



**U.S. Department of Energy
Advanced Research Projects Agency – Energy
Announcement of Teaming Partner List
for Upcoming Funding Opportunity Announcement:
Methane Observation Networks with Innovative Technology
to Obtain Reductions (MONITOR)**

The Advanced Research Projects Agency Energy (ARPA-E) intends to issue a Funding Opportunity Announcement (FOA) entitled Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR) to solicit applications for financial assistance to fund the development of disruptive new approaches to methane sensing in order to reduce associated costs to the point that widespread implementation is feasible. 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 MONITOR FOA. The FOA will provide specific program goals, technical metrics, and selection criteria. The FOA terms will be controlling. For purposes of the Teaming Partner List, the following summarizes current planning for the FOA:

The MONITOR program's focus will be on "oil and gas systems," from the wellhead to the end user. Cost-effective measurement of methane will facilitate detection and early mitigation from leaks and process upsets, thus reducing the overall emissions of methane from the production of natural gas.

Currently, ARPA-E anticipates that the FOA will target research of: (1) *complete systems*, which combine methane measurement with data analytics in order to estimate methane emission rates and location of leaks; the systems should also include provisions for data quality control and digital communication; and (2) *partial solutions* which may demonstrate promising new approaches to sensing, but which are too early in their development to warrant incorporation into a complete system.

The complexity of the task requires discussion of a measurement "system." For example, a potential measurement system could consist of some combination of, **but is not limited to**:

1. Single high-sensitivity (but likely higher cost) fixed sensor;
2. Network consisting of a number of lower cost and lower sensitivity fixed sensors;
3. Systems incorporating imaging technology;
4. Sensor(s) mounted on vehicles that drive prescribed or random routes and uses both concentration and wind data to estimate the location of leaks;
5. Sensors mounted in conventional or unmanned aircraft;
6. Satellite imaging ;
7. Biological solutions in which plants might "signal" (change of color, release of chemicals) the presence of methane.



In general, each of these would require not only the physical sensing component (laser spectrometer, catalytic sensor, imaging sensor, biological sensor), but also wind data (speed, direction) and potentially other weather data (temperature, precipitation). In turn, the concentration wind/weather data would be used in conjunction with a dispersion model to estimate the location and magnitude of a leak.

Expertise in the following Technical Areas may be useful in responding to the FOA: reduced-cost approaches to optical spectroscopy (e.g. reduced cost lasers, reduced cost detectors, novel configurations, etc.), imaging (e.g. reduced cost, increased resolution, improved performance, enhanced speed, non-cryogenic, etc.), mobile sensing (e.g. from ground vehicles or conventional / unmanned aircraft), advanced data analytics (e.g. dispersion modeling, microclimatic modeling, GIS integration, reinforcement learning, etc.), data quality assurance, and systems integration. System-level considerations such as communications, reliability, and robustness in extreme environments may also be useful in responding to this FOA.

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 April 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 April or May 2014, for instructions on submitting an application and for the terms and conditions of funding.