Gasoline and Diesel from Wood, Agricultural Waste, and Algae R&D

Gas Technology Institute will conduct research and development on hydropyrolysis and hydroconversion processes to make gasoline and diesel.

GTI's 50-kg-per-day IH_2 pilot plant; biomass feedstock; control room with several monitos; engineer monitoring liquid collection section of unit; and clear gasoline in beaker next to biomass feed

Gas Technology Institute (GTI) will conduct a research and development (R&D) project at the company's Research Campus in Des Plaines, Illinois, to develop the design basis for an integrated pilot-scale facility to process one ton per day of wood products, agricultural waste, or algae into gasoline and diesel products. For more information, please visit the GTI website.

Project Description

GTI is conducting R&D on a novel process—integrated hydropyrolysis and hydroconversion (IH_2)—for the economic conversion of wood, agricultural waste, and algae biomass into fungible gasoline and diesel.

The wood material used in testing—which is the reside from harvesting and manufacturing and includes roundwood, chips, and sawdust—is supplied by Johnson Timber. Cornstover is provided by Cargill. Algae test samples are provided by both Aquaflow and Blue Marble.

The project objectives and the value proposition support the national goals of energy independence, greenhouse gas reduction, and green job creation and retention.

These goals include the following:

- Research in optimal catalyst and test conditions for integrated hydropyrolysis and hydroconversion
- Demonstrate the effective use of wood and agricultural waste, including cornstover and algae for gasoline and diesel production
- Analyze testing data for the three types of biomass material
- Gather metrics for the construction and scale up to a one ton per day integrated pilot facility and a commercial-size facility
- Run a continuous 50-kilogram-per-day IH_2 pilot for an extended period to gather catalyst life and attrition data.

Potential Impacts

Outside of the scope of the U.S. Department of Energy-funded R&D project, GTI may pursue plans to build a 1–50-ton-per-day pilot facility, which is scheduled for startup in 2013.

Once the proposed thermochemical process has been demonstrated to work at a 1–50-ton-per-day scale, it can be expanded to produce fungible gasoline and diesel in amounts sufficient enough to allow the United States to reduce its dependence on imported oil.

Initial results for a variety of biomass feedstocks—wood, cornstover, bagasse, algae—all achieve good yields of low oxygen (below detection limit < 0.5%) gasoline and diesel.

Other Participants

Other participants include Cargill, CRI Catalyst Company, Johnson Timber, Aquaflow, Blue Marble Energy, Michigan Technical University, and the National Renewable Energy Laboratory.

Prime	Gas Technology Institute
Location	Des Plaines, Illinois (Office and Project Site)
Feedstock (s)	Wood, agricultural byproducts, and algae
Scale	Research and development
Primary Products	Renewable gasoline and diesel
Capacity	Bench scale and 50 kilograms per day
Award Date	January 29, 2010
GHG Reduction	> 85% reduction
Anticipated Job Creation	10 Jobs over the life of the project
Company Contact	Michael Roberts, 847-768-0518

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