DME Coming to North America: Connecting the Dots

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DME has achieved a remarkable success to become a commercial reality. However, this achievement and major developmental activities have been primarily outside of North America. But the question often asked is "When is DME coming to North America?". Now, the pathway leading to DME coming to North America as a new fuel can be seen more clearly by connecting the following dots.

Dot 1: Significant Global DME Activities: Recent Activities

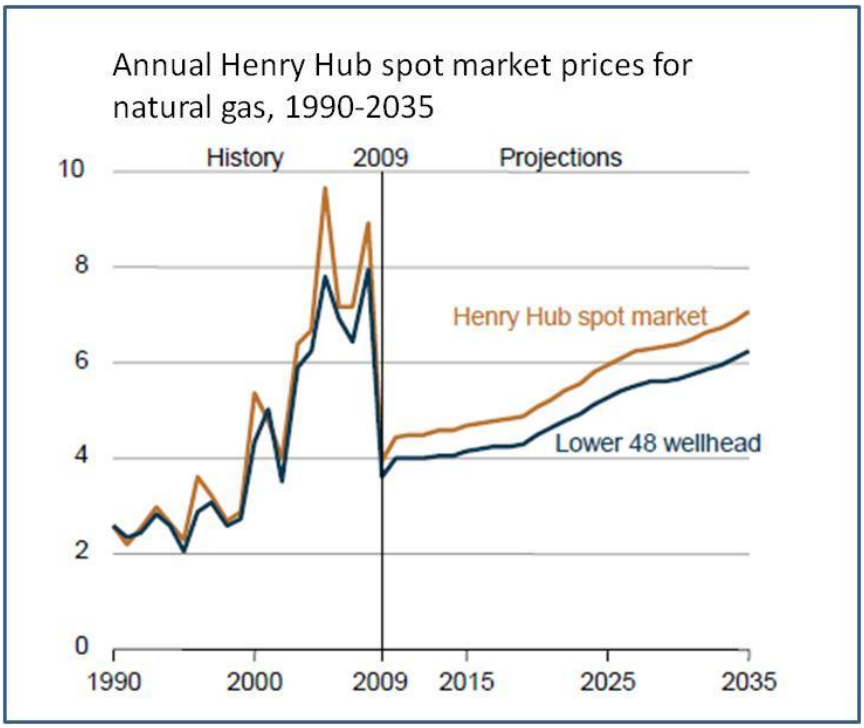
Members of the International DME Association (IDA) representing a broad spectrum of expertise related to DME met with members of the EU Commission, consultants, and journalists on September 22nd in Brussels. The briefing, hosted by the IDA's European Affairs Committee, culminated with a display of a new Volvo FH heavy truck running on DME, part of the vanguard BioDME project involving a number of fleet operators including DHL Express. See the Oct 2010 DeWitt Bits for background on the Volvo trucks used in its DME program.

The latest global developments will be presented at the upcoming 7th Asian DME Conference in Japan in November 2011. (http://www.dmeforum.jp/confernce7/index.html).

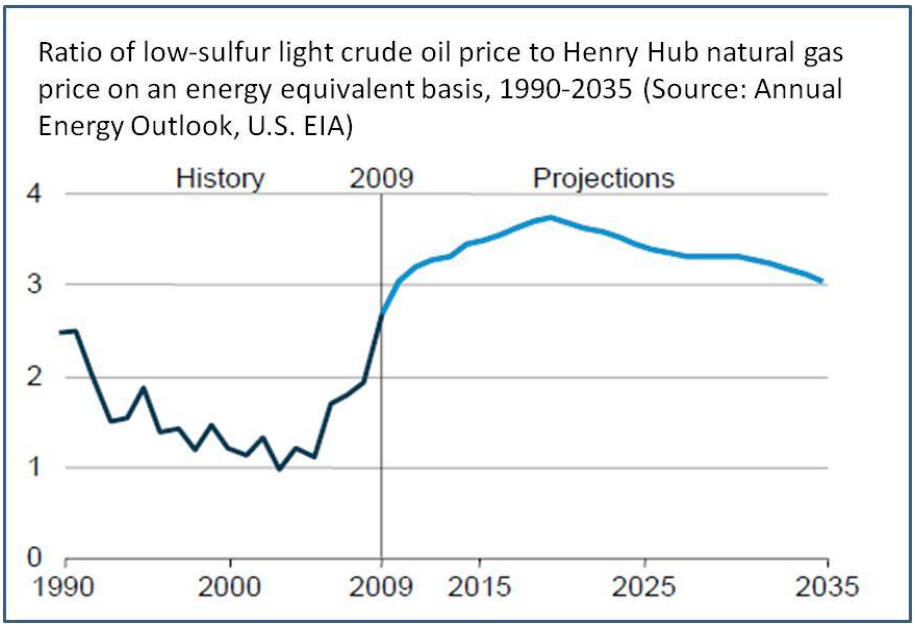
Dot 2: Shale Gas Revolution in the U.S. resulting in low natural gas prices.

Natural gas prices have plunged since 2008 as vast shale fields laden with gas are tapped through hydraulic fracturing and horizontal drilling. Rising estimates of shale gas resources have been the primary factor in nearly doubling the estimated U.S. natural gas resource over the past decade. U.S. shale gas production has continued to grow despite low natural gas prices.

According to the U.S. Energy Information Administration (EIA) Annual Energy Outlook 2011, Henry Hub price for natural gas does not pass $5 per million BTU until 2020.



Furthermore, the EIA projects that the ratio of oil prices to natural gas prices will continue to increase.



Dot 3: EIA projects that U.S. will be world's third-largest GTL Producer

The discovery of unconventional resources from shale gas and the resulting lower prices for natural gas is providing the strategic and economic underpin for the acceleration of GTL projects. GTL refers to projects that convert natural gas to liquid

fuels (diesel, gasoline, methanol and DME) using technologies such as Fischer-Tropsch (FT) and ExxonMobil's Methanol-to-Gasoline (MTG) technologies that convert synthesis gas (CO and H2) to fuels.

According to the U.S. Energy Information Agency 's 2011 International Energy Outlook, in the high oil price cases, the United States rapidly becomes the world's third-largest GTL producer, accounting for 96 thousand barrels per day of the world's total of 400 thousand barrels per day in 2035. http://www.eia.gov/forecasts/ieo/liquid_fuels.cfm

Dot 4: Sasol initiates feasibility studies for GTL-FT projects in U.S. and Canada.

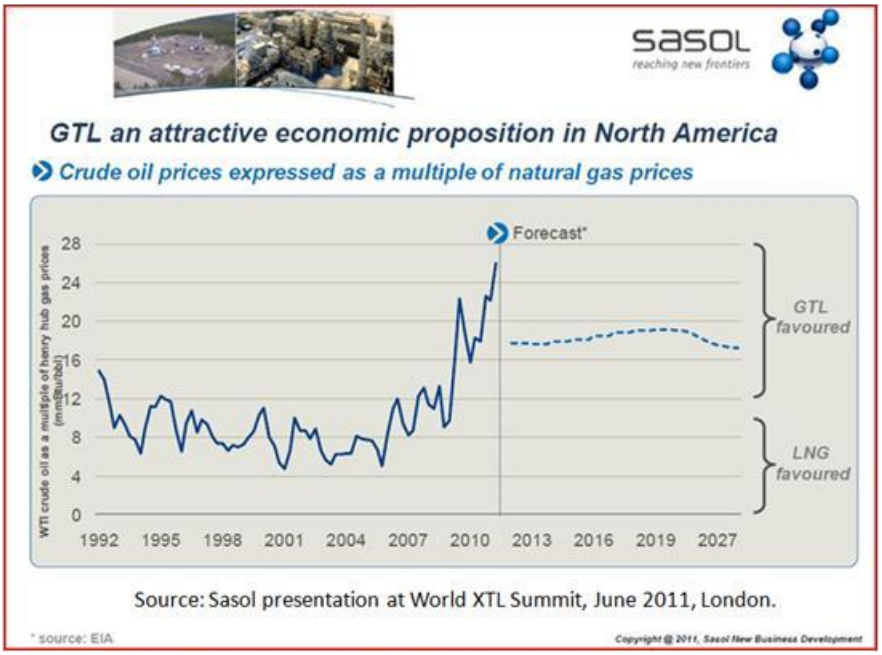
Sasol CEO David Constable has reported that Sasol is receiving regular enquiries to partner with others in exploiting what is currently a growing arbitrage opportunity between the price of gas and GTL, using their FT technology. Sasol has been producing diesel from natural gas using their FT technology at the Oryx joint venture with Qatar Petroleum in Qatar since 2007. Sasol is also the world's largest producer of diesel from coal (CTL).

In December 2010, Sasol acquired a 50% stake in the two shale gas assets of Talisman Energy Inc. located in Canada. Following this acquisition, Sasol commenced with a feasibility study to determine the technical and commercial viability of a GTL plant in western Canada.

In September 2011, Sasol announced plans to bring its GTL technology to Louisiana. Sasol will do a feasibility study that last up to eighteen months and will consider two options: 2 and 4 million ton per year facilities. (www.sasolGTL.com).

At the World XTL Summit in London in May 2011, Sasol stated GTL is economically attractive in North America due to a current and projected high ratio of crude oil to natural gas prices.

Dot 5: Economics for Gas to DME projects.



The DME value chain can be considered a GTL value chain technology because it can be produced from natural gas-derived methanol and DME is a fuel that is a liquid under pressure.

Dot 6: BioDME Project in Sweden demonstration DME as Diesel Alternative

The next issue key issue for DME coming to North America is what is the market. Of the several market options for fuel DME, the most likely for North America is as a diesel alternative. One of the most promising vehicle development programs for DME as a diesel alternative is being conducted in Sweden.

The BioDME project now underway will demonstrate the possibilities offered by DME as an ultra-clean transportation fuel, and involves the complete chain from production of fuel from biomass to its utilization in a fleet of trucks. The field test, begun in 2008 and set to conclude in 2012, is partially funded by the European Union and Swedish Energy Agency, and involves a consortium of industry partners: Chemrec, Delphi, ETC, Haldor Topsoe, Preem, Total, and Volvo. To date, the field test has involved 7 trucks, which have accumulated about 135,000 km, by customers.

Volvo Trucks develops and build DME trucks and a fuel injection system with Delphi, involving 10 DME trucks in Sweden (more details can be found in the October 2010 issue of DeWitt Bits). Preem is responsible for Bio-DME distribution and has built four fuel stations in Sweden. Total is providing engine oil, lubricity additives and material compatibility support.

As per Niklas Gustavsson, Volvo VP Public and Environmental Affairs, the ongoing complete DME field test is an important step to further verify DME in real operation. Volvo believes that DME has good potential to be an important transport fuel. Stable and long-term engagement is needed from all major stakeholders; that is, society, policy makers, authorities, fuel producers, vehicle manufacturers and customers.

Dot 7: DME Activities in U.S. and Canada

Oberon Fuels (**www.oberonfuels.com**), based in San Diego, is focused on the development of small-scale, skid-mounted units that produce DME. Oberon is working with a variety of policy leaders and state agencies to help ensure that DME becomes part of California's clean alternative transportation fuel options. In August, Oberon and Southern California Gas Co. announced a joint research and development agreement to design and construct the first commercial facility in the United States to produce DME from natural gas for use as a transportation fuel.

Oberon has also become an active participant in the North American Advisory Council, a sub-committee of the IDA focused on developing a market for DME and raising awareness at government and regulatory levels.

DME Pilot Vehicle Demos Moving Forward in North America. Eric Switzer, founder of GV Energy (**www.gvenergyinc.com**), a Canadian company, is leading a BioDME project with a coalition of members of the IDA's North American Affairs Committee for a DME vehicle demonstration project in Vancouver to demonstrate DME blended with propane.

The Future

The future for DME as a diesel alternative is still challenging, as more market development is needed, particularly in the North America. As Steve Jobs said: “you can't connect the dots looking forward; you can only connect them looking backwards". So you have to trust that the dots will somehow connect in your future.” So we will need to wait awhile for the 8th dot; that is, development of a large-scale market for DME as a diesel alternative to be realized.

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