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Meeting Our Long-Term Energy Needs Through Federal R&D

by Senator Pete V. Domenici



The funds we spend on research and development (R&D) for new energy technologies are some of the most important dollars in the federal budget.

But we have a problem—federal funding for energy R&D has been declining for years, and it is not being made up by increased private sector R&D expenditures. There is a vital need for a bipartisan effort to increase federal R&D funding for energy technology, to leverage those funds with increased private sector investment and to work with the Executive Branch to bring new energy technologies quickly to the market place. In the last year, we have taken important steps to implement this vision.

Over the 25-year period from 1978 to 2004, federal appropriations for energy R&D fell from \$6.4 billion to \$2.75 billion in constant year-

2000 dollars, a reduction of nearly 60 percent. Even worse, federal and private sector expenditures combined are less than one percent of total energy sales. Private sector investment in energy R&D fell from about \$4 billion in 1990 to about \$2 billion today.

“There is a vital need for a bipartisan effort to increase federal R&D funding for energy technology...”

Of our nation’s high-technology industries, energy is the least intensive in terms of R&D. Consider, for comparison, that private sector R&D investments equal about 12 percent in the pharmaceuticals industry, and about 15 percent of sales in the airline industry. It is past time to reverse that trend.

Last August, Congress enacted the first comprehensive energy legislation in 12 years – the Energy Policy Act of 2005. Already we are seeing results. But the challenges we face are long-term—they will require continued hard work for years to come. To this end, the Act strengthens our commitment to investing in energy-related R&D. In all, it calls for \$24.2 billion in funding over the next three years for research programs in energy technology and energy-related science.

The Energy Policy Act also provides a framework for a balanced set of programs in energy research, development, demonstration, and commercial application. Previously, the Secretary of Energy had no guidance in choosing research topics and program components for energy R&D. The Act addresses this problem, establishing clear guidelines for research programs in energy efficiency, renewable energy, fossil energy, and nuclear energy technologies.

With the Energy Policy Act, the Department will be better able to manage our R&D investments. The Act creates a new Under Secretary for Science to serve as the primary science and technology advisor to the Secretary of Energy. The new Under Secretary is responsible for monitoring civilian research and development programs, and advising the Secretary in managing national laboratories supporting basic research.

nologies. And these technologies must move from laboratory to market, or we will be no closer to realizing a stronger energy economy. Crossing this “Valley of Death” is not easy. Even technologies with obvious commercial potential often confound attempts to find successful markets.

Federal funding for energy R&D is critical, but we also need policies that encourage greater private sector investment.

The Energy Policy Act strengthens Department of Energy efforts to partner with private companies interested in lab-developed technologies. The Act establishes a technology transfer coordinator to advise the Secretary on technology transfer and commercialization. It also creates a technology commercialization fund with a budget of about \$25 million annually. That federal funding will be seed money to leverage private sector investments through partnerships with local businesses. Helping laboratories “spin-off” technologies to the private sector will lead to new businesses, job creation, and a more innovative economy.

The Energy Policy Act also gives the Department of Energy new authority to hold prize competitions in “grand challenge” areas of energy technology. The Department can use this authority to accelerate progress in challenging areas — such as hydrogen and fuel cell vehicles and carbon capture and storage. This prize authority is modeled after that used successfully by the Defense Advanced Research Programs Agency (DARPA). DARPA spurred private sector investment in robotics technologies, for example, through a well-publicized race through the Mohave Desert. The X-Prize stands as another example of successful use of prize authority. This \$10 million privately-funded award produced the first successful space flight ever achieved without public support. These prizes encourage multiple teams to undertake novel approaches, and they generate significant private sector

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The President's Advanced Energy Initiative builds on the Energy Policy Act by identifying key technologies where we will focus our efforts.

The purpose of the AEI is to reduce our national dependence on foreign sources of energy, including the natural gas we use to heat our homes and the crude oil we rely upon to fuel our cars. To support this initiative, the President has requested an overall 22 percent increase in fiscal year 2007 funding for the development of key technologies.

Under the President's Initiative, we will invest in technologies for zero-emission coal-fired power plants. These plants will capture and store pollutants and carbon dioxide rather than releasing them into the atmosphere. We will continue our support for revolutionary new solar and wind technologies, to make them more cost-competitive. Through the Global Nuclear Energy Partnership, we will develop a nuclear fuel cycle that enhances energy security, while addressing proliferation concerns.

The AEI emphasizes the importance of advanced transportation technologies. To accelerate consumer adoption of hybrid-electric vehicles, the administration has committed to increase the energy storage and the lifetimes of batteries for these vehicles. To achieve greater use of home-grown renewable fuels, the initiative will develop advanced technologies to make competitively priced ethanol from cellulosic biomass, such as agricultural and forestry residues, trees, and grasses. Moreover, President Bush three years

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ago gave Americans the vision of a hydrogen future free from a reliance on foreign oil. The Energy Policy Act moves us toward that future with an authorization of over \$3 billion in research on hydrogen and hydrogen fuel cells.

Our nation has a bright energy future. Greater public and private investment in energy R&D will produce a suite of new technologies that will make our energy sector cleaner, more secure, and more resilient. We laid the groundwork in the Energy Policy Act, and by following through on the President's vision of the Advanced Energy Initiative we will meet the energy challenges that lie ahead.

Senator Pete V. Domenici (R, NM) chairs the Senate Energy & Natural Resources Committee and the Senate Appropriations Energy & Water subcommittee.

About the Senator

- Republican, Senior Senator from New Mexico; serving in his 6th term.
- Chair of the Senate Energy & Natural Resources Committee, which has jurisdiction over the Department of Energy (DOE) and all the national labs. As well, he is chair of the Senate Appropriations Energy & Water subcommittee, which has jurisdiction over the budget of DOE.

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