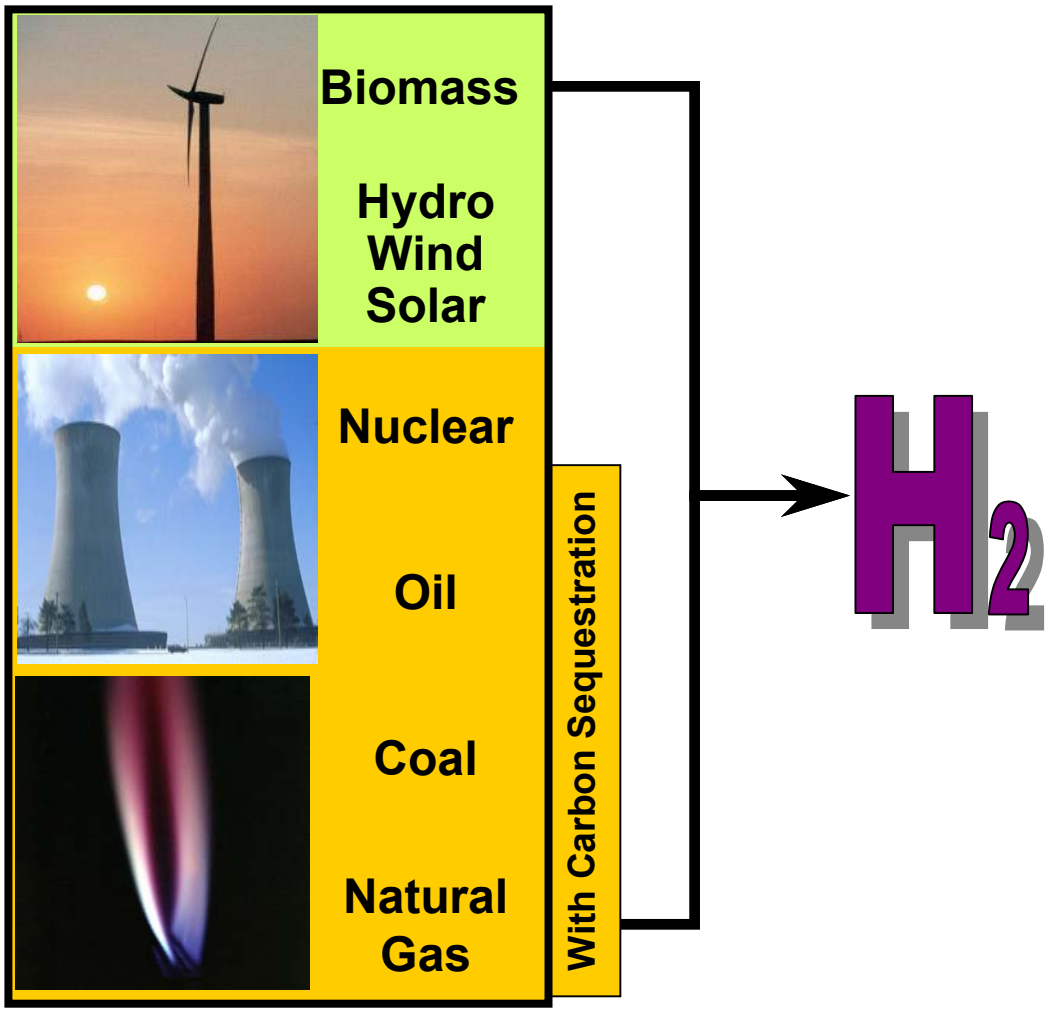

Biological- and Biomass-Based Hydrogen Production

Roxanne Danz

Barriers

Hydrogen Production from Biomass

BARRIERS

- Cost
- Feedstock availability
- Fermentative micro-organisms

Targets and Status

Hydrogen Production from Biomass

Characteristics	Units	2003 status	2005	2010
Central Hydrogen from Biomass via Gasification & Steam Reforming				
Total cost	$/kg H_2	3.60	3.30	2.60
Net energy ratio		28	29	34
Central Hydrogen from Biomass via Pyrolysis & Steam Reforming				
Total cost	$/kg H_2	3.80	3.70	2.90
Net energy ratio		26	27	32

Projects
Hydrogen Production from Biomass

• H_2 Production by Catalytic Reforming of Pyrolysis Vapors	NREL
• Pyrolysis of Waste Plastics and Greases	NREL
• Fluidizable Reforming Catalysts	NREL
• Bacterial Colony Fermentation	Iowa State University
• Biological Water Gas Shift	NREL

Posters

Hydrogen Production from Biomass

• Biomass-Derived H_2 from a Thermally Ballasted Gasifier	Iowa State University
• Supercritical Water Partial Oxidation	General Atomics
• Techno-Economic Analysis of H2 Production by Gasification of Biomass	Gas Technologies Institute
• Renewables Analysis	Directed Technologies, Inc.
• Biomass Pyrolysis Unit for the Production of H_2 from Peanut Shells	Clark University

Discussion Points

- Gasification and pyrolysis technologies – start moving toward system integration in addition to improving components
- Fermentation technologies – investigate this area to determine cost and production capability
- Other concepts – look for additional feasible technologies to produce hydrogen from biomass