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FEBRUARY 8, 2009, 7:56 P.M. ET

A Gamble in Qatar

Royal Dutch Shell is making a huge -- and risky -- bet on technology that transforms natural gas to diesel fuel

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By **GUY CHAZAN**

In the search for alternatives to gasoline, **Royal Dutch Shell PLC** has made one of the biggest and boldest bets in the energy industry.

The Journal Report

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The Anglo-Dutch company is investing up to \$18 billion in a vast plant in Qatar to transform natural gas into clean-burning synthetic diesel fuel. Due to come on line in

late 2010, it is one of the world's most ambitious industrial projects and Shell's largest single investment.

But the development, known as Pearl GTL, involves huge risks. It's based on a technology known as gas to liquids, or GTL, that is untested on such a massive scale. And with construction costs higher than they were when the project was announced in 2002, some Shell investors fear that Pearl could suffer the same extended delays and budget blowouts that have plagued other multibillion-dollar energy projects around the world in recent years.

There are also concerns that the project might not be viable with oil prices around current levels. The International Energy Agency says the cost per barrel of producing GTL is in the range of \$40 to \$90. GTL looked like a safe bet when crude traded at a record high around \$150 a barrel in July, but with prices now hovering around \$40, GTL's economics are no longer so sturdy.

The IEA also warns that, while GTL fuel burns cleaner than gasoline, the production process emits so much carbon dioxide that costs could increase significantly if governments impose taxes on greenhouse-gas emissions to help fight global warming.

The agency calls GTL's long-term future "uncertain" and says it expects the production of GTL fuel to total 650,000 barrels per day by 2030 -- just 0.6% of the projected global oil output for that year.

GTL's murky prospects reflect a wider problem across the energy industry. Western oil majors, largely frozen out of the places where oil is plentiful and easily accessible, like the Middle East, Russia and Venezuela, are increasingly turning to so-called unconventionals -- difficult-to-extract resources such as shale gas in the U.S. and oil from Canadian tar sands, and technologies like GTL and liquefied natural gas. But the investments required are so huge they only make sense if the price of oil stays high.

Some in the industry wonder whether unconventionals can break even with oil below \$60 a barrel. And some plans are being rethought. Shell, for instance, has delayed a decision on expanding its Canadian oil-sands venture, in the hope that the overheated market for the labor, materials and services it uses will cool and costs will come down. But on Pearl, Shell has ruled out any delays.

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Shell

Shell Pearl GTL plant under construction at Ras Laffan, the industrial city 50 miles north-east of Doha, Qatar, where Shell Pearl has its operations

Long History

Shell started experimenting with GTL technology during the energy crisis of the 1970s, when it began to search for an alternative to gasoline. In 1993, Shell opened its first GTL demonstration plant in Bintulu, Malaysia. The project was derailed in 1997 by a massive explosion caused by a profusion of carbon molecules in the air as a result of extensive forest fires in Indonesia. It took three years to repair the damage.

Since then, fuel from the Bintulu plant has built up a small but growing presence on the

market. Shell's V-power diesel, which is blended with GTL fuel, has proved a hit with drivers in Europe despite selling at a premium to conventional diesel. GTL fuel ignites more easily than conventional fuels, so it improves the performance of car engines. An Audi race car powered by diesel blended with Shell GTL has won the Le Mans 24-hour endurance race in France for the past three years.

In 2002, Shell announced its Pearl GTL venture, in partnership with state-run Qatar Petroleum. For both partners, the project offers diversification. Gas-rich Qatar can turn some of that resource into higher-value fuel and lubricants, reducing its exposure to shifts in natural-gas prices on the international market. For Shell, Pearl is the key to its efforts to reduce its dependence on petroleum-based products as concerns grow about the depletion of the world's oil supply.

Some 35,000 workers are employed at what is one of the world's largest construction sites. When finished, the complex will boast four cricket pitches for its workers, three soccer fields, an outdoor movie theater -- and its own mayor.

Building such a huge complex is costly, but there's no question it can be done. Making GTL technology work on such a grand scale is less of a certainty. "If Shell can pull off Pearl it will be an earth-shaking technological achievement," says Dan Rogers, a Houston-based lawyer with the law firm King & Spalding who specializes in energy infrastructure projects.

Everyone's Watching

Analysts say the success or failure of the Pearl plant will go a long way toward determining other energy companies' interest in GTL fuel. So far, there are only three small GTL plants operating commercially -- the Mossel Bay plant operated by Petroleum Oil & Gas Corp. of South Africa in its home country; the Oryx plant in Qatar, a joint venture of South Africa's Sasol Ltd. and Qatar Petroleum; and Shell's Bintulu plant.

Other companies have looked at GTL but gradually backed away because of technological and cost concerns. ConocoPhillips, Marathon Oil Corp. and Exxon Mobil Corp. have all jettisoned planned GTL projects in Qatar. Algeria last year canceled tenders for a GTL project in Tinrhert. Chevron Corp. and Nigerian National Petroleum Corp. are moving ahead with their Escravos plant in Nigeria, but costs have increased substantially and the start-up date has been pushed out a year, to 2011.

Some industry observers think GTL's future lies less in megaprojects like Pearl than in much smaller-scale applications. For instance, a British company, CompactGTL PLC, is developing a system to make synthetic crude oil from the gas produced as a byproduct of oil extraction. Currently, much of that gas is simply burned off, or "flared."

"There's more than five trillion cubic feet a year of gas that's flared -- more than the consumption of France and Germany combined," says Peter Riches, CompactGTL's CEO. "That's a huge market for us."

—Mr. Chazan is a staff reporter for The Wall Street Journal in London.

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Drop in the Ocean

Despite being almost 90 years old, GTL has seen little commercial application

Name (Location)	Company	Capacity, barrels per day
Pearl (Qatar)*	Shell & QP	140,000
Escravos (Nigeria)*	Chevron & NNPC	34,000
Oryx (Qatar)	Sasol & QP	24,000
Mossel Bay (South Africa)	Petro SA	22,500
Bintulu (Malaysia)	Shell	14,700

*Plants under construction

Sources: Companies; Deutsche Bank

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