Nanoscience solutions for energy technologies advocated

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Breakthroughs in nanotechnology could open up the possibility of moving beyond the United States' current alternatives for energy supply by introducing technologies that are more efficient, inexpensive and environmentally sound, according to a new science policy study by Rice University.

The report, based on input from 50 leading U.S. scientists who gathered at Rice in May 2003, found that key contributions can be made in energy security and supply through fundamental research on nanoscience solutions to energy technologies. The group of experts concluded that a major nanoscience and energy research program should be aimed at long-term breakthrough possibilities in cleaner sources of energy, particularly solar energy, while providing vital science backup to current technologies in the short term, including technologies for storing and transmitting electricity.

The study findings were announced as Congress and the Bush administration begin another round of efforts to pass national energy legislation. Senator Pete Domenici, chairman of the Senate Energy and Natural Resources Committee, recently vowed to work collaboratively with Democrats to get a substantive, passable bill.

“The 2003 energy bill effort was an amalgamation of giveaways to special-interest groups,” said Amy Myers Jaffe, the Wallace S. Wilson Fellow for Energy Studies at Rice's Baker Institute for Public Policy. “What is needed is a more focused debate that puts regional or parochial short-term interests aside and emphasizes our long-term national

interests. The outlook is dire. We need real solutions, not useless handouts."

The participating scientists agreed that nanotechnology could revolutionize lighting and electricity grid technology. A breakthrough in electricity transmission technology would facilitate not only distributed electricity but also render commercially viable the transmission of electricity from distant sources of energy such as solar collector farms located in desert geography or closed-loop clean coal FutureGen sequestration power plants built near geologic formations. Improvements in electricity transmission would also permit the transportation of electricity by wire from power stations built near stranded natural gas reserves in remote regions.

Scientists theorize that transmission lines built from carbon nanotubes that could conduct electricity across great distances without loss would radically change the economics of moving "energy" supply from distant natural gas sources, distant wind and solar farms, and coal sequestration sites. Howard Schmidt, executive director of the Carbon Nanotechnology Laboratory at Rice, believes that development of such a wire is possible within five years with adequate research and development funding.

"Energy is unique not only in its ability to give us answers to most other problems, but it is also uniquely something we can do something about," said Nobel Laureate Richard Smalley, University Professor at Rice. He noted that the Bush administration's initiatives on energy technology were laudable but the level of financial commitment is not large enough to achieve needed breakthroughs.

The meeting was hosted by the Baker Institute, Rice's Center for Nanoscale Science and Technology, Environmental and Energy Systems Institute and the Rice Alliance for Technology and Entrepreneurship as

part of an ongoing program on energy and nanotechnology that is aimed to reinvigorate public interest in the physical sciences by showcasing potentially revolutionary breakthroughs in the energy technology area. The program highlights how science can have direct bearing on people's lives.

Source: Rice University