
REMAPPING DEBATE

Asking "Why" and "Why Not"

GOP study group: slash catalyst research for industry innovation

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January 25, 2011 — Last week's proposal from a group of Republicans in the House of Representatives to slash federal spending by more than \$2 trillion over 10 years includes a proposal to cut back funding for applied research at the Department of Energy (DOE) by \$1.27 billion annually — a move that could strip away federal funds for research on an array of energy-related projects, and potentially make it harder for new technologies to reach the marketplace.

This element of the [Republican Study Committee's plan](#) — which would also freeze the pay of public employees, shrink the size of the federal workforce, and scale back or eliminate entirely some familiar targets of past funding fights, like subsidies for public broadcasting, the National Endowment for the Arts, family planning, and Amtrak — reflects a sharp divide between the economic agendas of Republicans in Congress and the Obama White House that may have important implications for federal policy.

While the GOP plan offers many specific targets for funding reductions, it is not entirely clear which federal programs would be affected by the proposed research cut. According to the American Association for the Advancement of Science (AAAS), total DOE spending on applied research — which falls between basic research, undertaken at the beginning of a scientific inquiry, and product development, which occurs in the late stages of the process — amounts to about \$3.7 billion in the White House's proposed budget for the 2011 fiscal year.

Of that total, \$2.2 billion is dedicated to the National Nuclear Security Administration, which manages the nation's nuclear weapons stockpile, while the other \$1.5 billion is devoted to various energy programs, ranging from fossil fuels to renewable sources of energy to improvements in efficiency and delivery, said Patrick Clemins, director of the R&D budget and policy program at AAAS.

That \$1.5 billion would represent a 40 percent increase over the 2010 budget, part of [President Obama's emphasis on research and technology](#) spending as a path to job creation. But efforts to expand federal funding for applied research on energy projects — which often consist of grants to private companies or research institutions — have sometimes met Republican opposition in the past. Politicians of all stripes generally support government funding for basic research, but conservatives [have long argued](#) that research that may have commercial applications should be done by the private sector, and that government involvement may lead to distortions of the marketplace. (A spokesman for the RSC did not offer a detailed reply to inquiries about the proposal.)

Clemins, though, noted that applied research typically focuses on a potential product or technology that is still five years away from public use, if all goes well. That may be more than some companies can handle. “A five-year time frame for a small business is a pretty long time,” he said.

More broadly, while industry spending on R&D remains robust, it has increasingly shifted toward a “short-term development cycle,” emphasizing projects that have a one- or two-year time frame, he said. And while there is no strict rule about how funding should be distributed between basic and applied research and product development, “there needs to be a balance between the different stages of the research pipeline,” Clemins said.

The debate over how to allocate federal funds played out most recently over the America COMPETES Act, which was initially passed in 2007 to bolster innovation in technology. Among other provisions, the law established a new Advanced Research Projects Agency for Energy within the Department of

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Energy. Explicitly modeled after the Defense Advanced Research Projects Agency (DARPA), a military office whose most famous research contributions are the information processing technologies that gave rise to the Internet, ARPA-E was designed to bridge the gap between basic research discoveries and application, an area where some observers see the U.S. falling behind overseas rivals.

But while the COMPETES Act passed with broad bipartisan support and was signed into law by George W. Bush, ARPA-E did not receive its initial \$400 million funding until the stimulus package of 2009. And when the COMPETES Act came up for reauthorization last year, it was initially stymied before finally clearing the House in December [with scant Republican support](#). (The measure cleared the Senate by unanimous consent, meaning no formal roll call vote was taken.)

In opposing the reauthorization, House Republicans objected to the projected \$86 billion in spending but also argued that the government should focus on basic research. Government support in developing commercial technologies “could lead to inappropriate market innovation,” [worried Rep. Ralph Hall](#), a Texas Republican who is now chairman of the House Science and Technology Committee. (Hall’s office did not respond to an inquiry about what he meant by the phrase “inappropriate market innovation,” or whether he supports the proposed cuts in applied research. A committee spokesman declined comment on the Republican proposal, but said the committee “will be providing close oversight of DOE programs and will work to minimize duplication and unnecessary spending, including in applied research programs.”)

Since receiving its original round of funding, ARPA-E has supported [a range of energy-related research projects](#). Some are focused on renewable energy sources, like bringing solar power to the electric grid, or improving the efficiency and performance of batteries for electric cars, a favorite project of President Obama.

Others, though, are focused on improving existing products through advances in materials. For example, a \$3 million grant is boosting a California company's attempt to devise energy-efficient industrial motors that could allow companies to run their electronic systems at far lower costs.

And a \$1 million grant is supporting a project at the Georgia Institute of Technology that aims to increase the efficiency of chargers for portable consumer electronics like laptops, smart phones, and GPS devices, while also shrinking them to a "negligible" size, said Mark Allen, a professor and project leader. If successful, the project should yield benefits for both consumers and manufacturers of the devices, he said.

The research areas supported by ARPA-E were selected following consultation with outside scientists about where government support could play a role in transitioning technologies from basic research to the marketplace, Allen said.

In that way, ARPA-E and other applied research projects may bolster the economy by directing resources to valuable technologies that the private sector can't, or wouldn't, research on its own. "Not having some of these ideas in the pipeline five years down the road could depress economic growth in that time frame," said Clemins of AAAS.

Still, the debate over government support for applied research is unlikely to end anytime soon. The COMPETES Act, for example, authorized about \$300 million annually for ARPA-E. But actual appropriations levels won't be set until Congress hashes out a budget, and members of the Republican Study Committee have set their sights high — or low, as it were. Last week's proposal, a spokesman for the group said, "is a head start on cutting back spending, not the whole race."

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Patrick Clemins, American Association for the Advancement of Science

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