Innovative Energy Technology Research & Development and ARPA-E

The Advanced Research Projects Agency–Energy (ARPA-E), which began operations in 2009, is an organization under the U.S. Department of Energy. The agency aims to create innovation in the energy sector through high risk, high impact results. Its operational characteristics include high levels of authority being delegated to its program director, with reviews of interim results and decisions to continue projects made rapidly. Based on the investigations into the trends of ARPA-E, noteworthy features of the program are proposed.

- ARPA-E focuses on supporting the development of budding technologies, even if their cost and performance are inferior at the present time. The agency is based around a philosophy of creating success by retaining technologies that can bring about future, disruptive change (Figure. 1).
- ARPA-E provides three kinds of funding opportunities: call for proposal in non-specific technical area (open), in specific technology area, and for small /medium business. The technical goals of the funding programs are presented after public workshops. Project proposals are evaluated for their scientific and technical merits, as well as for innovativeness.
- The agency has a budget of $350 million (2019). Its programs are categorized by technology fields of generation-transmission-distribution, energy and resource efficiencies, and transportation, but they may span multiple fields.
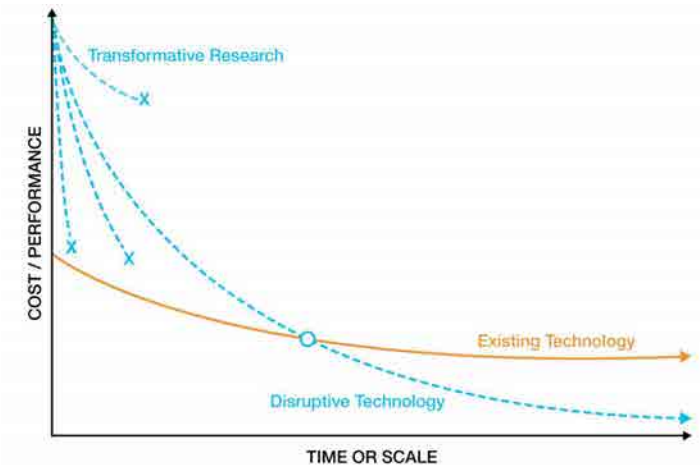

Figure 1: The potential for disruptive creation through selecting a diverse group of technologies [1].

Proposals for Policy Development

The keys to realizing a low carbon society include innovation based on technological seeds that lead to reductions in greenhouse gases, as well as management that expands these efforts and disseminates them to society at large.

1) ARPA-E covers a wide variety of technological seeds and aims for high impact results. The program directors are uniquely provided a great deal of discretion and responsibility when running the programs.
2) The Defense Advanced Research Projects Agency (DARPA), which is comparable to ARPA-E and operates under the Department of Defense, has had a large impact on the civilian sector through technologies such as the internet and GPS. ARPA-E has a lot of project-based failures over the past 10 years and cancels projects that lack prospects. Identifying successful projects requires a long-term perspective.

[1] ARPA-E Website https://arpa-e.energy.gov/.(accessed Dec. 20, 2019).