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Scientific Panel Concludes ARPA-E Is Working. Will It Matter?

As the White House aims to eliminate the moonshot energy research program, a two-year analysis from the National Academies finds it's on track to achieve its aims.

by James Temple June 13, 2017

After two years of analysis, the National Academies has concluded the Department of Energy's moonshot clean-energy research program is on track to accomplish what it was established to do and should remain focused on supporting potentially breakthrough technologies.

The 238-page assessment of the Advanced Research Projects Agency-Energy from the respected scientific institution, released Tuesday, follows years of attacks by Republican lawmakers, and the Trump

administration's recent calls for its elimination (see "Will ARPA-E Survive Trump's Looming Budget Cuts?").

As of last October, ARPA-E had invested more than $1 billion in more than 500 projects, across a variety of areas including carbon capture, biofuels, grid storage, and batteries for electric cars. Among the signs of success highlighted by the congressionally mandated report: 25 percent of the teams raised additional funding, about half published their research in peer-reviewed journals, and around 13 percent of the projects earned patents.

ARPA-E was created under President George W. Bush but first funded through President Barack Obama's 2009 stimulus package. Its multipronged missions include enhancing the United States' economic and energy security, ensuring the nation's technological lead in the space, and "accelerating transformational technological advances" that private industry isn't likely to undertake on its own.

"There are clear indicators that ARPA-E is making progress toward achieving its statutory mission and goals," concluded the authors, a committee of academic and private industry experts at institutions such as MIT, the University of California, Berkeley, Dow Chemical, and Honeywell. "Importantly, especially at this early stage, the committee found no signs that ARPA-E is failing, or on a path to failing."

The report specifically advised against reforms that would pressure the agency to shift its focus to more easily achieved short-term results. A critical strength of ARPA-E is that it supports "high risk, high reward" technologies that aren't on the established product road map that most of the private sector is following, said Louis

Schick, a committee member and cofounder of private equity firm New World Capital, during a public briefing on Tuesday.

The National Academies' report is strictly nonpartisan. But it's sure to provide fodder for lawmakers hoping to protect spending on clean-energy research in the upcoming budget negotiations. The White House's proposals call for shutting down ARPA-E, which received nearly $262 million last year, by 2019 (see "Amid Trump Cuts, California Proposes Its Own Energy Moonshot").

The fair critique of the agency is it hasn't yet produced any breakout commercial success stories, or a technology that's radically transformed the energy landscape. But the report stressed that the agency couldn't be expected to have achieved all its stated missions at this early stage.

"To expect it to have changed the entire economic and energy security for the United States would be a tall order with six years and hundreds of millions of dollars," says Erica Fuchs, a committee member and professor in the Department of Engineering and Public Policy at Carnegie Mellon. "That's not a reasonable thing to expect so quickly."

The assessment included case studies for a handful of successful ARPA-E funded projects, including 1366 Technologies, which is developing novel wafers that could significantly lower the cost of solar electricity; 24M, which is working on lithium-ion batteries for grid applications; and Smart Wires, which is developing technology to control power flow within the electricity grid, enabling greater use of renewable sources.

The report qualified the term "successful" in this context, however, noting that while all of the companies show potential, none have shaken up the energy space so far, "as would be expected given the extended period of time in the market required for transformational technologies to become apparent."

The assessment does provide a series of recommendations for the agency, urging it to develop a system for measuring impact so it can demonstrate its value; ensure that program directors continue to feel empowered to take risks in picking projects; and reevaluate the program's strategy for moving projects to the marketplace. On that point, it notes that ARPA-E's three-year time frame for most projects is too short to "move from concept to market."

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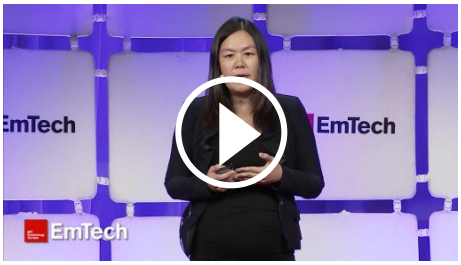

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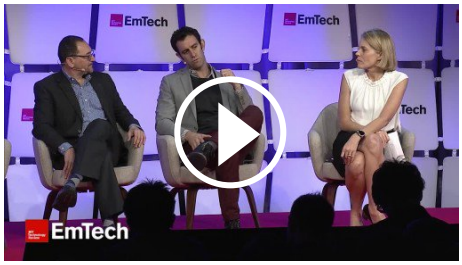

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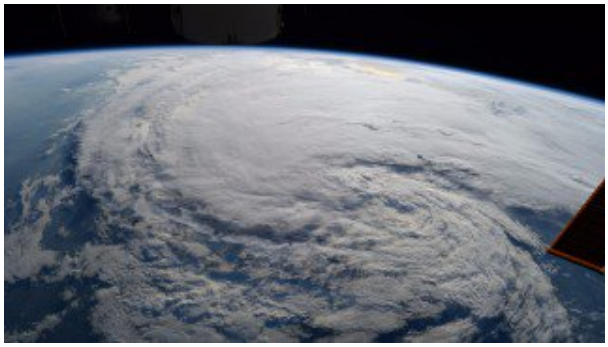

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