



Neste Moves Forward with Green Diesel

Posted by [Robert Rapier](#) on June 16, 2008 - 10:00am

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I have written periodically on 'green diesel', which is not to be confused with biodiesel. Neste, Petrobras, and ConocoPhillips (in a venture with Tyson foods), have all entered the green diesel arena. (See a bit on announced projects from these companies [here](#); explore previous green diesel stories I have written [here](#)).

Green diesel is produced either from hydrotreating or hydrocracking plant oils or animal fats (Neste, Petrobras, and COP) or via the BTL reaction (Choren). Green diesel is chemically different from biodiesel. Green diesel has chemical properties identical to petroleum diesel, while biodiesel is not a pure hydrocarbon (it contains oxygen atoms, hence the somewhat different physical properties).

On Friday the 13th, Neste issued a press release announcing that they will build a facility in the Netherlands:

[Neste Oil to build a NExBTL renewable diesel plant in Rotterdam](#)

Neste Oil is to build an 800,000 t/a plant to produce NExBTL renewable diesel in Rotterdam in the Netherlands. Construction will start immediately and the facility is scheduled to be completed in 2011. Total cost of the investment is projected to be €670 million. Neste Oil announced its decision to go ahead with a similar-sized plant in Singapore in November 2007. Both plants are linked to Neste Oil's goal of becoming the world's leading producer of renewable diesel fuel.

NExBTL renewable diesel is based on Neste Oil's proprietary technology, which can use a wide range of raw materials. In its plant in Finland, the company currently uses a mix of palm oil, rapeseed oil, and animal fat to produce renewable diesel. Offering excellent product quality - even better than fossil diesel - NExBTL can be used in all diesel engines.

Neste Oil has a major R&D program under way to develop new renewable raw materials for fuel production, and is working towards a target of completely non-food raw material use by 2020. Neste Oil is cooperating with over 20 universities and research institutions globally as part of this program, which is divided into six areas, including non-food vegetable oil, wood-based materials, and algae.

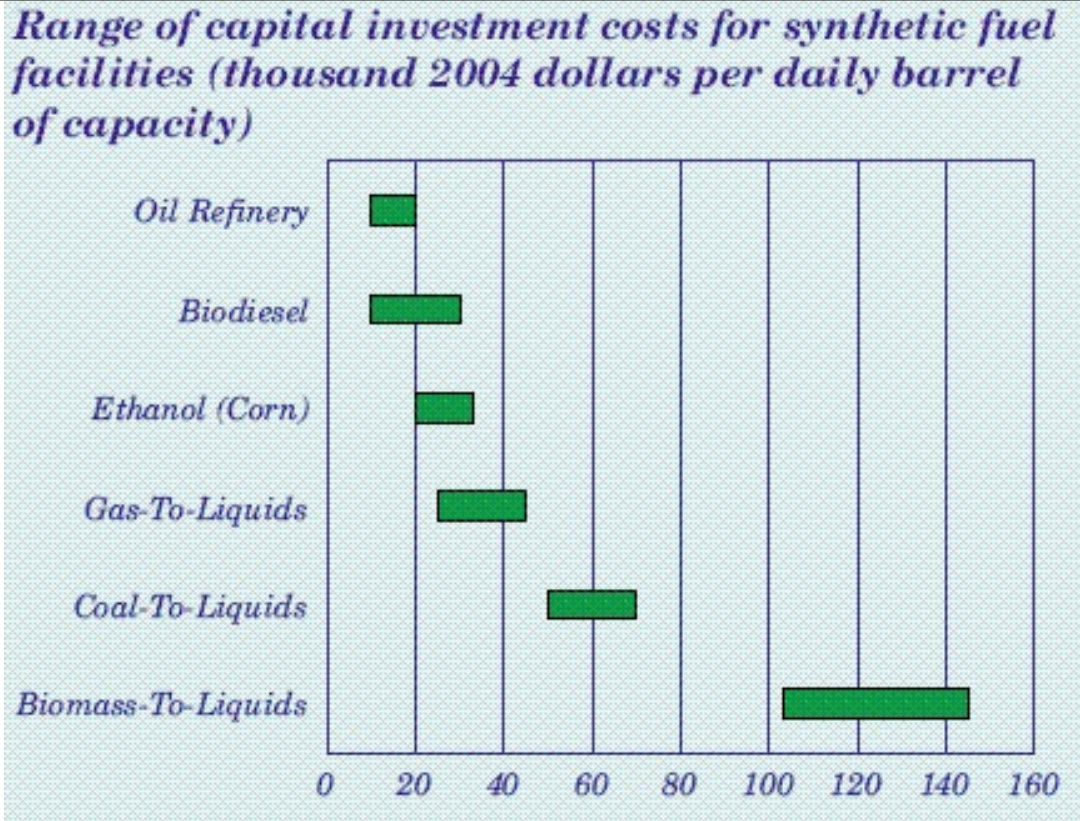
Regarding the NExBTL diesel, Neste says:

NExBTL renewable diesel is an advanced fuel based on renewable raw materials that performs more efficiently and has a lower level of environmental impact than fossil diesel or FAME-type biodiesel. Neste Oil requires its raw material suppliers to observe a responsible approach to sustainability. Feedstock of this type ensures that NExBTL renewable diesel has a 40-60% lower level of greenhouse gas emissions over its entire lifecycle compared to fossil diesel. NExBTL renewable diesel can be blended with conventional diesel fuel or used as such, and is suitable for all diesel engines.

Neste Oil is the leader in renewable diesel production. The company's first NExBTL facility was commissioned in Finland at Neste Oil's Porvoo refinery in summer 2007. Second facility is due to come on stream there in 2009. They both have a capacity of 170 000 t/a. In addition Neste Oil is building 800 000 t/a plants in Singapore and Rotterdam. Singapore facility is due to be completed by the end of 2010 and Rotterdam facility in 2011.

While this is an improvement, in my opinion, over biodiesel, they are still going to rely on oil crops such as palm oil. Destruction of rain forests in Malaysia and Indonesia to plant palm oil plantations [poses a serious environmental threat](#). The future of green diesel needs to be based on non-food crops - especially those like jatropha that can be grown on marginal land - and waste materials such as biomass that is currently destined for landfills.

I was curious about the costs per barrel, so I worked that out. A barrel of oil weighs 0.137 metric tons (and has density similar to pure diesel). Then 800,000 t/yr is equal to 5.8 million bbl/year (16,000 bbl/day). For perspective, a mid-sized oil refinery will be around 250,000 bbl/day, but the Neste facility is certainly of a respectable size. The cost is projected to be €670 million. If I convert that to dollars, I can compare the cost to various other fuel technologies. A Euro is [currently worth \\$1.53](#), so the project is going to cost US \$1.025 billion. That works out to \$64,000 per daily barrel. Again, for perspective the recently announced 400,000 bbl/day Jubail Refinery Project that Total is building with Saudi Aramco [is currently estimated at \\$10 billion](#) (\$25,000/daily barrel).



Capital Costs of Fuel Facilities

Source: EIA Annual Energy Outlook 2006

To be honest, if Neste pulls the project off for that, it will come in at a competitive cost relative to other fuel technologies. See the above EIA figure for estimated costs of various fuel facilities. And that was from a couple of years ago, when stainless steel prices were significantly lower. So, on the one hand I hope Neste pulls this off, but on the other they need to source a different feedstock than edible oils for the facility.



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