Assessing the President's FY08 Energy RD&D Budget Request

Kelly Sims Gallagher[1]

In the President's FY08 budget request for energy research, development, and demonstration (RD&D) activities there are four big surprises. The first revelation is that the budget reflects virtually no new sense of urgency in response to the accumulating evidence that climate change is real and scary. The second shock is the four-fold increase in the Advanced Fuel Cycle Initiative, resulting in more than a doubling of fission RD&D and making fission by far the largest recipient of energy RD&D funding for the first time in twenty years. The third surprise is that the National Renewable Energy Laboratory's (NREL) budget is actually cut in a time when concerns over energy security and climate change are at their most fevered pitch in recent memory. And, the President's proposal to cut assistance to low-income families by 41% from FY06 levels for weatherization to improve the energy efficiency of their homes is startling.

A commendable feature of the President's budget request is that there is an overall upward trend in investments for energy RD&D. At $2.7 billion, the overall energy RD&D FY08 request is $685 million higher than the FY06 appropriated budget. Exactly half of that growth is accounted for by the big increases in fission, and the rest is moderate increases in funding for biofuels, solar, FutureGen, plus a whopping $147 million increase for fusion research.

Of course, the $2.7 billion won't actually get spent as Secretary Bodman and his technical program directors would like. Congressional earmarks in the energy domain are higher than ever. In FY06, 52% of biomass and biofuels, 17% of solar, 27% of hydrogen, and 30% of wind appropriated funds were devoted to congressionally-directed activities. As the renewable energy and energy-efficiency budgets are squeezed to accommodate other spending priorities, the actual available funds for the ongoing research programs are greatly diminished by these Congressional earmarks. This combination of pressures is why NREL laid off 32 employees a year ago, most of whom were hired back in advance of the President's trip to NREL in an embarrassing incident.

The four-fold increase in funding for the Advanced Fuel Cycle Initiative is astonishingly large, especially when one considers that the $395 million, if appropriated, would be greater than all the DOE investment in efficiency RD&D and just slightly less than all money spent on renewables RD&D.

If you watched the President's State of the Union address, you might be forgiven for believing that he was determined to improve vehicle fuel efficiency, but in terms of investments in advanced vehicle technology, they are actually cut in the budget request. Industrial efficiency RD&D funding is also cut in the President's request, with a modest increase in building efficiency funding. Overall, there is a 14% cut in the budget request

[1] Energy Technology Innovation Project, Belfer Center for Science & International Affairs, Kennedy School of Government, Harvard University, Cambridge, MA.

from FY06 levels in funding for efficiency RD&D, not including hydrogen RD&D or deployment programs such as weatherization and the federal energy management program. This continues a steady decline in efficiency RD&D funding that began in 2002; if the FY08 budget request were appropriated at that level, it would represent a 32% decline in funding since 2001 in current dollars.

In terms of renewable energy, there is an 80% increase in solar from the FY06 appropriation to $148 million, most of which is devoted to photovoltaic research. Biomass and biorefinery systems receive a 100% increase from the FY06 level. Wind is essentially held constant at $40 million, but hydrogen energy (non-fossil) gets a big boost of $60 million. Geothermal and hydropower research are zeroed out.

In the area of fossil energy, petroleum and natural gas funding is sensibly halted given that there are large corporations capable of bearing substantial research portfolios in these areas. A significant increase of $91 million is requested for FutureGen which is aimed at demonstrating the technical and economic feasibility of a zero-emission (including carbon dioxide) coal-fired power plant. This is complemented by a very modest increase of $14 million for carbon sequestration RD&D, which is disappointing given the great need for the demonstration of the feasibility of carbon storage in a variety of geologic conditions at various scales.

It is very difficult to assess from the budget documents how much money is being spent to accelerate the early deployment of advanced energy technologies, but suffice to say, many of the more obvious line items appear to be suffering cuts. The weatherization assistance program has been slashed, the Federal Energy Management Program, which strives to incorporate advanced energy technologies in federal facilities is cut by 11%, and the Gateway deployment program funds have either been cancelled or moved into other categories.

Although the President's budget request is somewhat larger than the FY06 appropriation, combined U.S. public and private investment in energy-technology innovation is not remotely commensurate with the magnitude of the energy challenges faced by individual nations and the world as a whole in the twenty-first century. This was powerfully reinforced by the findings of the Fourth Assessment of the Integovernmental Panel on Climate Change, released this month, which concluded among other things that a doubling of pre-industrial levels of carbon dioxide would likely cause a 3 degree C average warming, a level of temperature change and resulting climatic disruption that many experts have judged likely to be intolerable.

Past investments in energy-technology innovation, both public and private, led to large improvements over the course of the twentieth century in the performance of specific energy technologies, energy sectors, and the whole energy systems of nations and the world, as measured in increased technical efficiency, increased reliability, and decreased cost and environmental impact per unit of energy output and

per unit of economic product.[2] Where and when it has been possible to make at least rough comparisons between the investments in and the returns from energy-technology innovation, the rates of return to society from these investments have been seen to be high. In the face of the enormous challenges of global climate change, nuclear terrorism, and ever-increasing oil dependence, there has been no analogous rise in investments as occurred in the late 1970s by either the public or private sector. And the needs of the global energy poor continue to be largely ignored.[3]

February 12, 2007

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[2] Committee on Benefits of DOE R&D on Energy Efficiency and Fossil Energy, "Energy Research at DOE: Was it Worth It? Energy Efficiency and Fossil Energy Research 1978-2000." National Research Council, National Academy Press, 2001.

[3] Gallagher, K.S., Holdren, J.P., and A. Sagar, "Energy-Technology Innovation" in Annual Review of Environment and Resources, 3: 193, 2006.