**U.S. Department of Energy**
**Advanced Research Projects Agency-Energy**

# Announcement of Teaming Partner List for Upcoming Funding Opportunity Announcement: *Recovery of High Energy-Value Materials from Wastewater*

The Advanced Research Projects Agency-Energy (ARPA-E) is considering issuing a Notice of Funding Opportunity (NOFO) to support the development of new technologies to recover high energy-value materials from wastewater to reduce reliance on foreign imports, domestic energy demands, and greenhouse gas emissions associated with conventional sourcing and waste stream treatment. The purpose of this announcement is to facilitate the formation of new project teams to respond to a potential future 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 goal of the program is to develop technology to recover multiple critical minerals and/or ammonia-based products from domestic wastewater sources. Critical minerals of highest interest are those designated by the Department of Energy as the 12 most energy and supply-chain relevant metals, including lithium, cobalt, and rare-earth elements.[1] Ammonia-based products include fertilizers, other high-value nitrogen products, and hydrogen from ammonia oxidation. Wastewater is broadly defined and may include (but is not limited to) municipal, livestock, industrial, and mining waste streams. Capable technologies for recovery of high energy-value ammonia and critical minerals will be energy efficient, highly selective, and durable over extended use. Preferable processes will be continuous, involve few sequential steps, easily adaptable to existing or new wastewater facilities, and scalable (e.g., modular).

Several technical categories are foreseen to achieve this objective, including:

1) New functional-materials development to address the difficulty of separating and concentrating target ions of similar size, charge, redox potential, and solubility within the complex and harsh conditions of a target wastewater matrix;
2) Process derisking to enable continuous or repeated cycles of efficient recovery of a market-valuable product in minimal steps (again within the complex and harsh conditions of a target wastewater matrix); and
3) Process integration to ensure technologies are capable of energy-efficient and continuous recovery of market-valuable product in a real wastewater matrix, and that the process is scalable to anticipated wastewater flow rates.

For all categories, the final recovered products will need to include at least two targeted high energy-value materials, have greater than 90% recovery efficiency, and be commercially viable in the U.S. market.

[1] U.S. Department of Energy, Critical Materials Assessment Report, July 2023. energy.gov/sites/default/files/2023-07/doe-critical-material-assessment_07312023.pdf

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

- Organic synthesis, chelation, and/or redox chemistries
- Water/wastewater chemistry
- Synthetic/molecular biology
- Biologically-inspired separations
- Electrochemical separations
- Ion exchange separations
- Membrane separations
- Process engineering
- Wastewater treatment, operation, and/or management
- Techno-economic assessment

ARPA-E held a workshop on this topic in August 2024. Information on this workshop can be found at https://arpa-e.energy.gov/events/ammonia-critical-minerals-recovery-workshop.

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.

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 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 form at the following link: https://arpa-e-foa.energy.gov/Applicantprofile.aspx. Required information includes the following: 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 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 list is completely voluntarily to participate in and utilize.** 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 NOFO.

**This Notice does not constitute a NOFO. No NOFO exists at this time.** Applicants must refer to the NOFO, expected to be issued by November 2024, for instructions on submitting an application and for details on how projects will be funded.