



Investigating ARPA-E as a Model for Energy Innovation Funding

Harvard Kennedy School Energy Policy Seminar Series, Fall 2017

Monday, September 18, 2017

By Louisa Lund, Program Director, Consortium for Energy Policy Research

Noting that “climate policy and technology policy go hand in hand to meet our decarbonization goals,” Anna Goldstein, a postdoctoral researcher at Stanford University and the Carnegie Institution for Science and recent postdoctoral fellow with the Belfer Center for Science and International Affairs’ Science, Technology, and Public Policy Program, presented her research findings examining what makes ARPA-E (the federal Advanced Research Projects Agency - Energy) distinctive as a model for energy innovation funding and whether the ARPA-E model is proving effective in promoting the development of innovative technologies.

Goldstein began by explaining that ARPA-E, as an agency for promoting energy research, is distinctive because it plays an “in between” role in the DOE, “bridging the gap” between basic science and applied energy programs. Inspired in part by Harvard professor Venky Narayanamurti’s argument that the division often drawn between “basic” and “applied” research is artificial and counterproductive, Goldstein looked to see whether ARPA-E’s efforts to bridge this gap were successful. Taking publications as evidence of success in basic research and awarded patents as evidence of success in applied research, Goldstein explained, she examined ARPA-E projects from 2010-2015 and contrasted with other DOE-funded projects. ARPA-E projects were indeed significantly more likely to produce both patents and publications, Goldstein said. Compared with the (much larger) DOE Office of Science, which focuses explicitly on “basic” research, ARPA-E projects resulted in essentially the same percentage of publications, while also producing a much higher percentage of patents, a result Goldstein described as “evidence for the complementarity of discovery and invention in energy research.” Perhaps, Goldstein suggested, the Office of Science should be more open to technology-related goals, in order to improve the productive results of its grant-making.



Goldstein continued on to discuss her findings related to another distinctive feature of ARPA-E grants, the significant discretion allowed to project directors in selecting which proposals to fund. External reviews of ARPA-E grant proposals are used, but program directors retain ultimate authority in determining which proposals to fund. This program director discretion creates the conditions in which proposals can be funded even if they receive one or more low ratings (Goldstein termed such programs “promoted” programs). In theory, Goldstein suggested, this may mean that innovative ideas that challenge conventional wisdom have a better shot at receiving funding than they would under a system in which grants were awarded based strictly on the average rating given to them through peer review. The risk, of course, would be that such programs would on average perform less well than proposals that received universally strong ratings.

To assess the impact of program director discretion, Goldstein explained that she compared the performance of “promoted” ARPA-E research programs to projects that scored well in traditional peer review. The comparison, Goldstein said, yielded “a very exciting non-result”—“promoted” research performance was just as good as the performance of projects with uniformly high peer review scores. Though it is too early to know, over time, Goldstein observed, it is possible that these high-risk projects will also prove to be higher reward, yielding more breakthrough innovations.

Goldstein spoke as part of the Kennedy School’s Energy Policy Seminar Series, which is sponsored by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.