



Union of Concerned Scientists

June 29, 2001

Ms. Bonny Overton
US Department of Energy
Office of Energy Efficiency and Renewable Energy, EE 3.1
1000 Independence Avenue, SW
Washington, DC 20585

RE: Comments on Funding DOE's Energy Efficiency and Renewable Energy Research and Development Programs

Ms. Overton:

Thank you for the opportunity to submit comments on funding the Department of Energy's energy efficiency and renewable energy research and development programs. I am writing on behalf of the Union of Concerned Scientists and our over 50,000 members nationwide to strongly oppose the \$280 million (28 percent) cut that the Bush Administration has recommended for DOE energy efficiency and renewable energy R&D programs (apart from grants for low-income households for home weatherization).

The Union of Concerned Scientists is a nonprofit partnership of scientists and citizens combining rigorous scientific analysis, innovative policy development, and effective citizen advocacy to achieve practical environmental solutions. Our Clean Energy Program works, in part, to promote policies that maximize energy efficiency and the rapid ramping up of renewable energy technologies.

President Bush's National Energy Policy report states that a shortage of power plants and overburdened transmission systems has placed America in the midst of an energy crisis unseen since the embargoes of the 1970s. A crisis, according to President Bush, that is evidenced by blackouts in California and skyrocketing heating and gasoline prices throughout the nation. In the face of such serious energy problems, UCS believes we should be expanding, not slashing, the budgets for important and historically effective programs that result in a cleaner, more efficient energy system.

As discussed in the comments below, DOE's energy efficiency and renewable energy programs have proven successful in the past and are an essential component for resolving the energy problems of today and ensuring a cleaner, more reliable energy future. We urge DOE and the Administration to reconsider cuts in energy efficiency and renewable energy R&D and deployment programs and instead significantly increase their overall budget.

Past Successes of Research and Development

Energy Efficiency

DOE recently documented the results of its twenty most successful energy efficiency programs and initiatives and found that over the past twenty years they have saved the nation 5.5 quadrillion BTUs of energy and nearly \$30 billion in avoided energy costs.

Some of the programs and technologies highlighted in the report include:

- new types of compact fluorescent light fixtures that are replacing wasteful and unsafe halogen torchiere fixtures;
- support for improvements in building codes in numerous states, thereby saving consumers over \$1 billion as of 1998; and
- spectrally selective window coatings that are increasing the energy efficiency of windows in warmer parts of the country.

In addition to demonstrated efficiency savings, support for DOE's programs has also proven to be a sound financial investment. The programs have cost taxpayers \$712 million over the past decade, less than 3 percent of the benefits. These benefits will continue to grow year after year.

DOE also tracks the adoption and utilization of new technologies it has funded. The Office of Industrial Technologies, for example, has documented its contribution to over 45 new commercially available technologies. These technologies, in conjunction with related technical assistance activities, have lowered industrial energy use by 1.6 quadrillion BTUs and cut energy bills by \$6.5 billion. They have also helped to reduce material costs, waste generation, and waste disposal costs while increasing productivity and profitability.

DOE's research and development programs have consistently served as the foundation of broad-based cooperation between the federal government, state governments, and industry. For example, the 120 Federal programs in industrial efficiency have initiated and supported nearly 500 R&D and deployment projects, involving over 2,000 partners. While these projects involve substantial cost sharing with industry, it is unlikely that they would have materialized without federal support.

Renewable Energy

Through technical leadership and cost-shared programs with industry, DOE renewable energy programs have contributed to significant improvements in performance and reduction in costs of many important renewable energy technologies. The case of wind energy provides an excellent example.

The cost of wind energy has dropped by more than 80% since the early 1980s, from 38 cents per kilowatt-hour (kWh) of electricity generated to a current range of 4-6 cents/kWh. While cost reductions are due, in part, to growing market penetration, multiple technological advances spurred by federal R&D programs have also played an important role. Increasing the rotor size of wind turbines, for example, has been a major factor in lowering costs. Structural dynamics work done through federal programs to improve the ability of rotors to deal with the structural stresses of longer blades has made the larger machines in use today possible. While today's

enormous turbines cost up to 20 times as much as those built in the early 1980s, they are able to generate 120 times as much electricity.

Federal research has also improved the power electronics systems that large wind turbines use to interconnect with the electric utility transmission system. This advance has made the varying electrical output of wind plants much easier for utility system operators to deal with, and has been a critical step in greater utility acceptance of wind energy.

Investments in R&D have also helped dramatically improve the performance and lower the costs of other renewable resources. The cost of geothermal energy has come down to the point where new facilities can produce electricity at a cost of 3-5 cents/kWh and technological advances have provided industry with the capacity to improve the efficiency of older geothermal plants by 20-30 percent. Breakthroughs in biomass gasification have improved efficiency by 50 percent and helped to lower costs of biomass energy to 2.5-7.5 cents/kWh. Solar photovoltaics costs, while still higher than other renewable sources, have come down by almost 90 percent since 1980.

Benefiting from Research and Development Today

There are many serious problems evident in our energy system today – volatile fuel prices, bottlenecked transmission lines, as well as supply shortages and potential blackouts in the west. Cutting funding for DOE's energy efficiency and renewable energy programs at this critical time would only worsen the situation, causing consumers' energy bills to increase, slowing U.S. economic growth, raising the likelihood of power shortages, and increasing air pollution and public health risks. Continued robust funding of DOE programs, on the other hand, can build on the momentum that they have already established and make an immediate impact on our current energy problems.

One of the most significant advantages to efficiency measures and renewable energy technologies is that they are both cost-effective and readily deployable. For example, tight power markets in the west have led to record price spikes and the constant threat of rolling blackouts. DOE's energy efficiency programs, including the appliance standards and building codes programs, the industrial best practices program, and various R&D programs have had an immediate impact helping utilities and end-users lower peak demand and improve system reliability. Furthermore, the Federal Emergency Management Program has mobilized expert teams to assist Federal agencies in California with efforts to reduce electricity demand.

Renewable energy is also contributing to resolving the supply shortages in the west. Facilities can be constructed much more quickly than traditional power plants and have the added advantage of no fuel costs or air emission burdens, thereby helping to stabilize prices.

DOE's R&D and deployment programs are also helping to reduce household and business energy expenses throughout the nation. Lower consumer energy bills can help stimulate the economy by freeing up money that can be spent on other goods and services. Developing new types of heat pumps, light sources, and fuel cells, improving industrial processes, and supporting renewable energy manufacturers helps increase productivity and maintain leadership in highly competitive global markets.

Fossil-fueled energy production accounts for a majority of the nation's air pollutant emissions including carbon dioxide, sulfur dioxide, nitrogen oxides, and particulates. Energy efficiency improvements reduce energy use and the deployment of renewable energy sources avoids the need for fossil fuels. Cutting all types of air pollutant emissions through efficiency and renewable energy leads to improved public health and a reduced threat from climate change.

Research and Development for a Cleaner, More Reliable Energy Future

Strong support for DOE's energy efficiency and renewable energy programs is not only necessary to alleviate the energy problems of today, it is also vital for ensuring that we can meet future energy demands in a balanced and sustainable manner. For example, UCS recently released a report, *Clean Energy Blueprint*, that found it was possible to decrease the nation's reliance on fossil fuels, save consumers money, and make real progress reducing the environmental damage from our energy system. UCS' *Clean Energy Blueprint* analyzed a package of policies to increase energy efficiency in homes, businesses, and industry, and to develop renewable energy resources. A doubling in federal R&D spending to \$1.2 billion annually is one of the cornerstone policies analyzed in this report. Investment in R&D proved to be an integral component in the success of the other policies in the Blueprint as well as a significant contributor to the overall cost and performance improvements.

Similarly, a report from DOE's five national laboratories found that significant investments in R&D coupled with other policies, could cut our nation's energy bill by over 20 percent by 2020, while lowering energy use and air pollutant emissions.

Conclusion

Thanks to the Department of Energy's R&D programs in energy efficiency and renewable energy, the United States has made significant progress toward increasing the energy efficiency of our homes, businesses, and industries, and furthering the development of renewable energy technologies. These programs have consistently proven to be a sound investment for our nation. Yet, there remains enormous potential for further cost-effective advances in efficiency and renewable energy deployment. Continued vigorous support for R&D is necessary to realize this potential and help meet our nation's energy needs for today and the future.

UCS urges the Bush Administration to pursue a responsible and balanced national energy policy that protects consumers, stimulates the economy, and reduces damage to our environment. As part of this overall effort, we request that the Administration and the Department of Energy reconsider cuts in energy efficiency and renewable energy R&D and instead significantly increase funds for these critically important and beneficial programs.

Respectfully submitted,

// Signed //

Deborah Donovan
Energy Research Coordinator
Union of Concerned Scientists