

Project Summary

Project Title:	Integration of IH ² with Cool Reforming for the Conversion of Cellulosic Biomass to Drop in Fuel
Principal Investigator/ Project Director:	Terry Marker/ Michael Roberts/ Pedro Ortiz-Toral
Name of Applicant:	(GTI) Gas Technology Institute
Solicitation Number:	DE-FOA-0002029 (Area of Interest 4)

Objectives:

In this project we will integrate the Integrated Hydrolysis and Hydroconversion (IH²®) pilot plant with the Cool Reforming pilot plant to show that the IH² process is hydrogen self sufficient and that the systems can be integrated in a simple low cost way. The goal of the project is to:

- Make Drop-in fuels from cellulosic biomass for <\$2.5/GGE
- Show the integrated system is hydrogen self sufficient
- Show the integrated system is simple and low cost
- Run the integrated system for more than 1000 hours, and more than 100 continuous hours, and produce more than 100 gallons of drop in biofuel with less than 0.4% oxygen
- Demonstrate the integrated system can convert more than 50% of the biogenic carbon from a wood feed into biofuel
- Develop a skid mounted modular design for IH² based on the Cool Reformer integration along with innovative new technologies for the peripheral equipment and reduce the capital cost by more than 30% and the operating cost by more than 40%
- Confirm the improved design reduces greenhouse gas emissions by more than 70% compared to petroleum fuels.

Brief description of technology proposed methods to be employed:

GTI will integrate the IH² pilot plant with the Cool Reforming pilot plant to show the hydrogen required for the IH² process can be produced by reforming the biogas from the IH² process. The IH² process uses hydrolysis followed by hydroconversion to convert cellulosic biomass directly to high quality drop in fuel. The IH² process produces 86 GPT of high quality gasoline and diesel from wood. Cool Reforming can convert the biogas from the IH² process to make all the hydrogen required in the IH² process in a simple low cost process.

Potential impact of project benefits and outcomes:

This project will lead to rapid commercialization of the IH² process in compact modular plants. These modular plants will be used to produce biorenewable drop in fuel for less than \$2.5/GGE.

Major participants (collaborative projects):

GTI

Shell Catalyst and Technology

KBR

Michigan Technological Institute

Forest Concepts

Synsel Energy