

Dow Jones Newswires

FOCUS: New Technology Is Turning Stranded Gas Into Profit

By James Herron
Of DOW JONES NEWSWIRES
17 April 2008
[Dow Jones International News](#)
English
(c) 2008 Dow Jones & Company, Inc.

LONDON (Dow Jones)--Reserves of natural gas all over the world previously considered too small or too remote to be profitable are being reappraised as technology advances and prices rise.

Innovations like floating gas liquefaction vessels, combined with an increasingly globalized gas trade allowing suppliers to tap the highest-value markets no matter where their resources are located, will help to develop stranded reserves and prevent wasteful and environmentally damaging gas flaring.

An energy-hungry world economy would have much to gain from this. Estimates of stranded gas reserves vary greatly, but top-end figures are in the range of 2,000 trillion-3,000 trillion cubic feet - energy equivalent to twice the oil reserves of Saudi Arabia.

There is big money to be made tapping these resources. Global gas reserves will gain \$8.2 trillion in value in the next 10 years, as energy use and prices rise, according to analysts at Bernstein Research.

"The potential is absolutely enormous," said Phillip Fjeld, chief executive of innovative gas producer [Flex LNG Ltd.](#) (FLNG.NO).

Floating Gas Plants

At present, the main way to exploit gas located far from the market for which pipelines aren't economic or practical has been to cool it to liquid form and ship it in giant ocean tankers. Indeed, the trade in liquefied natural gas is booming, connecting buyers and sellers as far apart as Japan and Trinidad. But projects are expensive and suitable only for very large resources.

Now, a number of companies are taking advantage of rising gas prices and downsizing LNG plants to mount them on ships that could be anchored over small or remote offshore fields and produce gas at lower cost and with a smaller environmental footprint.

"If you go back 10 years, LNG priced at around \$2-3 (per million British thermal units). That didn't support a floating solution," said Fjeld.

But rising demand due to the growth of gas-fired electricity and tighter carbon dioxide controls means the price of clean-burning natural gas is climbing in most major markets. LNG producers can now sell their gas at above \$10/MBTU in parts of Europe and the U.S., and at as much as \$20/MBTU in Asia.

Oslo-listed Flex LNG is the first mover in this field and has four LNG producing ships on order in South Korea. The first will be ready in spring 2011 and Flex already has a contract with Peak Petroleum Industries Nigeria Ltd. to produce up to 1.7 million tons of LNG annually from one of the Nigerian firm's offshore fields for at least 15 years.

Fjeld said there are also numerous opportunities for floating LNG in Australia, southeast Asia and Brazil.

The technology, he said, is in a similar position today to floating oil production units, known as FPSOs, 30 years ago. "In 1980 there were no oil FPSOs, today there are 110-120," producing 15-20% of the world's oil, Fjeld said. "If we draw the same analogy to floating LNG, there could one day be 100 million-150 million tons per annum of liquefaction capacity offshore," he said.

Cutting Costs In Trinidad

An alternative approach to producing LNG is to transform gas into clean-burning road diesel. But so far, gas-to-liquids, or GTL, plants have been large and expensive affairs, like [Royal Dutch Shell PLC's](#) (RDSB) \$18 billion, 320,000 barrel a day Pearl project in Qatar. However, newcomers to the field are adapting the technology.

New York-based **World GTL** uses secondhand equipment to build plants at a fraction of the cost of new facilities. The first of these is under construction in Trinidad and is scheduled to start operations later this year, said **World GTL** Chief Executive David Loring.

"In Trinidad, we have a methanol reactor we bought from [Methanex Corp.](#) (MEOH). If you ordered it new today it would take years and years to get it designed and built and would cost \$50 million to \$60 million. We bought it for a scrap value of \$500,000, all we had to do was relocate it," Loring said.

The adapted plant will produce a modest 2,250 barrels of fuel a day and cost \$250 million. Loring said this makes his approach perfect for small fields.

"If you look at all the stranded gas fields in the world, there are only a couple of hundred big enough for LNG and there's thousands that are too small for anything else. Those are

the ones we will be focussing on," Loring said. These fields could contain the equivalent of 80 billion barrels of oil, he added.

There are lots of idle methanol plants in North America suitable for conversion, Loring said, and numerous resource opportunities all over the world.

"Bolivia would be a good example," he said. The country has more gas than Saudi Arabia, but imports 10,000 barrels a day of dirty filtered diesel, which it could replace with clean GTL fuel made from its own gas, Loring said.

World GTL has a preliminary agreement with Bolivian state-run energy company YPF to develop a GTL plant there, although the change of government and the subsequent nationalization of the gas industry in 2006 has slowed progress on this.

Looking ahead to when useable secondhand methanol reactors are no longer available, **World GTL** is also designing a new 800 barrel a day modular plant that could be shipped by rail or sea to remote locations. It plans to produce the first unit in 2010.

Unlocking Oil Reserves

GTL technology doesn't just have the potential to tap stranded sources of gas, it can also facilitate the development of tricky oil fields.

U.K.-based technology company Compact GTL is developing a small plant designed to convert the gas associated with oil production into a synthetic crude that can be exported from fields in remote areas blended with the rest of the oil.

"If you have an oil field that has got associated gas, but you cannot develop it because you cannot reinject it, or a pipeline is completely uneconomic, then there's no intrinsic value," said Peter Riches, chief executive of Compact GTL. Often such associated gas is simply burned off, or flared, on site. "If you put our plant on it, you would liberate the entire value of the oil field," he added.

Compact GTL will commission a small plant demonstrating its technology in the U.K. this year. The next step is to build a pilot plant producing around 20 barrels per day of syncrude from gas, probably in Brazil, where the company is working closely with state-controlled [Petroleo Brasileiro SA](#) (PBR).

"Given all the discoveries there have been in Brazil, the need for our technology has blossomed dramatically in the last six to eight months," Riches said.

Most of the largest Brazilian oil fields are located far offshore in very deep water, making gas pipelines expensive. By 2012 or 2013, Compact GTL plans to have a full

commercial-scale plant operating, producing oil and up to 5,000 barrels a day of syncrude converted from gas on a platform or FPSO offshore Brazil.

According to the World Bank, every year over 6 trillion cubic feet of gas - equivalent to 75% of exports from Russia - is burned off from oil fields because there is no export route to a market. This wastes billions of dollars and adds 350 million tons of carbon dioxide into the atmosphere every year.

But despite recent regulation limiting the use of flaring in many countries, efforts to reduce the practice in places like Nigeria and Russia have made little progress. Riches and Loring said their technology could also help eliminate this waste.

The potential is obvious, but any energy project today faces the challenge of rampant cost inflation caused by a shortage of raw materials and skilled labor. New and unproven technologies become exceptionally risky in this environment.

"There may be some resistance at first from the oil companies due to the much higher level of capex required," said a research report on floating LNG from analysts at [Citigroup](#). "However, once some of the technical challenges are overcome, pricing on some elements may ease."

Flex LNG's ships cost around \$1 billion each. Ton for ton of LNG, this is less than half the cost of some recent onshore projects, so the economics are secure, said Fjeld.

The sheer scale of the resources that can be tapped seals the deal, said Riches. "Whichever way you look at it, we only need to have one or two percent of that to have a really huge business," he added.

-By James Herron, Dow Jones Newswires; +44 (0)20 7842 9317;

james.herron@dowjones.com