

The Mercurius Times

Summer 2011

Jetting Into The Future

It was a long, cold, and wet winter and spring but the time was well spent at Mercurius Biofuels. First there was the adoption of a modified business name, Mercurius Biorefining Inc., corresponding to the C-corporation model that will be used as Mercurius develops and better representing the diversified product range that the Mercurius process allows. In December, Mercurius Biorefining was able to enrich and broaden the validation of its cellulosic diesel production process by further batch processing and analysis leveraging its continuing partnership with Pacific Northwest National Laboratory (PNNL). The



Pacific Northwest National Laboratory

analytical results of this collaboration are very promising and have helped lead to interest from possible partners, co-locators, and feed stock providers in the Pacific

Northwest and internationally in Scandinavia and South Africa. The global licensing rights granted by the Energy & Environment Research Center (EERC) that Mercurius Biofuels



Energy & Environment Research Center

holds for its proprietary catalytic ethanolysis process (the Mercurius Process for creating diesel, jet fuel, and various chemicals) give it a potentially critical option for attaining funding should the US biofuels funding market continue to be erratic.

Green Earth Molecules Into Fuel



Fresh Water Pulp Eureka California

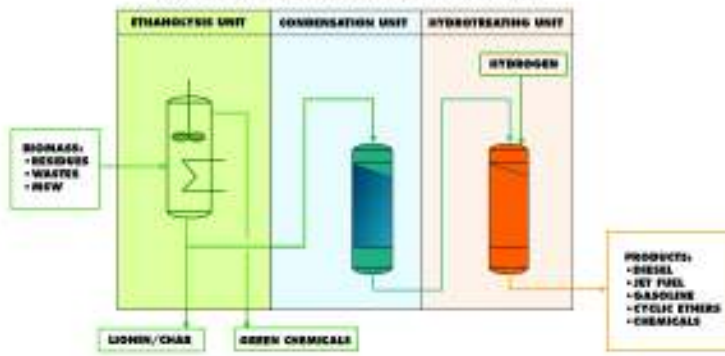
Partners 'N Pulp

When talking about cellulosic biomass it is hard to find more experience than in the pulp and paper industry where paper mills have well-established biomass procurement systems, continually processing vast quantities of woody biomass throughout the year. Some of the valuable feedstock that Mercurius views favorably include mixed hardwood and pine chips, forest residues, timber processing waste currently burned for energy, and sustainably grown plantation wood. In this context Mercurius is continuing to pursue partnerships within the pulp and paper industry and is pleased to see that the industry itself is becoming

more aware of the synergies between cellulosic biofuels and pulping operations. An article in Biofuels Digest (<http://biofuelsdigest.com/bdigest/?s=pulp+non+fiction>) clearly delineates the possibilities and shows how Mercurius may be poised to step into the breach and add value to a struggling industry.

Additionally, Mercurius is actively partnering with two world-renowned catalyst companies to develop the most appropriate catalysts for use in its pilot plant projects at the EERC.





The Dakota Two-Step

Mercurius Biorefining Inc. intended to build a 5-ton a day pilot plant straight after completing its successful bench scale batch processing research in February. Instead, Mercurius is developing a two-step pilot strategy reflecting its current limited research budget. To this end, Mercurius CEO, Karl Seck, visited the EERC, located in Grand Forks, North Dakota, in April. The reason for this visit was the refinement of a project plan for a continuous bench-scale pilot plant dubbed the Micro-Pilot Plant. After meeting with Ben Oster (research engineer) and Ed Olson (Mercurius IP developer) of

the EERC, Karl was very pleased to find that the changes made necessary by budget constraints had actually led to a more efficient design than originally planned. Ben and Ed identified a way to use an existing batch reactor and convert it to a continuous process.

The Micro-Pilot Plant will provide proof of process for the Mercurius three-step conversion process. It starts with small amounts of biomass (i.e. a few pounds of sawdust) being put into the front-end Ethanolysis Unit creating a bio-crude that then goes into the Condensation Unit and finally, the Hydrotreating Unit with diesel and jet fuel

being produced.

The Micro-Pilot proof of process is a crucial step in the technology development road map identified by Mercurius. The nature of the Mercurius process, using catalytic ethanolysis and solid-catalyst-bed technology, helps mitigate scale-up risk because very similar technologies have already been scaled to very large capacities. For

hydrotreating steps should commence in early July with continuous processing achieved by the end of the month. The products made from the Micro-Pilot plant will be in sufficient quantity to perform product testing for both diesel and jet fuel applications. Other important benefits of operating a continuous unit are that different types of feedstock & catalyst combinations can be tested and optimization strategies developed to improve yields.

The Micro-Pilot project is funded partially by a DOE grant obtained by the EERC and the balance by Mercurius. Additionally, funding for a 2-5 ton a day pilot plant at the EERC is currently in the works.



example, the first step in the catalytic ethanolysis process is very similar to those used in the pulp and paper industry and the condensation and hydrotreating steps are (as solid-catalyst bed processes) analogous to technologies that have been used at very large scale in the petroleum refining industry.

As of mid June, the EERC has run the Micro-Pilot condensation step using a solid catalyst and achieved very good results with high yields of the desired products. Initial runs of the ethanolysis and



Photos this page courtesy: EERC

