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

Announcement of Teaming Partner List for Upcoming Notice of Funding Opportunity: Harnessing Autonomy for Energy Challenges Offshore (HAECHO)

The Advanced Research Projects Agency – Energy (ARPA-E) is considering issuing a Notice of Funding Opportunity (NOFO) to support research and development of technologies that would enable a scaled, offshore seaweed industry, creating a gigaton-scale supply of sustainable hydrocarbons without significant disruption of existing industries and no additional requirements for land, fresh water, or artificial fertilizer. Specifically, this NOFO would fund the development of new sensor, ocean engineering, and market-enabling technologies.

The purpose of this Teaming Partner List announcement is to facilitate the formation of new project teams to respond to the potential NOFO. Any NOFO issued in the future would provide specific program goals, technical metrics, and selection criteria. If there are any inconsistencies between this announcement and the potential NOFO, the NOFO language would be controlling.

The anticipated goals of the program are:

- To reduce the cost of seaweed biomass cultivation by a factor of four when scaled, from the low thousands today to $120-275 per Dry Metric Ton (DMT, 10% moisture) depending on the cultivated species;
- To develop new, energy-centric, million-ton-scale markets in the United States; and
- To increase the scale of the U.S.-based seaweed cultivation industry by three orders of magnitude, from one thousand to one million tons per year wet harvest through these new markets.

The NOFO would focus on technology development in three categories to achieve these objectives:

1. **Pioneering Smart Aqua Farms:** New sensors and models to enable a complete, real-time, remote, and persistent understanding of farm state offshore. Parameters of interest include in-situ quantification of biomass growth rates and absolute quantities, nitrate and sugar content/type, biofouling and herbivory impacts, and structural loading. Such sensing capabilities will inform both dynamically updated structural and biological models that will curtail manual inspection, enable autonomy, enhance yield, enhance worker safety, and protect operational assets.

2. **Creating Offshore Scale:**
    a. Depth cycling: Hardware and control systems to enable the crop to periodically access optimal environments below nutriclines and thermoclines; and
    b. Dewatering: Methods of seaweed dewatering at sea to improve the economics of biomass transport and extend shelf life.

3. **Enabling Megaton Markets:**
    a. Biostimulant characterization: The discovery of biostimulant formulations and mechanisms, and investigation of their applicability to bioenergy row crops as a direct product line; and
    b. Other new and innovative approaches that harness the potential of a scaled seaweed production process to address U.S. energy needs.

Expertise in the following areas may be useful in responding to the potential NOFO:

- Deep water engineering, modeling, energy harvesting
- Automation and offshore robotic systems
- Seaweed cultivation, optimization, and processing
- Analytical biochemistry
- Biological/biochemical sensing
- Optical, electromagnetic, and acoustic sensing of biological phenomena
- Agricultural biochemistry
- Plant and microbial biology
- Uncrewed ocean surface vehicles and platforms
- Thermal and non-thermal water removal
- Technoeconomic and life-cycle analysis

ARPA-E strongly encourages outstanding scientists and engineers from different organizations, scientific disciplines, and technology sectors to submit their information 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. Furthermore, teaming arrangements with researchers from the Republic of Korea may be strongly encouraged under this program.

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 2024. 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 form: 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 your information to this Teaming Partner List, 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 email addresses or by other means will not be considered. **Participation in and utilization of this list is completely voluntary.**

ARPA-E will not identify or facilitate connections through the Teaming Partner List and participation in the list has no bearing whatsoever on the evaluation of applications submitted to the potential funding opportunity.

This list does not constitute a NOFO. A NOFO does not exist at this time. Applicants must refer to the NOFO, expected to be issued by December 2024, for instructions on applying and for details on how projects will be funded.