

Clean Energy Resource Teams



Helping Communities
Determine Their Energy
Future



Bio Mass
May 2004



WHAT IS BIOMASS ?

2002 Farm Bill defines biomass as “any organic material that is available on a renewable or recurring basis.”

- Agricultural crops and residues
- Trees, plants and associated residues
- Plant fiber
- Livestock manure, poultry litter and sewage
- Residues from biomass processing facilities
- Paper component of MSW / C&D Waste
- Animal fats

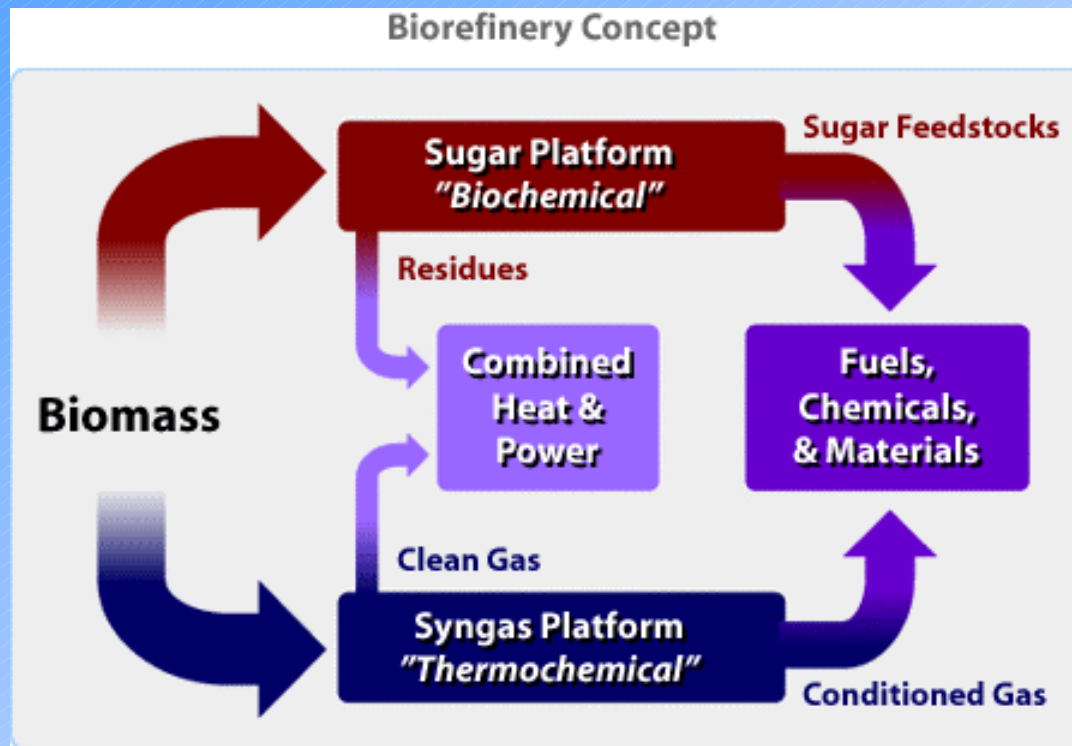
HOW IS IT USED?

- Traditional Markets – food and fiber
- BioFuel for Transportation
 - Ethanol and biodiesel
- BioPower for electric power production.
- “BioHeat” for serving “thermal loads”
 - Combined heat and power
- BioBased Chemicals
- Biomass is not all or nothing:
 - Blended fuels and co-firing.

BIOMASS TECHNOLOGIES

- Combustion (stoves, boilers, turbines and engines)
- Fuel Conversion – making higher value fuels.
 - Gasify
 - Pyrolysis / Anaerobic digestion
 - Ferment
- BioRefineries
 - Integrates a number of processing technologies to extract a range of products from biomass.

BioRefining



Source: National Renewable Energy Laboratory;
<http://www.nrel.gov/biomass/biorefinery.html>

WHY BIOENERGY?

- Economic
- Environmental
- Security Benefits

Bio Summary

- Diverse biologically based sources of energy
- Diverse markets / applications
 - Energy is not always the highest and best use
- Diverse utilization technologies
- Diverse benefits