



Biomass Program

Thermochemical R&D

Gasification of Wet Biomass

Wet biomass feedstocks, such as residues from fermentation facilities and animal manures, are difficult to gasify using conventional technologies due to their high moisture content. Development of an effective method to convert these residues to valuable products or fuels is important for an integrated biorefinery both in terms of achieving high conversions of the feedstock and reducing processing wastes.

Research has shown that wet biomass can be converted to a methane-rich gas at temperatures of around 350°C. Basic studies have shown that high yields of hydrogen could potentially be produced under different conditions. Both are valuable fuels with significant markets.

Led by the Pacific Northwest National Lab, this project is developing a catalytic gasification technology for recovery of energy from wet biomass. Researchers are developing catalyst systems that can efficiently convert the feedstock into a gas product composed primarily of methane and carbon dioxide in a low-temperature, high-pressure liquid water environment. A key issue is the ability of the catalysts to withstand the reaction conditions.



Engineering development of catalytic gasification of wet biomass.

R&D Pathway

The scope of the project involves preliminary batch reactor testing with wet biomass materials, and bench-scale continuous-flow to validate process kinetics and address various material handling issues. The goal is to develop sufficient process information to convince an industrial partner to join the R&D effort.

The process will be scaled-up to a half-ton per day processing unit. A conceptual commercial plant design will be developed and a detailed techno-economic analysis performed. An industrially co-funded pilot plant is envisioned as the next process development step.

Benefits

- Transform biomass residues, such as fermentation wastes, into usable bioenergy
- Improve overall process efficiency of biorefineries

Applications

The resulting technology will enable the conversion of wet biomass resources into fuel gases.

Project Partners

Furst-McNess
Midwest Grain Products
Pacific Northwest National Laboratory
Washington State University

Project Period

FY 2002 – FY 2004

For more information contact:

Douglas C. Elliott
Pacific Northwest National Lab
Dougc.Elliott@pnl.gov

EERE Information Center
1-877-EERE-INF (1-877-337-3463)

Visit the Web site for the Office of the Biomass Program (OBP) at
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