

Abstract
Process Economics Program Report 258
BIOMASS GASIFICATION
November 2005

Biomass is poised to provide a significant renewable source of energy and materials. Biomass in the form of forestry and agricultural residues is the oldest energy source used by mankind but was replaced by fossil fuels such as coal and petroleum. Today biomass is responsible for 11% of the energy needs globally but only 3% in the developed countries.

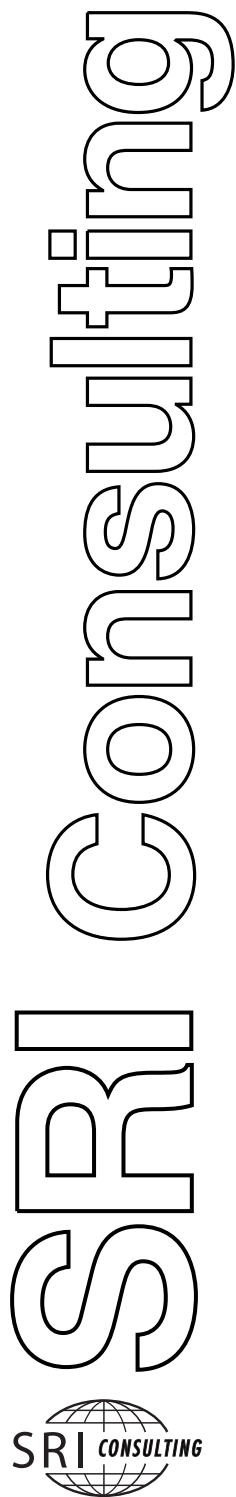
Rationale for growth of fuels and materials from renewable resources include:

- Increased energy security
- Reduction in Greenhouse gases
- Reduction sulfur emissions
- Rising cost of petroleum and natural gas
- Improvement in local economy

Previous reports on renewable biofuels include PEP Report 251 *Biodiesel* and PEP Report 252 *Chemicals from Agricultural Wastes*, which addressed the production of biodiesel and ethanol. This report focuses on the conversion of biomass feedstocks such as forestry wastes, agricultural residues, animal wastes and municipal solid wastes to biosyngas by the thermochemical gasification.

Biomass gasification converts these renewable resources into a form that can be integrated into the existing fuels infrastructure with minimal changes. The biosyngas can be combusted in a boiler or gas turbine to produce heat and electricity. It can also be used as a feedstock for a BTL facility to produce synthetic diesel via Fischer-Tropsch reaction.

The technologies examined include a biomass-to-liquids (BTL) plant utilizing Choren Industries gasification technology coupled with Shell's Fischer-Tropsch synthesis to produce "green" diesel and Battelle Columbus Laboratories' indirectly-heated gasifier technology (now licensed to FERCO Technologies) for the production of medium biosyngas (300-450 btu/ft³).



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BIOMASS GASIFICATION

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