

Energy & Clean Technology Alert

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ARPA-E Launches Five New Programs with \$130 Million in Funding

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The U.S. government's incubator for transformational early-stage energy inventions, the [Advanced Research Projects Agency-Energy \(ARPA-E\)](#), launched its fourth round of funding with five new program areas last week. U.S. Secretary of Energy Steven Chu announced last week that up to \$130 million will support five program areas: smart-grid control systems, advanced power electronics for solar panels, breakthrough biofuel technologies, thermal storage applications, and alternatives to rare earth materials.

ARPA-E received \$180 million overall funding for fiscal year (FY) 2011 as a result of the recent budget deal struck by Congress. As the initial FY 2011 budget proposal in H.R. 1, the appropriations bill, allocated only \$50 million to ARPA-E, this funding level was a testament to the program's success in incubating early-stage clean energy technologies given current budget constraints. In his testimony before Congress regarding a \$650 million funding request under the FY 2012 budget, ARPA-E Director Arun Majumdar emphasized the agency's novel approach to project development—identifying research gaps, conducting technology workshops, rigorously assessing candidate technologies, and subjecting proposals to a peer-review process—which culminates in rapid negotiation of contracts and project funding.

ARPA-E will begin reviewing proposals for breakthrough technologies in the following five new program areas (note that each heading links to a PDF of the respective Funding Opportunity Announcement):

1. [Green Electricity Network Integration \(GENI\)](#)

- Program: GENI will fund innovative control software and high-voltage hardware that improves reliability of the electric grid and aids integration of renewable technologies. Specific areas of interest are (1) control architectures that can monitor the electric grid and control power flows in a predictive manner in situations with high percentages of grid-connected intermittent resources (i.e., solar and wind), and (2) resilient power flow control hardware—or the energy equivalent of an Internet router—to enable more electricity through existing transmission lines.
- Program Funding: Approximately \$30 million total funding is available, likely to be allocated across seven to 14 awards varying from \$250,000 to \$10 million.
- Concept Paper Due Date: May 19, 2011.

2. [Solar Agile Delivery of Electrical Power Technology \(Solar ADEPT\)](#)

- Program: Solar ADEPT aims to reduce solar costs by increasing the efficiency of electronic components that convert and regulate electricity produced by solar panels. Through strategic R&D investments in magnetics, semiconductor switches, and charge storage, ARPA-E hopes to substantially reduce power conversion costs and contribute to the Department of Energy's **SunShot Initiative** to reduce the installed cost of solar to \$1/watt (grid parity) by 2020.
- Program Funding: Approximately \$10 million total funding is available, likely to be allocated across two to five awards varying from \$250,000 to \$5 million.
- Concept Paper Due Date: May 19, 2011.

3. Plants Engineered to Replace Oil (PETRO)

- Program: PETRO aims to cut in half the current cost of biofuels by increasing energy density and reducing the processing required from field to pump. Eligible technologies should be directed toward improving the entire photosynthetic and chemical process of converting sunlight to liquid fuel (systems development) or improving a specific aspect of this conversion process (component development).
- Program Funding: Approximately \$30 million total funding is available, likely to be allocated across three to eight awards varying from \$250,000 to \$15 million.
- Concept Paper Due Date: May 19, 2011.

4. High Energy Advanced Thermal Storage (HEATS)

- Program: HEATS focuses on development of cost-effective technologies for storing thermal energy. The primary focus areas of HEATS are (1) development of high temperature storage systems (i.e., over 600°C) for nonintermittent concentrated solar power (CSP) and nuclear power that enable such generation sources to provide peaking power; (2) production of synthetic fuels through sunlight-induced thermochemical reactions; and (3) thermal battery systems that heat and cool electric vehicle cabins, which allow the vehicle's electric battery to be dedicated to powering the drivetrain and increase the driving range of electric vehicles by up to 40%.
- Program Funding: Approximately \$30 million total funding is available, likely to be allocated across 10 to 20 awards varying from \$250,000 to \$10 million.
- Concept Paper Due Date: May 19, 2011.

5. Rare Earth Alternatives in Critical Technologies for Energy (REACT)

- Program: Rare earth materials, minerals with unique magnetic properties, have become increasingly important to advanced energy technologies. As 95% of global production of rare earth minerals currently comes from China, REACT targets early-stage technology alternatives that reduce or eliminate the dependence on rare earths in two key areas: electric vehicle motors and generators for direct-drive wind turbines.
- Program Funding: Approximately \$30 million total funding is available, likely to be allocated across 11 to 16 awards varying from \$250,000 to \$10 million.
- Concept Paper Due Date: May 19, 2011.

These five technology areas announced last Wednesday will join ARPA-E's seven existing programs in power electronics (ADEPT), battery technologies (BEEST), building cooling (BEETIT), nonphotosynthetic biofuels (Electrofuels), grid energy storage (GRIDS), carbon capture (IMPACCT),

and its initial open solicitation.

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