

WORLD GAS INTELLIGENCE®



Vol. XXIII, No. 51

December 19, 2012

Special Reprint of *World Gas Intelligence* for Oxford Catalysts Group. Copyright © 2012 Energy Intelligence Group.
Unauthorized access or electronic forwarding, even for internal use, is prohibited.

Small GTL's Market Reach as Great as Opec's, UK Firm Says

Royal Dutch Shell's \$19 billion Pearl venture in Qatar or Sasol's up-to-\$14 billion Lake Charles project are the "space age" way to develop gas-to-liquids (GTL) if you have super-abundant cheap gas and almost unlimited capital (WGI Dec.5'12). If you don't, UK-based technology specialist Oxford Catalysts Group (OCG) is offering what Chief Executive Roy Lipski calls "GTL for the masses" — small modular GTL reactors.

He sees worldwide opportunities for "bite-sized" GTL, particularly for small gas producers in North America, to which the technology "is perfectly suited," he says. "The shale gas industry was pioneered and created by small and medium-sized independents in North America. This revolution unleashed all this gas which, by its nature, is quite distributed."

In a recent interview with WGI — before OCG's over-subscribed \$50 million extra share placement — Lipski said a 1,000 barrel per day unit would cost around \$100 million, or roughly \$100,000 for every b/d of installed capacity (EIF Dec.12'12). That sounds like a lot, but in OCG's target 1,000-15,000 b/d project market, Lipski claims the capital cost of projects by its main rival, Compact GTL, are about \$200,000 per b/d.

Compact GTL's business development director, Iain Baxter, disputes that estimate, saying its capital costs range from \$100,000 to \$300,000 per b/d, and that the \$200,000 figure comes from an estimate for a mid-range modular plant project.

Lipski believes an installed cost of \$80,000 per b/d may be feasible for a 15,000 b/d plant, putting total costs at \$1.2 billion, based on multiples of its proprietary Velocys micro-channel reactors, each of 175 b/d. It uses similar Fischer Tropsch (FT) chemistry to Shell, Sasol and BP, albeit with technical twists.

OCG believes its economics work well for units of 15,000 b/d or less. With gas at \$4 per million Btu, small modules could produce finished GTL diesel products for just \$66/bbl, Lipski says. "Even onshore North America, there are a lot of places still that do not achieve Henry Hub. If you're in Alberta, you'll get \$1 or \$1.50 below Henry Hub, which makes these economics very compelling for a gas producer."

With US-based Ventech, OGC and subsidiary Velocys are in the final stages of front-end engineering and design (Feed) for a 1,000-1,500 b/d GTL unit at Karns City, Pennsylvania, for Calumet Specialty Products. Calumet wants construction to start

by mid-2013 and for the unit to be running in 2014. The US firm now buys in crude cuts and processes them into higher-value waxes and lubes at its 5,500 b/d Karns City complex, which Lipski says is "slap bang in the middle of the famous Marcellus Shale gas field, with decades and decades of low-cost gas on their doorstep." He says Calumet plans to make lots of money by switching feedstock, and that "every one of [its] competitors is thinking the same thing" (NGW Oct.1'12). As Calumet's capacity across several US sites is 135,000 b/d, he sees potential for more GTL units.

OCG technology can achieve a good gas conversion ratio of 10,000 cubic feet per barrel of finished GTL product, Lipski says, or sometimes even 9,000 cf/bbl. "From 1,000 to 15,000 b/d, Sasol doesn't compete and can't compete with our technology; nor do Shell or BP."

Lipski says his company reckons "there is enough low-value feedstock at these kinds of scales to make as much as 25 million b/d of fuel — almost as much fuel as Opec produces. We've doubled our business development team and we still can't deal with all the enquiries coming in."

Although focused on North America, OCG is also looking at regions like the former Soviet Union and Australia, and sees GTL opportunities for stranded gas in the Amazon Basin. A planned biomass-to-liquids project using OCG technology near London City airport is also making progress; British Airways would be the anchor customer (EI's NE Dec.6'12).

In Brazil, Compact GTL's technology at a demonstration GTL unit was qualified for future use in early 2012 by Brazil's state-run Petrobras. It's now OCG's turn (WGI Mar.10'10). However, both firms say it could be 2017 before Petrobras mounts whichever technology it chooses on an offshore production vessel.

Elsewhere, Lipski says OCG has just completed a demo "at a confidential client site in the Asia-Pacific region; the client is an integrated energy company with an existing inland site, and they have demonstrated a commercial scale 25 b/d reactor." He says the client isn't Russian Rosneft or Thailand's state PTT — for which OCG is doing design work — but a company that has bought a reactor, tried it and is now "moving on to engineering of a 5,000 b/d GTL plant."

The OCG boss says "we've done all the demos we need to attract early adopters; other customers will only feel comfort-

(continued on page 2)

Market Reach *(continued from page 1)*

able when they see a commercial plant up and running.”

Compact GTL’s Baxter, meanwhile, tells WGI his firm is doing client-funded engineering work “for several major oil companies, including one at a Russia/FSU site to run on 100 million cubic feet per day of feed gas.”

OCG will rely on strong partnerships to build facilities. These include Haldor Topsoe for reformers (it also supplies Sasol GTL plants); Japan’s Kobe Steel; Petrofac, Hatch and Toyo for engineering; Mourik for handling catalysts (it has a similar

function at Pearl); and two major undisclosed catalyst suppliers.

“Changing catalysts in an [OCG] micro-channel reactor is easier than in a conventional system. We can turn around a reactor in the course of a day; a conventional reactor can take up to two or three weeks,” Lipski says. “Moreover when the catalyst is replaced by Mourik, the inspection service SGS will be there to certify the reactors are fit to go back into service — providing a fully-engineered turnkey solution, plus longevity, to the customer.”

Mark Smedley, London