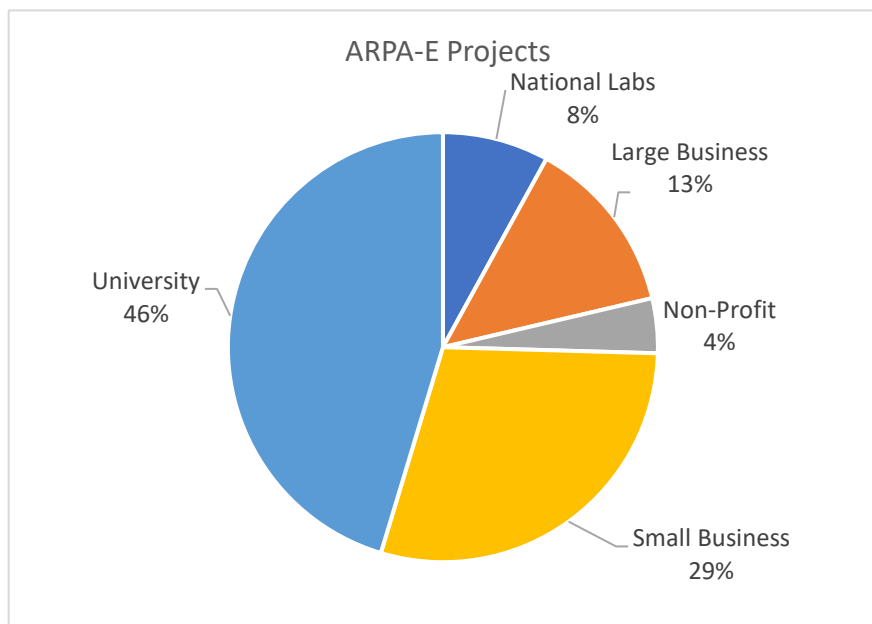


Planned ARPA-E Solicitations

The Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA-E) funds high-risk, high-reward energy technology projects. The goal is to accelerate transformational technological advances in areas where industry by itself is not likely to invest due to technical and financial uncertainty. ARPA-E focuses on early-stage energy technology research and development that can be meaningfully advanced over three years. Since its inception in 2009, ARPA-E has provided \$2.6 billion in funding to over 1,000 projects through focused programs and open funding solicitations. Research universities are well positioned for ARPA-E awards typically receiving 46 percent of projects awards (see graphic below).



The fiscal year (FY) 2022 President's budget request would fund ARPA-E at \$500 million, a \$73 million or 17 percent increase above the FY 2021 enacted level. In FY 2022, ARPA-E plans to release up to 15 new funding opportunity announcements (FOAs). The FOAs will advance new technology areas not represented in the present portfolio. In FY 2020, ARPA-E released 11 FOAs in focused program areas. Focused programs fund activities in specific technology areas that are led by ARPA-E program managers with input from research universities and industry through workshops and Requests for Information. Some of the planned FY 2022 topic areas include:

- **Materials for carbon-neutral or carbon-negative buildings:** The main interest is using buildings as carbon sinks to reduce their embodied emissions, and potentially make future buildings carbon neutral or even carbon negative. This focus area would support novel materials derived from feedstocks including forestry and other purpose-grown raw materials, agricultural residues, as well as direct use of greenhouse gases (e.g., carbon dioxide and methane).
- **Technologies to dramatically reduce high-level nuclear waste:** This focus area would support new technologies such as modular separations and processing systems which could economically, safely, and securely reduce by an order of magnitude the amount of high-level waste in spent nuclear fuel. New technologies would be applied to existing commercial nuclear reactors, emerging advanced reactor concepts, or from other sources.
- **Advanced battery electrodes and conductors for high capacity and rapid charge:** This focus area would support efforts to develop battery systems that can withstand extremely fast charging, have a much higher capacity at lower weight, or utilize abundant, easily-sourced materials – all well beyond the capability of current generation lithium ion, or even emerging solid-state lithium-metal batteries. These types of advances would enable broad adoption of electrified transportation applications, including electric vehicles and electrified aviation.

- **Grid resilience, reliability, and flexibility:** This focus area would support technologies that flexibly utilize grid resources through approaches in topology and power flow optimization, integration of distributed energy resources into transmission-level operations, and microgrids.
- **Advanced fusion approaches and energy applications:** This focus area would support alternative fuel options to Deuterium-Tritium (D-T) thermonuclear reactions that could offer significant system advantages with far lower levels of neutron production and resultant radiological waste, along with novel power conversion approaches.

ARPA-E will also release a **Solicitation on Topics Informing New Program Areas**. ARPA-E typically releases a funding call that covers a broad range of topics in innovative and unconventional ideas for energy technologies. This seed funding allows teams to explore new areas of technology development that, if successful, could then lead to larger focused programs. ARPA-E will also release a solicitation called **SCALEUP**, which was first started in FY 2020. SCALEUP is designed to fund successful technologies that were previously funded by ARPA-E for which the proof-of-concept research and develop challenges have been addressed but require additional support in scaling up. These pre-commercial “scaling” projects are considered critical to meeting performance and cost parameters and attracting future investors and partners to justify substantial commitments of financial resources, personnel, production facilities, and materials to develop promising ARPA-E technologies into early commercial products. The graphic below shows the most recent funding distribution for each type of solicitation.

