

Call For Papers!

Abstract Deadline: September 21, 2009



MATERIALS CHALLENGES IN ALTERNATIVE & RENEWABLE ENERGY

February 21-25, 2010

Hilton Cocoa Beach Oceanfront | Cocoa Beach, Florida, USA

Co-Organized by:

The American
Ceramic Society

ASM International

Society of Plastics
Engineers

Endorsed by:

Materials Research
Society

SAMPE

www.ceramics.org/energy2010

MATERIALS CHALLENGES IN ALTERNATIVE & RENEWABLE ENERGY

Designed to bring together leaders in materials science and energy, **Materials Challenges in Alternative & Renewable Energy** aims to facilitate information sharing on the latest developments involving materials for alternative and renewable energy sources and systems.

Three of the premier materials organizations - The American Ceramic Society, ASM International, and Society of Plastics Engineers - representing the disciplines of ceramics, metals and polymers, have joined forces to co-sponsor this conference of global importance. Featuring tutorials and invited presentations on leading energy alternatives, **Materials Challenges in Alternative & Renewable Energy** will address Solar, Wind, Hydropower, Geothermal, Biomass, Nuclear, Hydrogen, and Battery Technology.

Since the Industrial Revolution, fossil fuels including natural gas, coal and oil, have provided the major sources of energy for powering new technologies and improving standards of living for countries around the world. The United States continues to be the largest consumer of these fossil fuels and currently must import more than half of its needed inventory, of which about 2/3 goes into transportation. That demand is anticipated to more than double in the next 50 years. In addition to the increasing demand of this diminishing resource and its insecure sources, there are also growing environmental concerns involving pollution and global warming threats. It is im-

perative that all nations develop alternative and renewable energy sources for the future. Most likely, not one but an arsenal of these sources will be used depending on the natural resources and capabilities available in the various regions.

The objective of **Materials Challenges in Alternative & Renewable Energy** is to bring together leaders in materials science and energy to share information and latest developments involving materials for alternative and renewable energy sources and systems. The conference will include tutorials and invited overview presentations on leading energy alternatives, provided by global leaders in these fields, along with technical sessions addressing state-of-the-art materials issues involved with future energy sources and systems.

The meeting is designed for scientists and engineers working on alternative and renewable energy sources and systems, interested in materials challenges. The overall efficiency, effectiveness and practicality of potential future energy sources and systems are directly related to many materials related factors. Some of these key features include materials costs, availability and improvements in chemical, mechanical, electrical and/or thermal properties of materials now being considered, as well as the ability to produce and fabricate materials in forms and shapes that work effectively in areas of energy generation, storage and distribution.

WHO SHOULD ATTEND

Similar to the first ACerS/ASM interdisciplinary conference, **Materials Challenges in Energy 2010** is intended for not only scientists and engineers active in energy and materials science research (in areas involving ceramics, metals and polymers), but also those new to the field who would like to know more about current materials related opportunities involved with leading alternative and renewable energy sources and systems.

PRELIMINARY SCHEDULE

Sunday, February 21, 2010	5:00 - 7:00 pm	Welcome Reception
Monday, February 22, 2010	8:00 - 8:15 am	Opening Remarks
	8:15 - 9:15 am	Keynote Address
	9:15 - 12:15 pm	Tutorials
	2:00 - 3:30 pm	Tutorials
	3:30 - 5:30 pm	Concurrent Technical Sessions
	6:30 - 9:00 pm	Dinner/ Social Networking Event
Tuesday, February 23, 2010	8:00 - 12:00 pm	Concurrent Technical Sessions
	1:30 - 5:30 pm	Concurrent Technical Sessions
	7:00 - 9:00 pm	Posters/ Networking
Wednesday, February 24, 2010	8:00 - 12:00 pm	Concurrent Technical Sessions
	1:30 - 5:00 pm	Concurrent Technical Sessions
	7:00 - 9:00 pm	Posters/ Networking
Thursday, February 25, 2010	8:00 - 12:00 pm	Concurrent Technical Sessions

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CONFERENCE FOCUS AREAS

Solar

Solar power is energy derived from sunlight and can be converted into various forms of energy such as heat and electricity. The conversion to electricity can take place by photovoltaic (PV) or solar cells, as well as by use of solar power plants. There are currently more than a dozen major solar plants in the US, with most of these facilities located in California.

Wind

Wind power plants or wind farms often consist of many individual units. The largest wind farm located in Texas, consists of over 400 wind turbines that generate enough electricity to power about a quarter of a million homes each year. The US is ranked second in the world in wind power capacity, only following Germany. In countries such as Denmark, about 20% of its electricity is generated from the wind.

Hydropower

Hydropower is the most often used form of renewable energy in the US. Mechanical energy is produced and used by harnessing moving water. Over half of the US hydroelectric capacity to generate electricity is located in three states: Washington, California and Oregon, with the largest facility being the Grand Coulee Dam in Washington. Hydropower currently accounts for about 6% of the total electricity generated in the US.

Geothermal

The US produces more geothermal electricity than any other country, but this still amounts to less than 1/2 of one percent of all energy generated. Most geothermal reservoirs are deep underground but can find their way to the surface as volcanoes, hot springs and geysers. California has almost three dozen geothermal power plants that produce the largest fraction of US energy from this source.

Biomass

Biomass is energy derived from organic plant and animal matter including wood, crops, manure, and municipal solid wastes. When burned, the energy in biomass is released as heat but it can also be converted to other forms of energy like methane gas, ethanol and biodiesel. Biomass fuels currently account for about 3% of the energy used in the US.

Nuclear

Nuclear power extracts usable energy from atomic nuclei by controlled nuclear reactions and most often, through nuclear fission. On a global scale, there are more than 400 operating nuclear power plants in more than 30 countries, which gen-

erate about 30% of the energy produced in the European Union and almost 20% of the energy produced in the US. Among the advantages of nuclear energy are no greenhouse emissions.

Hydrogen

Hydrogen is the simplest element known to man and like electricity, is primarily an energy carrier compared to an energy source. "Materials Innovations in an Emerging Hydrogen Economy" was the focus of the first inter-society energy conference held by ACerS and ASM in 2008. Hydrogen can be produced from a variety of domestic sources, including fossil fuels as well as from renewable resources and can be stored in gas, liquid or solid forms. There is considerable work in progress on development of materials and systems for effective hydrogen storage. This alternative is considered a promising energy concept of the future, but like many alternatives, there currently is no infrastructure in place to produce, store, transport or distribute hydrogen effectively.

Battery Technology

Batteries are devices that convert chemical energy into electrical energy. There are many types of batteries available, representing a multi-billion dollar industry. Among the battery types of much interest are standard lead acid batteries and Li-ion batteries. Materials improvements are critical in making these energy systems more effective in the future.

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Submit your abstract at www.ceramics.org/energy2010

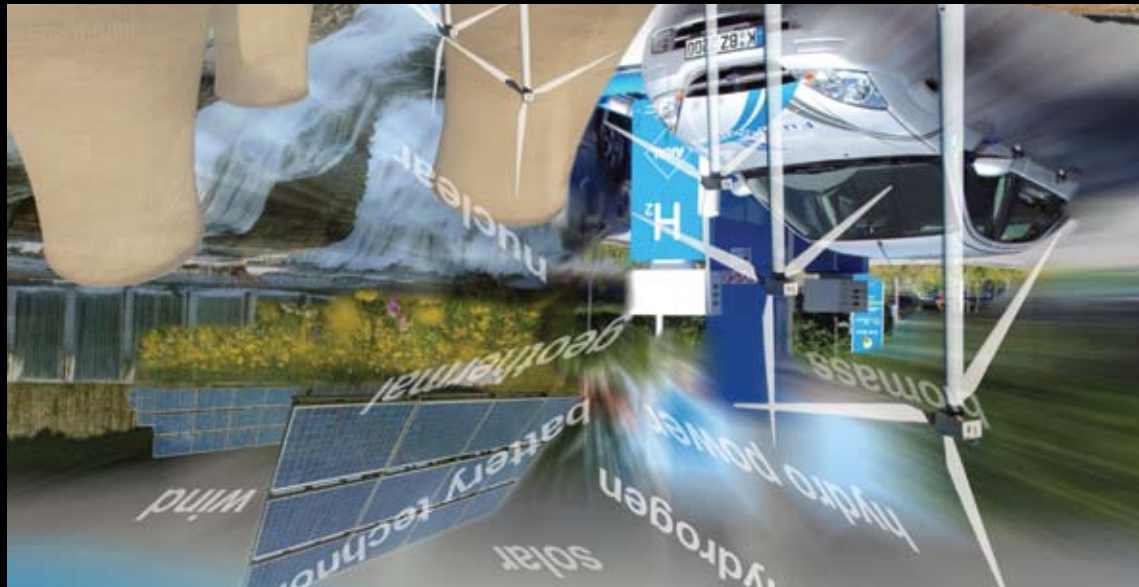


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