

Global Views on Advancing Renewable Energies

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The growing world population, rising standard of living in the developing world, and the limited supply of fossil fuels, which accounts for 85% of the world's energy needs, have an impact on global energy security, economics, and climate. Solutions to these global challenges require a global effort. In addition to energy conservation and increased efficiency in the use of energy, access to clean, affordable, reliable, and sustainable energy production—especially renewable energy—will be essential to enhancing global peace, alleviating poverty, and growing our economies while at the same time ensuring that we pass on a healthy planet to future generations. The world has tapped just a small portion of the vast supply of renewable energy resources such as solar, wind, geothermal, biomass, hydroelectric, hydrogen, and ocean wave. Considerable challenges in research and development (R&D), market adoption and financing, and economic development—especially rural development—must be addressed and overcome to ensure a rapid scale up of renewable energy technologies worldwide. Policies with crosscutting impact on these challenges need to be implemented at the sub-national, national, and international levels. For example, funding research will result in more efficient and cost-effective materials and catalysts. New and innovative methods for financing renewable technologies and their deployment will result in rapid market adoption. Equitable distribution of revenues generated by these technologies will enhance all economies, especially in the rural developing world.

To find solutions for these challenges and to speed up market adoption, the U.S. government, together with the American Council on Renewable Energy (ACORE), organized and conducted the Washington International Renewable Energy Conference (WIREC) held March 4–6, 2008 at the Washington, D.C. Convention Center. WIREC, a ministerial level conference, was the collective effort of public and private partners, both domestic and international, that resulted in bringing together the world's leaders in the field of renewable energy from governments, international organizations, non-governmental organizations, and the private sector. Nearly 9,000 individuals from 125 countries, including 103 ministers, participated in WIREC. More than 70 Official Side Events and Workshops were hosted during WIREC, representing organizations from Africa, North America, Latin America and

the Caribbean, Asia and the Pacific, and Europe. WIREC also featured a world-class trade show with exhibits from 246 organizations and a global business conference. WIREC was sponsored by nine U.S. government agencies (Departments of State, Agriculture, Commerce, Energy, and Interior, Environmental Protection Agency, National Aeronautics and Space Administration, United States Agency for International Development, and White House Council on Environmental Quality) as well as by countries such as Canada, Germany, Italy, and Sweden. Among the corporate sponsors were BP, Brookfield Power, Chevron, Covanta Energy, General Electric, General Motors, Good Energies, Renewable Capital, Stoel Rives, UNICA, and Volvo. In addition to ACORE, the partners of WIREC included the Renewable Energy Policy Network for the 21st Century (REN21) and the Renewable Energy and Energy Efficiency Partnership (REEEP).

Nations and other conference participants voluntarily submitted 145 pledges committing to contribute to the scaling up of renewable energy in the coming months and years. The pledges constituted a rich collection of concrete and often innovative measures. The Washington International Action Plan (WIAP) developed at WIREC provides governments and other major stakeholders in all parts of the world with an inspiring roadmap of global renewable energy progress, and an invaluable source of information on specific steps they can consider in advancing the uptake of renewable energy worldwide.

The ministerial level meeting at WIREC constituted a plenary session and focused on four crosscutting themes: research and development; market adoption and finance; agriculture, forestry, and rural development; and sub-national and national partnerships. Environmental, economic, social, and security dimensions of renewable energy were integrated into each of the theme plenary and concurrent sessions. Speakers and panelists included cabinet-level officials from national and state governments, mayors from small and large cities in the developed and developing world, CEOs and high-ranking executives from the private sector, leaders of associations, and scientists and engineers from academia, industry, and national laboratories. The speakers at the plenary sessions set the stage by defining issues and challenges within the theme topics that ranged from research and development of materials and technology, to rural and economic development, to market

deployment and financing, to education and training. They recognized that these difficult challenges require a concerted effort not only by visionary scientists and engineers in academia, industries, and laboratories but also by all other major stakeholders. Policymakers at all levels of government, and leaders in finance, business, and civil society, should work together to accelerate deployment of these technologies.

The strategies identified for each of the themes were as follows:

- **Technology/Research and Development**
 - Outline the broad R&D issues;
 - Identify the challenges in adopting various renewable energy technologies;
 - Present actions needed to scale up the use of renewable energy.
- **Agriculture and Rural Development**
 - Discuss the technical, environmental, and political issues;
 - Identify the opportunities for agriculture and the rural sector;
 - Assess the role agriculture and forestry could play in scaling up renewable energy and promoting rural development.
- **Market Adoption and Finance**
 - Define opportunities for accelerating renewable technology's transition from laboratory to market;
 - Explore market adoption of new renewable energy technologies;
 - Develop policies and tools for financing renewable energy in mature and emerging markets.
- **Sub-National and National Partnerships**
 - Announce renewable energy policy and financing initiatives;
 - Share lessons learned and emerging strategies in economic development and renewable energy;
 - Define renewable energy collaboration opportunities, leading to the creation of national and sub-national partnerships.

Speakers and panelists in all the themes recognized that research and development is critical to increase efficiency and lower costs across all renewable energy

technologies. The speakers and panelists of the R&D theme called for stable and predictable policies and regulations to ensure industry–university–government partnership in R&D capacity building and recommended a commitment of 3% of total worldwide investment in renewable energy technologies into R&D in order to sustain innovation. In terms of an infrastructure to support this investment, they identified the importance of integrating renewable energy sources into existing energy systems and recommended the establishment of centers of excellence in interdisciplinary renewable energy technology research worldwide.

Recognizing that certain countries have great expertise in specific technologies (e.g., Iceland in geothermal, Norway in hydroelectric, and Brazil in biofuels), participants in the R&D theme recommend that mechanisms be established to enable international partnerships, collaborations, and information sharing. They also recognized the need for human resource development, acknowledging that an increasing energy demand implies a growing workforce. They specifically recommend capturing the enthusiasm of young people, using new interdisciplinary educational approaches, and distributing R&D workforce demands equitably worldwide.

Furthermore, the speakers and panelists of the R&D theme gave recommendations on key research challenges in the following renewable energy technologies: bioenergy feedstocks, bioenergy conversion/electric hybrids, wind and solar,

and ocean, tidal, geothermal, hydroelectric, and hydrogen.

WIREC 2008 ended with a strong sense of optimism about the future of renewable energy. There was an overall appreciation of the scale of the energy issue that deals with climate change and energy needs of a growing population and recognition that scaling up of renewable energies requires a global commitment and a global partnership. There was, furthermore, recognition that no single renewable energy technology can meet the world's energy demand and emphasis must be placed on promoting all available energy sources that take advantage of national needs and resources.

In terms of market adoption and financing, key general outcomes of WIREC included the formulation of long-term policies and favorable regulatory frameworks, coupled with appropriate incentives, which would work to remove uncertainty in the market and look to attract increased investment in renewable energy technologies; collaboration with international and regional organizations that encourage clean energy regimes and increase skills and knowledge among local and national decision and policymakers; the development of suitable finance and business models to provide attractive long-term investment environments for promoting renewable energy; the education of financial institutions and investors to gain a better understanding of renewable energy projects and their rates of return; and the sharing of knowledge and best practices with other stakeholders

working in the renewable energy field.

WIREC has received 145 voluntary pledges by nations and organizations from across the world to scale up the use of renewable energy technologies. WIREC also has the commitment of the National Renewable Energy Laboratory to analyze and report to WIREC organizers the impact of these pledges on greenhouse gas emissions.

The government of India agreed to host the next International Renewable Energy Conference in 2010.

More information on WIREC can be accessed at Web site www.wirec2008.gov.

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Impediments to a Renaissance of Nuclear Power in the U.S.—Discussion of Materials Science Solutions
Tuesday, December 2 • 6-8PM • Sheraton Boston Hotel • Grand Ballroom

Join us for this FREE forum on research and development of materials technologies that might mitigate some of the impediments to a renaissance of nuclear power in the U.S. The forum includes an overview presentation of the issues, followed by a professionally moderated panel discussion.

Panelists

- **Bernard Bigot**, Commission for Atomic Energy (French Atomic Energy Commission)
- **Chaim Braun**, Center for International Security and Cooperation, Stanford University
- **Thomas B. Cochran**, Nuclear Program, National Resources Defense Council
- **Rodney C. Ewing**, Department of Geological Sciences, University of Michigan
- **Michael Mayfield**, Division of Engineering Technology, U.S. Nuclear Regulatory Commission

Moderated by **Ira Flatow**, Host and Executive Producer, *Science Friday*, National Public Radio

For more information on this, and other 2008 MRS Fall Meeting activities, visit www.mrs.org/fall2008