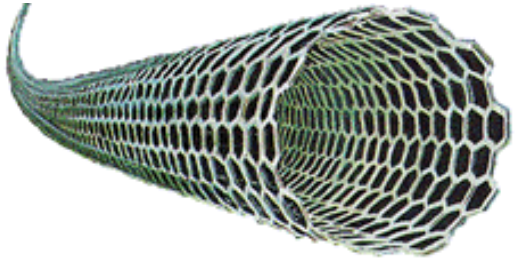
Findings From R&D Sessions

Mildred Dresselhaus

Massachusetts Institute of Technology, Cambridge, MA



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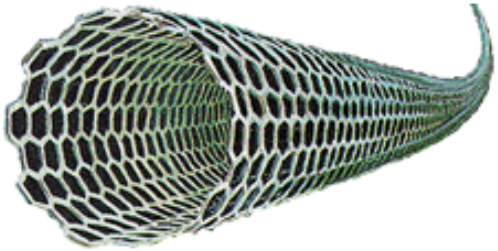

Washington International Renewable Energy Conference

WIREC-2008

Rapporteurs

Puru Jena, Georges Belfort, Ross Corotis, Joseph Dunn, Richard Eckman, Syed Rizvi, Jerry Peterson

General Observations

- A strong sense of optimism about the future of renewable energy.

- An appreciation of the scale of the energy problem that deals with climate issues to meet energy needs of a growing population.

- We need stable and predictable policies and regulations to ensure industry-university-government partnership in R & D capacity building.

- The renewable energy industry needs to commit 3% of its total investment in R & D in order to sustain innovation.

Capacity Building for Renewable Energy

- Human Resource Development
- Infrastructure in Support of Renewable Energy
- Strategies for investment in R&D

Human Resource Development

- Recognize that an increasing energy demand implies a growing workforce
- Capture the enthusiasm of young people
- Use new interdisciplinary educational approaches
- Distribute R&D workforce demands equitably world-wide

Infrastructure in Support of Renewable Energy

- Address the important need to integrate renewable energy sources into existing energy systems
- Establish centers of excellence in interdisciplinary renewable energy technologies world-wide
- Recognizing that certain countries have great expertise in specific technologies (e.g., Iceland in geothermal, Norway in hydro), establish mechanisms for international partnerships and information sharing

Strategies for investment in R&D

- Establish an international fund contributed by developed countries to enable developing countries to participate in R&D

- Take advantage of the tremendous opportunity to bring hydropower and other renewable energies such as solar to developing countries to assist their economies

- Commit three percent of annual investments to R&D.

Research & Development in Renewable Technologies

- Ocean, Tidal, Geothermal, Hydro and Hydrogen
- Wind and solar
- Bioenergy Feedstocks
- Bioenergy Conversion/Electric Hybrids

Ocean, Tidal, Geothermal, Hydro and Hydrogen

- Corrosion and fouling (ocean, tidal)
- Drilling technology (Geothermal)
- Scalable pumping and turbine technologies (hydro)
- Hydrogen production and storage
- Concentration technologies for ocean (similar to concentrators in solar)

Wind and Solar

- Continue the trajectory of strong growth in wind power in the U.S. which contributed 26% of new generating capacity last year
- Need better grid interoperability
- Need a million solar roofs per year for 50 years to reach 10% of U.S. electrical capacity with PV growing at 30% per year
- Need large systems for both wind and solar energy storage, perhaps using the virtual storage offered by a large grid
- Requires a larger market for economies of scale for both technologies

Bioenergy Feedstocks

- Bioenergy feedstock diversity, sustainability, and economic viability are critical components of renewable energy
- New partnerships among all players are needed
- A global/integrated approach to biomass energy is necessary
- Productivity and diversity of feedstocks need to be enhanced
- Better understanding of feedstock options is needed

Bioenergy Conversion/Electric Hybrids

- Recalcitrance (breaking plant fibers into sugar) – single biggest barrier to making biofuels cost effective
- All biofuels are not created equal; different geographic locations may specialize in different biofuels
- Biomass supply and logistics need to be developed
- Local communities must capture some of the economic benefits of biofuel processing
- Conversion of sugars to biofuels other than ethanol using nanotechnology should be pursued
- R&D for efficient storage battery is needed