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

Announcement of Teaming Partner List for Upcoming Funding Opportunity Announcement: GENerators for Small Electrical and Thermal Systems (GENSETS)

The Advanced Research Projects Agency Energy (ARPA-E) intends to issue a Funding Opportunity Announcement (FOA) entitled GENerators for Small Electrical and Thermal Systems (GENSETS), to solicit applications for financial assistance to pursue innovative research on natural gas powered kW-scale generators to enable widespread deployment of residential combined heat and power (CHP). As described in more detail below, the purpose of this announcement is to facilitate the formation of new project teams to respond to the upcoming GENSETS FOA. The FOA will provide specific program goals, technical metrics, and selection criteria and the FOA terms are controlling. For purposes of the Teaming Partner List, the following summarizes current planning for the FOA:

The focus of the GENSETS program is to develop high-efficiency, low-cost, long-life, low-emissions, natural gas powered engines for residential hot water, space heating, and air-conditioning needs. This research space falls outside the current state-of-the-art CHP technologies and represents a high risk, high reward opportunity to identify new pathways to high-efficiency engines/generators. Widespread deployment of residential CHP will offer huge energy savings and greenhouse gas (GHG) emissions reduction.

Currently, ARPA-E anticipates that the FOA will target research in: (1) *Engine efficiency enhancement* – cost-effective systems such as internal combustion engines and Stirling engines with reduced heat transfer, friction, and parasitic losses and increased recuperation to yield high fuel to electricity conversion efficiency while delivering low-emissions at 1 kW electrical power capacity; (2) *Combined topping and bottoming cycles* – cost-effective systems with high bottoming cycle efficiency for harvesting the rejected (exhaust) heat from a topping cycle to generate additional electrical power; and (3) *New and efficient thermodynamic cycles and engine concepts.* There may be areas of overlap between the research areas and such a system is also within the scope of this planned FOA. The teams are expected to gather sufficient expertise to design and assemble an innovative 1 kW electrical engine at the end of the second year of the proposed three-year program.

ARPA-E anticipates that expertise in several technical areas may be useful in responding to this FOA, including but not limited to: heat engines, thermodynamic cycles, internal combustion engines, external combustion engines (such as Stirling engines and steam engines), combustion micro-turbines, micro-Rankine cycles, thermophotovoltaics, solid-state devices (such as thermionic emitters, thermoelectric generators, pyroelectrics, and ion expansion devices), and other novel engines/cycles (such as rotary engines, free piston engines, detonation engines, thermoacoustic engines).

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 October 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 October 2014, for instructions on submitting an application and for the terms and conditions of funding.