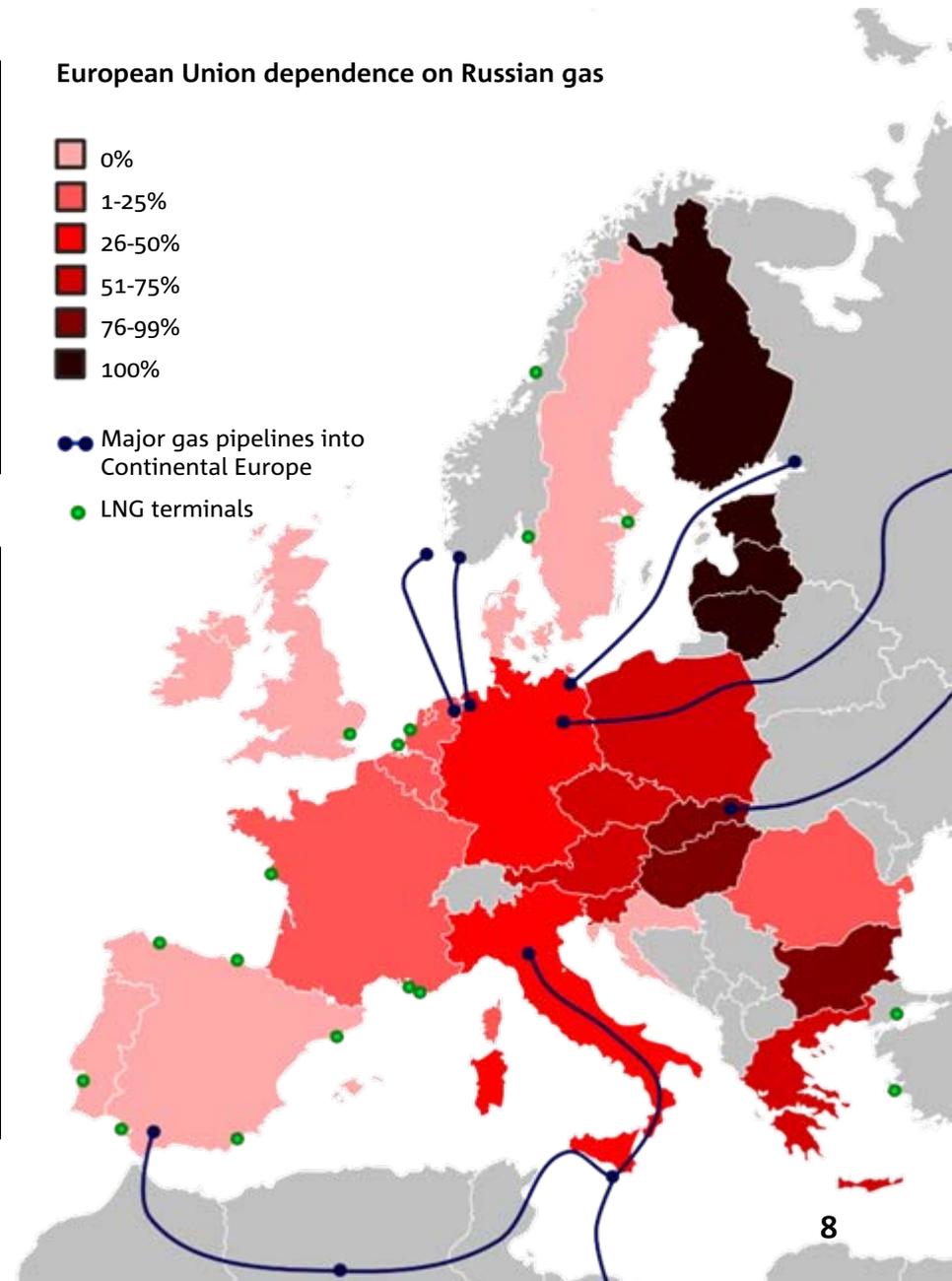
Source: Thomson Datastream, Gas Infrastructure Europe

Source: Eurogas, Gas Infrastructure Europe, Deutsche Welle and NAB Group Economics

European Union dependence on Russian gas

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100%

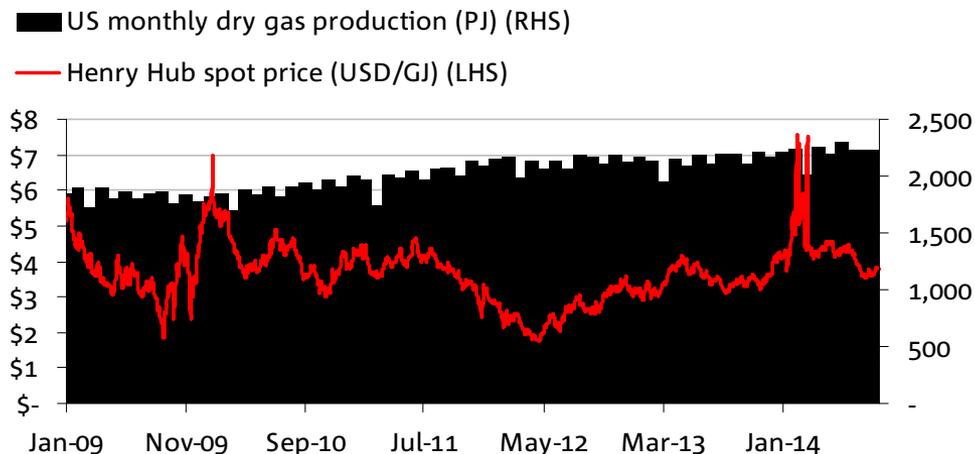
- Major gas pipelines into Continental Europe
- LNG terminals



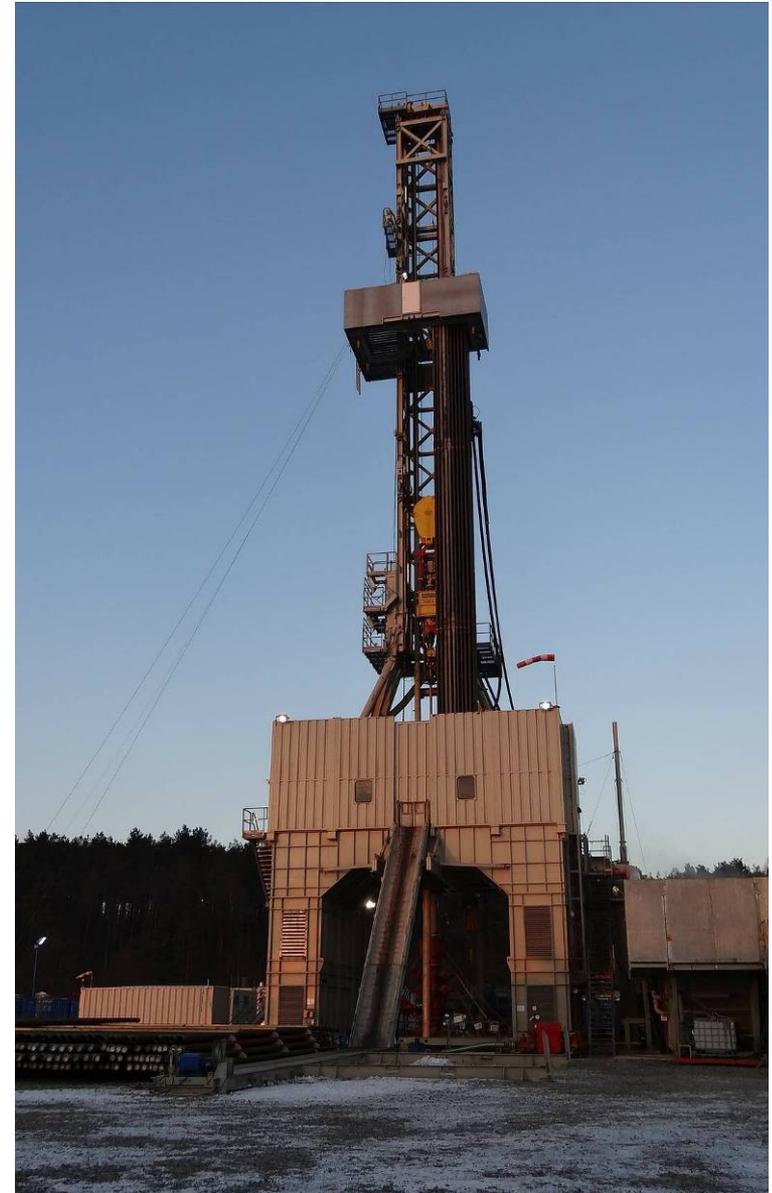
United States

- US natural gas prices have been falling for much of 2014 after price spikes in February and March caused by unusually harsh winter conditions. Prices began to rise moderately in July and now stand at US\$3.80/GJ (US\$4.01/mmbtu).
- Inventories have rebuilt quickly since April but remain below normal levels, a hangover from high winter gas use. Working gas in underground storage totalled 2,709 bcf at the end of August, below the 2009-2013 5 year minimum level.
- Shale gas production continues to increase, leading to considerable interest in LNG export. US oil and gas exports are tightly regulated and require Federal approval. The US Federal Energy Regulatory Commission has approved 3 LNG export terminals, one of which (Sabine, Louisiana) is under construction. A further 14 projects have sought approval. While large scale US LNG exports would likely depress international prices, domestic prices could increase considerably as domestic customers face netback world parity pricing.

Figure 12: United States natural gas production and Henry Hub spot price



Source: US Energy Information Administration



Natural gas price forecasts

- In the near term, prices in the US and Europe are likely to increase moderately towards the December quarter as winter approaches. We expect LNG prices in East Asia to remain reasonably stable for the remainder of the year in line with low oil price volatility.
- The outlook for Australian gas prices is more clouded. While it is possible that wholesale spot prices will decline in the near term, we expect that retail prices will rise as new long term contracts are written in light of LNG export from Queensland.
- Overall, our gas price forecasts remain largely unchanged, although we expect slightly lower Henry Hub prices in the September quarter. Our oil price forecasts are revised down based on slack demand and ample global supply.

	Actual	Actual	Forecasts							
	3/09/2014	Jun 14	Sep 14	Dec 14	Mar 15	Jun 15	Sep 15	Dec 15	Mar 16	Jun 16
Henry Hub (\$US/mmbtu)	4.01	4.59	4.00	4.20	4.20	3.90	4.10	3.90	3.90	3.90
Henry Hub (US\$/GJ)	3.80	4.35	3.79	3.98	3.98	3.70	3.89	3.70	3.70	3.70
Japan LNG (US\$/mmbtu)	NA	16.41	15.50	15.50	15.50	15.30	15.00	14.50	14.35	14.35
Japan LNG (US/GJ)	NA	15.56	14.69	14.69	14.69	14.50	14.22	13.74	13.60	13.60
Brent Oil	101.8	110	104	105	105	105	105	105	105	105

Source: Datastream, World Bank, CEIC, NAB Group Economics

Need to know:

GJ: Gigajoules

Mmbtu: million British thermal units

Mtpa: million tonnes per annum

Netback world parity price: the international price of gas, minus the costs of bringing the gas to market, such as transmission and liquefaction.

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