



U.S. Department of Energy
Advanced Research Projects Agency – Energy
Announcement of Teaming Partner List
for Upcoming Funding Opportunity Announcement:
Network Optimized Distributed Energy Systems (NODES)

The Advanced Research Projects Agency - Energy (ARPA-E) intends to issue a new Funding Opportunity Announcement (FOA) to develop transformational grid operation and control strategies that optimize the usage of flexible Distributed Energy Resources (DERs) to improve the overall efficiency of the U.S. electric grid and enhance penetration of renewable energy resources. Specifically, NODES will develop innovative and disruptive technologies for real-time management of transmission and distribution networks by large-scale active load control and system-wide coordination of DERs. Of particular interest are cost effective control technologies that would more efficiently direct the flow of power on the grid, help stem energy losses, support higher renewables penetration, and enable the grid to be more responsive and resilient, while providing ancillary services to the electric grid at different time scales. The program will build on grid-wide sensing, communication and energy efficient building control advances made over the past decade to enable consumers and grid operators to adapt their operations for optimal efficiency and lower cost.

Currently, ARPA-E anticipates two primary areas of interest in the FOA: (1) Creating new functionality in grid-edge technology that will provide net-load automated frequency response capability needed to overcome frequency stability limitations at higher renewable energy penetration levels; and (2) Developing advanced net-load shaping strategies, which make adjustments to net-load over both short and long time horizons. Also of interest are additional technologies for active control of load and distributed energy resources, and, connecting the features of these additional technologies with the operating performance of the central station fleet to manage the variability of demand and generation on the system.

Previously, ARPA-E held a workshop on this topic. More information on the workshop can be found at <http://arpa-e.energy.gov/?q=arpa-e-events/grid-future-vertical-flat>.

In order to realize the goals of the NODES program, expertise in the following areas may be required:

- **Power systems** including: grid operations planning and optimization, demand-side management, management of distributed generation and storage, renewables integration, and distribution networks.
- **Control systems** including: hierarchical control, networked control, de-centralized control, transactive energy control, direct control of utilities' network-edge resources, and building management systems.
- **Networks and Embedded systems** including: system architectures for critical energy infrastructures, embedded control systems, and real-time control systems.
- **Machine learning and data analytics** including: management and analysis of large-data sets from various grid sensors and sources, load and distributed generation forecast, and model/data-driven identification and prediction of load behavioral patterns.



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, starting in December 2014. 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 in 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 to this Notice, 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 themselves 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 in January 2015, for instructions on submitting an application and for the terms and conditions of funding.