## U.S. Department of Energy
## Advanced Research Projects Agency – Energy

# Announcement of Teaming Partner List for Upcoming Funding Opportunity Announcement:

# New Program in Fast Charging Batteries for EVs

The Advanced Research Projects Agency Energy (ARPA-E) is considering issuing a Funding Opportunity Announcement (FOA) to support the development of advanced batteries for electric vehicles (EVs) that can achieve significantly faster charging as well as superior low temperature performance compared to state of the art commercial options. While EVs continue to gain market share, domestically, more work is required to make them accessible to all Americans. ARPA-E has identified three market needs that will require better and more affordable technologies than are available today if the mass market is to be appropriately served in the future.

- 37% of Americans live in residences without garages or carports and therefore do not have access to the convenience of charging at home. Consequently, EV fast charging will be necessary to appeal to this market.
- Many Americans live in colder climates, where EV battery performance becomes unsatisfactory at low temperatures due to reductions in capacity and power. Therefore, EV batteries that are more resilient at low temperatures are critical to motivating broader adoption, especially in colder regions.
- Two thirds of Americans purchase used vehicles rather than new. In the case of EVs, the reduced range for a car resulting from a degraded battery can be a major purchase detractor.

In addition to the above, domestic/global availability of battery materials, safety, and affordability continue to be significant factors that must be considered in a new battery program. To address these challenges, ARPA-E is contemplating several areas for possible investment:

**First**, a high-power battery (cell ≥ 200 Wh/kg) that can be charged in 5 minutes to 80% of its capacity. **Second**, a high energy battery (cell: ≥ 400 Wh/kg) that can be charged in 15 minutes to 80% of its capacity. The next generation of high energy and high-power battery chemistries and components will present considerable safety challenges that require new safety testing protocols. A **third** focus area of this potential program is therefore being considered, specifically to explore this safety testing topic, with the intent to de-risk chemistries with commercial potential (developed under this program) by the early application of competent and intentional failure analysis, Failure Mode Effects Analysis (FMEA), and deployment of new tests.

For the first and second areas of interest, ARPA-E expects that a "total cell" solution (i.e., combination of anode, cathode, and electrolyte in a commercially viable package) will be required to achieve the primary program objectives. In addition, both will require significant reductions in cycle life degradation and performance loss at low temperatures, as well as a focus on low cost and globally abundant materials.

ARPA–E held a virtual workshop entitled "High Energy, Fast Charging Batteries for EV Applications" on October 26 and 28, 2021. Information from this workshop can be found at the event webpage (https://arpa-e.energy.gov/events/high-energy-fast-charging-batteries-for-ev-applications-workshop).

As described in more detail below, the purpose of this announcement is to facilitate the formation of new project teams to respond to a potential FOA for development of advanced cell chemistries and battery designs for EVs. Expertise in the following Technical Areas may be useful in responding to a potential future FOA: advanced battery materials/components research and development, computational modeling, cell and battery design, battery cell manufacturing, battery safety and testing, etc.

As a general matter, ARPA-E strongly encourages outstanding scientists and engineers from different organizations, scientific disciplines, and technology sectors to form new project teams. Interdisciplinary and cross-sector collaboration spanning organizational boundaries enables and accelerates the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible.

The Teaming Partner List is being compiled to facilitate the formation of new project teams. The Teaming Partner List will be available on ARPA-E eXCHANGE (http://arpa-e-foa.energy.gov), ARPA-E's online application portal, in March 2022. Once posted, the Teaming Partner List will be updated periodically, until the close of the Full Application period, to reflect new Teaming Partners who have provided their information.

Any organization that would like to be included on this list should complete all required fields at the following link: https://arpa-e-foa.energy.gov/Applicantprofile.aspx. Required information includes: Organization Name, Contact Name, Contact Address, Contact Email, Contact Phone, Organization Type, Area of Technical Expertise, and Brief Description of Capabilities.

By submitting a response, you consent to the publication of the above-referenced information. **By facilitating this Teaming Partner List, ARPA-E does not endorse or otherwise evaluate the qualifications of the entities that self-identify for placement on the Teaming Partner List.** ARPA-E will not pay for the provision of any information, nor will it compensate any respondents for the development of such information. Responses submitted to other email addresses or by other means will not be considered.

**This Notice does not constitute a FOA. No FOA exists at this time.** Applicants must refer to the final FOA, expected to be issued by April 2022, for instructions on submitting an application and for the terms and conditions of funding.