

Review Confirms Reliability of Stockpile Stewardship

Secretary of Energy Bill Richardson released the results of a comprehensive internal review of the stockpile stewardship program. The assessment concludes that the program, which began in 1993, is sound and developing the science, technology, and production capabilities needed to maintain the long-term safety, security, and reliability of the United States' existing nuclear weapons without underground nuclear testing.

In science, the program is providing the data to validate advanced nuclear weapons simulation codes. In surveillance, the program is developing the chemical, analytical, and materials science tools to anticipate and assess the aging of stockpile components. In production, the nation is restoring its capacity to produce nuclear weapons components to replace aging parts in the enduring nuclear stockpile.

Richardson has ordered implementation of the 15 specific actions that emerge from the report's findings, including to

- define the workforce needs to meet the next decade's major life extension work;
- place stronger emphasis on longer term investments in exploratory science that are necessary to assure the necessary scientific foundation for the future and to

attract and retain the next generation of scientists;

- recapitalize the weapons complex to update machinery and equipment that will be needed for weapons refurbishment;
- develop an overall defense plutonium strategy; and
- support restoration of Laboratory Director Research and Development funding to 6% and establish a similar mechanism at the production plants in order to provide the scientific, engineering, and manufacturing base for the next generation of stockpile stewardship.

For a copy of the review, access <http://www.dp.doe.gov/>.

Report Recommends U.S.-China Collaboration on Energy R&D

At a presidential summit in 1997, Chinese and U.S. leaders signed the Energy and Environment Cooperation Initiative, agreeing to work together on energy and environmental research and trade issues. By then, the United States was ranked first and China second in world energy consumption, and together they were responsible for more than a third of the planet's emissions of greenhouse gases.

Drawing on that agreement, a report by the National Research Council of the U.S.

National Academies and the Chinese Academies of Sciences and Engineering urges both countries to strengthen their collaborative efforts to develop and deploy cleaner and more-efficient energy technologies. The committee that prepared the report was appointed by the U.S. National Academy of Sciences, U.S. National Academy of Engineering, Chinese Academy of Sciences, and Chinese Academy of Engineering.

The report focuses on seven areas:

- *Energy efficiency.* Collaboration in the research and development of promising, pre-commercial energy-efficiency technologies should be strengthened. There are compelling reasons to promote increased trade between the two countries in energy-efficiency technology at this time, the committee said, including the potential for these technologies to reduce emissions of greenhouse gases and cut costs. If barriers to trade can be overcome, ample opportunities should exist for companies in both countries that produce or use energy-efficiency technology.
- *Clean coal.* Both governments should convene a joint task force to assess how clean-coal technologies developed in the United States can be implemented in China. Currently the market for these technologies is very limited in the United States because numerous utilities rely on

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cleaner natural gas plants to meet the government's clean-air standards. Many clean-coal technologies have not been given serious consideration in China because they have been designed for industrialized countries with stringent environmental standards, other market conditions, and other types of coal. The committee called for collaboration between China and the United States to adapt clean-coal technologies for practical use in China, and to help create the institutional and regulatory conditions necessary to attract private-sector investment in these technologies. In return, the United States, and other nations that rely heavily on coal, could gain by observing the environmental benefits of clean-coal technologies in action.

■ *Natural gas.* Policymakers from both nations should collaborate on a strategy to accelerate the production and use of cleaner-burning natural gas and coal-bed methane in China. In doing so, they need to look for ways to improve China's infrastructure for transporting, distributing, and using natural gas. In addition, China should consider tapping remote sources of natural gas and coal-bed methane to supply power to rural populations, and make further reforms to environmental policy so natural gas can compete better against coal in China's energy marketplace.

■ *Petroleum.* With each country becoming more dependent on oil imports, the U.S.-China Oil and Gas Industry Forum and other joint groups should consider a range of technical and institutional options including market restructuring, long-term development strategies, national oil reserves, and alternatives to petroleum-dependent transportation. For example, new opportunities for collaboration could include research and development on fuel cells and battery technologies for cars.

■ *Renewable energy.* Chinese and U.S. researchers cooperating on the study of solar, wind, and biomass energy should focus on lowering costs to make these energy sources more attractive. The committee noted that although industrialized nations currently lead in the development of technologies which produce energy from renewable resources, the long-term market for these technologies will largely be in developing countries, a fact that should be reflected in R&D priorities.

■ *Nuclear energy.* Given both countries' heavy dependence on coal, nuclear energy remains an important option for power generation in the future. The committee suggested that risks and costs could be minimized by simplifying and standardizing the design of future nuclear plants. The two countries also should cooperate on the demonstration and public acceptance of

long-term options for the storage and disposal of nuclear waste, which is needed for the continued commercial use of nuclear power. The committee endorsed the Peaceful Use of Nuclear Technology agreement signed by China and the United States in 1997, and urged both nations to expand their cooperation on nonproliferation issues.

■ *Electricity transmission and distribution.* China should consider international financing options to expand and improve the performance of its electric power grid. Like the United States, China is exploring the deregulation of electric-power markets, which the committee noted presents a unique opportunity for cooperation between the two countries.

To facilitate overall collaboration, a standing committee representing the science and engineering academies of both countries should be formed to identify opportunities for joint research and deployment of cleaner and more-efficient energy technologies, the report said. A forum should be held to bring together industry, academic, and government participants from each country.

Cooperation in the Energy Futures of China and the United States is available from the National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20055; 1-800-624-6242. □

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