

**Moving Toward Sustainable Energy Systems:
Exploring Global Pathways to a Common Destination**
October 24-25, 2006

Co-hosted by
Center for Science Technology, and Public Policy
Humphrey Institute, University of Minnesota
Initiative for Renewable Energy and the Environment, U of MN

Supported by the U of MN President's Initiative on the Environment and Renewable Energy

Given the need to create a sustainable energy system in the context of global climate change, in the U.S., India, the rest of Asia, and the world, a transformation from the existing CO₂ intensive energy system must take place. However, different countries face significantly different challenges and opportunities, and practical solutions for one part of the world may not cohesively address the challenges in another. This workshop will bring policy makers, scientists, and stakeholders from India, the U.S. and the Upper Midwest, and several other nations together to identify the commonalities and differences and highlight the potentials for learning, collaboration, and policy formulation for crafting sustainable energy systems within a carbon-managed energy future.

Significant technical experience with development and deployment of technologies needed to create a more sustainable energy system exists today. However, technology alone is insufficient; policy, economic and social considerations must be fully integrated into a larger system of energy system transformation. This workshop concentrates upon blending the science and technology within a policy relevant context.

Objectives:

The overarching objective of this workshop is to identify and analyze pathways for transformation towards a sustainable energy future.

This workshop will focus on comparing constraints and opportunities around the globe, and in particular in the Upper Midwest and India, in order to examine how different technologies can be deployed and policies structured to create economically viable and environmentally sound energy futures under local and national circumstances. The roles of changing energy demand, stranded costs, natural resources, transmission systems, balance of capital/operating costs are among the factors that influence the potential role of emerging technologies. The workshop will consider these and social, policy and economic challenges that each country faces. Finally, the workshop will explore the potential for collaborative work between investigators in the U.S., India, and elsewhere, building on complementary areas of expertise and interest in both technical and policy research related to the development of a sustainable, carbon-managed energy system.

Goals:

- Add to public understanding about the challenges and opportunities of achieving a sustainable energy future that respects both the need for continued energy-based economic development and global environmental protection.
- Identify technical and policy opportunities and challenges for which U.S.-India and other collaborative studies or efforts would be beneficial
- Formulate key questions for interdisciplinary technical and policy analysis on low carbon energy issues
- Agree on strategies for moving forward for research and policy

Structure:

One day public workshop with a keynote lunch speaker, Dr. David Jhirad, Vice President for Science and Research, World Resources Institute, 4 panels, and a policy synthesis. The audience will be asked to participate in question and answer sessions at the close of each panel. Speakers will be invited from India, the Upper Midwest, the rest of the U.S., and other nations. A half-day working group session (by invitation) will be held the following day in the morning (October 25th) to identify common themes and potential collaborations.

October 24, 2006

Registration
8:00-8:30 a.m.

Welcome
8:30-8:45

J. Brian Atwood, Dean, Humphrey Institute, University of Minnesota

Session I: Features and Challenges within National Energy Systems
8:45-10:00

Moderator:

Kenneth H. Keller, Charles M. Denny Professor and Chair in Science, Technology and Public Policy & Director, Center for Science, Technology and Public Policy, University of Minnesota

- How do India and the Upper Midwest compare?
 - Keynote lectures focusing on differences in demand, resources, transmission, stranded costs, capital and operating costs, challenges of growing an energy system in a carbon constrained world
- What are lessons learned from other nations?

Speaker(s):

Robert Donkers, Environment Counselor, Delegation of the European Commission to the United States

Surya P Sethi, Advisor, Planning Commission, Government of India

Bill Grant, Izaak Walton League

Session II: Envisioning the Future
10:00-11:00 p.m.

Moderator:

Jennifer Kuzma, Assistant Professor & Interim Director, Center for Science, Technology and Public Policy, University of Minnesota

- What would a sustainable, low-carbon energy system look like? In India? In the Upper Midwest? In the U.S. as a whole? In other nations?
 - Integrated Analysis for sustainable energy systems
 - Designing societies for efficient energy use
 - Industry structure – incentives and disincentives for change
 - Economics
 - Regulatory structure
 - Technological considerations

Speaker(s):

David Hales, President, College of the Atlantic & Chair, American Council on Renewable Energy (ACORE) Higher Education Committee
Leena Srivastav, Executive Director, The Energy Research Institute (TERI)

Lunch: Keynote Speaker

11:00-12:30 p.m.

Introduction:

Don Shelby, Anchor and Reporter, WCCO-TV

David Jhirad, Vice President for Science and Research, World Resources Institute, Washington DC, USA

Session III: Providing Energy Services

Moderator:

David Jhirad, Vice President for Science and Research, World Resources Institute, Washington DC, USA

12:30-2:00 p.m.

- Providing energy within a Sustainable Future: Coal, Natural Gas and Renewables:
 - Energy reserves
 - Potential for advanced coal, IGCC , Using coal in a carbon constrained world
 - The potential of polygeneration: H2, liquid fuels, and electricity opportunities
 - Carbon constrained coal; geologic carbon sequestration
 - Wind, biomass, solar, hydro resources in India and the Upper Midwest
 - Resource availability
 - Overcoming issues with intermittent dispatch
 - Models of community development and ownership

Speaker(s):

Lester Lave, Harry B. and James H. Higgins Professor of Economics and Finance, Director H. John Heinz III School of Public Policy and Management Carnegie Mellon Green Design Initiative, Carnegie Mellon University
M. K. Gajendra Babu, Professor, Indian Institute of Technology Delhi

- The role of energy and development:
 - Expanding electrification to 27% of Indian households with no electricity
 - Reliability and transmission
 - Efficient electrical transmission, role of technology and policy
 - The Roles of efficient use and conservation
 - Energy Implications of land use patterns
 - H2/storage as an energy carrier/load leveler

- Small scale energy: potential for distributed generation
 - Co-gen
 - Effects on local air quality
 - Regulatory and policy issues
- Role of technology and possibility of leap-frogging

Speaker(s):

Armin Rosencranz, Visiting Professor, Graduate School of Public Policy, University of Maryland & Professorial Lecturer, School of Advanced International Studies, Johns Hopkins University

S. K. Sarkar, Director of Regulatory Policy, Regulatory Studies, and Governance, TERI

2:00-2:15 p.m. Break

Session IV: A Special Focus on Bioenergy and Biofuels

2:15-3:45 p.m.

Moderator:

Dick Hemmingsen, Director, Initiative for Renewable Energy and the Environment, University of Minnesota

- Transportation Fuels: Biomass potential:
 - Resources for Biomass
 - Production technologies
 - Other transportation fuels
 - Policies for promoting alternative transportation fuels (CNG, Ethanol)
 - Land use issues
 - Terrestrial Carbon sequestration

Speaker(s):

Bob Elde, Dean of the College of Biological Sciences & Chair, Initiative for Renewable Energy and the Environment, University of Minnesota

Naveen Kumar, Professor, Coordinator Bio-Diesel Research, Delhi College of Engineering

Nick Jordan, Department of Agronomy and Plant Genetics, University of Minnesota

Session V: Synthesis Panel---Energy within a social, political and economic context

3:45-5:00 p.m.

Moderator:

Kenneth H. Keller, Charles M. Denny Professor and Chair in Science, Technology and Public Policy & Director, Center for Science, Technology and Public Policy, University of Minnesota

- Institutional, organizational, social, economic, and science and technology policy (e.g. funding) challenges associated with moving towards a sustainable, and low carbon economy
- Current national and international policies
- Social, Economic, and Policy research needs
- Practical policy steps

Speaker(s):

David Morris, Vice President, Institute for Local Self-Reliance

Elizabeth Wilson, Assistant Professor, Center for Science, Technology and Public Policy, University of Minnesota

Don Shelby, Anchor and Reporter, WCCO-TV