Commerce Secretary Unveils Plan for Smart Grid Interoperability

Commerce Secretary Gary Locke unveiled an accelerated plan for developing standards to transform the U.S. power distribution system into a secure, more efficient and environmentally friendly Smart Grid and create clean-energy jobs.

The draft of the report is available at Web site www.nist.gov/public_affairs/releases/smartgrid_interoperability.pdf.

Produced by the Commerce Department's National Institute of Standards and Technology (NIST), the approximately 90-page document identifies about 80 initial standards that will enable the vast number of interconnected devices and systems that will make up the nationwide Smart Grid to communicate and work with each other. These standards will support interoperability of all the various pieces of the system-ranging from large utility companies down to individual homes and electronic devices. The report also lists a set of 14 "priority action plans" that address the most important gaps in the initial standard set.

"To use an analogy from the construction world, this report is like a designer's first detailed drawing of a complex structure," said Locke in prepared remarks. "It presents a high-level conceptual model to ensure that everyone is on the same page before moving forward to develop more detailed, formal Smart Grid architectures. This high-level model is critical to help plan where to go next."

The draft will be posted for a 30-day period of public comment and review. According to George Arnold, NIST's National Coordinator for Smart Grid Interoperability, finalizing the standards will ensure that the grid transformation goes both smoothly and rapidly—a priority of the Obama Administration. About $4.5 billion of American Recovery and Reinvestment Act of 2009 (ARRA) funds to the Department of Energy also are slated for Smart Grid demonstration projects.

"Because of the urgent need to remake the grid into a modern power distribution system, we have set a timetable that is much swifter than usual for establishing these standards," said Arnold. "But at the same time, we also want to be certain that the initial standards we establish will hold up in the future so that investments in the Smart Grid will not become prematurely obsolete."

When completed, the Smart Grid will employ real-time, two-way digital information and communication technologies in the operation of the country's electricity grid. The system would allow consumers to better manage and control their energy

NIST Issues Call for White Papers on Critical National Needs

www.nist.gov/tip/guide_for_white_papers.pdf

The National Institute of Standards and Technology (NIST) is soliciting ideas for topics that could form the basis of future funding competitions under the agency's Technology Innovation Program (TIP). The white papers are expected to describe an area of critical national need and the associated societal challenges, explain why government support is needed, and provide a high-level discussion of potential scientific advancements or technologies needed to address the challenges. They are not meant to include proposals for specific research projects and, because they will become public documents, should contain no secret or proprietary information.

TIP promotes innovation in the United States through cost-shared funding for high-risk, high-reward research projects by single small-sized or medium-sized businesses or by joint ventures that also may include institutions of higher education, nonprofit research organizations, and national laboratories. Competitions for TIP funding target large national and societal needs that arguably could be addressed or reduced through a program of high-risk, transformational research. Suggestions in the form of white papers from interested parties, including industry; academia; federal, state, and local governments; and professional organizations and societies are among the several sources consulted by TIP in deciding the scope of future competitions.

While TIP is interested in white papers addressing any area of critical national need, the program is particularly soliciting information related to several potential topic areas currently under consideration. These include:

Civil infrastructure. New construction approaches and materials to improve the nation's infrastructure and for mitigating the expense of repairing or replacing existing infrastructure, which includes systems for transportation (e.g., airport facilities, roads, bridges, rail, and waterway locks) and systems for water distribution and flood control (e.g., water distribution systems, storm and waste water collection, dams, and levees).

Complex networks and complex systems. Improved methods and models for predicting and controlling the behavior of complex systems and networks—a broad category ranging from networks used for energy delivery, telecommunication, transportation, and finance to the environment, neural systems, and the body's molecular-level response to disease.

Energy. A variety of research areas that would support the country's existing investment in energy research, including technologies for improved manufacturing of critical components for alternative energy production; replacement of fossil-fuel–derived fuels with non-food, renewably produced fuels; or improved technologies for stable connections of many power sources to the electrical grid.

Ensuring Future Water Supply. New, energy-efficient technologies to help ensure adequate supplies of fresh, safe water, including new methods of monitoring water for contamination and to recycle waste water.

Healthcare. Particularly focused on developing a better understanding of drug mechanisms; the genetic sources of variable response to drugs; targeted drug and vaccine delivery systems; and improved, low-cost advanced diagnostic and data integration tools.

Manufacturing. Innovative technologies that would shorten the manufacturing innovation cycle, increase flexibility, and accelerate the use of newly developed advanced materials, such as nanostructured materials and advanced composites and alloys.

Nanomaterials/nanotechnology. Research to overcome the technical barriers to scaling up laboratory advances in nanotechnology to commercial use.

Sustainability. Technologies that would address a broad range of sustainable manufacturing issues, including new use of renewable resources, improved methods to recover and recycle resources, and technologies that replace hazardous materials with more benign, environmentally safe materials.

Detailed instructions on how to prepare and submit white papers may be found in "A Guide for Preparing and Submitting White Papers on Areas of Critical National Need," available on the TIP Web site at www.nist.gov/tip/guide_for_white_papers.pdf. **White papers will be accepted at any time from Nov. 9, 2009, through Sept. 30, 2010.** To speed processing, TIP requests that submitters try to meet one of four interim submission dates, Nov. 9, Feb. 15, May 10, and July 12. White papers should be submitted by e-mail to tipwhitepaper@nist.gov.

The full text of the notice of the Federal Register (Vol. 74, No. 171, Friday, Sept. 4, 2009, p. 45823) is available at Web site www.nist.gov/tip/2009_tip_frn_cnn_white_paper_8_13_09.pdf /.

use and costs, reduce U.S. dependence on foreign oil, and create clean-energy jobs.

The draft report, entitled "NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 1.0," incorporates input from more than 1500 industry, government, and other stakeholders who have participated in the NIST framework development process.

The Framework draft includes a basic set of standards for interoperability and security, identifying roughly 80 specific standards and specifications to support the Smart Grid and a summary of a separate NIST cyber security strategy, which aims to protect the Smart Grid against the modern threat of cyber attack. It also covers the 14 "priority action plans" that describe what is being done immediately to fill important gaps where additional or revised standards are needed. These outline everything from plug-in electric vehicles, to home energy management systems, to distributed intelligence aimed at keeping the grid from developing problems before they arise. Each plan identifies standards organizations responsible for addressing them, a recommended approach, and aggressive timelines to develop solutions to these needs.

Following the 30-day public review and comment on the draft, NIST will finalize the Framework document, which is the culmination of the first phase of NIST's three-phase approach to develop Smart Grid standards. Phase 1, the engagement of stakeholders in a participatory public process to identify applicable standards and gaps in currently available standards and priorities for new standardization activities, ends with the final publication of the Framework report after public comments have been incorporated.

Phase 2 will establish a private-public partnership and forum—a Smart Grid Interoperability Panel—to drive longer term progress. NIST is using ARRA funds to establish the panel by the end of 2009. Phase 3 will develop and implement a framework for testing and certification of how standards are implemented in Smart Grid devices, systems, and processes. NIST is consulting with industry, government, and other stakeholders to develop a plan for a testing and certification framework by the end of 2009 and take steps toward implementation in 2010.

The results of NIST's ongoing work on standards for the Smart Grid also provides input to the Federal Energy Regulatory Commission, which under the 2007 Energy Independence and Security Act is charged with instituting, once sufficient consensus is achieved, rulemaking proceedings to adopt the standards and protocols necessary to ensure Smart Grid functionality and interoperability in interstate transmission of electric power, and in regional and wholesale electricity markets.

For more information on NIST's work with Smart Grid and for updates on the 30-day public review and comment, visit Web site www.nist.gov/smartgrid/.

United States and South Africa Sign Agreement on Cooperation in Nuclear Energy Research and Development

U.S. Secretary of Energy Steven Chu and South African Minister of Energy Dipuo Peters signed a bilateral Agreement on Cooperation in Research and Development of Nuclear Energy on September 14 in Vienna, Austria. This Agreement will facilitate cooperation in the areas of advanced nuclear energy systems and reactor technology. The two countries will collaborate in research and development of advanced technologies for improving the cost, safety, and proliferation-resistance of nuclear power systems. The agreement will also expand efforts to promote and maintain nuclear science and engineering infrastructure and expertise in each country.

"As the world moves to address the climate crisis and cut carbon pollution, it is clear that nuclear energy has a major role to play in

our energy future," said Secretary Chu. "This agreement reflects our commitment to a new, clean energy economy and strong partnerships with nations around the world to address our shared climate and energy challenges."

One potential area of cooperation may be research and development associated with South Africa's Pebble Bed Modular Reactor (PBMR) and the United States' Next Generation Nuclear Plant, which are both high-temperature, gas-cooled reactors. The research aims to assist in the development of Generation IV technologies and to draw on the unique expertise of each country.

Ministry of Economy, Trade and Industry of Japan Issues Reports

This summer, Japan's Ministry of Economy, Trade and Industry (METI) issued interim reports on new and renewable energy and on industrial science technology policy.

The interim report released by the New and Renewable Energy Subcommittee of the Committee for Natural Resources and Energy results from deliberation on Japan's future energy policy. According to the report, expanding the introduction of new and renewable energy is significant in relation to not only Japan's energy and environmental policy but also its industrial policy. To meet Japan's goal of increasing the installed capacity of solar power generation facilities about 20-fold by around 2020, a new system to buy electricity generated by solar power generation facilities should be implemented as soon as possible, said the report. For other new and renewable energies, an environment to maximize their introduction must be created by a comprehensive mix of regulations, assistance, and voluntary efforts, according to the characteristics of each energy source.

The Subcommittee, chaired by Takao Kashiwagi, professor at the Integrated Research Institute, Tokyo Institute of Technology, said that emphasis should also be placed on increasing public awareness (e.g., by publicizing leading-edge activities such as Next-Generation Energy Parks) and developing and promoting innovative technologies.

Through these activities, the Subcommittee said Japan should pursue the ambitious target of increasing the renewable energy share of final energy consumption to 20% by around 2020.

On a separate topic, to propose the direction of industrial science technology policy that can drive the medium- to long-term development of the Japanese economy and industry, METI established the Fundamental Issues Subcommittee under the Industrial Science Technology Policy Committee of the Industrial Structure Council in December 2008, and has been conducting discussions since then. Tsutomu Kimura, former president of the National Institution for Academic Degrees and University Evaluation, chaired the Subcommittee.

According to the Subcommittee, the research and development (R&D) system of Japan faces two crisis factors: a slowdown in R&D investments (business cyclical factor) and poor systems for exit-oriented R&D, that is, exit to market (structural factor). The report proposes that, in order to overcome the crisis and drive innovation as an engine for economic growth, Japan should move to national technology strategies that focus on solving specific problems, such as the creation of a low-carbon society and a safe and secure society.

The report suggests that Japan should carry out the following policies:

- maintain and increase R&D investments,
- move to exit-oriented national technology strategies,
- strengthen exit-oriented R&D systems,
- develop human resources, ventures, and regions to support exit-oriented R&D systems, and
- reinforce a virtuous circle of innovation and social needs. □