

**COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES**

HEARING CHARTER

“The Advanced Research Projects Agency – Energy (ARPA-E): Assessing the Agency’s Progress and Promise in Transforming the U.S. Energy Innovation System”

Wednesday, January 27, 2010
10:00 a.m.
2318 Rayburn House Office Building

Purpose

The purpose of this hearing is to review progress made on establishing ARPA-E and discuss what differentiates ARPA-E from other DOE programs, hear accounts of experiences with the agency’s first funding opportunities, examine the agency’s plans and goals for the coming year, and discuss ways in which ARPA-E may be improved through reauthorization of the America COMPETES Act, as appropriate.

Witnesses

- **Dr. Arun Majumdar** is the Director of the Advanced Research Projects Agency - Energy (ARPA-E) at the U.S. Department of Energy. He was nominated by President Obama in September 2009 and confirmed by the Senate in October. Dr. Majumdar was formerly Associate Laboratory Director for Energy and Environment at Lawrence Berkeley National Laboratory and a Professor of Mechanical Engineering and Materials Science and Engineering at the University of California at Berkeley.
- **Dr. Charles Vest** is the President of the National Academy of Engineering and former President of the Massachusetts Institute of Technology (MIT). Dr. Vest served on the National Academies “Rising Above the Gathering Storm” panel, which proposed the creation of ARPA-E.
- **Mr. John Denniston** is a Partner at the venture capital firm Kleiner, Perkins, Caufield and Byers (KPCB). He is a leading expert on clean energy technology investment.
- **Dr. Anthony Atti** is the President & CEO of Phononic Devices, Inc, a small firm that originated at the University of Oklahoma. Phononic Devices received funding for development of thermoelectric energy conversion devices.
- **Dr. John Pierce** is the Vice President of Technology at DuPont Applied BioSciences. DuPont, a Fortune 100 company, was chosen to receive funding for development of processes to produce bio-butanol from macroalgae.

Background

The Advanced Research Projects Agency – Energy (ARPA-E) was originally authorized in the America COMPETES Act of 2007 (P.L. 110-69). That Act followed on the direct recommendations of the widely-acknowledged 2005 National Academies report, “Rising Above the Gathering Storm.” The “Gathering Storm” panel was chaired by retired Lockheed Martin Chairman and CEO Norman Augustine, and included, among a number of experts on innovation, the current President of the National Academy of Engineering, Dr. Charles Vest, the current Secretary of Defense, Dr. Robert Gates, and the current Secretary of Energy, Dr. Steven Chu. The panel made a series of recommendations to enhance the nation’s technological competitiveness, including a recommendation calling on the federal government to create a new energy research agency (ARPA-E) within Department of Energy patterned after the successful Defense Advanced Research Projects Agency (DARPA) within the Department of Defense.

According to the Gathering Storm report, ARPA-E should be structured to “sponsor creative, out-of-the-box, transformational, generic energy research in those areas where industry itself cannot or will not undertake such sponsorships, where risks and potential payoffs are high, and where success could provide dramatic benefits for the Nation.... It would be designed as a lean, effective, and agile—but largely independent—organization that can start and stop targeted programs based on performance and ultimate relevance.”

Several other components of the panel’s recommendations were included in the COMPETES Act, including extending special personnel and contracting authorities, hiring of staff for limited terms of approximately three years, and authorizing \$300 million in initial year funding. COMPETES differs from the “Gathering Storm” recommendations primarily by having the Director of ARPA-E report directly to the Secretary of Energy, further reducing bureaucratic inefficiencies and enhancing decision-making powers of the Director. The America COMPETES Act was signed into law in August 2007.

Despite being authorized in 2007 it was not until 2009 that ARPA-E received funding. The American Recovery and Reinvestment Act of 2009 (P.L. 111-5) included allocations of \$400 million for ARPA-E to become fully operational. At the same time, Fiscal Year 2009 Omnibus Appropriations Act appropriated \$15 million for the start-up of ARPA-E.

Passage of the Recovery Act served as the launch point for ARPA-E. However, the stipulations for funding under the Recovery Act provided a unique and challenging situation for the Department in standing up ARPA-E by requiring that agencies obligate all funds by the end of fiscal year 2010. Therefore, within this timeframe of less than two years, the Department would have to establish ARPA-E, overcome logistical challenges such as acquiring office space and hiring core staff and contractors, announce opportunities for project funding, conduct intensive project selection processes, make a large number of awards and complete the contracting process with award recipients, oversee the execution of these projects with high degree of interaction with performers, and terminate funding for projects that did not appear promising. Furthermore, the

Director of ARPA-E required Presidential nomination and Senate confirmation. To date, despite very limited staffing and an unexpectedly high number of applications, ARPA-E has met all specified deadlines and obligations.

Shortly after receiving Recovery Act funding, ARPA-E released its first Funding Opportunity Announcement (FOA) in April 2009, and it received an unprecedented response. The scope of the announcement was broad, limiting applications simply to “transformational” technologies. Furthermore, to reduce the administrative burden on both ARPA-E staff and applicants and to mitigate costs associated with a full application, the FOA called for submission of concept papers of only eight pages or less.

Consequently, ARPA-E received almost 3,700 concept papers. After an intensive selection process utilizing expert volunteers from industry and academia, 334 of those were chosen to submit full applications. Ultimately, 37 projects were chosen to participate, totaling over \$150 million in awards to a diverse range of technologies and performers. A detailed list of awards can be found here:

[http://www.energy.gov/news2009/documents2009/ARPA-E Project Selections.pdf](http://www.energy.gov/news2009/documents2009/ARPA-E_Project_Selections.pdf)

ARPA-E also follows an aggressive schedule for negotiating and signing contracts with performers. For the first round of funding, ARPA-E completed all of the award contracts within three months after the award announcement, and most within two months. By all accounts this is a rapid pace for federal contracting and represents a 60% reduction over the average Department of Energy procurement cycle time.

A second round of solicitations totaling \$100 million was announced in early December. Informed by a series of open workshops the second round focuses on three distinct areas: innovative materials and process for carbon capture, transportation batteries, and liquid fuels from carbon dioxide. The deadline for submission was January 15, 2010. Despite the comparatively narrow scope of this solicitation, ARPA-E received over 600 concept papers. It is expected that awards will be announced in the spring of 2010, totaling 30-40 projects, and a third round of solicitations will be announced in a similar timeframe.

Given the high demand for both the first and second rounds of funding, it became clear that ARPA-E had the financial and human capacity to accommodate only a small percentage of applications. Assuming that many more projects were worthy of funding, and that those that did receive ARPA-E awards would ultimately have to secure private sector funding, the Department announced that it would work with outside organizations to hold an ARPA-E Energy Innovation Summit on March 1-3rd. The summit is expected to highlight projects that both received awards and those that did not receive awards but might be of interest to the investor community. Securing private sector funding for projects, either as cost-share on projects or follow-on investment after project completion, is critical to commercializing successful innovations from ARPA-E. Detailed information on the ARPA-E Energy Innovation Summit can be found here:

<http://www.ct-si.org/events/EnergyInnovation/>

For more information on the hearing please contact Chris King at 225-8844 or Christopher.king@mail.house.gov