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Petrobras Provides Fresh Impetus for Flagging GTL Sector

Beset by delays and soaring costs, gas-to-liquids (GTL) technology has largely fallen off industry radars over the last two years. But interest looks to be rebounding, at least in smaller variants on the theme and perhaps a bit in the full-scale format. A contract awarded last week by Brazil's Petrobras to Japanese shipbuilder Modec and two partners to build a GTL demonstration plant at Fortaleza in Brazil for possible deployment on floating production vessels (FPSOs) to eliminate flaring could be a first breath of new life into the sector.

Modec's involvement is significant: It is the world's second-largest owner and supplier of FPSOs and is already building two giant FPSOs for Petrobras' massive Tupi and Guara oil fields. The Japanese shipbuilder last week said that a Joint Demonstration and Testing Agreement (JDTA) covering construction and operation of the demo plant had been signed by it, fellow Japanese contractor Toyo and the Ohio-based Velocys subsidiary of the UK's Oxford Catalysts. Modec and Toyo are to pay the expected tens of millions of dollar tab for the demo plant, while Petrobras is to cover installation and operating costs. Japan's Kobe Steel will assist in manufacturing the GTL reactors.

Partners say the GTL technology could be commercially deployed on an FPSO as soon as 2014. Modec is interested in establishing feasibility of a 2,000 barrel per day GTL unit, taking up one-quarter of an FPSO's deck space.

That's obviously tiny compared to the 140,000 b/d Pearl GTL giant being developed in Qatar by state Qatar Petroleum (QP) and Royal Dutch Shell. It is slated for completion later this year, phased start-up next year, and plateau output by 2012. Pearl GTL's estimated cost started out at \$5 billion, escalated to \$12 billion-\$18 billion in 2007, and is now at or above the top of that range (WGI Feb.18'09,p5). Smaller 34,000 b/d GTL projects in Qatar and Nigeria have had a fitful gestation (WGI Oct.28,p5).

Modec and its partners' ambitions offshore Brazil could benefit from being much more modest: turning small gas feedstock volumes that otherwise would be flared into syncrude. Plans don't encompass finished transport fuels, as a hydrocracker and product storage would take up too much

deck space. The GTL syncrude would instead be co-mingled and shipped in the same tankers with crude oil.

The GTL demonstration unit at Fortaleza is to incorporate Velocys' microchannel reactor and catalyst technologies for the key steam methane reforming (SMR) and Fischer-Tropsch (FT) sections. The unit is to operate for around a year at its onshore location after delivery in early 2011. The SMR section will combine methane and steam at up to 900° Celcius to produce hydrogen and carbon monoxide. This syngas then goes into the FT reactors to produce syncrude: straight-chain hydrocarbons. No oxygen plant is required. As some of the FPSOs have capacity for 100,000 b/d or more of oil and 175 million cubic feet per day of gas production, the less risk of combustion, the better.

Large offshore Brazilian gas volumes would still need to be transported as LNG or to shore by dedicated pipe (WGI Dec.23,p5).

Launched on the UK's Alternative Investment Market (Aim) in 2006, Oxford Catalysts boasts some veteran gas industry chiefs: Non-executive Chairman Pierre Jungels was head of UK independent Enterprise Oil until its sale to Shell in 2002. Last month he welcomed to the Oxford board Andrew Jamieson, a Nigeria LNG managing director and more recently a hands-on director of Qatar Shell GTL. Both are directors of Australia's Woodside.

Oxford also signed a memorandum of understanding with Thailand's PTT to develop small-scale GTL units, with PTT to provide \$5 million of funding over two years. The Thai company is understood to be planning onshore plants of up to 10,000 b/d capacity. Oxford already had licensed its FT-only technology to Portugal's SGC Energia, which may use it in Brazil to make biodiesel from biomass.

Petrobras chief Jose Sergio Gabrielli told WGI in 2008 that, for Tupi and other subsalt fields, various gas possibilities were discussed, adding: "In the beginning we were discussing GTL plants, but now it's probably less likely to move in this direction" (WGI Aug.13'08,p8). However, it appears that Petrobras — in addition to evaluating pipes to shore and floating LNG (FLNG) — will consider offshore GTL after all, provided contractors bear some front-end risk.

Petrobras and field partners BG, Repsol YPF and Galp

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last year agreed to fund front-end engineering by three rival consortia work for a proposed FLNG project, with designs to be submitted by mid-December. But the earliest a Brazilian FLNG unit could start up is mid-2015. So mini-GTL might be operational offshore Brazil a year before LNG (WGI Feb.10,p4).

The next three years could be critical to large-scale GTL, too. South African Sasol and QP's joint 34,000 b/d Oryx GTL facility in Qatar has operated fitfully since its 2008 completion. Sasol this week said Oryx is now "producing well" after an unscheduled outage last year. But it also

confirmed that Nigeria's 34,000 b/d Escravos GTL, planned with Sasol technology and owned 75% by Chevron and 25% by state Nigerian National Petroleum Corp., won't start before 2012 (WGI Oct.28,p5).

This week, too, French contractor Technip said it would do a feasibility study for an Uzbek onshore GTL plant for Uzbekistan GTL, owned by state Uzbekneftegaz, Sasol and Malaysian state Petronas. The trio did prefeasibility on such a scheme a year ago. Technip said the plant would use Sasol technology and be similar in capacity to Oryx.

Mark Smedley, London