

Climate Technology Cooperation

Washington-area professionals gathered on September 25 for the ninth session of the IRG Discussion Forum, "Climate Technology Cooperation." Robert Dixon from the U.S. Department of Energy reported on the International Partnership for the Hydrogen Economy. U.S.AID's Ko Barrett discussed the inherent conflict between U.S. big technology investments and U.S.AID's traditional smaller-scale technology approach for developing countries. William Chandler of Battelle Pacific Northwest Laboratory outlined the challenges to climate technology cooperation and provided examples of current programs.

Last November, an article in the well-regarded journal, *Science*, stated that existing energy technologies, even with enhancements, could not meet the world's future appetite for energy and simultaneously deliver the emissions reductions necessary to stabilize the concentrations of greenhouse gases in the atmosphere. In his speech to the American Academy in Berlin in September 2003, U.S. Energy Secretary Spencer Abraham stressed that the world is faced with two options: either reduce greenhouse gas emissions dramatically at the expense of economic growth and

living standards or develop breakthrough technologies that can reduce emissions while maintaining economic growth and improving the standard of living worldwide.

The United States has adopted the second option as the only acceptable course. Although regulation can play a role in stabilizing the climate, the United States recognizes that targeted research and development of new technologies coupled with international cooperation is needed. Collaboration among government, business, and academia across national boundaries is being encouraged to develop and invest in breakthrough and cost-effective technologies for mitigating greenhouse gas emissions, which are reconciled with the national economic growth priorities in developing countries. The goal is for business and government to harness the power of markets to quicken the pace of technology change, encourage scientific and technological breakthroughs, and promote global participation so new technologies are affordable and appropriate for both the developed and developing world.

The United States has endorsed the U.N. Framework Convention on Climate Change, which aims to "achieve a stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

Climate Technology Programs

Aggressive efforts are underway to lay the foundation for international cooperation in research and development of new climate technologies. By working with international partners, scarce resources can be leveraged, duplication of efforts avoided, best intellectual skills and talents harnessed, and interoperable standards developed. Public-private collaborations can also address the technological, financial, and institutional barriers to technologies so they are cost competitive, standardized, widely accessible, and at the same time safe and environmentally benign.

Normally, a long time horizon—sometimes decades—is required for

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Shaikh, IRG Advisor Jeff
Seabright, Bob Dixon, Bill
Chandler,
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For More Information...

U.S. Department of Energy/International Partnership for the Hydrogen Economy:
www.eere.energy.gov/hydrogenandfuelcells/partnerships.html

Pew Center Global Climate Change: <http://www.pewclimate.org/>

Carbon Sequestration Leadership Forum:
<http://www.fe.doe.gov/programs/sequestration/csrf/>

FutureGen: <http://www.fossil.energy.gov/futuregen/>

Battelle Memorial Institute <http://www.battelle.org/>

Pacific Northwest National Laboratory: <http://www.pnl.gov/>

USAID Climate Change Program:
http://www.usaid.gov/environment/climate_change.html

applied research and development, then to demonstrate and test promising technology, catalyze the private sector for investment, acquire financing, and gain consumer confidence. Given the urgency of addressing climate change as demand for global energy continues to increase, these partnerships hope to expedite that lab to market process.

International Partnership for the Hydrogen Economy. Hydrogen-based technologies hold promise for energy independence and safeguarding the world's climate system. Hydrogen is abundant, clean, efficient, and can be derived from diverse domestic resources, diminishing reliance on imported or fossil fuels. Building a safe, efficient, economical, worldwide infrastructure for hydrogen production, storage, transport, distribution, and use requires the excellent planning and the best expertise from around the world. The United States, the European Union, Japan, Australia, Brazil, Canada, China, France, Germany, Iceland, India, Italy, Republic of Korea, Russia and the United Kingdom have made substantial commitments to or initiated roadmaps for hydrogen and fuel cell technology research development and deployment. The International Partnership for the Hydrogen Economy (IPHE) is helping coordinate those efforts and building on and fostering bilateral and multilateral relationships. The ultimate goal? By 2020, to produce hydrogen at a cost that makes it the fuel of choice for transportation needs, enabling consumers in participating countries to purchase a competitively priced hydrogen-powered vehicle that can be conveniently refueled and operates at the same levels of safety, performance, and range of today's gasoline-powered vehicles. In November 2003, IPHE will hold

its first Ministerial Summit, bringing together energy ministers from 15 countries to discuss common areas of interest in, and obstacles to, hydrogen research, development, and demonstration projects; policy and regulation; and commercialization of hydrogen-based technologies.

FreedomCAR. The FreedomCAR (Cooperative Automotive Research) partnership supports advanced automotive technology research to improve energy efficiency and reduce carbon intensity of transportation systems, both for near-term technologies such as hybrid-electric vehicles and for fuel-cell vehicles such as hydrogen. By catalyzing the simultaneous development of hydrogen-fueled vehicles through FreedomCAR and the necessary hydrogen production and refueling infrastructure through IPHE, the commercialization of fuel cell vehicles and infrastructure should be accelerated by 15 years, from about 2030 to 2015.

Carbon Sequestration Leadership Forum. There are only two ways to stabilize concentrations of greenhouse gases in the atmosphere. One is to avoid emitting them in the first place; the other is to capture and store them after they have been produced. Carbon sequestration is the capture and long-term or "permanent" storage of carbon dioxide produced from the use of fossil fuels by utilities and industry. Potential storage reservoirs beneath the Earth's surface include salt domes, old mines, and the deep regions of the ocean. Carbon sequestration research and technology recognize that fossil fuels will for the foreseeable future be the most reliable and lowest-cost energy resource. The Carbon Sequestration Leadership Forum is a multilateral effort to advance technologies that capture and store carbon emissions. The Forum was formally inaugurated in June 2003 when an international charter was signed by 13 coal producing and consuming nations and the European Union.

FutureGen. The challenge: To design and build a prototype of the first coal-burning power plant with near zero CO₂ emissions (about 10%) that will generate electricity and hydrogen. Hydrogen produced by the power plant will be used in fuel cells to produce electricity and power automobiles. Any carbon dioxide produced by the power plant would be geologically sequestered. The 275-megawatt prototype plant, a ten-year, private-public undertaking will serve as a large-scale engineering laboratory for testing new clean

power, carbon capture, and coal-to-hydrogen technologies.

Virtually every aspect of the prototype plant will employ cutting-edge technology. Partners participating in the Carbon Sequestration Leadership Forum will be invited to participate in the development and testing of these new technologies.

Climate VISION. Climate, Voluntary Innovative Sector Initiatives: Opportunities Now, known as Climate VISION, was launched in 2003. This voluntary, public-private partnership pursues cost effective initiatives to reduce greenhouse gas emission within the energy-intensive industries of energy, manufacturing, transportation and forestry. Climate VISION builds on the progress made during 1990–2001 when the economy grew by 40 percent while greenhouse gas emissions in the industrial sector were constant. Sustaining and accelerating this progress and scaling up and transferring these technologies around the world will be critical to reducing greenhouse gas emissions worldwide.

No Country Left Behind

Technological innovation may be the key to the future of reduced greenhouse gas emissions, but only if all countries, including developing nations, have access to these technologies. National government policies need to work in tandem with the private sector to encourage innovation and investment in cutting-edge technologies; governments need to create an enabling climate through legislation and development planning. It will be important to build local capacity, reform policies, and develop mechanisms for financing. In *Powerful Partnerships*, the President's Committee of Advisors on Science and Technology recommended increasing funding by \$250 million per year for U.S.-sponsored international energy and climate

cooperation. This would help build the capacity of governments and the private sector in all countries to collaborate on climate technology development and implementation.

Forum Feedback

- ♦ While the U.S. big technology push is appropriate, a global solution also needs to involve smaller developing countries through technological interventions that yield shorter-term/smaller scale benefits that match their development goals. Perhaps regional partnerships and networks can play a useful role.
- ♦ The U.N. Foundation supports 40 projects in some of the largest greenhouse gas emitting countries—China, India, and Brazil. Using an enterprise-based approach, these projects focus on financing mechanisms, energy efficiency, and Clean Development Mechanism.
- ♦ Have efforts been made to form a coalition among donors and the international development community to address big technology and opening developing country markets to smaller scale climate friendly technologies?
- ♦ The MARKAL energy and environmental modeling program has been used by 100 institutions in 50 countries to assess the long-term roles of new technologies for energy systems—evaluating options, establishing baselines, identifying solutions, and providing estimates for prices, demand, emissions, and mitigation.
- ♦ Has there been any thought to applying hydrogen technology research and development to the trucking industry?

Robert K. Dixon, U.S. Department of Energy's Senior Advisor for Climate Change, has 20 years of energy and environment experience with three federal agencies, the private sector, and academia. He is the author or co-author of seven books and 125 articles on energy and environment science and policy and co-author of two U.S. patents. As a consultant to the President's Office of Science and Technology Policy, he led a national research and development program to support the Clean Air Act and Amendments and supported preparations for the 1992 Earth Summit. He is co-founder of Plant Health Care, Inc., a biotechnology research and development firm. Ko Barrett, Director of the Climate Change Program at the U.S. Agency for International Development, manages development assistance funding to address climate-related issues in over fifty countries. She is a core member of an interagency group of senior policymakers tasked with developing and implementing U.S. climate change policy and serves as a lead climate negotiator for the United States. William Chandler, Director of Advanced International Studies at Battelle Pacific Northwest Laboratory, has worked for 29 years in energy and environmental policy, particularly on the constraints in the use of energy-efficient technologies and the environmental impacts of central planning. He is the author of 11 books and numerous articles, a lead author for the Intergovernmental Panel on Climate Change, and served on the President's Council of Advisors on Science and Technology. He also led the creation of independent, non-profit energy-efficiency centers in six nations, including Russia and China.

About the IRG Discussion Forum

The IRG Discussion Forum is a monthly roundtable for the Washington-area policy community. Building on the Central Asia Speaker Series held at IRG in spring 2002, the Discussion Forum focuses on public and private sector issues affecting international development—agriculture, energy, sustainability. Each session is informal, and off the record; guest speakers and attendees are participating in a personal capacity.

With the Discussion Forum, IRG hopes to foster an environment for sharing experiences, exchanging ideas, and creating new approaches to development.

Henri-Claude Bailly, chairman of the IRG Advisory Board and senior advisor to the president, moderates the IRG Discussion Forum. Mr. Bailly is the former chairman and CEO of Hagler Bailly, an international management and consulting firm to the energy and utility industries. He is a director of the Alliance to Save Energy and a member of the Advisory Council of the Energy Future Coalition.

2003/2004 Schedule

September 25	October 16	November 20	December 18
January 15	February 19	March 18	April 15
May 20	June 17		

For comments, questions, or information on the Discussion Forum, contact discussionforum@irgltd.com or call IRG at 202-289-0100.

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