AUSTRALIAN LNG BUSTING THE BUDGET

The unprecedented boom that Australia’s LNG industry has enjoyed over the past decade has seen more than $200 billion committed to investments, with seven major projects still under construction.

But Australia is a costly place to invest in and the next wave of projects is looking much more likely to shift offshore, utilizing new floating LNG technology using massive vessels built in South Korea.

Six of the new LNG plants being built are onshore. Shell’s Prelude project was the world’s first FLNG facility to be approved when it was given the go-ahead in May 2011.

Together the seven export plants will raise Australia’s nameplate LNG capacity from around 24 million mt/year now, to more than 80 million mt/year by 2017, potentially making it the world’s biggest producer ahead of current leader Qatar.

But the boom has not been all plain sailing. Most of the projects have suffered budget blow-outs, estimated by analysts at anywhere between 15% and 50%. The increasing costs have led some projects to be delayed or even shelved. Woodside’s 12 million mt/year Browse LNG project at a remote site on James Price Point in Western Australia was one such casualty.

Soaring labor and equipment costs were behind Woodside’s decision in April this year to shelve the project. The original budget had ballooned, with some observers speculating the cost of the development would have been as high as $100 billion.

Woodside and its joint venture partners Shell, MIMI, PetroChina and BP subsequently decided to develop their Browse gas using a floating LNG production facility. The redesigned project will use FLNG technology pioneered by Shell.

Woodside has suffered budget and timetable overruns at other LNG projects too. Its 90%-owned Pluto LNG project in Western Australia, which finally started exports in May 2012, was plagued by delays and came in nearly A$3 billion over budget at just under
A$15 billion ($14.2 billion at current exchange rates).

Others have faced similar issues at their Australian LNG projects. In late 2012, US major Chevron, operator of the massive Gorgon LNG project, also in Western Australia, revealed that the budget had risen by 40% to A$52 billion. The project was expected to cost A$43 billion when the final investment decision was taken in 2009.

Despite the blow-out, attributed to high labor costs, productivity issues and the stronger Australian dollar, Chevron said the project remained viable due to rising oil prices and because the company, and its partners Shell and ExxonMobil, had been able to hike the plant’s nameplate capacity by 4% to 15.6 million mt/year. The plant is due to be commissioned in late 2014, with the first cargo expected to be loaded in the first quarter of 2015.

Meanwhile, on the east coast of the country, the world’s first coalsam gas-to-LNG projects, being built on Curtis Island in the Queensland port city of Gladstone, have also experienced cost pressures. The three plants now represent an aggregate investment of $63.6 billion, up from $51 billion when they were first given the green light.

Although the Curtis Island proponents are all building their own pipelines and infrastructure, they now concede that some of the duplication could have been avoided and are looking for ways to cooperate. The plants will have a total nameplate capacity of 25.3 million mt/year of LNG and will be supplied with CSG from onshore fields in Queensland’s Bowen and Surat basins.
flow from one project to the other when necessary, maximizing plant productivity, according to Santos.

Origin Energy, the upstream operator of the third Curtis Island project, Australia Pacific LNG, earlier this year agreed to sell Santos 365 petajoules (347 Bcf) of gas for GLNG, in a move that was seen as foreshadowing consolidation among the players.

A fourth LNG export project, the Shell- and PetroChina-owned Arrow Energy, has also been proposed for Curtis Island. Rather than pushing ahead with another standalone project, however, Shell now appears to be favoring a deal under which Arrow’s CSG would be processed by one of the other plants.

Rising costs are not the only issue for the Queensland projects. Arrow is said to be struggling to secure the landholder agreements it needs to develop its CSG acreage, much of which is on prime farmland.

Some of the region’s farmers fear CSG production could have an impact on precious underground aquifers and are concerned about the storage and disposal of the salty water that is a byproduct of CSG drilling. Environmental lobbyists are also mounting opposition to hydraulic fracturing, which will eventually be needed to increase output from most of the Queensland CSG deposits.

Aside from Prelude, the other two LNG projects currently being built – Chevron’s Wheatstone and Inpex’s Ichthys – will have onshore liquefaction facilities at Ashburton North in Western Australia and Darwin in the Northern Territory respectively.

Shell has been tight-lipped about the cost of the groundbreaking Prelude project. When it was approved, the company had indicated that Prelude would cost around $10.8 billion to $12.6 billion, and there has been no update since then. Prelude will produce 3.6 million mt/year of LNG, 1.3 million mt/year of condensate and 400,000 mt/year of LPG. The facility is expected to start up in 2017.

Onshore, Chevron has maintained its A$29 billion budget for the foundation Wheatstone LNG project. The liquefaction facilities will be designed to produce 8.9 million mt/year from two trains and start up in 2016.

The two-train Ichthys LNG plant being built in Darwin will process gas piped from the field, nearly 900 km away, off

<table>
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<tr>
<th>Name</th>
<th>Location</th>
<th>Operator</th>
<th>Approved capacity (mill mt/yr)/trains</th>
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<td>GLNG</td>
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<tr>
<td>Wheatstone</td>
<td>Ashburton North, Western Australia</td>
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<td>3.6/1</td>
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*At August 15, 2013 A$/US$ exchange rate
**At December 5, 2012 A$/US$ exchange rate
Source: Platts, company reports
Western Australia, and will have the capacity to produce 8.4 million mt/year of LNG. The project’s managing director recently said Ichthys remained on track with its original budget of $34 billion and would ship its first LNG cargo at the end of 2016.

Like the rethink at Browse, the next round of investment in Australian LNG projects looks likely to be focused on the emerging floating production technology, and apparently for sound commercial reasons. According to calculations by Hong Kong-based analysts with Bernstein Research, the capital cost of floating LNG facilities ranges over $2,500-3,000 per metric tonne of capacity, compared with $4,000/mt for onshore projects in Australia.

Woodside is now eyeing a possible FID on the FLNG option for its Browse gas in 2015, and industry insiders say the project could be operational as early as 2018.

Elsewhere, ExxonMobil and partner BHP Billiton recently sought government approval to install the world’s largest FLNG production facility at their Scarborough gas field off Western Australia. The FLNG project would process around 1.1 Bcf/day of gas, producing an estimated 6 million-7 million mt/year of LNG from five trains mounted on a massive 495 meter barge.

France’s GDF Suez is also pursuing the development of its Bonaparte FLNG project off northern Australia. That project is expected to produce between 2 million mt/year and 2.5 million mt/year of LNG from the Petrel-Tern-Frigate gas fields in the Bonaparte Basin which the company owns in a joint venture with Santos.

Thai state-owned upstream company PTT Exploration and Production is meanwhile eyeing an FLNG project to develop its 2-3 Tcf of gas in the Cash-Maple field in the Timor Sea. PTTEP plans to choose a partner for the project at the end of 2013, with a view to starting production around 2016.

At present, the only other onshore project on the horizon is a small facility being planned by local junior Liquefied Natural Gas Limited, at a site at Fisherman’s Landing in Gladstone. That proposal, for a 3 million mt/year plant costing $1.7 billion, has struggled to get off the ground, however, as it has been unable to secure gas supply.

**Flow-on effect**

The development of the LNG export projects is having a flow-on effect in the eastern Australian domestic gas market. Gas production in eastern Australia will need to rise from the current level of around 600 Pj/year to about 1,500 Pj/year in order to supply the export plants after they start producing in 2014 and 2015.

The startup of the Curtis Island plants will coincide with the roll-off of major gas supply contracts in neighboring New South Wales, leaving consumers there facing the prospect of much higher prices and a shortage of supply.

Eastern Australian gas prices, which have historically been low at around $3-4/Mcf, are now heading for export-parity levels of around $10/Mcf, prompting calls for some gas to be reserved for the domestic market. So far those calls have been resisted by the state and federal governments.