Pilot Scale Biorefinery:

Sustainable Transport Fuels from Biomass and Algal Residues via Integrated Pyrolysis and Catalytic Hydroconversion

This project will leverage two commercially proven core technologies into an integrated platform: pyrolysis of biomass from Ensyn Corporation and hydroconversion from UOP.

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The UOP Integrated Biorefinery will convert a variety of biomass feedstocks to fungible liquid transportation fuels.

Project Description

UOP proposes to conduct a pilot scale operation of a fully integrated process to convert high impact biomass to fuels including gasoline, diesel, and jet range hydrocarbon. Feedstock producers will provide feed and information for detailed life cycle assessment and growth potential. The feeds will be converted to fuels via integrated pyrolysis and hydro-conversion. Refiners and engine manufacturers are also team members, to demonstrate fungibility of the fuels within the refinery, determine fuel properties and accelerate qualification and acceptance as liquid transportation fuels.

UOP is currently working with DOE to develop pyrolysis oil upgrading technology that will improve stability of the products and remove highly reactive components that will allow more cost effective downstream processing of the pyrolysis oils. The unit will include RTP™ rapid thermal processing technology developed by Ensyn Corporation to convert the biomass to pyrolysis oil. The RTP technology has been used commercially since 1989 and is currently used to process biomass and other feedstocks in seven North American units.

The production of pyrolysis oils is envisioned taking place near areas of biomass resources in order to transport a higher energy density product to the refinery where upgrading to fuels will take place. The stabilization of pyrolysis products will allow longer term storage of feedstocks at the refinery. Once at the refinery, the pyrolysis oils will be processed using modified hydroconversion technologies to produce liquid transportation fuels.

Potential Impacts

As a result of this project, UOP anticipates deploying the technology on a commercial scale. Each commercial application would have four RTP units and one Upgrading unit to produce 50 million gallons of fuels annually, with the potential to create approximately 800 construction jobs and 1000 permanent jobs, including biomass production.

Other Participants

- Tesoro
- Ensyn
- PNNL
- CH2M Hill
- Ambitech
- Michigan Tech University
- Ceres
- Cargill, Inc.
- Grays Harbor Paper LP
- Targeted Growth Inc.
- Imperium Renewables
- HR BioPetroleum
- Mesa Engineering
- Countrymark Petroleum
- Kern Oil
- Honeywell
- Boeing
- General Motors

Prime	UOP, LLC.
Location	Kapolei, Oahu, Hawaii
Feedstock (s)	Agriculture wastes, pulp, paper, wood, energy crops and algae
Size	1 ton per day
Primary Products	Gasoline, Diesel and Jet fuels
Capacity	4 Barrels per day
Award Date	Early 2010
GHG Reduction	60% reduction versus fossil fuel equivalent
Anticipated Job Creation	85 peak construction jobs and an average of 40 sustained per year during the project duration
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