

U.S. House Committee on Science and Technology Addresses Climate Change

In May, at the third of a series of hearings aimed at addressing the science, research, and findings of the Intergovernmental Panel on Climate Change's Fourth Assessment Report, the U.S. House Committee on Science and Technology heard from the distinguished authors of the recently released Third Working Group Report.

That report—released May 4, 2007 in Bangkok—highlights the key findings of the comprehensive appraisal of the current state of scientific knowledge on strategies to mitigate climate change.

"The IPCC reports tell us that if we are to avoid the dangerous impacts of climate change associated with global temperature increases of four degrees or higher, we must develop and implement mitigation strategies," said Committee Chair Bart Gordon (D-Tenn.). "This is the third time this Committee has benefited from the expertise of the world's leading scientists on this matter, this year. Moving forward, their findings and guidance will certainly shape Congress' response."

The previously released Working Group I and II Reports established both the occurrence of global climate change and the likely effects of the phenomena. The full underlying report will be released later this year.

This third section of the IPCC's Fourth Assessment Report, entitled "Mitigation of Climate Change," builds on previous findings to begin the discussion on global adaptation and mitigation strategies needed to counteract the effects of increasing greenhouse gas concentrations in the atmosphere. The report also addresses the relationship between mitigation and sustainable development.

Looking in detail at the most promising technologies for reining in heat-trapping gases, Working Group III's report outlines the need for improving energy efficiency in buildings, vehicles, and appliances; shifting energy sources away from fossil fuels; retaining forests as a carbon sink; and reducing emissions associated with agriculture. The experts found that the sooner these measures are put in place, the better.

The representatives on the House Committee questioned the financial costs of climate change mitigation. But Rep. Gordon said, "Inaction is not cost-free, either in monetary terms or in human suffering. Longer, more intense droughts, increased flooding, and accelerated sea level rise are all very costly. Increased public health problems and increased migration of environmental refugees are also very costly."

Mitigation also brings opportunity, Gordon said. "While there will be costs, there will also be benefits and opportunities for new jobs and new industries. We must do for the U.S. the types of analyses performed by the IPCC on a global basis [in order] to understand the costs and benefits associated with alternative mitigation policies and technologies. We have an opportunity to lead the world in a cooperative effort to make sustainable development not just a goal, but a reality."

The Third Working Group report did not point to any single policy or group of technologies that will achieve emission reductions. The IPCC deduced that each country and region must participate in a global effort to reduce emissions by developing strategies that will work within their respective economic and social frameworks.

In an effort to advance new energy technologies to combat climate change, the full Committee plans to consider legislation (H.R. 364) to provide for the establishment of the Advanced Research Projects Agency-Energy (ARPA-E). Modeled after the Department of Defense's DARPA, ARPA-E would be a new program charged with the mission of rapidly developing and commercializing transformational clean energy technologies. The bill was drafted as a result of the widely regarded recommendations of the National Academies' (NAS) *Rising Above the Gathering Storm* report.

"DARPA succeeded largely because it continued to foster a culture of innovation. We cannot legislate an agency's culture. But we can set up a nimble organization with minimal administrative layers and the ability to quickly start and stop research programs. These elements are key to the success of ARPA-E, and to transforming energy R&D from the laboratory bench into market-ready technologies," said Gordon.

The Committee also expects to advance Earth and climate observation and research programs through legislation introduced in February by Reps. Mark Udall (D-Colo.) and Bob Inglis (R-S.C.), called the Global Change Research Data and Management Act of 2007 (H.R. 906).

The bill would replace the current law that established the U.S. Global Change Research Program in 1990 and simplify its detailed organizational structure. It would give the Bush administration flexibility in forming an Interagency Committee, which would identify and consult with the user community in developing a research plan, and would involve the National Governors Association in evaluating the plan for its practical uses and policy relevance. The bill would retain many

of the key features of the current law such as requirements for a 10-year strategic plan; periodic reviews of the effects on global change on natural, social, and economic systems; and increased international cooperation in global change science.

In addition, the bill creates a new interagency working group to coordinate federal policies on data management and archiving. Advances in computer monitoring and satellite technologies have vastly expanded the ability to collect and analyze data, said the House Committee, and Udall urges improvement in managing and archiving data to support the work of scientists and to make that data and research more relevant to policymakers on the state and local levels.

At the beginning of the 110th Congress in January, the new House majority brought with it a shift in Congress' national priorities. Among the subjects on the agenda of the House Committee on Science and Technology are a continued effort to assure that U.S. workers are equipped to compete in the global economy; a firm commitment to math and science education on all levels; working to utilize the strategic energy fund created in Congress' "first 100 hours" to increase the country's energy independence; maximizing the effectiveness of the U.S. civil and commercial space and aeronautics programs; working to assure national security; and ensuring adequate federal support for basic research.

During a hearing on global warming before the Committee a month later, House Speaker Nancy Pelosi (D-Calif.) delivered opening remarks. She said, "I have...asked the committees that have jurisdiction over energy, environment and technology policy to report legislation on these issues by June. We hope to have legislation that will be a starting point on global warming and energy independence through the committees by July 4th, so that this year, Independence Day is also Energy Independence Day."

Pelosi said, "We are creating a Select Committee on Energy Independence and Global Warming to raise the visibility of these urgent issues and gather critical information to protect America's security. The Select Committee...will develop recommendations on policies, strategies, technologies and other innovations intended to reduce the dependence of the United States on foreign sources of energy, and to achieve substantial and permanent reductions in emissions and other activities that contribute to climate change and global warming."

The IPCC Fourth Assessment Report can be accessed on the IPCC Web site at www.ipcc.ch.

NIST Report Highlights S&T Measurement Challenges Key to Sustaining U.S. Innovation

A report based on an analysis of more than 700 scientific and technical measurement challenges facing U.S. industry calls on the public and private sectors to address those challenges by crafting a "strategic, long-term approach" designed to sustain U.S. innovation at a world-leading pace.

The call for collaboration is one of several key messages contained in *An Assessment of the United States Measurement System: Addressing Measurement Barriers to Accelerate Innovation*, a report released in February by the National Institute of Standards and Technology (NIST).

The report is the product of a NIST-led survey and analysis of measurement-related needs for supporting innovation across a sample of 11 industrial sectors and technology areas. These ranged from materials to software and from building and construction to nanotechnology. In all, more than 1000 people in industry, academia, and government were involved in

the study. Examples of the measurement challenges identified included the need for versatile, high-accuracy methods to measure the three-dimensional geometry of manufactured products and the need for tools for measuring the properties of nanodevices and materials.

"The 21st century will be defined by new technologies that fundamentally change the products available, the way they are manufactured and the impact on our quality of life," said NIST Director William Jeffrey. "But before these technologies can be realized—and commercialized—new measurement techniques will be needed."

Measurement challenges distilled in the report were identified in 15 specially convened workshops, reviews of more than 160 technology "roadmaps" produced by public and private sector organizations, and interviews.

The assessment of the country's measurement infrastructure was unique in its focus on technological innovation and in its system-wide scope, encompassing a varied sample of private and public sector

organizations ranging from university laboratories to commercial testing services to regulators. It resulted in 14 conclusions regarding the structure and function of the U.S. measurement system (USMS), challenges posed by progress in science and technology, and potential actions to ensure that anticipated measurement capabilities are available to U.S. industry when needed.

The emphasis on innovation reflects growing recognition that the country's future prosperity and security will depend increasingly on how well the United States performs in conceiving, developing, and applying new technology and in introducing it into the marketplace.

This year, for example, the U.S. semiconductor industry alone will spend a projected \$9 billion on measurement equipment, according to NIST. NIST said studies and industry forecasts cite measurement-related challenges as major barriers to continued miniaturization of the circuits that are at the heart of current vast offerings of electronic gear.

Successful development and introduction of important next-generation products will hinge on progress on several measurement-related fronts, according to NIST. For example, realization of the promise of quantum computing, nanoscale devices, and other frontier technologies will require advances in the science of measurement. With regard to nanotechnology, the report said, "Industry is limited not only in its ability to measure key parameters but also in its ability to identify which key parameters must be measured to meet anticipated regulations."

In addition, breakthroughs in measurement capabilities may be necessary to clear a path to market. "Innovation has in some cases been stalled," the study said, "due to lack of measurement technology to assure and verify compliance or to resolve questions regarding potential risks and hazards that emerging technologies may pose."

The report, *An Assessment of the United States Measurement System: Addressing Measurement Barriers to Accelerate Innovation*, is available on the NIST Web site at <http://usms.nist.gov>.

European Commission Invites Public Consultation on ERA: New Perspectives

With the Green Paper on the European Research Area (ERA), the European Commission launches a broad institutional and public debate on what should be done to create a unified and attractive European Research Area, which would fulfill the needs and expectations of the scientific community, business, and citizens.

The debate is open to everyone with an interest in the realization of a European knowledge society. In particular, the Commission expects to receive responses from research institutions—including universities, researchers, industry, civil society organizations, and national and regional public authorities as well as the general public. The Commission will use the results of the debate to prepare initiatives that will be proposed in 2008.

The best way to engage in the debate is to participate in the on-line consultation linked to the Green Paper. Views are sought on the overall priorities for ERA, as well as on six main dimensions on which the consultation is focused, namely:

- Realizing a single labor market for researchers;
- Developing world-class research infrastructures;
- Strengthening research institutions;
- Sharing knowledge;
- Optimizing research programs and priorities; and
- Opening ERA to the world.

The online consultation will remain open until **August 31, 2007**.

The questionnaire can be accessed at Web site http://ec.europa.eu/research/era/questionnaire_en.html.



Materials VOICE
 A Web-based tool to ensure that your voice is heard on Capitol Hill
www.mrs.org/materialsvoice