

Trojan Horse

By Sunita Dubey

Hidden costs of coal-to-liquids in the USA

US interest in the coal-to-liquids (CTL) technology was sparked when German scientists and technical documents were captured in the latter stages of WWII. One of the reasons for this were the massive quantities of coal available in the US and the Federal Government began investigating possible coal-based synthetic alternatives in response to the scenario of a decline in America's natural oil supplies. Passage of the Synthetic Liquid Fuels Act of 1944 began the first concentrated effort to study future ways to use the nation's abundant coal supplies¹. In fact, the United States experimented with CTL in 1979 by creating a Synthetic Fuels corporation (SFC), assuming high oil prices in the 1980s. Although SFC invested in six CTL projects, all its products became unviable due to a sustained drop in oil prices in the 80s, and SFC was terminated in 1985. Although companies like Rentech and Syntroleum have been doing technology research, no large-scale commercial plant has been built in the US.

In the recent times, however, the coal-to-liquids lobby and its proponents have found fresh vigour to promote and push this technology at Capitol Hill. At least nine coal-to-liquids facilities are now in the planning stages, including one each in Illinois, Pennsylvania, and Wyoming that already have significant funding lined up and are slated to begin production by 2009, according to the National Energy Technology Laboratory. There are currently a number of projects undergoing feasibility studies, including the Medicine Bow Project in Wyoming, the Waste Management and Processors Inc (WMPPI) project in Pennsylvania and the Rentech project in Illinois. There are also projects proposed in Arizona, Montana and North Dakota. DKRW Energy's CTL project in Medicine Bow, Wyoming, is being designed to produce 11,000 barrels per day (bbl/d) of various fuels – primarily diesel. DKRW Energy has long-term plans to further expand the capacity of the facility to produce as much as 40,000bbl/d of fuels. The Medicine Bow project will also include the construction of an integrated gasification combined cycle (IGCC) unit to produce electricity on the site using the syngas² and steam produced in the CTL process. During the first phase, an estimated 45MW of power will be generated. As reported by the National Coal Council to the Department of Energy, if federal tax incentives and state subsidies are provided

to kick-start the industry, coal-based fuel production could soar to 40 billion gallons a year by 2025 – or about 10 percent of forecast oil demand that year.

The Energy Policy Act of 2005 also encourages the development of these technologies in a number of ways, including a new loan guarantee program for innovative technologies that does not require the appropriation of any taxpayer funds³. On March 30, 2006, DOE awarded funding of about \$4.3 million for a \$5.4 million project that would further develop Syntroleum technology to produce either hydrogen or high hydrogen-content. The funding was part of a broader award of \$62.4 million for 32 U.S. clean coal research projects⁴. The USA's proposed Foreign Oil Displacement Act seeks to provide financial tax incentives for CTL projects. Specifically, the bill would provide a 28% Investment Tax Credit and exemption from the Fuels Excise Tax for CTL fuels.

The Energy Information Agency projects that the US will get 1.7 million barrels of transportation fuel per day from coal by 2030. This is nearly half of the expected worldwide coal-to-liquids (CTL) production. A new report prepared by the National Coal Council suggests CTL technologies could produce 2.6 million barrels per day, including gasoline, diesel and jet fuel.

However, such a promise is called into question in a DOE environmental impact filing in December 2006, which reported that a leading CTL development had no near-term plan to capture any of the 2.3 million tons of CO₂ it would produce annually. According to Wall Street Analysts, the \$800 million project, which would make 5,000 barrels of CTL fuel a day in Gilberton, Pa., is part of an industry push where CO₂ capture costs are not factored into the bottom line of the business plan.

Ongoing Lobbying Efforts

The National Mining Association has ramped up Capitol Hill lobbying by creating a new coalition and a website, "futurecoalfuels.org". Many in Washington are warming to the idea of CTL. The bills promoting CTL in the House of Representatives and the Senate have received strong bipartisan backing and supporters of the bill range from



Plants Under Consideration in the United States



According to the U.S. Department of Energy, companies, local governments and American Indian tribes have announced plans to build the nation's first 16 coal-to-oil plants. Map courtesy of DOE.

Sen. Barack Obama (D) of Illinois to President Bush. In his State of the Union speech on January 23, 2007, President Bush called for the United States to produce 35 billion gallons of "alternative fuel" by 2017.

The "Coal to Liquids Coalition" is a network of companies and organizations trying to promote CTL in the US, which includes companies like Sasol, Rentech, Syntroleum, and National Mining Association etc. This coalition was launched on March 28, 2007, and several US Congress members from coal-producing states attended the launch. Sasol North America, a division of the company that produces CTL fuel in South Africa, paid the Livingston Group \$320,000 last year to lobby Congress to support building CTL plants in the United States. With congressional members and the White House promising to promote alternative fuels, a number of other alternative-fuel companies have joined Sasol in hiring firms to lobby for tax breaks and other incentives to ease their entrance into a market dominated by oil companies.⁵ Sasol wants to build coal-to-liquid (CTL) plants in three US states as part of its global expansion program. The three states - Montana, Illinois and Wyoming - hold about 56 percent of total US coal reserves, or 267.3 billion tons combined.

Glitches in the CTL

The price estimates cited by CTL industry proponents assume facilities are going to be uncontrolled for CO₂ emissions. However, the judgment by the US Supreme Court on April 2, 2007, on global warming, categorised CO₂ as an air pollutant under the Clean Air Act and well within the jurisdiction of EPA. Given the current debate in the Congress, and public concern on global warming, investors should be careful of the increasing likelihood that the US could establish emissions controls, so that any large investment in CTL would need significant subsidies to offset environmental costs. High capital costs - \$1 billion to \$6 billion for a single facility - and the unknown cost of carbon sequestration could make such projects unappetising for investors to swallow without federal incentives. A key question is whether CTL plants will have carbon sequestration as an integral part of their operations. If they do not, then these plants will emit millions of tons of CO₂ into the atmosphere annually. Even if gases were pumped underground, CTL fuel, when burned in an engine, would still emit about 8 percent more CO₂ than a gallon of gasoline, according to a Princeton University study in 2003.⁶



Sasol plant
polluting
Secunda.
Picture from
groundWork



It is only because such health and environmental problems are ignored that Sasol's fuels are relatively cheap. CTL plants require enormous investments—about \$1 billion dollars for a 10,000 bbl/d, and up to \$6.5 billion or more for a large-scale 80,000 bbl/d plant with a five to seven year lead-time⁷.

Furthermore, with the looming challenge of mitigating global warming, it is important for Nations not to invest in high carbon emission technologies. According to a recent MIT study, the conversion of coal to synthetic fuels and chemicals requires large energy inputs, which in turn result in greater production of carbon dioxide (CO₂). Thus, synthetic fuels derived from coal produce a total of 2.5 to 3.5 times the amount of CO₂ produced by burning conventional hydrocarbons⁸.

The groundWork US office has been following the recent development on CTL in the US and has come up with a comprehensive background paper on the status of CTL globally. We are trying to forge a network with like-minded groups, who are opposed to fossil fuel based technology and are working towards curbing green house gas emissions. Lessons are also being drawn from our work on Sasol's CTL plants in South Africa. 

Footnotes

¹ DOE and its History

² Syngas (from synthesis gas) is the name given to a gas mixture that contains varying amounts of carbon monoxide and hydrogen generated by the gasification of a carbon containing fuel to a gaseous product with a heating value.

³ http://energy.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease_id=234935&Month=4&Year=2006

⁴ http://www.fossil.energy.gov/news/techlines/2006/06035-Syntroleum_Projects_Show_Progress.html: DOE Projects Provide Stepping Stone to America's Hydrogen Economy

⁵ <http://thehill.com/leading-the-news/its-coal-vs.-oil-as-lobbying-heats-up-hill-2007-03-26.html>

⁶ <http://www.csmonitor.com/2007/0302/p02s01-ussc.html>: Coal in cars: great fuel or climate foe?

⁷ <http://www.futurecoalfuels.org/faq.asp>

⁸ Furthermore, even if the CO₂ emissions from the manufacturing process can be captured and sequestered, combustion of the resulting fuel would still put more CO₂ into the atmosphere than conventional fuel would. See: Future of Coal-Options for a Carbon Constrained World, An interdisciplinary MIT Study, pp 152-154 March 2007.

