

EXPRESSWAY TO U.S. ENERGY INDEPENDENCE – GTL DIESEL



JUNE 2012

Monthly Report - Preview

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June 2012

1. According to BP Statistical Review of World Energy (June 2011) consumption of middle distillates in the USA in 2010 was 5,449,000 barrels per day or 28.46 per cent of total oil consumption of 19,148,000 barrels per day. It is estimated that 4 million barrels per day of the middle distillates are diesel.
2. The shale gas revolution in the USA has resulted in the discovery of enormous reserves estimated by the Energy Information Administration in 2011 at 869 trillion cubic feet. This estimate was reduced by EIA to 480 trillion cubic feet of economically recoverable reserves in January 2012 apparently because of the dramatic fall in the price of natural gas from a high of \$8.85 per 1,000 cubic feet in 2008 to about \$3.00 in early January 2012. Since January this price has dropped even further to the current level of about \$2.20 despite cutbacks in drilling for gas by a number of corporations much as Chesapeake Energy and the relocation of drilling to geological areas with proportionately more liquids production as compared to gas.
3. In other words, the US natural gas industry is burdened by an enormous supply surplus, which cannot be reduced sufficiently even though increases in demand are expected in electricity generation, petrochemicals and exports of LNG. The obvious solution is the use of natural gas in transportation. GTL fuels have an enormous advantage over compressed natural gas (CNG) now widely discussed because they do not require changes in engines and above all they can use the existing infrastructure of pipelines and retail stations for distribution.
4. Three questions require satisfactory answers in order to determine the feasibility of GTL diesel. These questions are: a) are the technologies feasible? b) Does the USA have enough gas reserves? And c) is it economic?
5. Royal Dutch Shell and Sasol have already proved the technical feasibility of GTL technologies with their plants in Qatar. Shell's Pearl GTL is based in Ras Laffan, Qatar. The capacity of Pearl GTL is given as 140,000 barrels of products per day and include:
 - a. GTL base oil for lubricating vehicle engines, gearboxes and transmissions
 - b. GTL gas oil for blending with conventional diesel for cleaner burning and lower emissions.
 - c. GTL Kerosene for cooking, lighting and dry-cleaning and potentially as jet fuel. GTL normal paraffin and
 - e. GTL naphtha for plastics and several other products.
6. Shell's Pearl GTL begun operations in mid-2011 and will reach full production by mid-2012. Without attributing any cost for the gas input, a high official of Shell has claimed that the Pearl

GTL plant would be profitable as long as oil prices remain above \$40 per barrel (Wikipedia "Pearl GTL", January 26, 2012). Similarly, another report stated that "Shell expects its Qatar Pearl gas-to-liquids operations in the Middle East, to generate \$4.5 billion of annual cash flow when fully up and running at a \$70-a-barrel oil price assumption (Wall Street Journal, July 29, 2011, pg. C8).

7. As is often the case with corporations, especially with oil companies, estimation of their costs is one of the most difficult if not impossible tasks. For the Pearl GTL plant apparently the gas input is provided free but the Government instead has been given a share of the plant. In addition to the direct investment for the plant, Shell was apparently responsible for the drilling and related costs to produce the necessary gas input from proved reserves.

8. In North America, the first announcement for a possible GTL facility in Western Canada was made in mid-2011 (Pennenergy, June 24, 2011 "Sasol Taps Foster Wheeler for gas-to-liquids feasibility study in Canada), by Sasol and Talisman. The plant will convert shale gas into GTL naphtha, diesel and liquid petroleum gas, using Sasol's GTL technology. After the completion of a feasibility study, a decision is expected by the 2nd half of 2012. Sasol also announced, in September 2011 that its Board had approved an 18-month feasibility study for a GTL project in Louisiana with an estimated cost of \$10 billion for a capacity of 96,000 barrels per day of diesel and some jet fuel based on natural gas from suppliers using long-term contracts (Wall Street Journal, September 14, 2011, pg. B3).

9. Based on the above figures of Sasol, with a 6% interest capital cost is estimated at \$17.14 per barrel. Other costs are mainly the amount and cost of the gas. At a price of \$3.00 per thousand cubic feet per barrel of diesel the total cost is estimated at \$47.71 per barrel. Since the price of diesel has recently been well above \$3.00 per gallon or \$126.00 per barrel, the profitability is obvious. Shell has indicated that gas input is much lower at its Qatar plant (6,154 cubic feet per barrel) and since GTL diesel is sulfur free, a premium could be added to the diesel price, thus improving the profitability considerably.

10. The adequacy of gas reserves has already been mentioned above. At an input of 10,000 cubic feet per barrel of diesel, the production of 4 million barrels per day would require 14 trillion cubic feet per year. At the lower estimate of Shell of an input of 6,154 cubic feet per barrel, total gas requirements would be considerably less at 8.6 trillion cubic feet per year. The mystery of it all is why the shale gas corporations cut drilling instead of looking into the most promising GTL market.

11. In conclusion, it may be stated that the successful application of GTL technologies could save the USA about \$175 billion per year in foreign exchange and reduce its dependence on oil imports by about one-third. This seems to be the only expressway to American energy independence.

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