

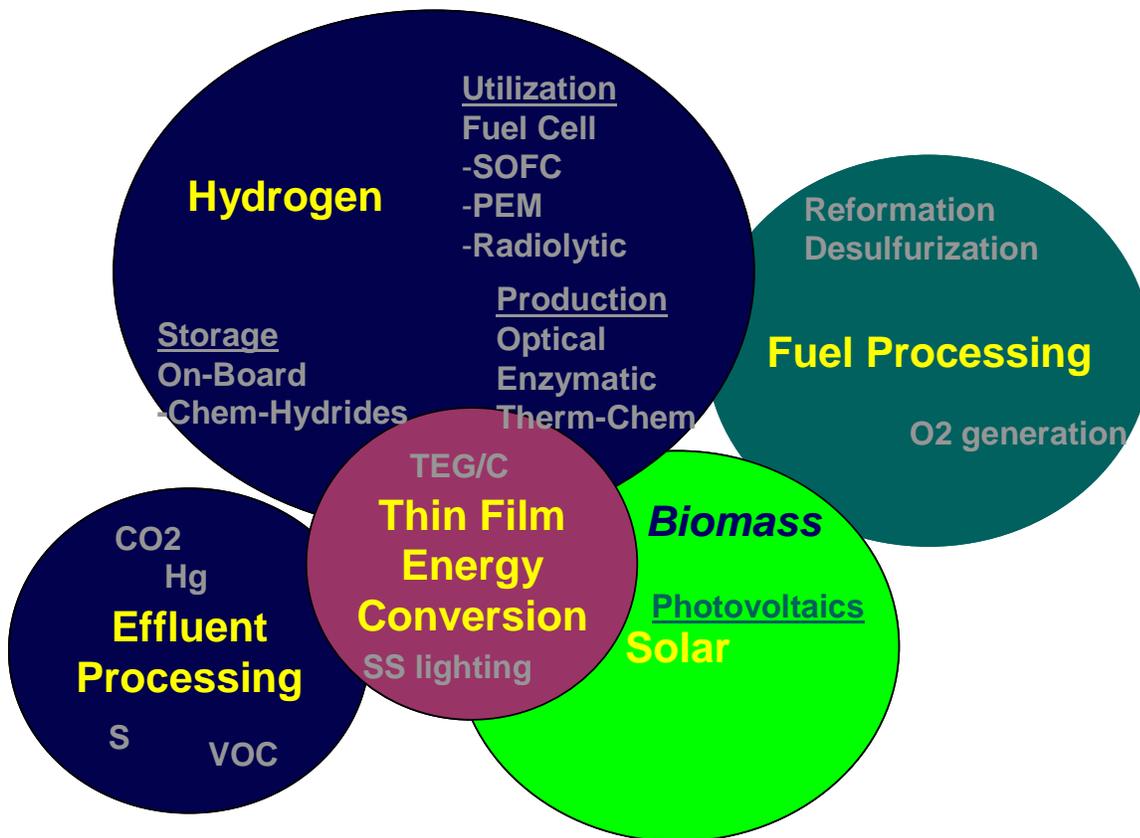
**Micro Nano Breakthrough Conference
July 28-29, 2004**

**Energy Working Group
Discussion Notes**

The Energy Working Group at the Micro Nano Breakthrough Conference included the individuals listed in Attachment 1.

Areas of Potential Collaboration

The purpose of the working group was to identify areas of potential collaboration in the energy field, and to identify some of the means and mechanisms that collaboration might be maintained and nurtured. Introductions were held that included identification of areas of present activity or interest by participants, and then a general discussion of the overlap between potential opportunities and the interests expressed. The result of that discussion is visually displayed at a high level in the figure below.



Opportunities were identified as those having two or more potential parties in the region who would have a potential interest in collaborating in the subject topic. It was recognized that the attendees represented only a small portion of the potential collaborators in the region, and that

steps would be required to engage some of those parties. Doing so would undoubtedly increase the range of potential collaborative topics.

As discussion proceeded it appeared that with some exceptions we could classify opportunities into several large application groups.

- Hydrogen
- Fuel Processing
- Solar
- Thin Film Energy Conversion
- Effluent Processing

It was also recognized that there was considerable overlap between these topics, exemplified best by the topic of Biomass, which is a renewable (solar) topic, but which can involve fuel processing, production of hydrogen, and could involve effluent processing.

The attendees tried to go one more level down in potential collaborative activities, with highly variable results. In some cases specific concepts were identified (Grätzel Cells for electrical production and for splitting of water), while in others broader areas of application (fuel reforming to produce hydrogen).

The detailed listing of these subtopics is provided in Attachment 2. These will serve as the launching point for establishing potential collaborative interest areas.

Modes of Collaboration

Discussion shifted to how we would facilitate interaction to set the stage for collaboration. It was observed that in Oregon, under the Oregon University System (OUS), an effort had been launched to facilitate collaboration. This effort, called the Knowledge Connection” was being taken over by the Oregon Science and Technology Partnership (???). This collaborative effort was aimed precisely at linking organizations and individuals to facilitate information sharing and partnering.

A collaboration facilitation tool established at PNNL is the Collaboratory Suite. This is a network information management and sharing tool set that provides for many features ranging from secure, tailored electronic communication, to web casts, and common (and specialized) information storage and access.

Additionally, PNNL has established the Northwest Nanoscience and Nanotechnology Network (N4), which collects and links information from a variety of organizations in the Pacific Northwest. It might also serve as a collaboration vehicle.

It was recognized that the participants in the room represented only a limited set of potential collaborators, and that efforts would be required to broaden the potential participants. This could be done through a network of networks outreach effort, starting with the participants at the meeting, and asking them to broadcast the engagement message to others who could elect to become a participant in information exchanges and solicitations of interest in partnering, collaborating, or referral of interest to others.

Decisions on the next steps would await further consideration from all the workgroups.

Attachment 1.

Energy Workgroup Participants¹

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¹ Partial listing of attendees.

Attachment 2.

Energy Workgroup Collaborative Topic Areas

Themes	Applications	Science & Tech Focus	Potential Collaborators	Needs	Sponsors	
H2	Storage	on-board	Chemical Hydrides	PNNL, UW, UI UO? others	Synthesis	
			Metal Hydrides	PNNL		
	Production		New Materials Li3N aerogels	PNNL Pnnl, UW	molecular biologists	
			Gratzel Cell novel TiO2 Photo electrical	PNNL, PSU, UI		
Utilization	Fuel Cells Chemical	AI hydrolysis enzymatic	BC? ?	Neah, Avista, Ballard, SECA		
		HDS	ATA (portland)			
solar	PV solar electrolysis water splitting thermal		UO, PSU			
			PNNL, PSU			
			?			
Fuel Processing	biomass	gasification H2	hydro-treating	OSU		
		desulfurization reformation	Grätzel Cell		Army	
	Energy Efficiency	chemicals	selective oxidation			
		Thin film Energy	Thermal Electrics Thermionics solid state lighting	ordered nanostructure	PNNL, UO	
Other	moon based power recycling H,C,O				NASA	
	paper production					
	forrest products					
Environmental (effluent)	Carbon sequestration					
	waste streams Flue gas	Hg		OSU		