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ADVANCED ENERGY TECHNOLOGIES

Budget Trends and Challenges for DOE's Energy R&D Program

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Highlights

Highlights of GAO-08-556T, a testimony before the Subcommittee on Energy and Environment, Committee on Science and Technology, House of Representatives

Why GAO Did This Study

For decades, the nation has benefited from relatively inexpensive energy, in the process growing heavily reliant on conventional fossil fuels—oil, natural gas, and coal. However, in the current wake of higher energy costs and environmental concerns about fossil fuel emissions, renewed attention is turning to the development of advanced energy technologies as alternatives. In the United States, the Department of Energy (DOE) has long conducted research, development, and demonstration (R&D) on advanced renewable, fossil, and nuclear energy technologies. DOE's Office of Science has also funded basic energy-related research.

This testimony addresses (1) funding trends for DOE's renewable, fossil, and nuclear energy R&D programs and its Office of Science and (2) key challenges in developing and deploying advanced energy technologies. It is based on GAO's December 2006 report entitled *Department of Energy: Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs* (GAO-07-106). In doing that work, GAO reviewed DOE's R&D budget data and strategic plans and obtained the views of experts in DOE, industry, and academia, as well as state and foreign government officials.

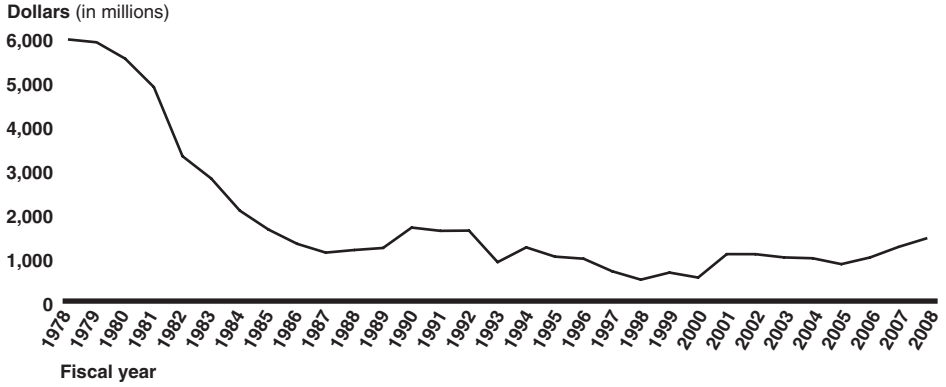
To view the full product, including the scope and methodology, click on GAO-08-556T. For more information, contact Mark E. Gaffigan, at 202-512-3841 or gaffiganm@gao.gov.

What GAO Found

Between fiscal years 1978 and 1998, DOE's budget authority for renewable, fossil, and nuclear energy R&D fell 92 percent when adjusted for inflation (from its $6 billion peak in fiscal year 1978 to $505 million in fiscal year 1998). It has since rebounded to $1.4 billion in fiscal year 2008 (see figure). Energy R&D funding in the late 1970s was robust in response to the 1973 energy crisis caused by constricted oil supplies. However, R&D funding plunged in the 1980s as oil prices returned to their historic levels. DOE's fiscal year 2009 budget, as compared with 2008, requests slightly less budget authority for renewable energy R&D, while seeking increases of 34 percent for fossil energy R&D and 44 percent for nuclear energy R&D. In addition, DOE is requesting $4.7 billion for basic research under its Office of Science.

The development and deployment of advanced energy technologies present key technical, cost, and environmental challenges. DOE's energy R&D program has focused on reducing high up-front capital costs; improving the operating efficiency of advanced energy technologies to enable them to better compete with conventional energy technologies; and reducing emissions of carbon dioxide, a greenhouse gas linked to global warming, and pollutants that adversely affect public health and the environment. However, while DOE has spent $57.5 billion over the past 30 years for R&D on these technologies, the nation's energy portfolio has not dramatically changed—fossil energy today provides 85 percent of the nation's energy compared to 93 percent in 1973. Because DOE's energy R&D funding alone will not be sufficient to deploy advanced energy technologies, coordinating energy R&D with other federal energy-related programs and policies will be important. In addition, other governments and the private sector will play a key role in developing and deploying advanced energy technologies that can change the nation's energy portfolio.

Budget Authority for Renewable, Fossil, and Nuclear Energy R&D, Fiscal Years 1978-2008



Source: GAO analysis of DOE data.

Note: Budget authority is in real terms, adjusted to fiscal year 2008 dollars to account for inflation.