

## ORNL Aspires to "Gathering Storm" Goals

*The work represents funding and job protection*

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Creative thinking and the unique capabilities of Oak Ridge National Laboratory could play a role in realizing some of the goals outlined in the comprehensive "Rising Above the Gathering Storm" report commissioned by The National Academies.

ORNL's Craig Blue, deputy director of technology for the Materials Science and Technology Division, was selected to serve on one of several elite focus groups that guided a 20-member committee composed of leaders in academe, industry and government. Blue noted that ORNL has established an impressive record of making fundamental discoveries and transforming that knowledge into technologies to save energy.

"Integration of basic energy researchers with applied research scientists is one of the strengths of Oak Ridge National Laboratory, and it is this integration that will be crucial to achieving some of the goals identified in the 'Gathering Storm' report," Blue said.

The report was in response to a request by Sen. Lamar Alexander (R-Tenn.) and Sen. Jeff Bingaman (D-N.M.) to identify the top 10 actions that federal policymakers could take to enhance science and technology and ensure that the United States continues to prosper. One of the committee's recommendations was to respond to the nation's need for clean, affordable and reliable energy.

In this area, the Department of Energy's ORNL has vast capabilities plus an extensive track record of accomplishments, including several in the area of superconductivity. A recent paper in *Science* discusses an ORNL-developed method to sustain high currents in wires in the presence of a large magnetic field, thus making it more practical to use high-temperature superconductors in motors, generators and power transmission. In recent years, working with industry, ORNL has demonstrated superconducting power cables able to carry five times more electricity than conventional lines while cutting transmission losses in half.

"Oak Ridge National Laboratory does more energy research than any other national laboratory," said Blue, who pointed to the lab's 122 R&D 100 Awards, many of which were for technologies to use energy more efficiently. The awards are presented annually by R&D Magazine in recognition of the year's most significant technological innovations.

Meanwhile, a process to enhance properties of nickel aluminide for rolls used to produce steel has resulted in greatly improved reliability and efficiency of natural gas-fired furnaces. Other success stories include ORNL's contributions to make nuclear energy safer and more efficient, rapid infrared heating technology, which offers a low-cost energy-efficient heating method to enhance material properties, near-net-zero energy homes and solar hybrid lighting. With 24 percent of commercial building energy in the United States consumed by lighting, solar hybrid lighting could save ratepayers billions of dollars annually.

On the horizon are better materials made possible by discoveries at the \$1.4 billion Spallation Neutron Source, which will be completed this spring, and the new

Nanoscience Center, a collaborative user research facility for the synthesis, characterization, theory, modeling, simulation and design of nanoscale materials.

In addition, the National Center for Computational Sciences is on track to reach 100 teraflops of computing power by the end of this year and 250 teraflops in 2008. Such computing capability dedicated to scientific challenges – including those related to energy efficiency -- will enable the United States to achieve what could only be imagined previously.

"Rising Above the Gathering Storm" was commissioned by The National Academy of Sciences, The National Academy of Engineering and The Institute of Medicine of The National Academies.