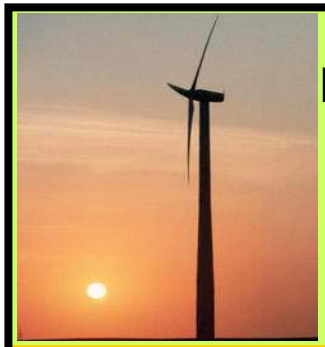
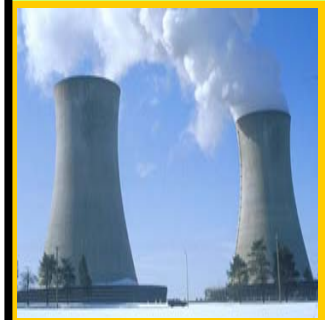


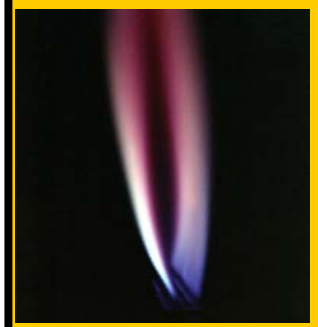
Biomass

Hydro
Wind
Solar



Nuclear

Oil



Coal

Natural
Gas

With Carbon Sequestration

Photolytic Hydrogen Production

H_2

Roxanne Danz

Barriers

PHOTOELECTROCHEMICAL BARRIERS

- Material durability
- Materials and system engineering
- Efficiency

PHOTOBIOLOGICAL BARRIERS

- Light utilization efficiency
- Rate of hydrogen production
- Continuity of photoproduction
- Systems engineering

Targets and Status

Photolytic Hydrogen Production

Characteristics	Units	2003 status	2005	2010
Photoelectrochemical Hydrogen Production				
Solar-to-H_2 Efficiency	%	7	7.5	9
Durability	Hours	100	1,000	10,000
Cost	\$/kg H_2	N/A	360	22
Photobiological Hydrogen Production				
Util. Eff. of Abs. Light	%	~5	10	20
Absorbed Light Energy to H_2 Efficiency	%	0.1	0.5	5
Duration of Continuous Photoproduction	Hours	240	500	1500
Cost	\$/kg H_2	200	100	30

Projects
Photolytic Hydrogen Production

• Combinatorial Chemically Derived Materials	UC Santa Barbara
• Combinatorial Discovery of Photocatalysts for Hydrogen Production	Southwest Research Institute
• Algal Hydrogen Production	**NREL**

Posters
Photolytic Hydrogen Production

• Photoelectrochemical Hydrogen Production	University of Hawaii
• Photoelectrochemical Systems for Hydrogen Production	NREL
• Maximizing Photosynthetic Efficiencies in H_2 Production in Microalgal Cultures	UC Berkeley
• Algal H_2 Production System	ORNL

Discussion Points

- These technologies are in the early stages of development
- A key to reaching a commercialization decision is for the PIs of the various projects to work together in developing each photolytic technology
- We initiated two working groups (photobiological and photoelectrochemical) made up of the current PIs and other support as necessary