U.S. Department of Energy
Energy Efficiency and Renewable Energy
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Biomass Program

Thermochemical R&D

Syngas Particulate Cleanup

The raw gases (syngas) from biomass gasification contain tar, particulates, alkali, ammonia, chlorine, and sulfur and must be cleaned and conditioned before they are further processed to fuels, chemicals, or power. The cleanup technologies currently available do not meet the needed cost, performance, or environmental criteria to achieve commercial implementation of gasification systems.

The National Renewable Energy Lab (NREL) will investigate the effectiveness of current and emerging cleanup technologies for removing particulate matter from syngas. NREL has added an on-line particle size analyzer to their Thermochemical Process Development Unit (TCPDU) that will enable the detailed characterization of the particulate matter in syngas.

The on-line particle size analyzer will, in the long-term, contribute to the development of new process optimization techniques for control and removal of particulate matter in biomass gasification systems.

Fluidized bed reactor at the Thermochemical Process Development Unit at NREL.

R&D Pathway

Researchers will validate and optimize the on-line process measurement capability for particle size analysis using the high temperature condensable gas streams produced in the thermochemical unit. This will help to establish a baseline of cleanup technology performance.

Once a performance baseline has been established, the on-line particle size analyzer will then be used to test and evaluate existing and developing particulate removal technologies.

Benefits

- **Improved economic viability of biomass gasification**

Applications

The on-line particle size analyzer will contribute to improving particulate removal technologies for gasification of a range of biomass, including grains, agricultural residues, and woody biomass.

Project Partners

National Renewable Energy Laboratory

Project Period

FY 2003 – FY 2004

For more information contact:

Andy Watt
National Renewable Energy Lab
Andrew_Watt@nrel.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 www.eere.energy.gov/biomass.html

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