

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**ADVANCED RESEARCH PROJECTS AGENCY – ENERGY (ARPA-E)
U.S. DEPARTMENT OF ENERGY**

***SEEDING CRITICAL ADVANCES FOR LEADING ENERGY TECHNOLOGIES
WITH UNTAPPED POTENTIAL 2023 (SCALEUP 2023)***

**Announcement Type: Initial Announcement
Funding Opportunity No. DE-FOA-0003100
CFDA Number 81.135**

Funding Opportunity Announcement (FOA) Issue Date:	June 8, 2023
First Deadline for Questions to ARPA-E-CO@hq.doe.gov:	5 PM ET, July 11, 2023
Submission Deadline for Concept Paper:	9:30 AM ET, July 21, 2023
Second Deadline for Questions to ARPA-E-CO@hq.doe.gov:	5 PM ET, October 3, 2023
Submission Deadline for Full Application:	9:30 AM ET, October 13, 2023
Submission Deadline for Replies to Reviewer Comments:	5 PM ET, November 14, 2023
Expected Date for Finalist Notifications:	December 2023
Completion of Oral Presentation:	January 2024
Expected Date for Final Award Selection Notifications:	February 2024
Total Amount to Be Awarded:	Approximately \$100 million, subject to the availability of appropriate funds.
Anticipated Awards:	ARPA-E may issue one, multiple, or no awards under this FOA. The Federal share of awards may vary between \$5 million and \$20 million.

- For eligibility criteria, see Section III.A of the FOA.
- For cost share requirements under this FOA, see Section III.C of the FOA.
- To apply to this FOA, Applicants must register with and submit application materials through ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/Registration.aspx>). For detailed guidance on using ARPA-E eXCHANGE, see Section IV.H.1 of the FOA.
- Applicants are responsible for meeting each submission deadline. Applicants are strongly encouraged to submit their applications at least 48 hours in advance of the submission deadline.
- For detailed guidance on compliance and responsiveness criteria, see Sections III.D.1 through III.D.3 of the FOA.

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REQUIRED DOCUMENTS CHECKLIST

For an overview of the application process, see Section IV.A of the FOA.

For guidance regarding requisite application forms, see Sections IV.B and VII.G of the FOA.

For guidance regarding the content and form of the Concept Paper, Full Application, Replies to Reviewer Comments, and Oral Presentation see Sections IV.C, IV.D, IV.E, and IV.A.5 of the FOA.

SUBMISSION	COMPONENTS	OPTIONAL/ MANDATORY	FOA SECTION	DEADLINE
Concept Paper	<ul style="list-style-type: none"> • Each Applicant must submit a Concept Paper in Adobe PDF format by the stated deadline. Sections 1-4 of the Concept Paper must not exceed 4 pages in length and must include only the following: <ol style="list-style-type: none"> 1. Project Summary and Objectives 2. Commercial Viability, Strategy, and Impact 3. Project Feasibility and Technical Merit 4. Project Team Qualifications, Experience and Capabilities 5. References (no page limit) 	Mandatory	IV.C	9:30 AM ET, July 21, 2023
Full Application	<ul style="list-style-type: none"> • Each Applicant must submit a Technical Volume in Adobe PDF format by the stated deadline. The Technical Volume must include only the following: <ul style="list-style-type: none"> ○ Executive Summary (1 page max.) ○ Sections 1-8 (20 pages max.) <ol style="list-style-type: none"> 1. Project Summary and Objectives 2. Technology Status 3. Intellectual Property (IP) Position and Strategy 4. Commercialization Plan 5. Project Plan 6. Team Organization and Capabilities 7. Anticipated Impacts 8. Budget ○ References and Business Documents (no page limit) ○ Personal Qualification Summaries (each PQS limited to 3 pages in length, no cumulative page limit) • The Technical Volume must be accompanied by: <ul style="list-style-type: none"> ○ Letter(s) of Intent (no page limit, Adobe PDF format); ○ SF-424 (no page limit, Adobe PDF format); ○ Budget Justification Workbook/SF424A (no page limit, Microsoft Excel format); ○ Team Pitch Video (6 minute maximum length, describing the opportunity, team and technology; MP4 format, submitted via kiteworks™); ○ Project Plan Workbook (Excel format) – Applicants may use the Project Plan Workbook template available on ARPA-E eXCHANGE (https://arpa-e-foa.energy.gov); 	Mandatory	IV.D	9:30 AM ET, October 13, 2023

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

	<ul style="list-style-type: none"> ○ Summary for Public Release (250 words max., Adobe PDF format); ○ Summary Slide (1 page limit, Microsoft PowerPoint format)); ○ Completed and signed Business Assurances & Disclosures Form (no page limit, Adobe PDF format) 			
Reply to Reviewer Comments	<ul style="list-style-type: none"> • Each Applicant may submit a Reply to Reviewer Comments in Adobe PDF format. This submission is optional. The Reply may include only the following: <ul style="list-style-type: none"> ○ Up to 2 pages of text; and ○ Up to 1 page of images. 	Optional	IV.E	5 PM ET, November 14, 2023
Oral Presentation	<ul style="list-style-type: none"> • Selected Finalists (and selected commercialization partners) will be invited to meet with ARPA-E representatives to present the contents of their Full Application and respond to questions posed by ARPA-E. 	Mandatory	IV.A.5	January 2024

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I. FUNDING OPPORTUNITY DESCRIPTION

A. AGENCY OVERVIEW

The Advanced Research Projects Agency – Energy (ARPA-E), an organization within the Department of Energy (DOE), was chartered by Congress in the America COMPETES Act of 2007 (P.L. 110-69), as amended and codified at 42 U.S.C. § 16538. ARPA-E issues this Funding Opportunity Announcement (FOA) to achieve ARPA-E statutory goals at 42 U.S.C. §16538(c)(1):

- “(A) to enhance the economic and energy security of the United States through the development of energy technologies that—
- (i) reduce imports of energy from foreign sources;
 - (ii) reduce energy-related emissions, including greenhouse gases;
 - (iii) improve the energy efficiency of all economic sectors;
 - (iv) provide transformative solutions to improve the management, clean-up, and disposal of radioactive waste and spent nuclear fuel; and
 - (v) improve the resilience, reliability, and security of infrastructure to produce, deliver, and store energy; and
- (B) to ensure that the United States maintains a technological lead in developing and deploying advanced energy technologies.”

The FOA and any cooperative agreements or grants awarded under this FOA are subject to 2 C.F.R. Part 200 as supplemented by 2 C.F.R. Part 910.

ARPA-E funds research on, and the development of, transformative science and technology solutions to address the energy and environmental missions of the Department. The agency focuses on technologies that can be meaningfully advanced with a modest investment over a defined period of time in order to catalyze the translation from scientific discovery to early-stage technology. For the latest news and information about ARPA-E, its programs and the research projects currently supported, see: <http://arpa-e.energy.gov/>.

ARPA-E funds transformational research. Existing energy technologies generally progress on established “learning curves” where refinements to a technology and the economies of scale that accrue as manufacturing and distribution develop drive improvements to the cost/performance metric in a gradual fashion. This continual improvement of a technology is important to its increased commercial deployment and is appropriately the focus of the private sector or the applied technology offices within DOE. In contrast, ARPA-E supports transformative research that has the potential to create fundamentally new learning curves. ARPA-E technology projects typically start with cost/performance estimates well above the level of an incumbent technology. Given the high risk inherent in these projects, many will fail to progress, but some may succeed in generating a new learning curve with a projected cost/performance metric that is significantly better than that of the incumbent technology.

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ARPA-E funds technology with the potential to be disruptive in the marketplace. The mere creation of a new learning curve does not ensure market penetration. Rather, the ultimate value of a technology is determined by the marketplace, and impactful technologies ultimately become disruptive – that is, they are widely adopted and displace existing technologies from the marketplace or create entirely new markets. ARPA-E understands that definitive proof of market disruption takes time, particularly for energy technologies. Therefore, ARPA-E funds the development of technologies that, if technically successful, have clear disruptive potential, e.g., by demonstrating capability for manufacturing at competitive cost and deployment at scale.

ARPA-E funds applied research and development. The Office of Management and Budget defines “applied research” as an “original investigation undertaken in order to acquire new knowledge...directed primarily towards a specific practical aim or objective” and defines “experimental development” as “creative and systematic work, drawing on knowledge gained from research and practical experience, which is directed at producing new products or processes or improving existing products or processes.”¹ Applicants interested in receiving financial assistance for basic research (defined by the Office of Management and Budget as “experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts”)² should contact the DOE’s Office of Science (<http://science.energy.gov/>). Office of Science national scientific user facilities (<http://science.energy.gov/user-facilities/>) are open to all researchers, including ARPA-E Applicants and awardees. These facilities provide advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, as well as facilities for studying the nanoworld, the environment, and the atmosphere. Projects focused on early-stage R&D for the improvement of technology along defined roadmaps may be more appropriate for support through the DOE applied energy offices including: the Office of Energy Efficiency and Renewable Energy (<http://www.eere.energy.gov/>), the Office of Fossil Energy and Carbon Management (<https://www.energy.gov/fecm/office-fossil-energy-and-carbon-management>), the Office of Nuclear Energy (<http://www.energy.gov/ne/office-nuclear-energy>), and the Office of Electricity (<https://www.energy.gov/oe/office-electricity>).

B. PROGRAM OVERVIEW

The Seeding Critical Advances for Leading Energy technologies with Untapped Potential 2023 (SCALEUP 2023) Funding Opportunity Announcement provides a vital mechanism for the support of innovative energy R&D that complements ARPA-E’s primary R&D focus on early-stage transformational energy technologies that still require proof-of-concept.

¹ OMB Circular A-11 (https://www.whitehouse.gov/wp-content/uploads/2018/06/a11_web_toc.pdf), Section 84, pg. 3.

² OMB Circular A-11 (https://www.whitehouse.gov/wp-content/uploads/2018/06/a11_web_toc.pdf), Section 84, pg. 3.

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An enduring challenge to ARPA-E’s mission is that even technologies that achieve substantial technical advancement under ARPA-E support face significant remaining technical and commercial risks upon completion of an award's funding period, and thus are at risk of being stranded in their development path once ARPA-E funding ends. Experience across ARPA-E’s diverse energy portfolios, and input from a wide range of investors and industry stakeholders, indicates that pre-commercial “scaling” projects are critical to establishing that performance and cost parameters can be met in practice for these potentially transformative technologies. These pre-commercial scaling projects aim to translate the performance achieved at bench scale to commercially scalable versions of the technology, integrate the technology with broader systems, provide extended performance data, and validate the manufacturability and reliability of new energy technologies. Success in these scaling projects should enable industry, investors, and partners to justify the substantial commitments of financial resources, personnel, manufacturing facilities, and materials necessary to subsequently deploy the technologies at commercial scale.

The SCALEUP 2023 FOA seeks to scale the most promising technologies previously funded by ARPA-E. The stranding of promising ARPA-E-funded technologies in their development pathways leaves substantial intellectual property developed with American taxpayer dollars vulnerable to adoption by foreign competitors, who can and do capture it for continued development – and economic benefit – overseas. This harms national competitiveness, as U.S. industries often lose the lead on the development, scaling, and manufacturing of technologies necessary to compete in rapidly evolving global energy markets. Thus, projects selected for SCALEUP 2023 will meet ARPA-E’s statutory direction to achieve the above goals by “accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty”.³

C. PROGRAM OBJECTIVES

The objective of the ARPA-E SCALEUP 2023 FOA is to support the scaling of high-risk and potentially disruptive new technologies across the full spectrum of energy applications. This FOA focuses only on scale-up and pre-pilot projects of promising technologies that ARPA-E has previously funded – following highly competitive selection processes – and for which the scale-up award would substantially build upon innovations achieved under the original ARPA-E award. Eligible projects will be based upon inventions that were conceived or first actually reduced to practice in the performance of work under the original ARPA-E award (“subject inventions”) with the intent to advance the innovative results to practical application. Only organizations leveraging subject inventions that were created during an ARPA-E award and reported in the iEdison system (with the exception of some software products, see Section III.B.) are eligible for funding under this program. SCALEUP 2023 Applicants are not required to have participated within the original ARPA-E award; Applicants may have licensed or purchased

³ 42 U.S.C. §16538(c)(2)(a-c)

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the relevant intellectual property rights to such subject inventions, and thereby become eligible under the SCALEUP 2023 FOA.

Because of the breadth of energy technologies solicited under the SCALEUP 2023 FOA, specific technical and project targets are not specified. Therefore, ARPA-E asks each Applicant to address how its proposed SCALEUP project will sufficiently advance the technology to enable a viable path to market and ultimately lead to successful commercialization and the anticipated impact. The anticipated impacts must meet one or more of the agency's statutory goals cited above and including substantial U.S. manufacturing of resulting technologies. ARPA-E funding under the SCALEUP program focuses on projects for which the proof-of-concept R&D challenges were largely addressed in a successful original ARPA-E award, and for which the logical next step is a path to real-world impact. For the SCALEUP 2023 FOA, Applicants must illustrate the path to market, making the strongest case for how its proposed technology will scale and ultimately thrive in the open market. This includes building a Project Team with the skillset and capabilities necessary for scaling high-risk energy technologies during and beyond the completion of the SCALEUP 2023 project. Applicants should communicate the anticipated development path for bringing the technology to scale and achieving market adoption, emphasizing where the proposed SCALEUP 2023 project fits in that path and how successful completion will unlock the additional resources necessary to take the next step.

The ARPA-E SCALEUP 2023 FOA award selection process consists of three phases: 1) Concept Paper submissions, resulting in an encourage or discourage notification to Applicants; 2) Full Application submissions, resulting in selection of Finalists; 3) Finalists who will be invited to provide Oral Presentations, leading to award selections.

The ARPA-E SCALEUP 2023 FOA seeks Applicants with an existing early-stage developmental prototype that validates functionality in a controlled environment. Finalists selected for the SCALEUP 2023 Award will illustrate a path to market and be well positioned for investment from the private sector (e.g., financial or strategic venture capital, philanthropic awards, corporate development funding, etc.). To support this expectation, Finalists will not be required to provide a cost share payment for the initial portion of the award (approximately the first year of the award).

D. TECHNICAL CATEGORIES OF INTEREST

Applicants will address one or more of ARPA-E's statutory goals, without causing detriment to them, through the type of high-risk, transformational research described in Section I.A of the FOA. Concepts may span multiple disciplinary boundaries. In order to organize the submissions to this FOA for the purposes of merit review, ARPA-E requires that each Concept Paper and Full Application identify a Technical Subcategory or Subcategories for the proposed technology from the list provided below. Applicants may select a single Technical Subcategory or multiple Technical Subcategories for their proposed technology, as appropriate. The Applicant may

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select multiple Technical Subcategories from the same Technical Category or different Technical Categories.

The list of Technical Subcategories is intended to encompass the majority of energy-related technologies. If the proposed technology does not fall within any of the Technical Subcategories below, the Applicant should select from Category 7, “Other Energy Technologies,” Subcategory L, “Other Energy Technologies Not Listed Above.”

CATEGORY	SUBCATEGORY	DESCRIPTION	
CATEGORY 1: GRID	Subcategory A: Grid Transmission	Technologies for the electricity transmission system (>69 kV) planning and operations, including both AC and DC systems.	
	Subcategory B: Grid Distribution	Technologies for the electricity distribution system (≤69 kV) planning and operations including both AC and DC systems.	
	Subcategory C: Modeling, Software, Algorithms, And Control For The Grid	Modeling, algorithms, or control methodologies that improve grid planning, operations, or markets.	
	Subcategory D: Batteries – Grid Scale	Grid scale battery technologies.	
	Subcategory E: Grid Scale (Non-Battery) Storage	Non-battery technologies for grid-scale storage such as: pumped-hydro, compressed air, high angular velocity flywheels, etc.	
	Subcategory F: Grid Reliability	Technologies that maintain the efficient function of the grid during unusual events, particularly in the context of increasing renewable energy sources and/or distributed generation.	
	Subcategory G: Grid – Other	Grid technologies that do not fit into one of the above categories.	
	CATEGORY 2: TRANSPORTATION	Subcategory A: Alternative Fuels (Non-Bio)	Technologies that create fuels that are substitutes for gasoline/diesel, but are not bio based.
		Subcategory B: Engines – Transportation	Improved engines/turbines for generation applications using liquid and/or gaseous fuels, for example increasing engine efficiency or reducing emitted GHGs.
		Subcategory C: Electric Motors – Transportation	Technologies for improved electric motors specifically for transportation applications.
Subcategory D: Fuel Cells - Transportation		Technologies for improved fuel cells specifically for transportation applications.	
Subcategory E:			

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CATEGORY	SUBCATEGORY	DESCRIPTION	
	Advanced Vehicle Designs and Materials	Advanced or alternative vehicle designs and/or key enabling technologies. Examples could include ultralightweight vehicles, advanced components, new vehicle designs and architectures, etc.	
	Subcategory F: Transportation Management	Technologies for traffic management, transportation behavior, self-driving cars and other advanced transportation management scenarios.	
	Subcategory G: Power Electronics – Transportation	Technologies that include advances in semiconductor materials, substrates, circuit topologies, magnetic materials, inductors, dielectric materials, capacitors, transistors, device packaging, etc. or optimizations of electronic systems applied specifically to transportation applications.	
	Subcategory H: Non-Automotive Ground/Sea Transportation	Technologies for advanced human powered vehicles, marine vessels, trains, etc.	
	Subcategory I: Air Transportation	Technologies for advanced airplanes	
	Subcategory J: Batteries – Transportation	Technologies for improved batteries for a wide range of vehicle applications, including hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (EVs).	
	Subcategory K: Non-Battery Storage For Transportation	Technologies that apply thermal storage, and non-battery electric storage, such as supercapacitors and others specifically for transportation application.	
	Subcategory L: Transportation – Other	Transportation energy technologies that do not fit one of the above categories,	
	CATEGORY 3: BUILDING EFFICIENCY	Subcategory A: Combined Heat and Power	Technologies for new Combined Heat and Power (CHP) designs/scenarios.
		Subcategory B: Building Heating and Cooling	Technologies that improve the efficiency of building heating and cooling systems.
		Subcategory C: Building Energy Demand Management	Demand response and/or management technologies such as smart meters, other building energy conservation technologies such as automatic control systems.
		Subcategory D:	

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CATEGORY	SUBCATEGORY	DESCRIPTION
	Lighting	Energy efficient and environmentally-friendly advanced lighting technologies.
	Subcategory E: Building Envelope	Building designs leading to better energy efficiency; technologies that could be applied to windows, insulation, roofing, etc.
	Subcategory F: Building Efficiency – Other	Building energy efficiency technologies that do not fit into one of the categories above.
CATEGORY 4: POWER GENERATION AND ENERGY PRODUCTION: LIQUID AND GASEOUS FUELS/NUCLEAR	Subcategory A: Combined Processes – Generation with Liquid and/or Gaseous Fuels	Improved generation designs which use a combination of technologies (for example- fuel cells and turbines) with liquid and/or gaseous fuels.
	Subcategory B: Stationary Engines/Turbines For Generation with Liquid and/or Gaseous Fuels	Improved engines/turbines for generation applications using liquid and/or gaseous fuels.
	Subcategory C: Stationary Fuel Cells For Generation with Liquid and/or Gaseous Fuels	Improved fuel cells intended to be coupled with generation sources using liquid and/or gaseous fuels.
	Subcategory D: Nuclear Fission Power Generation and Materials	Technologies that enhance fission, or materials specifically for safe nuclear fission power generation.
	Subcategory E Nuclear Fusion Power Generation and Materials	Technologies that enhance fusion, or materials specifically for safe nuclear fusion power generation.
	Subcategory F: Carbon Capture	Technologies for carbon capture, use, and storage, excluding biological/agricultural carbon management.
	Subcategory G: Exploration And Extraction (Non-Geothermal) Of Conventional and Unconventional Liquid and/or Gaseous Resources	Technologies/tools for resource identification, classification, and modeling, as well as technologies to extract conventional and unconventional liquid and/or gaseous resources. This subcategory can include sensors and imaging technologies, predictive models and algorithms, drills, pumps, etc.
	Subcategory H: Planning And Operations For Generation with Liquid and/or Gaseous Fuels	Technologies that improve the planning and operation of power generation with liquid and/or gaseous fuels.
	Subcategory I:	

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CATEGORY	SUBCATEGORY	DESCRIPTION	
	Infrastructure for Combustible Gas	Technologies for storage, transportation, handling, and/or monitoring of combustible gases. This could include tanks, pipelines, pumps, sensors, etc.	
	Subcategory J: Chemical and Biological Conversions From Liquid and/or Gaseous Fuels	Technologies that improve chemical or biological conversions of liquid and/or gaseous resources to more desired forms, and other forms of energy transduction, including downstream production of commodity chemicals.	
	Subcategory K: Water Conservation In Power Generation	Technologies that will enable significant water savings in the generation of power, such as water recovery/recirculation systems or dry cooling of power plants.	
	Subcategory L: Generation with Liquid and/or Gaseous Fuels – Other	Generation technologies that do not fit into one of the categories above.	
	CATEGORY 5: POWER GENERATION: RENEWABLE	Subcategory A: Wind – Energy Capture	Technologies that lead to better capture of wind resources. This could include different configurations, blade designs and materials. Also in this category could be tools for wind resource identification, classification, and modeling.
		Subcategory B: Wind – Energy Conversion	Technologies that lead to better conversion of wind power into useable energy, such as generators and magnetic materials, electronics, etc. specifically designed for wind energy.
Subcategory C: Geothermal Energy		Geothermal heat technologies including pumps, proppants, induced seismicity, enhanced geothermal systems (EGS), drilling, resource identification (sensors, models, tracers), zonal isolation techniques, robust equipment, low temperature generation, etc.	
Subcategory D: Hydro Energy		Technologies for capturing and/or converting hydrokinetic energy such as ocean, osmotic, tidal, etc., Technologies for hydro resource identification and modeling.	
Subcategory E: Solar – PV/CPV		Technologies for solar PV/CPV systems including materials, cell configurations, optical solar concentrators, BOS and other technologies for solar cells that convert light into electricity or fuel. Technologies to enable for cheaper	

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CATEGORY	SUBCATEGORY	DESCRIPTION
		installation or solar PV resource identification and modeling.
	Subcategory F: Solar – Non-PV	Technologies for non-PV conversion of solar energy including solar thermal conversion (materials, configurations, concentrators, and BOS), direct conversion of solar energy to fuels through thermal or catalytic routes, and other technologies that use or convert solar energy without PV conversion.
	Subcategory G: Power Electronics – Renewable Generation	Technologies that include advances in semiconductor materials, substrates, circuit topologies, magnetic materials, inductors, dielectric materials, capacitors, transistors, device packaging, etc. applied to renewable power generation.
	Subcategory H: Renewable Power – Other	Renewable energy technologies that do not fit one of the above categories.
CATEGORY 6: BIOENERGY	Subcategory A: Biomass Production	Technologies that improve biomass characteristics, such as yield and sustainability, and decrease cost of production and/or water use.
	Subcategory B: Biofuel Production – Biological Methods	Technologies that utilize a biological agent in one or more principal step(s) of feedstock conversion to fuels.
	Subcategory C: Biofuel Production – Nonbiological Methods	Technologies that do not utilize any biological agent in the conversion of organic feedstock to fuels, such as thermochemical and hybrid approaches or biomimetics.
	Subcategory D: Bioenergy Supply Chain	Technologies critical to supply chain development, such as feedstock collection and handling.
	Subcategory E: Bioenergy – Other	Technologies for bioenergy which do not fit in one of the above subcategories. Including but not limited to bioreactors, balance of plant, bioproducts, microbial fuel cells, sensors, and biological or agricultural carbon management.
	Subcategory A: Water Production/Reuse	Technologies that enable cost-effective and energy efficient ways of providing fresh water.
	Subcategory B: Thermal Energy Storage	Thermal energy storage technologies that can apply to multiple applications.
CATEGORY 7: OTHER ENERGY TECHNOLOGIES	Subcategory C:	

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CATEGORY	SUBCATEGORY	DESCRIPTION
	Advanced Manufacturing	Technologies that enable energy-efficient manufacturing capabilities or methods or that use advanced manufacturing to enable new energy technologies.
	Subcategory D: Appliance And Consumer Electronics Efficiency (End Use)	Technologies that improve the energy efficiency of appliances and consumer electronics, including but not limited to: refrigerators, washers, dryers, televisions, stoves, personal computers, phones, etc.
	Subcategory E: Data Centers And Computation	Technologies to improve the energy efficiency of large-scale computers, data centers, and computational infrastructure.
	Subcategory F: Industrial Efficiency – Materials	Technologies that improve the energy efficiency of or reduce emissions from producing industrial materials, including but not limited to glass, paper, iron, steel, plastics, aluminum, cement, etc.
	Subcategory G: Industrial Efficiency – Other	Technologies that improve the energy efficiency of industrial processes which are not covered by other subcategories.
	Subcategory H: Heat Recovery	Technologies for heat recovery including but not limited to thermoelectrics, Stirling engines, heat exchangers, conversion of waste heat, bottoming cycles, heat capture methods, materials, devices, etc.
	Subcategory I: High Temperature Materials	Materials designed specifically to withstand extremely high temperatures in order to enable new energy generation technologies.
	Subcategory J: Semiconductors	Technologies that enable the development of new semiconductor materials or the use of semiconductor materials in innovative applications.
	Subcategory K: Portable Power	Technologies for portable power applications such as piezoelectrics, portable fuel cells, batteries, etc.
	Subcategory L: Other Energy Technologies Not Listed Above	

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E. SCALING CATEGORIES

In addition to the Technical Category and Technical Subcategory list, Applicants will be required to identify a Scaling Category based on their technology and current scaling status. This Scaling Category will support ARPA-E’s reviewer application matching process to enable stronger matching of applications with reviewer qualifications.

The list of Scaling Categories is intended to encompass the majority of the scaling domain areas. If the proposed scaling category does not fall within any of the categories specified, the Applicant should select “Other”. Please note, the Applicant must select a single scaling category from the list below.

SCALING CATEGORY	DESCRIPTION
Biological Systems Scaling	Scaling of biological-based processes or technologies, such as agricultural- or aquaculture-based technologies, bacterial, fermentative processes, or any other technology where scaling the amount/production and/or maintenance of a biological component is the principal challenge.
Chemical Process Scaling	Scaling of chemical processes that do not involve the maintenance of biological systems, such as conversion of feedstocks into different products or mixtures, where scaling the reaction volume and/or quantity of desired products is the principal challenge.
Electrical Devices/Component Scaling	Scaling of electrical or electrochemical devices or component fabrication/assembly and/or manufacture, such as batteries, electronics, sensors, solid state devices, etc.
Grid Technology Scaling	Scaling of grid technologies related to infrastructure needed for transmission, distribution and providing services on the electrical grid for reliable operation or monitoring.
Materials Systems/Assemblies Scaling	Scaling of the manufacturing or fabrication of materials or material systems/assemblies using a range of feedstocks or refined materials to prepare higher-value products such as coatings, absorbents, metal organic frameworks (MOFs), and fuel cells.
Mechanical/Thermal Systems Scaling	Scaling of systems where mechanical and/or thermal components or systems are the primary scaling challenge, such as those related to engines and generators.
Software Implementation Scaling	Scaling of primarily software-based technologies across all application areas where software deployment, adoption, availability of training data, or integration with hardware components are the primary scaling challenges.
Other Scaling	Scaling technology challenges not represented in the above.

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II. AWARD INFORMATION

A. AWARD OVERVIEW

ARPA-E expects to make approximately \$100 million available for new awards under this FOA, subject to the availability of appropriated funds. ARPA-E anticipates making approximately 5-8 awards under this FOA. ARPA-E may, at its discretion, issue one, multiple, or no awards.

Individual awards may be made up to \$20 million in Federal share.

The period of performance for funding agreements is anticipated to be approximately 36 months. ARPA-E expects to issue funding agreements in May 2024, or as negotiated.

ARPA-E seeks Applications for projects that have progressed beyond proof-of-concept and need to validate scalability, reliability, and domestic manufacturability. All submissions must contain an appropriate cost and project duration plan that is described in sufficient technical detail to allow reviewers to meaningfully evaluate the proposed project.

Applicants should provide sufficient evidence to prove the technical viability of their proposed technology and project. Applicants are encouraged to submit proof-of-concept test data that supports the probability of success of the proposed project.

ARPA-E will provide support at the highest funding level only for applications with significant productization and market risk, aggressive timetables, and careful management and mitigation of the associated risks.

ARPA-E plans to fully fund the negotiated budget at the time of award.

1. PARTNERING REQUIREMENTS

Applicants must propose one or more SCALEUP Commercialization Partners in their Full Applications.

Commercialization Partners may include potential customers, end-users, suppliers, strategic investors, manufacturers, distributors, or other important stakeholders for the commercialization of the subject technology. It is preferable for Applicants to have at least one Commercialization Partner that represents the viewpoint and needs of the target customer to help ensure market adoption for the technology after the completion of the SCALEUP project. Commercialization Partners may be included as members of the Project Team or may be included as non-member third parties.

Commercialization Partners can make a contribution of cash, in-kind (e.g., use of a field validation site, intellectual property, etc.) or via other justifiable means that will be integral to

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the success of the project. Commercialization Partners are expected to actively participate in the project. Commercialization Partners make contributions with the goal that the technology will be successfully proven and commercialized.

For the Concept Paper, Letter(s) of Intent from Commercialization Partners are not required; however, at least one is required for the Full Application. Submission information regarding the Letter of Intent is provided in Section IV.D.4 of the FOA.

2. OPTIONAL FINANCIAL PARTNERS

Applicants may propose Financial Partners for their proposed project. A Financial Partner is an investing organization willing to provide the Applicant with funding for the cost share contribution to the project. Financial Partners may include venture capitalists, accelerators/incubators, angel/impact investors, etc. Financial Partners take on investment risk with the goal that the technology will be successfully proven and commercialized. Financial Partners provide cost share contributions without actively participating in research activities in the project. As outlined in Section II.A.1, Commercialization Partners may optionally provide cost share contributions, but must also provide insight to the project or project market segment. Because of this, Financial Partners are not considered a part of the SCALEUP Project Team and are considered non-member third parties.

Financial Partners are optional, and hence not a requirement of the SCALEUP 2023 FOA; however, their inclusion by an Applicant and commitment to the proposed project will be considered as a factor in Full Application selections. Applicants should include Letter(s) of Intent from any committed Financial Partner(s) with the Full Application. Submission information regarding the Letter of Intent is provided in Section IV.D.4 of the FOA.

B. RENEWAL AWARDS

At ARPA-E's sole discretion, awards resulting from this FOA may be renewed by adding one or more budget periods, extending the period of performance of the initial award, or issuing a new award. Renewal funding is contingent on: (1) availability of funds appropriated by Congress for the purpose of this program; (2) substantial progress towards meeting the objectives of the approved application; (3) submittal of required reports; (4) compliance with the terms and conditions of the award; (5) ARPA-E approval of a renewal application; and (6) other factors identified by the Agency at the time it solicits a renewal application.

C. ARPA-E FUNDING AGREEMENTS

For projects selected for participation in the SCALEUP Program, ARPA-E will provide financial assistance through cooperative agreements, other transactions, and similar agreements. ARPA-E provides financial and other support to projects that have the potential to realize ARPA-E's

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statutory mission. ARPA-E does not use such agreements to acquire property or services for the direct benefit or use of the U.S. Government.

Congress directed ARPA-E to “establish and monitor project milestones, initiate research projects quickly, and just as quickly terminate or restructure projects if such milestones are not achieved.”⁴ Accordingly, ARPA-E has substantial involvement in the direction of projects, as described in Section II.D of the FOA.

1. COOPERATIVE AGREEMENTS

ARPA-E generally uses Cooperative Agreements to provide financial and other support to Prime Recipients.⁵

Cooperative Agreements involve the provision of financial or other support to accomplish a public purpose of support or stimulation authorized by Federal statute. Under Cooperative Agreements, the Government and Prime Recipients share responsibility for the direction of projects.

ARPA-E encourages Prime Recipients to review the Model Cooperative Agreement, which is available at <https://arpa-e.energy.gov/technologies/project-guidance>.

2. FUNDING AGREEMENTS WITH FFRDCs/DOE LABS, GOGOs, AND FEDERAL INSTRUMENTALITIES

Any Federally Funded Research and Development Centers (FFRDC) involved as a member of a Project Team must provide the information requested in the “FFRDC Lab Authorization” and “Field Work Proposal” section of the Business Assurances & Disclosures Form, which is submitted with the Full Application.

When a FFRDC/DOE Lab is a member of a Project Team, ARPA-E executes a funding agreement directly with the FFRDC/DOE Lab and a single, separate Cooperative Agreement with the Prime Recipient, the lead entity for the rest of the Project Team. Notwithstanding the use of multiple agreements, the Prime Recipient under the Cooperative Agreement is the lead organization for the entire project, including all work performed by the FFRDC/DOE Lab and the rest of the Project Team.

Funding agreements with DOE/NNSA FFRDCs take the form of Work Authorizations issued to DOE/NNSA FFRDCs through the DOE/NNSA Field Work Proposal system for work performed under Department of Energy Management & Operation Contracts. Funding agreements with

⁴ U.S. Congress, Conference Report to accompany the 21st Century Competitiveness Act of 2007, H. Rpt. 110-289 at 171-172 (Aug. 1, 2007).

⁵ The term “Prime Recipient” is defined in FOA Section VIII.

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non-DOE/NNSA FFRDCs, GOGOs (including NETL), and Federal instrumentalities (e.g., Tennessee Valley Authority) will be consistent with the sponsoring agreement between the U.S. Government and the Laboratory. Any funding agreement with an FFRDC or GOGO will have similar terms and conditions as ARPA-E's Model Cooperative Agreement (<https://arpa-e.energy.gov/technologies/project-guidance/pre-award-guidance/funding-agreements>). Non-DOE GOGOs and Federal agencies may be proposed to provide support to the Project Team members on an applicant's project, through a Cooperative Research and Development Agreement (CRADA) or similar agreement.

3. OTHER TRANSACTION AUTHORITY

ARPA-E may use its "other transactions" authority under the America COMPETES Reauthorization Act of 2010 and DOE's other transactions authority as codified at 42 USC §7256 to enter into an other transaction agreement with Prime Recipients, on a case-by-case basis.

ARPA-E may negotiate an other transaction agreement when it determines that the use of a standard cooperative agreement, grant, or contract is not feasible or appropriate for a project.

The federal share of other transactions agreements should meet or exceed \$3,000,000. In general, an other transaction agreement requires a higher level of cost share than the 33.3% shown in Section III.C.2 of the FOA.

D. STATEMENT OF SUBSTANTIAL INVOLVEMENT

ARPA-E is substantially involved in the direction of projects from inception to completion. For the purposes of an ARPA-E project, substantial involvement means:

- Project Teams must adhere to ARPA-E's agency-specific and programmatic requirements.
- ARPA-E may intervene at any time in the conduct or performance of work under an award.
- ARPA-E does not limit its involvement to the administrative requirements of an award. Instead, ARPA-E has substantial involvement in the direction and redirection of the technical, design, and execution aspects of the project as a whole.
- During award negotiations, ARPA-E and Prime Recipients mutually establish an aggressive schedule of quantitative milestones and deliverables that must be met every quarter. In addition, ARPA-E will negotiate and establish "Go/No-Go" milestones for each project. If the Prime Recipient fails to achieve any of the "Go/No-Go" milestones and deliverables as determined by the ARPA-E Contracting Officer, ARPA-E may - at its discretion - renegotiate the statement of project objectives or schedule of milestones and deliverables for the project. In the alternative, ARPA-E may suspend or terminate the award in accordance with 2 C.F.R. §§ 200.339 – 200.343.

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- ARPA-E may provide guidance and/or assistance to the Prime Recipient to accelerate the commercial deployment of ARPA-E-funded technologies. Guidance and assistance provided by ARPA-E may include coordination with other Government agencies and nonprofit organizations⁶ to provide mentoring and networking opportunities for Prime Recipients. ARPA-E may also organize and sponsor events to educate Prime Recipients about key barriers to the deployment of their ARPA-E-funded technologies. In addition, ARPA-E may establish collaborations with private and public entities to provide continued support for the development and deployment of ARPA-E-funded technologies.

⁶ The term “nonprofit organizations” or “nonprofits” is defined in FOA Section VIII.

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III. ELIGIBILITY INFORMATION

A. SCALEUP 2023 ELIGIBLE APPLICANTS

Only organizations seeking to scale subject inventions created during an earlier ARPA-E award and reported in the iEdison system are eligible for funding under this program. Organizations may also leverage software, developed and reported (in technical reports or otherwise) under an ARPA-E award, that will be used in manufacturing, as “firmware” in manufactured products, or deployed on energy infrastructure or energy systems. For both subject inventions and software, note that “ARPA-E seeks Applications for projects that...validate scalability, reliability, and domestic manufacturability” (quoting from Section II.A of the FOA), and Applicants are required to agree to the U.S. Competitiveness Provision requirements detailed in Section V.E.7 of the FOA as part of an award under this FOA.

SCALEUP Applicants are not required to have participated within the original ARPA-E award – alternatively, Applicants may have licensed or purchased rights in such subject inventions or software and thereby become eligible for SCALEUP 2023. This FOA is open to the following Applicants that propose to scale subject inventions or software that have resulted from ARPA-E awards:

- i) Current and former ARPA-E awardees (except Institutions of Higher Education⁷ and FFRDCs/DOE Labs) that own/control subject invention(s) or software arising from their ARPA-E award(s);
- ii) Entities that are licensees⁸ of subject invention(s) or software arising from any ARPA-E award(s); or
- iii) Consortia – specified below – that have title to or are licensees of subject invention(s) or software arising from an ARPA-E award.

The eligible Applicants described in (i) or (ii) above may propose as a Standalone Applicant⁹ as the lead organization for a Project Team,¹⁰ or as a member of a Project Team that may include for-profit entities, educational institutions, and nonprofits¹¹ that are incorporated in the United States, including U.S. territories, and FFRDCs/DOE Labs.

⁷ The term “Institutions of Higher Education” or “educational institutions” is defined in FOA Section VIII.

⁸ Prior to any award, ARPA-E may inspect any licenses and/or assignment or other transfer of rights documents to confirm the Applicant/licensee-assignee has the necessary rights to conduct research, and commercialize, the results of its proposed research project.

⁹ The term “Standalone Applicant” is defined in FOA Section VIII. A Standalone Applicant must be its own Commercialization Partner.

¹⁰ The term “Project Team” is defined in FOA Section VIII.

¹¹ Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995 are not eligible to apply for funding as a Prime Recipient or Subrecipient.

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ARPA-E welcomes the participation of educational institutions and FFRDCs/DOE Labs, as Project Team Members and Consortia Members, but not as Standalone Applicants or Leads of Project Teams. This is in light of this FOA's goal of rapidly advancing the commercialization of energy technologies resulting from ARPA-E funding. Commercialization of such inventions of educational institutions and FFRDCs/Labs should be accomplished through for-profit businesses. Such businesses should have the incentive, ability, and organizational competencies to attract financial support during the project, such as the 20%-33.3% cost share, as well as additional private capital, particularly after a successful SCALEUP project. Educational institutions and FFRDCs/Labs are encouraged to participate as Project Team Members and Consortia Members in the proposals of businesses who license their – or others' - inventions arising from ARPA-E-funded research.

Consortia in (iii) above:

- Must include one or more U.S. for-profit businesses;
- May include for-profit entities, educational institutions, and nonprofits that are incorporated in the United States, including U.S. territories, and FFRDCs/DOE Labs; and
- Must designate one member of the consortium as the consortium representative to the Project Team. The consortium representative must be incorporated in the United States. Each consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium entity must provide a written description of its internal governance structure and internal rules to the Contracting Officer ([ARPA-E- CO@hq.doe.gov](mailto:ARPA-E-CO@hq.doe.gov)).

If selected for award, unincorporated consortia must provide the Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This collaboration agreement binds the individual consortium members together and shall include the consortium's:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding as Standalone Applicants, as the lead organization for a Project Team, or as a member of a Project Team. Foreign entities must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed or to be formed) under the laws of a State or territory of the United States to receive funding. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. The Applicant may request a

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waiver of this requirement in the Business Assurances & Disclosures Form, which is submitted with the Full Application and can be found at <https://arpa-e-foa.energy.gov/>. Refer to the Business Assurances & Disclosures Form for guidance on the content and form of the request.

B. SUBJECT INVENTION DISCLOSURE

ARPA-E allows for multiple technologies with subject inventions that are the result of ARPA-E awards to be combined into one SCALEUP application, as long as all are necessary for products resulting from a SCALEUP award. **ARPA-E is requiring all such subject inventions, whether the applicant's, team members' or licensed from other ARPA-E awardees, to be identified (see below) along with their award number(s) and be submitted per application in eXCHANGE.**

SCALEUP 2023 Applicants must propose leveraging/further developing subject inventions that were created during an ARPA-E award. Some software products are exempt from this requirement - see "Software Report" below. To be eligible for a SCALEUP 2023 award, the relevant subject invention(s) must be reported to the Department of Energy:

- a. prior to the SCALEUP 2023 Concept Paper deadline, and
- b. in accordance with the terms of the respective ARPA-E award(s).

SCALEUP Applications that do not specify an ARPA-E subject invention (and iEdison number) will be determined to be noncompliant / nonresponsive and may not be merit reviewed or considered for award (see Section III.D of the FOA).

1. IDENTIFYING SUBJECT INVENTIONS BY FINDING THEIR NUMBER

SCALEUP 2023 Applicants may find their subject invention number in the iEdison database found at: <https://iEdison.gov>. iEdison allows government funding recipients and contractors to report government-funded subject inventions, patents, and utilization data via the web to the Department of Energy for any previously funded award. A detailed guide for ARPA-E awardees on iEdison can be found on the ARPA-E website here: <https://arpa-e.energy.gov/technologies/project-guidance/post-award-guidance/subject-invention-reporting>.

If the SCALEUP 2023 Applicant filed an invention report prior to ARPA-E using iEdison and the period of reporting ended prior to the rollout of iEdison in 2016, ARPA-E will accept a DOE S Number for inventions that meet these criteria. The Format for a DOE-S# is "S" + 6 digits (S-#####).

SCALEUP 2023 Applicants may find they have several project record identifiers associated with their ARPA-E award. To provide clarity, listed below are the different types of record identifiers you may find.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

Eligible ARPA-E Award Number or DOE National Lab Work Authorization

- Enter a single ARPA-E award number into eXCHANGE. Format is: DE-AR + 7 digits OR national lab work authorizations are 2 digits + / + CJ000 + “/”2 digits + ”/” + two digits
- Example of an award number is DE-AR0000159
- Example of DOE work authorization is 13/CJ000/10/01

Eligible iEdison Invention Numbers

- Enter a single subject invention number into eXCHANGE. Format is: 7 or 8 digits + “-” + 2 digits + “-” + 4 digits
- Example of subject invention number: 9412501-10-0123

Software Report

Software inventions reduced to practice under an ARPA-E award must be reported in ePIC. Although the ePIC system is not presently set up to release a unique identifier of the software report, ARPA-E will validate the associated ARPA-E award. To complete the software report in ePIC, navigate to the “Project Reports” tab. For more detailed guidance please refer to the ePIC training guide here: <https://arpa-e.energy.gov/technologies/project-guidance/post-award-guidance/project-management-tool-epic>.

For SCALEUP Applicants that are proposing a developed software that is not associated with a subject invention reported in iEdison, when entering information in eXCHANGE, enter the title of the software.

C. COST SHARING¹²

Applicants are bound by the cost share proposed in their Full Applications.

1. COST SHARE DEFERRED FOR INITIAL PERIOD OF AWARD

As specified in Section V.E.4 of the FOA, for the initial portion of the award – approximately the first year of the award – cost share payment will be deferred. The cost share requirements/reduction in this section will be required for Total Projects Costs after this initial portion of the award. See Section V.E.4 of the FOA for details.

2. BASE COST SHARE REQUIREMENT

ARPA-E generally uses Cooperative Agreements to provide financial and other support to Prime Recipients (see Section II.C.1 of the FOA). For a Cooperative Agreement awarded under this

¹² Refer to Section V.E.3-4 for the FOA cost share payment schedule and reporting details.

FOA, the Prime Recipient must provide at least 33.3% of the Total Project Cost¹³ as cost share, except as provided in Section III.C.3 of the FOA.¹⁴

Under an other transaction agreement, a higher level of cost share than 33.3% is required.

3. REDUCED COST SHARE REQUIREMENT

Project teams may qualify for a reduced cost share of 20% if they qualify under one of the following specified applicant categories:

- Small businesses – or consortia of small businesses – will provide at least 20% of the Total Project Cost as cost share.
- Project Teams where a small business is the lead organization and small businesses perform greater than or equal to 80%, but less than 100%, of the total work under the funding agreement (as measured by the Total Project Cost) are entitled to the same cost share reduction provided to Standalone small businesses or consortia of small businesses.

Projects that do not meet any of the above criteria are subject to the minimum cost share requirements described in Section III.C.2 of the FOA.

4. LEGAL RESPONSIBILITY

Although the cost share requirement applies to the Project Team as a whole, the funding agreement makes the Prime Recipient legally responsible for paying, or ensuring payment of the entire cost share. The Prime Recipient's cost share obligation is expressed in the funding agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the period of performance, the Prime Recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The Prime Recipient is solely responsible for managing cost share contributions by the Project Team and enforcing cost share obligations assumed by Project Team members in subawards or related agreements.

¹³ The term "Total Project Cost" is defined in FOA Section VIII.

¹⁴ Energy Policy Act of 2005, Pub.L. 109-58, Sec. 988(c).

5. COST SHARE ALLOCATION

Each Project Team is free to determine how much each Project Team member will contribute towards the cost share requirement. The amount contributed by individual Project Team members may vary, as long as the cost share requirement for the project as a whole is met.

6. COST SHARE TYPES AND ALLOWABILITY

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.G of the FOA.

Project Teams may provide cost share in the form of cash or in-kind contributions. Cash contributions may be provided by the Prime Recipient or Subrecipients. Allowable in-kind contributions include but are not limited to personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third-party in-kind contribution. Project Teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the funding or property was not provided to the state or local government by the Federal Government.

The Prime Recipient may not use the following sources to meet its cost share obligations:

- Revenues or royalties from the prospective operation of an activity beyond the period of performance;
- Proceeds from the prospective sale of an asset of an activity;
- Federal funding or property (e.g., Federal grants, equipment owned by the Federal Government); or
- Expenditures that were reimbursed under a separate Federal program.

In addition, Project Teams may not use independent research and development (IR&D) funds¹⁵ to meet their cost share obligations under cooperative agreements. However, Project Teams may use IR&D funds to meet their cost share obligations under “other transaction” agreements.

Project Teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the Prime Recipient’s records, and necessary and reasonable for proper and efficient accomplishment of the project. Every cost share contribution must be reviewed and approved in advance by the

¹⁵ As defined in Federal Acquisition Regulation Subsection 31.205-18.

Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants may wish to refer to 2 C.F.R. Parts 200 and 910, and 10 C.F.R Part 603 for additional guidance on cost sharing, specifically 2 C.F.R. §§ 200.306 and 910.130, and 10 C.F.R. §§ 603.525-555.

7. COST SHARE CONTRIBUTIONS BY FFRDCs AND GOGOS

Because FFRDCs are funded by the Federal Government, costs incurred by FFRDCs generally may not be used to meet the cost share requirement. FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or a non-Federal source.

Because GOGOs/Federal Agencies are funded by the Federal Government, GOGOs/Federal Agencies may not provide cost share for the proposed project. However, the GOGO/Agency costs would be included in Total Project Costs for purposes of calculating the cost-sharing requirements of the Applicant.

8. COST SHARE VERIFICATION

Upon selection for award negotiations, Applicants are required to provide information and documentation regarding their cost share contributions. Please refer to Section V.E.3 of the FOA for guidance on the requisite cost share information and documentation.

D. OTHER

1. COMPLIANT CRITERIA

The Concept Paper submission is deemed compliant if:

- The Applicant meets the eligibility requirements in Section III.A of the FOA;
- The Concept Paper complies with the content and form requirements in Section IV.C of the FOA; and
- The Applicant entered all required information, successfully uploaded all required documents, and clicked the "Submit" button in ARPA-E eXCHANGE by the deadline stated in the FOA.

Concept Papers found to be noncompliant may not be merit reviewed or considered for award. ARPA-E may not review or consider noncompliant Concept Papers, including Concept Papers submitted through other means, Concept Papers submitted after the applicable deadline, and incomplete Concept Papers. A Concept Paper is incomplete if it does not include all required

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information. ARPA-E will not extend the submission deadline for Applicants who fail to submit required information and documents due to server/connection congestion.

Full Applications are deemed compliant if:

- The Applicant submitted a compliant and responsive Concept Paper;
- The Applicant meets the eligibility requirements in Section III.A of the FOA;
- The Full Application complies with the content and format requirements in Section IV.D of the FOA; and
- The Applicant entered all required information, successfully uploaded all required documents, and clicked the “Submit” button in ARPA-E eXCHANGE by the deadline stated in the FOA.

Full Applications found to be noncompliant may not be merit reviewed or considered for award. ARPA-E may not review or consider noncompliant Full Applications, including Full Applications submitted through other means, Full Applications submitted after the applicable deadline, and incomplete Full Applications. A Full Application is incomplete if it does not include required information and documents, such as Forms SF-424 and SF-424A. ARPA-E will not extend the submission deadline for Applicants who fail to submit required information and documents due to server/connection congestion.

Replies to Reviewer Comments are deemed compliant if:

- The Applicant successfully uploads its response to ARPA-E eXCHANGE by the deadline stated in the FOA; and
- The Replies to Reviewer Comments comply with the content and form requirements of Section IV.E of the FOA.

ARPA-E will not review or consider noncompliant Replies to Reviewer Comments, including Replies submitted through other means and Replies submitted after the applicable deadline. ARPA-E will not extend the submission deadline for Applicants who fail to submit required information due to server/connection congestion. ARPA-E will review and consider each compliant and responsive Full Application, even if no Reply is submitted or if the Reply is found to be noncompliant.

2. RESPONSIVENESS CRITERIA

ARPA-E performs a preliminary technical review of Concept Papers and Full Applications. The following types of submissions may be deemed nonresponsive and may not be reviewed or considered:

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- Submissions that do not identify a subject invention from a prior or ongoing ARPA-E award.
- Submissions that have been submitted in response to other currently issued ARPA-E FOAs.
- Submissions that are not scientifically distinct from applications submitted in response to this FOA or other currently issued ARPA-E FOAs.
- Submissions for basic research aimed solely at discovery and/or fundamental knowledge generation.
- Submissions for early-stage R&D projects aimed at developing a proof-of-concept technology.
- Submissions for proposed technologies that represent incremental improvements to existing technologies.
- Submissions for proposed technologies that are not based on sound scientific principles (e.g., violates a law of thermodynamics).
- Submissions for proposed technologies that are not transformational, as described in Section I.A of the FOA.
- Submissions for proposed technologies that do not have the potential to become disruptive in nature, as described in Section I.A of the FOA.
- Submissions that are not distinct in technical approach or objective from activities currently supported by or actively under consideration for funding by any other office within Department of Energy.
- Submissions that are not distinct in technical approach or objective from activities currently supported by or actively under consideration for funding by other government agencies or the private sector.
- Submissions that are not distinct and propose increasing throughput or incremental improvement of an existing pilot or manufacturing facility.
- Submissions that describe but do not propose a technology scaling R&D plan that allows ARPA-E to evaluate the submission under the applicable merit review criteria provided in Section V.A of the FOA.
- Submissions that are not scaling technology developed under ARPA-E awards (both prior and ongoing), and do not have a confirmed subject invention report filing with ARPA-E/iEdison.
- Submissions that fail to adequately prove ownership or licensing of the intellectual property necessary to accomplish the proposed project.

3. LIMITATION ON NUMBER OF SUBMISSIONS

Organizations may not use the same subject invention in more than one application to this FOA. More than one application can be made when organizations have multiple subject inventions for different fields of use.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

IV. APPLICATION AND SUBMISSION INFORMATION

A. APPLICATION PROCESS OVERVIEW

Under the SCALEUP 2023 FOA, ARPA-E will notify encouraged Applicants to submit Full Applications based on the Concept Paper submissions, select Finalists for Oral Presentations based on the Full Applications, and select Finalists for Award Negotiations following Finalists' Oral Presentations.

The first phase is the Concept Paper process, which requires Applicants to provide:

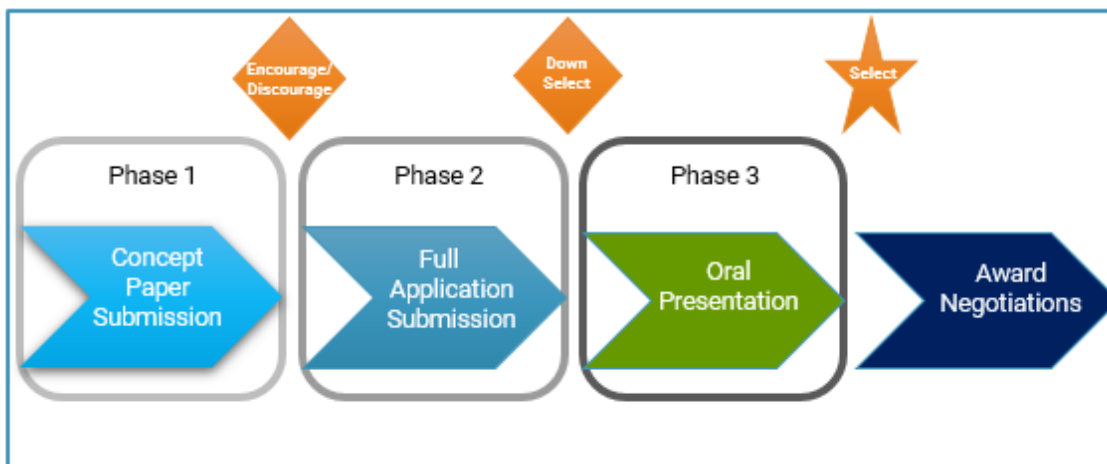
- a clear, concise, high-level statement of the problem to be solved;
- the goals and objectives of the proposed project;
- the expected impact of ARPA-E funds on the development of the technology;
- the efforts by the Applicant to date to secure other funding;
- the state of the technology; and
- the skills/competencies of the Applicant's project team that are relevant to the proposed project.

The content and criteria for the Concept Paper are described further in Sections **Error! Reference source not found.** and V.A of the FOA respectively.

Applicants will be notified whether they are encouraged or discouraged to submit a Full Application. Full Applications are due on October 13, 2023. Based on the Full Applications, ARPA-E will select Finalists, all of whom will be invited to participate in Oral Presentations. Following Oral Presentations, ARPA-E will make selections for award negotiations.

This process is visualized in Figure 1.

Figure 1. FOA Process Overview for SCALEUP



Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

1. REGISTRATION IN ARPA-E eXCHANGE

The first step in applying to this FOA is registration in ARPA-E eXCHANGE, ARPA-E's online application portal. For detailed guidance on using ARPA-E eXCHANGE, please refer to Section IV.H.1 of the FOA and the "ARPA-E eXCHANGE User Guide" (<https://arpa-e-foa.energy.gov/Manuals.aspx>).

2. CONCEPT PAPERS

Applicants must submit a Concept Paper by the deadline stated in the FOA. Section IV.C of the FOA provides instructions on submitting a Concept Paper.

ARPA-E performs a preliminary review of Concept Papers to determine whether they are compliant and responsive, as described in Section III.D of the FOA. Concept Papers found to be noncompliant or nonresponsive may not be merit reviewed or considered for award. ARPA-E makes an independent assessment of each compliant and responsive Concept Paper based on the criteria and program policy factors in Sections V.A.1 and V.B.1 of the FOA.

ARPA-E will encourage a subset of Applicants to submit Full Applications. Other Applicants will be discouraged from submitting a Full Application in order to save them the time and expense of preparing an application submission that is unlikely to be selected for award negotiations. By discouraging the submission of a Full Application, ARPA-E intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. Unsuccessful Applicants should continue to submit innovative ideas and concepts to future ARPA-E FOAs.

3. FULL APPLICATIONS

Applicants must submit a Full Application by the deadline stated in the FOA. Applicants will have approximately 45 days from receipt of the Encourage/Discourage notification to prepare and submit a Full Application. Section IV.D of the FOA provides instructions on submitting a Full Application.

ARPA-E performs a preliminary review of Full Applications to determine whether they are compliant and responsive, as described in Section III.D of the FOA. Full Applications found to be noncompliant or nonresponsive may not be merit reviewed or considered for award. ARPA-E makes an independent assessment of each compliant and responsive Full Application based on the criteria and program policy factors in Sections V.A.1 and V.B.1 of the FOA.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

4. REPLY TO FULL APPLICATION REVIEWER COMMENTS

Once ARPA-E has completed its review of Full Applications, reviewer comments on compliant and responsive Full Applications are made available to Applicants via ARPA-E eXCHANGE. Applicants may submit an optional Reply to Reviewer Comments, which must be submitted by the deadline stated in the FOA. Section IV.E of the FOA provides instructions on submitting a Reply to Reviewer Comments.

ARPA-E performs a preliminary review of Replies to determine whether they are compliant, as described in Section III.D of the FOA. ARPA-E will review and consider compliant Replies only. ARPA-E will review and consider each compliant and responsive Full Application, even if no Reply is submitted or if the Reply is found to be non-compliant.

5. FINALIST ORAL PRESENTATION

Based on merit review of Full Application submissions, ARPA-E will select Finalists. The Finalists proceed to the final evaluation phase, Oral Presentations. Applicants not selected as Finalists will receive a notification of their non-selection.

The invited Finalists will meet with ARPA-E representatives to present the contents of their Full Applications and provide ARPA-E an opportunity to ask clarification questions regarding the proposed project. The information provided by Finalists to ARPA-E through the Oral Presentation contributes to ARPA-E's selection decisions.

In addition to the project, plan, and stakeholder engagement, Finalists should include detail from their applicants on their current and future funding aspirations, an overview of financial projections (with and without SCALEUP 2023 funding), clearly describe their strategy to meet the US Competitiveness provisions referenced in Section V.E.7 of the FOA, and communicate key risks (and mitigation plans) for successful project execution and follow on.

A maximum of two team members (one of which is the Principal Investigator) from the Applicant organization are permitted to present the Oral Presentations. Up to three of the proposed Commercialization Partners will be scheduled to separate, non-confidential virtual presentations to discuss their role in the proposed SCALEUP 2023 project. The Principal Investigator shall be present in the Commercialization Partner interviews. Finalists and their Commercialization Partner(s) will be given a minimum of 2 weeks to prepare for Oral Presentations. Supplemental clarification questions on each Finalist's proposed SCALEUP 2023 project will also be provided to the Applicant by ARPA-E within this timeframe. Furthermore, additional clarification questions may arise during Oral Presentations, and Finalists should be prepared to provide verbal responses to ARPA-E. An estimated agenda for the oral presentation is represented in Figure 2, "Estimated Oral Presentation Agenda".

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

Figure 2: Estimated Oral Presentation Agenda (up to 3 hours total)

Estimated Oral Presentation Agenda (up to 3 hours total):

- **One hour – Applicants provide project plan overview**
- **30 minutes – Break**
- **45 minutes – Separate Partner interviews (up to 3 Partners)**
- **45 minutes – Applicant Q&A**

ARPA-E will arrange to meet with the invited Finalists and their proposed Commercialization Partners in person at ARPA-E offices or a mutually agreed upon location. Alternatively, ARPA-E may invite certain Finalists to present to ARPA-E via webinar, videoconference, or conference call.

ARPA-E will not reimburse Finalists nor their proposed Commercialization Partners for travel and other expenses relating to the Oral Presentations, nor will these costs be eligible for reimbursement as pre-award costs.

Note: The Oral Presentation process is distinct from pre-selection clarifications (see Section IV.A.6 of the FOA).

6. PRE-SELECTION CLARIFICATIONS

Throughout each FOA phase: Concept Paper, Full Application and Oral Presentation, ARPA-E may, at the Contracting Officer's discretion, conduct a pre-selection clarification process and/or perform a "down-select." Through the pre-selection clarification process, ARPA-E may obtain additional information from select Applicants through pre-selection meetings, webinars, videoconferences, conference calls, written correspondence, or site visits that can be used to accept or reject the Applicant's proposal. ARPA-E will not reimburse Applicants for travel and other expenses relating to pre-selection meetings or site visits, nor will these costs be eligible for reimbursement as pre-award costs.

Participation in a pre-selection meeting or site visit with ARPA-E does not signify that Applicants have been selected for the SCALEUP Award.

7. SELECTION FOR SCALEUP AWARD NEGOTIATIONS

ARPA-E carefully considers all of the information obtained through the application process and makes an independent assessment of each compliant and responsive Full Application based on the criteria and program policy factors in Sections V.A.1 and V.B.1 of the FOA. The Selection Official may select all or part of a Full Application for award negotiations. The Selection Official may also postpone a final selection determination on one or more Full Applications until a later

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

date, subject to availability of funds and other factors. ARPA-E will enter into award negotiations only with selected Applicants.

Applicants are promptly notified of ARPA-E's selection determination. ARPA-E may stagger its selection determinations. As a result, some Applicants may receive their notification letter in advance of other Applicants. Please refer to Section VI.A of the FOA for guidance on award notifications.

B. APPLICATION FORMS

Required forms for Full Applications are available on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov>), including the SF-424 and Budget Justification Workbook/SF-424A. Applicants may use the templates available on ARPA-E eXCHANGE, including the Concept Paper, Technical Volume of the Full Application, Project Plan Workbook, Summary Slide, Summary for Public Release, Reply to Reviewer Comments, and Business Assurances & Disclosures Form. A sample response to the Business Assurances & Disclosures Form is available on ARPA-E eXCHANGE.

C. CONTENT AND FORM OF CONCEPT PAPERS

The Concept Paper is mandatory (i.e., in order to submit a Full Application, an Applicant must submit a compliant and responsive Concept Paper) and must conform to the following formatting requirements:

- The Concept Paper Sections 1-4 must not exceed 4 pages in length including graphics, figures, and/or tables.
- The Concept Paper must be submitted in Adobe PDF format.
- The Concept Paper must be written in English.
- All pages must be formatted to fit on 8-1/2 by 11-inch paper with margins not less than one inch on every side. Single space all text and use Times New Roman typeface, a black font color, and a font size of 12 point or larger (except in figures and tables).
- The ARPA-E assigned Control Number, the Lead Organization Name, and the Principal Investigator's Last Name must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
- The first paragraph must include the Lead Organization's Name and Location, Principal Investigator's Name, ARPA-E/iEdison Number, Proposed Funding Requested (Federal and Awardee's Cost Share), and Project Duration.

Concept Papers found to be noncompliant or nonresponsive may not be merit reviewed or considered for award (see Section III.D of the FOA).

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

Each Concept Paper must be limited to a single concept or technology. Unrelated concepts and technologies must not be consolidated into a single Concept Paper.

A fillable Concept Paper template is available on ARPA-E eXCHANGE at <https://arpa-e-foa.energy.gov>.

Concept Papers must conform to the content requirements described in the Concept Paper template. If Applicants exceed the maximum page length indicated above, ARPA-E will review only the authorized number of pages and disregard any additional pages.

D. CONTENT AND FORM OF FULL APPLICATIONS

Full Applications must conform to the following formatting requirements:

- Each document must be submitted in the file format prescribed below.
- The Full Application must be written in English.
- All pages must be formatted to fit on 8-1/2 by 11-inch paper with margins not less than one inch on every side. Single space all text and use Times New Roman typeface, a black font color, and a font size of 12 point or larger (except in figures and tables).
- The ARPA-E assigned Control Number, the Lead Organization Name, and the Principal Investigator's Last Name must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.

Fillable Full Application template documents are available on ARPA-E eXCHANGE at <https://arpa-e-foa.energy.gov>.

Full Applications must conform to the content requirements described below.

Component	Required Format	Description and Information
Technical Volume	PDF	The technical volume is the centerpiece of the Full Application. Applicants must provide a detailed description of the proposed scaling, or pre-pilot R&D project and Project Team.
Team Pitch Video	MP4 (submitted via kiteworks™)	A Team Pitch Video (6-minute limit) that describes the opportunity, team, and technology.
Project Plan Workbook	XLS	The Workbook includes critical performance, scaling, and financial metrics. A Project Plan Workbook template is available on ARPA-E eXCHANGE.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

Letter(s) of Intent	PDF	Applicants must provide letter(s) from all third-party collaborators (including Commercialization or Financial Partners) that propose to provide all or part of the required cost share (e.g., cash, services, or property), as well as those not contributing cost share.
SF-424	PDF	Application for Federal Assistance. Applicants are responsible for ensuring that the proposed costs listed in eXCHANGE match those listed on forms SF-424 and SF-424A. Inconsistent submissions may impact ARPA-E’s final award determination.
Budget Justification Workbook/SF-424A	XLS	Budget Information – Non-Construction Programs
Summary for Public Release	PDF	Short summary of the proposed project. Intended for public release.
Summary Slide	PPT	A four-panel project slide summarizing different aspects of the proposed project.
Business Assurances & Disclosures Form	PDF	Applicants should provide comprehensive responses to the questions on this form. Requires the Applicant to make responsibility disclosures and disclose conflicts of interest within the Project Team. Requires the Applicant to describe the additionality and risks associated with the proposed project, disclose applications for funding currently pending with Federal and non-Federal entities, and disclose funding from Federal and non-Federal entities for work in the same technology area as the proposed R&D project. If an Applicant Team member is an FFRDC/DOE Lab, that entity must provide written authorization from the cognizant Federal agency and, if a DOE/NNSA FFRDC/DOE Lab, a Field Work Proposal. This form allows the Applicant to request a waiver or modification of the Performance of Work in the United States requirement. This form requires the Applicant to submit a Disclosure of Foreign Relationships. A sample response to the Business Assurances & Disclosures Form is also available on ARPA-E eXCHANGE.

ARPA-E provides detailed guidance on the content and form of each component below.

1. FIRST COMPONENT: TECHNICAL VOLUME

The Technical Volume must be submitted in Adobe PDF format. A Technical Volume template is available at <https://arpa-e-foa.energy.gov>. The Technical Volume must conform to the content and form requirements included within the template, including maximum page lengths. If Applicants exceed the maximum page lengths specified for each section, or add any additional sections not requested, ARPA-E may review only the authorized number of pages and disregard any additional pages or sections, or ARPA-E may determine that the submission as a whole is

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

noncompliant per Section III.D of the FOA.

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. ARPA-E and reviewers may review primary research literature in order to evaluate applications. However, all relevant technical information should be included in the body of the Technical Volume.

2. SECOND COMPONENT: TEAM PITCH VIDEO

The Team Pitch Video is limited to 6 minutes in length and should describe the opportunity, team, and technology for the proposed project. More specifically, the Team Pitch Video should focus on: (1) describing the problem, proposed solution, and how the Applicant's solution compares to existing alternatives; (2) describing the target market(s) and the Applicant's competitive advantage; (3) introducing the Project Team, highlighting knowledge, experience and unique capabilities; (4) describing strategic hires and partnerships for the proposed project; (5) explaining why/how the SCALEUP 2023 award will substantively improve the Applicant's likelihood of success. All Team Pitch Videos that exceed the 6-minute length will not be viewed beyond the 6-minute time limit. Team Pitch Videos should focus content on addressing elements 1 through 5 and while Applicants are not evaluated on video production aesthetics, ARPA-E encourages the inclusion of content that shows actual video footage of the technology/proposed solution, as opposed to a recorded MS PowerPoint pitch/presentation, if feasible.

To upload and submit the Team Pitch Video presentation video file, Applicants must utilize the DOE kiteworks™ platform. All Applicants who submit a Concept Paper and receive a notification to encourage submission of a Full Application (as outlined in Section V.D.2 of the FOA) will automatically receive an invitation via email within approximately 1-week of Concept Paper notifications to create an account on DOE's kiteworks™ platform, which will enable them to submit a Team Pitch Video as part of their Full Application. As noted in Section V.D.2, Applicants may submit a Full Application even if they receive a notification discouraging them from doing so. If such an Applicant intends to submit a Full Application, the Applicant must notify ARPA-E of their intent by sending an email to ARPA-E-CO@hq.doe.gov within 1-week of notification, with the subject line "Intent to Submit SCALEUP 2023 Full Application Team Pitch Video" so that they may receive an invitation to create an account on the kiteworks™ platform and submit the Team Pitch Video component of their Full Application. Access to upload files to DOE kiteworks™ will be sent to the Technical and Administrative Point of Contact Listed in eXCHANGE.

To start the Team Pitch Video submission process, Applicants should click the kiteworks™ web-link in their email inbox to enter their email address and create an account. Use the confirmation link sent via email to activate the kiteworks™ account. Within the kiteworks™ platform, select "Upload" in the upper-left corner and click "Upload Files." Browse for the video file on your computer, select the file, and click "Open." Users who have previously used DOE kiteworks™ may need to unlock their account; to do so, contact eits.kiteworks@hq.doe.gov.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

To facilitate efficient assignment of Team Pitch Videos to ARPA-E reviewers, Applicants must include their ARPA-E assigned Control Number (Control Number format is: Last 4 digits of FOA number, “-”, unique 4-digit identifier from eXCHANGE submission) for the SCALEUP 2023 application (found on eXCHANGE) and company name in the file name of the Team Pitch Video.

An example of an acceptable file name format is: “3100-####_CompanyName”.

Figure 3 below summarizes the file transfer instructions provided above:

Figure 3: kiteworks™ File Transfer Instructions

1 Receive email invitation to Kiteworks.

2 Click the link in your email and enter your email address in Kiteworks.

3 Choose a password and create your Kiteworks account.

4 Check your email for the confirmation link to activate your Kiteworks account.

5 Select “Upload” in the upper-left corner and click “Upload Files”. Browse for the video file on your computer, select the file, and click “Open”.

6 Your video will then be uploaded to Kiteworks. You’re all done.

Additionally, it is important to note for pitch presentation videos that:

1. If a new video file submission is required for any reason, the original file must be deleted or the file name must be changed. Two files of the same name cannot be uploaded to kiteworks™.
2. The file size limit is 2GB.
3. Videos may take several minutes to fully upload to the kiteworks™ platform, and Applicants are responsible for allocating sufficient time to upload Team Pitch Videos ahead of the Full Application submission deadline.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

3. THIRD COMPONENT: PROJECT PLAN WORKBOOK

The Project Plan Workbook must be submitted in XLS format. A Project Plan Workbook template is available at <https://arpa-e-foa.energy.gov>. The Project Plan Workbook requires information on the following data fields and metrics: (1) original ARPA-E project performance goals, progress by project-end, status to date, and future targets (where applicable); (2) scaling metric progress to date and proposed targets for the project; (3) follow-on funding since the original ARPA-E award; (4) total product sales to date; (5) list of commercial/financial partners and contact information; (6) past financial performance and future financial projections for the company, with and without the proposed ARPA-E award; (7) summary of intellectual property relevant to the proposed project, including the primary subject invention from the original ARPA-E award and any supplemental subject inventions included in the proposed project. Applicants must complete all required fields in accordance with the instructions provided in the template and must document all assumptions and resources as appropriate within the Project Plan Workbook template.

4. FOURTH COMPONENT: LETTER(S) OF INTENT

The Letter(s) of Intent must be submitted in Adobe PDF format. A Letter of Intent from at least one Commercialization Partner is required for the Full Application. Commercialization Partners may or may not be members of the proposed Project Team. Applicants should provide letter(s) from all third-party collaborators (including Commercialization or Financial Partners). Each letter should state the intended role of the third-party, including their authority within the proposed project, and clearly describe any constraints/restrictions. Any letters should also specify whether the third-party is committed to providing a specific minimum dollar amount of cost share for the Total Proposed Project Cost. If committed to providing cost share, in the budget justification, identify the following information: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed type of cost share – cash, services, or property (e.g., equipment or facilities). Where equipment or facilities are offered, each should be described and the basis for their value provided in the budget justification if their use will be charged to the project.

Financial Partners are optional, and hence not a requirement of the SCALEUP 2023 FOA; however, their inclusion by an Applicant and commitment to the proposed project will be considered in Awardee selections. Applicants should include Letter(s) of Intent from any committed Financial Partner(s) with the Full Application. Financial Partners may be included as members of the Project Team or may be included as non-member third parties.

5. FIFTH COMPONENT: SF-424

The SF-424 must be submitted in Adobe PDF format. This form is available on ARPA-E eXCHANGE at <https://arpa-e-foa.energy.gov>.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

The SF-424 includes instructions for completing the form. Applicants must complete all required fields in accordance with the instructions. Applicants may identify and include in Block 14 the entities, their addresses, and corresponding census tract numbers for any project activities that will occur within any designated Qualified Opportunity Zone (QOZ). To locate QOZs go to: <https://www.cdfifund.gov/opportunity-zones>.

Prime Recipients and Subrecipients are required to complete SF-LLL (Disclosure of Lobbying Activities), available at <https://www.grants.gov/forms/post-award-reporting-forms.html>, if any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with your application or funding agreement. The completed SF-LLL must be appended to the SF-424.

ARPA-E provides the following supplemental guidance on completing the SF-424:

- Each Project Team should submit only one SF-424 (i.e., a Subrecipient should not submit a separate SF-424).
- The list of certifications and assurances in Block 21 can be found at <http://energy.gov/management/downloads/certifications-and-assurances-use-sf-424>.
- The dates and dollar amounts on the SF-424 are for the entire period of performance (from the project start date to the project end date), not a portion thereof.
- Applicants are responsible for ensuring that the proposed costs listed in eXCHANGE match those listed on forms SF-424 and SF-424A. Inconsistent submissions may impact ARPA-E's final award determination.

6. SIXTH COMPONENT: BUDGET JUSTIFICATION WORKBOOK/SF-424A

Applicants are required to complete the Budget Justification Workbook/SF-424A Excel spreadsheet. This form is available on ARPA-E eXCHANGE at <https://arpa-e-foa.energy.gov>. Prime Recipients must complete each tab of the Budget Justification Workbook for the project as a whole, including all work to be performed by the Prime Recipient and its Subrecipients and Contractors. The SF-424A form included with the Budget Justification Workbook will “auto-populate” as the Applicant enters information into the Workbook. Applicants should carefully read the “Instructions and Summary” tab provided within the Budget Justification Workbook.

Subrecipient information must be submitted as follows:

- Each Subrecipient incurring greater than or equal to 10% of the Total Project Cost must complete a separate Budget Justification workbook to justify its proposed budget. These

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worksheets must be inserted as additional sheets within in the Prime Recipient’s Budget Justification.

- Subrecipients incurring less than 10% of the Total Project Cost are not required to complete a separate Budget Justification workbook. However, such Subrecipients are required to provide supporting documentation to justify their proposed budgets. At a minimum, the supporting documentation must show which tasks/subtasks are being performed, the purpose/need for the effort, and a sufficient basis for the estimated costs.

ARPA-E provides the following supplemental guidance on completing the Budget Justification Workbook/SF-424A:

- Applicants may request funds under the appropriate object class category tabs as long as the item and amount requested are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions described herein.
- If Patent costs are requested, they must be included in the Applicant’s proposed budget (see Section IV.G.3 of the FOA for more information on Patent Costs).
- For more information, please refer to the ARPA-E Budget Justification Guidance document at <https://arpa-e-foa.energy.gov>.

7. SEVENTH COMPONENT: SUMMARY FOR PUBLIC RELEASE

Applicants are required to provide a 250-word maximum Summary for Public Release. A Summary for Public Release template is available on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov>). The Summary for Public Release must be submitted in Adobe PDF format. This summary should not include any confidential, proprietary, or privileged information. The summary should be written for a lay audience (e.g., general public, media, Congress) using plain English.

<p>250 Words</p>	<p>SUMMARY FOR PUBLIC RELEASE</p>	<p>Briefly describe the proposed effort; summarize its objective(s) and project plan approach. Include context for how these goals and objectives are crucial for the commercial success of your technology. Specify what the technology product will be, at what scale (e.g., volume, number, weight, etc.) and how it will be delivered by the end of project. Describe its potential impact on ARPA-E statutory goals (see Section I.A of the FOA). The summary should be written at technical level suitable for a high-school science student and designed for public release.</p> <p>INSTRUCTIONS:</p> <p>(1) The Summary for Public Release <u>shall not exceed 250 words and one paragraph.</u></p> <p>(2) The Summary for Public Release <u>shall consist only of text</u>—no graphics, figures, or tables.</p>
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Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

		(3) For applications selected for award negotiations, the Summary may be used as the basis for a public announcement by ARPA-E; therefore, <u>this Cover Page and Summary should not contain confidential or proprietary information</u> . See Section VII.I of the FOA for additional information on marking confidential information.
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8. EIGHTH COMPONENT: SUMMARY SLIDE

Applicants are required to provide a single PowerPoint slide summarizing the proposed project. The slide must be submitted in Microsoft PowerPoint format. This slide will be used during ARPA-E's evaluation of Full Applications. A summary slide template, including content requirements, is available on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov>).

Summary Slides must conform to the content requirements described below:

- A Technology Summary;
 - Bullet points that describe novel aspects of the proposed technology and technology approach;
- A description of the technology's impact;
 - Quantitative description (through text or graphic) of the impact the proposed project will provide to the market and ARPA-E statutory goals;
- Proposed Targets;
 - Including any important technical performance metrics and/or impact categories;
 - Including quantitative description of the state of the art;
 - Including quantitative descriptions of the proposed targets;
- Any key graphics (illustrations, charts and/or tables) summarizing technology development and/or impact;
- The project's final objective(s);
- Project title and Principal Investigator information; and
- Requested ARPA-E funds and proposed Applicant cost share.

9. NINTH COMPONENT: BUSINESS ASSURANCES & DISCLOSURES FORM

Applicants are required to provide the information requested in the Business Assurances & Disclosures Form. The information must be submitted in Adobe PDF format. A fillable Business Assurances & Disclosures Form template is available on ARPA-E eXCHANGE at <https://arpa-e-foa.energy.gov>. A sample response to the Business Assurances & Disclosures Form is also available on ARPA-E eXCHANGE.

As described in the Business Assurances & Disclosures Form, the Applicant is required to:

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- Disclose conditions bearing on responsibility, such as criminal convictions and Federal tax liability;
- Disclose conflicts of interest within the Project Team and provide the Applicant's up-to-date, written, and enforced conflict of interest policy in accordance with DOE Interim COI Policy guidance at <https://www.energy.gov/management/financial-assistance-letter-no-fal-2022-02>; and
- Submit a Disclosure of Foreign Relationships.

In addition, ARPA-E is required by statute to “accelerat[e] transformational technological advances in areas that industry is by itself not likely to undertake because of technical and financial uncertainty.”¹⁶ In accordance with ARPA-E’s statutory mandate, the Applicant is required to:

- Describe the additionality and risks associated with the proposed SCALEUP 2023 project;
- Disclose any applications for the same project or related work currently pending with any Federal or non-Federal entities; and
- Disclose all funding for work in the same technology area as the proposed project received from any Federal or non-Federal entity within the last 5 years.

Finally, the Applicant may use the Business Assurances & Disclosures Form to:

- Request authorization to perform some proposed project work outside of the United States.

E. CONTENT AND FORM OF REPLIES TO REVIEWER COMMENTS

Written feedback on the Full Application is made available to Applicants before the submission deadline for Replies to Reviewer Comments. Applicants have a brief opportunity to prepare a short Reply to Reviewer Comments responding to one or more comments or supplementing their Full Application. A fillable Reply to Reviewer Comments template is available on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov>).

Replies to Reviewer Comments must conform to the following requirements:

- The Reply to Reviewer Comments must be submitted in Adobe PDF format.
- The Reply to Reviewer Comments must be written in English.
- All pages must be formatted to fit on 8-1/2 by 11-inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size of 12 points or larger (except in figures and tables).

¹⁶ America COMPETES Act, Pub. L. No. 110-69, § 5012 (2007), as amended (codified at 42 U.S.C. § 16538).

- The Control Number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.

ARPA-E may not review or consider noncompliant Replies to Reviewer Comments (see Section IV.E of the FOA). ARPA-E will review and consider each compliant and responsive Concept Paper and Full Application, even if no Reply is submitted or if the Reply is found to be noncompliant.

Replies to Reviewer Comments must conform to the following content and form requirements, including maximum page lengths, described below. If a Reply to Reviewer Comments is more than three pages in length, ARPA-E will review only the first three pages and disregard any additional pages.

SECTION	PAGE LIMIT	DESCRIPTION
Text	2 pages maximum	Applicants may respond to one or more reviewer comments or supplement their Concept Paper or Full Application.
Images	1 page maximum	Applicants may provide graphs, charts, or other data to respond to reviewer comments or supplement their Concept Paper or Full Application.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 (Intergovernmental Review of Federal Programs).

G. FUNDING RESTRICTIONS

1. ALLOWABLE COSTS

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles. Pursuant to 2 C.F.R. § 910.352, the cost principles in the Federal Acquisition Regulations (48 C.F.R. Part 31.2) apply to for-profit entities. The cost principles contained in 2 C.F.R. Part 200, Subpart E apply to all entities other than for-profit entities.

2. PRE-AWARD COSTS

ARPA-E will not reimburse any pre-award costs incurred by Applicants before they are selected for award negotiations. Please refer to Section VI.A of the FOA for guidance on award notices.

Upon selection for award negotiations, Applicants may incur pre-award costs at their own risk, consistent with the requirements in 2 C.F.R. Part 200, as modified by 2 C.F.R. Part 910, and other Federal laws and regulations. All submitted budgets are subject to change and are typically reworked during award negotiations. ARPA-E is under no obligation to reimburse pre-

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

award costs if, for any reason, the Applicant does not receive an award or the award is made for a lesser amount than the Applicant expected, or if the costs incurred are not allowable, allocable, or reasonable.

3. PATENT COSTS

For Subject Inventions disclosed to DOE under an award, ARPA-E will reimburse the Prime Recipient – in addition to allowable costs associated with Subject Invention disclosures, up to \$50,000 of expenditures for filing and prosecution of United States patent applications, including international applications (“PCT application”) submitted to the United States Patent and Trademark Office (USPTO).

The Prime Recipient may request a waiver of the \$50,000 cap.

4. FOREIGN TRAVEL

ARPA-E generally does not fund projects that involve foreign travel. Recipients are required to obtain written authorization from the authorized ARPA-E Official before incurring any foreign travel costs and provide trip reports with their reimbursement requests.

5. PERFORMANCE OF WORK IN THE UNITED STATES

ARPA-E strongly encourages interdisciplinary and cross-sectoral collaboration spanning organizational boundaries. Such collaboration enables the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible.

ARPA-E requires all work under ARPA-E funding agreements to be performed in the United States. However, Applicants may request a waiver of this requirement where their project would materially benefit from, or otherwise requires, certain work to be performed overseas.

Applicants seeking a waiver of this requirement are required to include an explicit request in the Business Assurances & Disclosures Form, which is part of the Full Application submitted to ARPA-E. Such waivers are granted where there is a demonstrated need, as determined by ARPA-E.

6. PURCHASE OF NEW EQUIPMENT

All equipment purchased under ARPA-E funding agreements must be made or manufactured in the United States, to the maximum extent practicable. This requirement does not apply to used or leased equipment. The Prime Recipients are required to notify the ARPA-E Contracting Officer reasonably in advance of purchasing any equipment that is not made or manufactured in the United States with a total acquisition cost of \$250,000 or more. Purchases of foreign

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equipment with a total acquisition cost of \$1,000,000 or more require the approval of the Head of Contracting Activity (HCA). The ARPA-E Contracting Officer will provide consent to purchase or reject within 30 calendar days of receipt of the Recipient's notification.

7. LOBBYING

Prime Recipients and Subrecipients may not use any Federal funds, directly or indirectly, to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. § 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

Prime Recipients and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (<http://www.whitehouse.gov/sites/default/files/omb/grants/sflllin.pdf>) if any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence any of the following in connection with your application:

- An officer or employee of any Federal agency,
- A Member of Congress,
- An officer or employee of Congress, or
- An employee of a Member of Congress.

8. CONFERENCE SPENDING

Prime Recipients and Subrecipients may not use any Federal funds to:

- Defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office which is not directly and programmatically related to the purpose for which their ARPA-E award is made and for which the cost to the United States Government is more than \$20,000; or
- To circumvent the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such a conference.

9. INDEPENDENT RESEARCH AND DEVELOPMENT COSTS

ARPA-E does not fund Independent Research and Development (IR&D) as part of an indirect cost rate under its Cooperative Agreements. IR&D, as defined at FAR 31.205-18(a), includes cost of effort that is not sponsored by an assistance agreement or required in performance of a contract, and that consists of projects falling within the four following areas: (i) basic research, (ii) applied research, (iii) development, and (iv) systems and other concept formulation studies.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

ARPA-E's goals are to enhance the economic and energy security of the United States through the development of energy technologies and ensure that the United States maintains a technological lead in developing and deploying advanced energy technologies. ARPA-E accomplishes these goals by providing financial assistance for energy technology projects, and has well recognized and established procedures for supporting research through competitive financial assistance awards based on merit review of proposed projects. Reimbursement for independent research and development costs through the indirect cost mechanism could circumvent this competitive process.

To ensure that all projects receive similar and equal consideration, eligible organizations may compete for direct funding of independent research projects they consider worthy of support by submitting proposals for those projects to ARPA-E. Since proposals for these projects may be submitted for direct funding, costs for independent research and development projects are not allowable as indirect costs under ARPA-E awards. IR&D costs, however, would still be included in the direct cost base that is used to calculate the indirect rate so as to ensure an appropriate allocation of indirect costs to the organization's direct cost centers.

10. PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

Per 2 C.F.R. § 200.216, recipients and subrecipients are prohibited from obligating or expending project funds to: (1) procure or obtain; (2) extend or renew a contract to procure or obtain; or (3) enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities). Refer to 2 C.F.R. § 200.216 for possible additional prohibitions and limitations.

11. BUY AMERICA REQUIREMENT FOR PUBLIC INFRASTRUCTURE PROJECTS

Projects funded through this FOA that are for, or contain, construction, alteration, maintenance, or repair of public infrastructure in the United States undertaken by applicable recipient types, require that:

- All iron, steel, and manufactured products used in the infrastructure project are produced in the United States; and
- All construction materials used in the infrastructure project are manufactured in the United States.

However, ARPA-E does not anticipate soliciting for or selecting projects that propose project tasks that are for, or contain, construction, alteration, maintenance, or repair of public infrastructure. If a project selected for award negotiations includes project tasks that may be subject to the Buy America Requirement, those project tasks will be removed from the project before any award is issued – i.e., no federal funding or Recipient cost share will be available for covered project tasks.

This “Buy America” requirement does not apply to an award where the Prime Recipient is a for-profit entity.

12. REQUIREMENT FOR FINANCIAL PERSONNEL

ARPA-E requires Small Business or Nonprofit applicants to identify a finance/budget professional (employee or contracted support) with an understanding of Federal contracting and/or financial assistance and cost accounting (including indirect costs, invoicing, and financial management systems) that will support the team in complying with all applicable requirements.

H. OTHER SUBMISSION REQUIREMENTS

1. USE OF ARPA-E eXCHANGE

To apply to this FOA, Applicants must register with ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/Registration.aspx>). Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted through ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/login.aspx>). ARPA-E will not review or consider applications submitted through other means (e.g., fax, hand delivery, email, postal mail). For detailed guidance on using ARPA-E eXCHANGE, please refer to the “ARPA-E eXCHANGE Applicant Guide” (<https://arpa-e-foa.energy.gov/Manuals.aspx>).

Upon creating an application submission in ARPA-E eXCHANGE, Applicants will be assigned a single Control Number. Applicants will receive a single Control Number for the Applicant Phase of the SCALEUP 2023 FOA. A control number format is 4 digits + “-” plus 4 digits (ex. 1015 – 1355) and is different than an ARPA-E award or work authorization number. Note: Applicant organizations may only submit one Concept Paper and Full Application per Subject Invention to this FOA. Any supplemental or related subject invention disclosures may be referenced in the Project Plan Workbook.

Once logged in to ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/login.aspx>), Applicants may access their submission by clicking the “My Submissions” link in the navigation on the left side of the page. Every application that the Applicant has submitted to ARPA-E and the

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

corresponding Control Number is displayed on that page. If the Applicant submits more than one application to a particular FOA, a different Control Number is shown for each application.

Applicants are responsible for meeting all submission deadline in ARPA-E eXCHANGE.

Applicants are strongly encouraged to submit their applications at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), Applicants should allow at least 1 hour to submit a Full Application. In addition, Applicants should allow at least 15 minutes to submit a Reply to Reviewer Comments. Once the application is submitted in ARPA-E eXCHANGE, Applicants may revise or update their application until the expiration of the applicable deadline.

Applicants should not wait until the last minute to begin the submission process. During the final hours before the submission deadline, Applicants may experience server/connection congestion that prevents them from completing the necessary steps in ARPA-E eXCHANGE to submit their applications. **ARPA-E will not extend the submission deadline for Applicants that fail to submit required information and documents due to server/connection congestion.**

ARPA-E may not review or consider incomplete applications and applications received after the deadline stated in the FOA. Such applications may be deemed noncompliant (see Section III.D of the FOA). Following is the entire list of errors could cause an application to be deemed “incomplete” and thus noncompliant:

- Failing to comply with the format and content requirements in Section IV of the FOA;
- Failing to enter required information in ARPA-E eXCHANGE;
- Failing to complete all required documents (including the Team Pitch Video) and comply with submission length requirements, as specified in the Application Documents;
- Failing to upload required document(s) to ARPA-E eXCHANGE;
- Failing to click the “Submit” button in ARPA-E eXCHANGE by the deadline stated in the FOA;
- Uploading the wrong document(s) or application(s) to ARPA-E eXCHANGE; and
- Uploading the same document twice, but labeling it as different documents. (In other words, failing to submit a required document.)

ARPA-E urges Applicants to carefully review their applications and to allow sufficient time for the submission of required information and documents.

V. APPLICATION REVIEW INFORMATION

A. CRITERIA

ARPA-E performs an initial review of Concept Papers and Full Applications to determine whether they are compliant and responsive (see Section III.D of the FOA). ARPA-E also performs a preliminary review of Replies to Reviewer Comments to determine whether they are compliant.

These criteria will be used to evaluate Applications at every stage of the process.

1. CRITERIA FOR CONCEPT PAPERS AND FULL APPLICATIONS

(1) *Project Feasibility and Technical Merit* (33.33%) - This criterion involves consideration of the following:

- The problem to be addressed, technology scaling challenges, and timeline for the proposed project;
- How R&D activities subsequent to the original ARPA-E award have helped mitigate any technical and business risks;
- The readiness of the technology for immediate scaling and that successful project completion will result in a commercially investable system, product, or service;
- Clearly defined milestones, including Go/No-Go decision points, and a clear statement of project deliverables;
- The necessary intellectual property (IP) rights have been granted including a well-formulated strategy for strengthening the IP position during the proposed project;
- Identification of key risk areas (including any potential safety, health and environmental risks) during and following the project completion with comprehensive and clearly articulated mitigation strategies;
- The impact the SCALEUP project will have on advancing the technology from its current state to validated commercial viability. Include performance, yield, conversion, throughput, scale, cost, and/or efficiency metrics, etc.
- A techno-economic analysis that adequately addresses the main cost, performance metrics, and value drivers; and
- A Project Plan and budget that includes the necessary technical resources – people and assets – to execute the proposed SCALEUP project.

(2) *Commercial Viability, Strategy, and Impact* (33.33%) – This criterion involves consideration of the following:

- How the goals and objectives of the proposed project are likely to lead to commercialization of the technology;

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- A path to market approach that addresses both entry and long-term commercialization factors. Include evidence of product-market fit with a quantifiable market opportunity;
- Evidence of a compelling customer value proposition compared to existing solutions, including differentiation based on a competitive analysis;
- Evidence of previous market validation efforts with findings that support a path to market and the proposed project goals and objectives;
- Characterization of the end-to-end value chain for the technology, including the supply chain, distribution channels, and plans to address any vulnerabilities and gaps in either;
- Credible business model tested against target customer feedback;
- Compelling financial projections with justification/validation;
- Identification of commercialization risks, such as regulatory risks, and mitigation strategies; and
- Extent to which the commercialized technology will reduce greenhouse gas emissions, in addition to the technology's impact on at least one of ARPA-E's statutory goals in Section I.A of the FOA.

(3) *Project Team Qualifications, Experience, and Capabilities* (33.33%) - This criterion involves consideration of the following:

- Capabilities of the individuals performing the project, the key capabilities of the organizations comprising the Project Team, the roles and responsibilities of each organization supporting the proposed project, and demonstrated capabilities to advance the project to completion, as evidenced by:
 - A track record of successful scale-up and commercialization of new technologies;
 - The ability to collect and analyze data, manage unexpected contingencies, and troubleshoot problems.
- Sufficiency of plans to access the equipment and facilities necessary to accomplish the proposed scaling effort and/or a clear plan to obtain access to necessary equipment and facilities;
- Commitment of Commercialization and Financial Partner(s) that will help enable the success of the project and ultimately the technology.
- Ability of the project team to clearly and succinctly communicate and describe the technical/commercial vision, including communication abilities demonstrated in the required video presentation.
- Applicants' previous work with ARPA-E, if applicable. Applicant's lack of prior work experience with ARPA-E (e.g. licensees of ARPA-E subject inventions) will not be disadvantaged for this subfactor.

Submissions will not be evaluated against each other since they are not submitted in accordance with a common work statement. The above criteria will be weighted as follows:

Project Feasibility and Technical Merit	33.33%
Commercial Viability, Strategy, and Impact	33.33%
Project Team Qualifications, Experience, and Capabilities	33.33%

2. CRITERIA FOR REPLIES TO REVIEWER COMMENTS

ARPA-E has not established separate criteria to evaluate Replies to Reviewer Comments. Instead, Replies to Reviewer Comments are evaluated as an extension of the Full Application.

3. CRITERIA FOR ORAL PRESENTATIONS

ARPA-E has not established separate criteria to evaluate the Oral Presentation. Instead, the Oral Presentation is evaluated as an extension of the Full Application.

B. REVIEW AND SELECTION PROCESS

1. PROGRAM POLICY FACTORS

In addition to the above criteria, ARPA-E may consider the following program policy factors in determining which Concept Papers to encourage to submit a Full Application and which Finalists to select for award negotiations:

- I. **ARPA-E Portfolio Balance.** Project balances ARPA-E portfolio in one or more of the following areas:
 - a. Diversity of technical personnel in the proposed Project Team;
 - b. Technological diversity;
 - c. Organizational diversity;
 - d. Geographic diversity;
 - e. Technical, team, or commercialization risk; or
 - f. Stage of technology development.

- II. **Relevance to ARPA-E Mission Advancement.** Project contributes to one or more of ARPA-E's key statutory goals:
 - a. Reduction of U.S. dependence on foreign energy sources;
 - b. Stimulation of U.S. manufacturing and/or software development;
 - c. Reduction of energy-related emissions;
 - d. Increase in U.S. energy efficiency;
 - e. Enhancement of U.S. economic and energy security; or
 - f. Promotion of U.S. advanced energy technologies competitiveness.

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- III. **Synergy of Public and Private Efforts.**
 - a. Avoids duplication and overlap with other publicly or privately funded projects;
 - b. Promotes increased coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer; or
 - c. Increases unique research collaborations.
- IV. **Low likelihood of other sources of funding.** High technical and/or financial uncertainty that results in the non-availability of other public, private, or internal funding or resources to support the project.
- V. **High-Leveraging of Federal Funds.** Project leverages Federal funds to optimize advancement of programmatic goals by proposing cost share above the required minimum or otherwise accessing scarce or unique resources.
- VI. **High Project Impact Relative to Project Cost.**
- VII. **Qualified Opportunity Zone (QOZ).** Whether the entity is located in an urban and economically distressed area including a Qualified Opportunity Zone (QOZ) or the proposed project will occur in a QOZ or otherwise advance the goals of QOZ. The goals include spurring economic development and job creation in distressed communities throughout the United States. For a list or map of QOZs go to:
<https://www.cdfifund.gov/Pages/Opportunity-Zones.aspx>.

2. ARPA-E REVIEWERS

By submitting an application to ARPA-E, Applicants consent to ARPA-E's use of Federal employees, contractors, and experts from educational institutions, nonprofits, industry, and governmental and intergovernmental entities as reviewers. ARPA-E selects reviewers based on their knowledge and understanding of the relevant field and application, their experience and skills, and their ability to provide constructive feedback on applications.

ARPA-E requires all reviewers to complete a Conflict-of-Interest Certification and Nondisclosure Agreement through which they disclose their knowledge of any actual or apparent conflicts and agree to safeguard confidential information contained in Concept Papers, Full Applications, Replies to Reviewer Comments, and Oral Presentations. In addition, ARPA-E trains its reviewers in proper evaluation techniques and procedures.

Applicants are not permitted to nominate reviewers for their applications. Applicants may contact the Contracting Officer by email (ARPA-E-CO@hq.doe.gov) if they have knowledge of a potential conflict of interest or a reasonable belief that a potential conflict exists.

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3. ARPA-E SUPPORT CONTRACTORS

ARPA-E utilizes contractors to assist with the evaluation of applications and project management. To avoid actual and apparent conflicts of interest, ARPA-E prohibits its support contractors from submitting or participating in the preparation of applications to ARPA-E.

By submitting an application to ARPA-E, Applicants represent that they are not performing support contractor services for ARPA-E in any capacity and did not obtain the assistance of ARPA-E's support contractor to prepare the application. ARPA-E will not consider any applications that are submitted by or prepared with the assistance of its support contractors.

C. ANTICIPATED ANNOUNCEMENT AND AWARD DATES

ARPA-E expects to announce selections for award negotiations in approximately February 2024 and to award funding agreements in approximately May 2024.

D. AWARD NOTICES

1. REJECTED SUBMISSIONS

Noncompliant and nonresponsive Concept Papers and Full Applications are rejected by the Contracting Officer and are not merit reviewed or considered for award. The Contracting Officer sends a notification letter by email to the technical and administrative points of contact designated by the Applicant in ARPA-E eXCHANGE. The notification letter states the basis upon which the Concept Paper or Full Application was rejected.

2. CONCEPT PAPER NOTIFICATIONS

ARPA-E promptly notifies Applicants of its determination to encourage or discourage the submission of a Full Application. ARPA-E sends a notification letter by email to the technical and administrative points of contact designated by the Applicant in ARPA-E eXCHANGE. ARPA-E provides feedback in the notification letter in order to guide further development of the proposed technology.

Applicants may submit a Full Application even if they receive a notification discouraging them from doing so. By discouraging the submission of a Full Application, ARPA-E intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. The purpose of the Concept Paper phase is to save Applicants the considerable time and expense of preparing a Full Application that is unlikely to be selected for award negotiations.

A notification letter encouraging the submission of a Full Application does not authorize the Applicant to commence performance of the project. Please refer to Section IV.G.2 of the FOA for guidance on pre-award costs.

3. FULL APPLICATION – FINALIST NOTIFICATIONS / ORAL PRESENTATION INVITATION

ARPA-E will promptly notify Applicants of its Finalist determinations. ARPA-E sends a notification letter by email to the technical and administrative points of contact designated by the Applicant in ARPA-E eXCHANGE. The notification letter may inform Applicants that their Full Application was selected as a Finalist, or not selected.

Written feedback on Full Applications is made available to Applicants before the submission deadline for Replies to Reviewer Comments. By providing feedback, ARPA-E intends to guide the further development of the proposed technology and to provide a brief opportunity to respond to reviewer comments.

As part of the evaluation and selection process, ARPA-E will invite Finalists to provide an Oral Presentation. ARPA-E will arrange to meet with the invited Finalists in person at the ARPA-E offices or a mutually agreed upon location. Alternatively, ARPA-E may invite certain Finalists and their proposed Commercialization Partners to present to ARPA-E via webinar, videoconference, or conference call.

Finalist will have a minimum of 2 weeks from receipt of the invitation letter to prepare for and complete the Oral Presentation. During the Oral Presentation, Finalists will meet with ARPA-E representatives to present the contents of the Full Application and provide ARPA-E an opportunity to ask questions regarding the proposed project. The information provided by Finalists to ARPA-E through the Oral Presentation contributes to ARPA-E's selection decisions.

4. SELECTION NOTIFICATIONS

a. SUCCESSFUL FINALISTS

ARPA-E will promptly notify Finalists of its selections for award negotiations. ARPA-E sends a notification letter by email to the technical and administrative points of contact designated by the Applicant in ARPA-E eXCHANGE. The notification letter may inform Finalists that they were selected for negotiation of an ARPA-E award or not selected. Alternatively, ARPA-E may notify one or more Finalists that their selection determination will be made at a later date, subject to the availability of funds and other factors.

ARPA-E has discretion to select all or part of a proposed project for negotiation of an award. A notification letter selecting a Finalist for award negotiations does not authorize the Finalist to

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commence performance of the project. **ARPA-E selects Finalists for award negotiations, not for award.** Finalists do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement. ARPA-E may terminate award negotiations at any time for any reason.

Please refer to Section IV.G.2 of the FOA for guidance on pre-award costs.

b. POSTPONED SELECTION DETERMINATIONS

A notification letter postponing a final selection determination until a later date does not authorize the Finalist to commence performance of the project. ARPA-E may ultimately determine to select or not select the Finalist for award negotiations.

Please refer to Section IV.G.2 of the FOA for guidance on pre-award costs.

c. NON-SELECTION OF FINALISTS

By not selecting a Finalist, ARPA-E intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. ARPA-E hopes that unsuccessful Finalists will submit innovative ideas and concepts for future FOAs.

E. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

The following administrative and national policy requirements apply to Prime Recipients. The Prime Recipient is the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to disputes and claims arising out of any agreement between the Prime Recipient and a FFRDC contractor. Prime Recipients are required to flow down these requirements to their Subrecipients through subawards or related agreements.

1. UNIQUE ENTITY IDENTIFIER AND SAM, FSRS, AND FEDCONNECT REGISTRATIONS

Prime Recipients must register with the System for Award Management (SAM) at www.sam.gov/SAM prior to submitting an application, at which time the system will assign (if newly registered)a Unique Entity Identifier (UEI).

Prime Recipients must:

- Maintain an active SAM registration with current information, including information on a its immediate and highest-level owner and subsidiaries, as well as on all predecessors

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that have been awarded a Federal contract or financial assistance award within the last three years, if applicable, at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency;

- Remain registered in the SAM database after the initial registration;
- Update its information in the SAM database as soon as it changes;
- Review its information in the SAM database on an annual basis from the date of initial registration or subsequent updates to ensure it is current, accurate and complete; and
- Not make a subaward to any entity unless the entity has provided its UEI.

Subrecipients are not required to register in SAM, but must obtain a UEI.

Prime Recipients and Subrecipients should commence this process as soon as possible in order to expedite the execution of a funding agreement. Registering with SAM and obtaining the UEI could take several weeks.

Prime Recipients are also required to register with the Federal Funding Accountability and Transparency Act Subaward Reporting System (FSRS) at <https://www.fsrs.gov/>.¹⁷ Prime Recipients are required to report to FSRS the names and total compensation of each of the Prime Recipient's five most highly compensated executives and the names and total compensation of each Subrecipient's five most highly compensated executives. Please refer to <https://www.fsrs.gov/> for guidance on reporting requirements. Prime Recipients are required to keep the FSRS data current throughout the duration of the project.

ARPA-E may not execute a funding agreement with the Prime Recipient until it has obtained a UEI and completed its SAM and FSRS registrations.

Finally, Prime Recipients are required to register with FedConnect in order to receive notification that their funding agreement has been executed by the Contracting Officer and to obtain a copy of the executed funding agreement. Please refer to <https://www.fedconnect.net/FedConnect/> for registration instructions.

2. NATIONAL POLICY ASSURANCES

Project Teams, including Prime Recipients and Subrecipients, are required to comply with the National Policy Assurances attached to their funding agreement in accordance with 2 C.F.R. 200.300. Please refer to Attachment 6 of ARPA-E's Model Cooperative Agreement (<https://arpa-e.energy.gov/?q=site-page/funding-agreements>) for information on the National Policy Assurances.

¹⁷ The Federal Funding Accountability and Transparency Act, P.L. 109-282, 31 U.S.C. 6101 note.

3. PROOF OF COST SHARE COMMITMENT AND ALLOWABILITY

Upon selection for award negotiations, the Prime Recipient must confirm in writing that the proposed cost share contribution is allowable in accordance with applicable Federal cost principles.

The Prime Recipient is also required to provide cost share commitment letters from Subrecipients or third parties that are providing cost share, whether cash or in-kind. Each Subrecipient or third party that is contributing cost share must provide a letter on appropriate letterhead that is signed by an authorized corporate representative.

4. COST SHARE PAYMENTS

All proposed cost share contributions must be reviewed in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Minimum cost share payments must be provided on the following schedule:

- a. Cost share may be deferred for approximately the first year of the awarded project, specifically: the period beginning on the agreement's effective date and ending on the date on which the Prime Recipient incurs costs in an amount equal to 1/3rd of the estimated Total Project Costs as shown in the approved award budget.
- b. Thereafter, Prime Recipients subject to the Base Cost Share requirement set forth in Section III.C.2 of the FOA will share 33.3% of all project costs incurred, including cost share deferred during the first third of the project.
- c. Prime Recipients subject to the Reduced Cost Share requirement set forth in Section III.C.3 of the FOA will share 20% of all project costs incurred.
- d. For b. immediately above,
 - The entirety of the cost share owed for the expended award project costs must be paid by the end of the award POP or at earlier termination. That is, if the award is terminated at, for example, 18 months, the cost share for the 18 month period must be contributed/paid by the recipient.
 - The Prime Recipient is required to pay the cost share amount as a percentage of the total project costs in each invoice period in which it is due.

Applicants selected for award negotiations may propose alternate cost share payment schedules. Proposed alternate schedules must not, at any time during the proposed period of performance, result in cumulative cost share payments less than the amount resulting from application of the minimum payment schedule above. At the agreement's conclusion (i.e., award expiration or termination), the Prime Recipient is required to pay its share (i.e., percentage) of the Total Project Cost incurred to date as of the termination or end date of the award.

ARPA-E may deny reimbursement requests, in whole or in part, or modify or terminate funding agreements where Prime Recipients (or Project Teams) fail to comply with ARPA-E's cost share payment requirements.

5. ENVIRONMENTAL IMPACT QUESTIONNAIRE

By law, ARPA-E is required to evaluate the potential environmental impact of projects that it is considering for funding. In particular, ARPA-E must determine before funding a project whether the project qualifies for a categorical exclusion under 10 C.F.R. § 1021.410 or whether it requires further environmental review (i.e., an environmental assessment or an environmental impact statement).

To facilitate and expedite ARPA-E's environmental review, Prime Recipients are required to complete an Environmental Impact Questionnaire during award negotiations. This form is available at <https://arpa-e.energy.gov/technologies/project-guidance/pre-award-guidance/required-forms-and-templates>. The Environmental Impact Questionnaire is due within 21 calendar days of the selection announcement.

6. INTELLECTUAL PROPERTY AND DATA MANAGEMENT PLANS

ARPA-E requires every Project Team to negotiate and establish an Intellectual Property Management Plan for the management and disposition of intellectual property arising from the project. The Prime Recipient must submit a completed and signed Intellectual Property Management plan to ARPA-E within six weeks of the effective date of the ARPA-E funding agreement. All Intellectual Property Management Plans are subject to the terms and conditions of the ARPA-E funding agreement and its intellectual property provisions, and applicable Federal laws, regulations, and policies, all of which take precedence over the terms of Intellectual Property Management Plans.

ARPA-E has developed a template for Intellectual Property Management Plans (<https://arpa-e.energy.gov/technologies/project-guidance/post-award-guidance/project-management-reporting-requirements>) so as to facilitate and expedite negotiations between Project Team members. ARPA-E does not mandate the use of this template. ARPA-E and DOE do not make any warranty (express or implied) or assume any liability or responsibility for the accuracy, completeness, or usefulness of the template. ARPA-E and DOE strongly encourage Project Teams to consult independent legal counsel before using the template.

Awardees are also required, post-award, to submit a Data Management Plan (DMP) that addresses how data generated in the course of the work performed under an ARPA-E award will be preserved and, as appropriate, shared publicly. The Prime Recipient must submit a completed and signed DMP as part of the Team's Intellectual Property Management Plan to ARPA-E within six weeks of the effective date of the ARPA-E funding agreement.

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7. U.S. COMPETITIVENESS

A primary objective of DOE's multi-billion dollar research, development, and demonstration investments – including ARPA-E awards - is advancement of new energy technologies, manufacturing capabilities, and supply chains for and by U.S. industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an applicant's project, the applicant must agree to the following U.S. Competitiveness Provision as part of an award under this FOA.

The following requirement is intended to apply to both subject inventions made under a new SCALEUP (2023) award and to the subject inventions made under prior awards that are to be advanced under the new SCALEUP (2023) award. A "Confirmatory License" confirming application of the following obligation and the other retained rights of the Government will be required of all awardees.

U.S. Competitiveness

The Contractor (Prime Recipient in ARPA-E awards) agrees that any products embodying any subject invention or produced through the use of any subject invention will be manufactured substantially in the United States unless the Contractor can show to the satisfaction of DOE that it is not commercially feasible. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., alternative binding commitments to provide an overall net benefit to the U.S. economy. The Contractor agrees that it will not license, assign or otherwise transfer any subject invention to any entity, at any tier, unless that entity agrees to these same requirements. Should the Contractor or other such entity receiving rights in the invention(s): (1) undergo a change in ownership amounting to a controlling interest, or (2) sell, assign, or otherwise transfer title or exclusive rights in the invention(s), then the assignment, license, or other transfer of rights in the subject invention(s) is/are suspended until approved in writing by DOE. The Contractor and any successor assignee will convey to DOE, upon written request from DOE, title to any subject invention, upon a breach of this paragraph. The Contractor will include this paragraph in all subawards/contracts, regardless of tier, for experimental, developmental or research work.

A subject invention is any invention of the contractor conceived or first actually reduced to practice in the performance of work under an award. An invention is any invention or discovery which is or may be patentable. The contractor includes any awardee, recipient, sub-awardee, or sub-recipient.

As noted in the U.S. Competitiveness Provision, at any time in which an entity cannot meet the requirements of the U.S. Competitiveness Provision, the entity may request a modification or waiver of the U.S. Competitiveness Provision. For example, the entity may propose modifying the language of the U.S. Competitiveness Provision in order to change the scope of the requirements or to provide more specifics on the application of

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the requirements for a particular technology. As another example, the entity may request that the U.S. Competitiveness Provision be waived in lieu of a net benefits statement or U.S. manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the U.S. economy and competitiveness. Commitments could include manufacturing specific products in the U.S., making a specific investment in a new or existing U.S. manufacturing facility, keeping certain activities based in the U.S. or supporting a certain number of jobs in the U.S. related to the technology. If DOE, in its sole discretion, determines that the proposed modification or waiver promotes commercialization and provides substantial U.S. economic benefits, DOE may grant the request and, if granted, modify the award terms and conditions for the requesting entity accordingly.

The U.S. Competitiveness Provision is implemented by DOE pursuant to a Determination of Exceptional Circumstances (DEC) under the Bayh-Dole Act and DOE Patent Waivers. See Section VII.A, "Title to Subject Inventions", of this FOA for more information on the DEC and DOE Patent Waiver.

8. CORPORATE FELONY CONVICTIONS AND FEDERAL TAX LIABILITY

In submitting an application in response to this FOA, the Applicant represents that:

- It is not a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months; and
- It is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply: A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States (but not foreign corporations). It includes both for-profit and nonprofit organizations.

9. APPLICANT RISK ANALYSIS

If selected for award negotiations, ARPA-E may evaluate the risks posed by the Applicant using the criteria set forth at 2 CFR §200.206(b)(2). ARPA-E may require special award terms and conditions or terminate award negotiations depending upon results of the risk analysis.

ARPA-E will not make an award if ARPA-E has determined that:

- The entity submitting the proposal or application:
 - has an owner or covered individual that is party to a malign foreign talent recruitment program;

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- has a business entity, parent company, or subsidiary located in the People's Republic of China or another foreign country of concern; or
 - has an owner or covered individual that has a foreign affiliation with a research institution located in the People's Republic of China or another foreign country of concern; and
- The relationships and commitments described above:
 - interfere with the capacity for activities supported by the Federal agency to be carried out;
 - create duplication with activities supported by the Federal agency;
 - present concerns about conflicts of interest;
 - were not appropriately disclosed to the Federal agency;
 - violate Federal law or terms and conditions of the Federal agency; or
 - pose a risk to national security.

10. RECIPIENT INTEGRITY AND PERFORMANCE MATTERS

Prior to making a Federal award, ARPA-E is required to review and consider any information about Applicants that is contained in the Office of Management and Budget's designated integrity and performance system accessible through SAM (currently the Federal Awardee Performance and Integrity Information System or FAPIIS) (41 U.S.C. § 2313 and 2 C.F.R. 200.206).

Applicants may review information in FAPIIS and comment on any information about itself that a Federal awarding agency previously entered into FAPIIS.

ARPA-E will consider any written comments provided by Applicants during award negotiations, in addition to the other information in FAPIIS, in making a judgment about an Applicant's integrity, business ethics, and record of performance under Federal awards when reviewing potential risk posed by Applicants as described in 2 C.F.R. §200.206.

11. NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS REPRESENTATIONS

In submitting an application in response to this FOA the Applicant represents that:

- (1) **It does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

- (2) **It does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:
- a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*
 - b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.
 - c. Notwithstanding provision listed in paragraph (a), a nondisclosure confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosure to congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

12. INTERIM CONFLICT OF INTEREST POLICY FOR FINANCIAL ASSISTANCE

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy) can be found at <https://www.energy.gov/management/financial-assistance-letter-no-fal-2022-02>. This policy is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant, cooperative agreement, or technology investment agreement or similar other transaction agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. DOE’s interim COI Policy establishes standards that provide a reasonable expectation that the design, conduct, and reporting of projects funded wholly or in part under DOE financial assistance awards will be free from bias resulting from financial conflicts of interest or organizational conflicts of interest. The applicant is subject to the requirements of the interim COI Policy and

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within each application for financial assistance, the applicant must certify that it is, or will be by the time of receiving any financial assistance award, compliant with all requirements in the interim COI Policy. For applicants to any ARPA-E Funding Opportunity Announcement, this certification, disclosure of any managed or unmanaged conflicts of interest, and a copy of (or link to) the applicant's own conflict of interest policy must be included with the information provided in the Business Assurances & Disclosures Form. The applicant must also flow down the requirements of the interim COI Policy to any subrecipient non-Federal entities.

13. COMMERCIALIZATION PLAN AND SOFTWARE REPORTING

If your project is selected and it targets the development of software, you may be required to prepare a Commercialization Plan for the targeted software and agree to special provisions that require the reporting of the targeted software and its utilization. This special approach to projects that target software mirrors the requirements for reporting that attach to new inventions made in performance of an award.

F. REPORTING

Recipients are required to submit periodic, detailed reports on technical, financial, and other aspects of the project, as described in Attachment 4 to ARPA-E's Model Cooperative Agreement (<https://arpa-e.energy.gov/technologies/project-guidance/pre-award-guidance/funding-agreements>).

VI. AGENCY CONTACTS

A. COMMUNICATIONS WITH ARPA-E

Upon the issuance of a FOA, only the Contracting Officer may communicate with Applicants. ARPA-E personnel and our support contractors are prohibited from communicating (in writing or otherwise) with Applicants regarding the FOA. This “quiet period” remains in effect until ARPA-E’s public announcement of its project selections for award negotiations.

During the “quiet period,” Applicants are required to submit all questions regarding this FOA to ARPA-E-CO@hq.doe.gov. Questions and Answers (Q&As) about ARPA-E and the FOA are available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, please send an email with the FOA name and number in the subject line to ARPA-E-CO@hq.doe.gov. Due to the volume of questions received, ARPA-E will only answer pertinent questions that have not yet been answered and posted at the above link.

- ARPA-E will post responses on a weekly basis to any questions that are received that have not already been addressed at the link above. ARPA-E may re-phrase questions or consolidate similar questions for administrative purposes.
- ARPA-E will cease to accept questions approximately 10 business days in advance of each submission deadline. Responses to questions received before the cutoff will be posted approximately three (3) business day in advance of the submission deadline. ARPA-E may re-phrase questions or consolidate similar questions for administrative purposes.
- Responses are published in a document specific to this FOA under “CURRENT FUNDING OPPORTUNITIES – FAQs” on ARPA-E’s website (<http://arpa-e.energy.gov/faq>).

Applicants may submit questions regarding ARPA-E eXCHANGE, ARPA-E’s online application portal, to ExchangeHelp@hq.doe.gov. ARPA-E will promptly respond to emails that raise legitimate, technical issues with ARPA-E eXCHANGE. ARPA-E will refer any questions regarding the FOA to ARPA-E-CO@hq.doe.gov.

ARPA-E will not accept or respond to communications received by other means (e.g., fax, telephone, mail, hand delivery). Emails sent to other email addresses will be disregarded.

During the “quiet period,” only the Contracting Officer may authorize communications between ARPA-E personnel and Applicants. The Contracting Officer may communicate with Applicants as necessary and appropriate. As described in Section IV.A.6 of the FOA, the Contracting Officer may arrange pre-selection meetings and/or site visits during the “quiet period.”

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

B. DEBRIEFINGS

ARPA-E does not offer or provide debriefings. ARPA-E provides Applicants with a notification encouraging or discouraging the submission of a Full Application based on ARPA-E's assessment of the Concept Paper. In addition, ARPA-E provides Applicants with reviewer comments on Full Applications before the submission deadline for Replies to Reviewer Comments.

VII. OTHER INFORMATION

A. TITLE TO SUBJECT INVENTIONS

Ownership of subject inventions is governed pursuant to the authorities listed below:

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions;
- All other parties: The federal Non-Nuclear Energy Act of 1974, 42. U.S.C. 5908, provides that the government obtains title to new subject inventions unless a waiver is granted (see below):
 - Class Patent Waiver for Domestic Large Businesses: DOE has issued a class patent waiver that applies to this FOA. Under this class patent waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class patent waiver, a domestic large business must agree to the U.S. Competitiveness Provision in accordance with Section V.E.7 of the FOA.
 - Advance and Identified Waivers: For applicants that do not fall under the class patent waiver or the Bayh-Dole Act, those applicants may request a patent waiver that will cover subject inventions that may be made under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to DOE within the time frames set forth in the award's intellectual property terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.
- DEC: On June 07, 2021, DOE approved a DETERMINATION OF EXCEPTIONAL CIRCUMSTANCES (DEC) UNDER THE BAYH-DOLE ACT TO FURTHER PROMOTE DOMESTIC MANUFACTURE OF DOE SCIENCE AND ENERGY TECHNOLOGIES. In accordance with this DEC, all awards, including sub-awards, under this FOA made to a Bayh-Dole entity (domestic small businesses and nonprofit organizations) shall include the U.S. Competitiveness Provision in accordance with Section V.E.7 of the FOA. A copy of the DEC may be found on the DoE website. Pursuant to 37 CFR § 401.4, any Bayh-Dole entity affected by this DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.

B. GOVERNMENT RIGHTS IN SUBJECT INVENTIONS

Where Prime Recipients and Subrecipients retain title to subject inventions, the U.S. Government retains certain rights.

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1. GOVERNMENT USE LICENSE

The U.S. Government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the Government.

2. MARCH-IN RIGHTS

The U.S. Government retains march-in rights with respect to all subject inventions. Through “march-in rights,” the Government may require a Prime Recipient or Subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant a license for use of the invention. In addition, the Government may grant licenses for use of the subject invention when Prime Recipients, Subrecipients, or their assignees and exclusive licensees refuse to do so.

The U.S. Government may exercise its march-in rights if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;
- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfactory manner;
- The owner has not met public use requirements specified by Federal statutes in a reasonably satisfactory manner; or
- The U.S. Manufacturing requirement has not been met.

C. RIGHTS IN TECHNICAL DATA

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

- Background or “Limited Rights Data”: The U.S. Government will not normally require delivery of technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.
- Generated Data: The U.S. Government normally retains very broad rights in technical data produced under Government financial assistance awards, including the right to distribute to the public. However, pursuant to special statutory authority, certain categories of data generated under ARPA-E awards may be protected from public disclosure for up to ten years in accordance with provisions that will be set forth in the award. In addition, invention disclosures may be

protected from public disclosure for a reasonable time in order to allow for filing a patent application.

D. PROTECTED PERSONALLY IDENTIFIABLE INFORMATION

Applicants may not include any Protected Personally Identifiable Information (Protected PII) in their submissions to ARPA-E. Protected PII is defined as data that, if compromised, could cause harm to an individual such as identity theft. Listed below are examples of Protected PII that Applicants must not include in their submissions.

- Social Security Numbers in any form;
- Place of Birth associated with an individual;
- Date of Birth associated with an individual;
- Mother's maiden name associated with an individual;
- Biometric record associated with an individual;
- Fingerprint;
- Iris scan;
- DNA;
- Medical history information associated with an individual;
- Medical conditions, including history of disease;
- Metric information, e.g., weight, height, blood pressure;
- Criminal history associated with an individual;
- Ratings;
- Disciplinary actions;
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal;
- Financial information associated with an individual;
- Credit card numbers;
- Bank account numbers; and
- Security clearance history or related information (not including actual clearances held).

E. FOAs AND FOA MODIFICATIONS

FOAs are posted on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/>), Grants.gov (<http://www.grants.gov/>), and FedConnect (<https://www.fedconnect.net/FedConnect/>). Any modifications to the FOA are also posted to these websites. You can receive an e-mail when a modification is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon as possible after release of the FOA to ensure that you receive timely notice of any modifications or other announcements. More information is available at <https://www.fedconnect.net>.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

F. OBLIGATION OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards on behalf of ARPA-E or obligate ARPA-E to the expenditure of public funds. A commitment or obligation by any individual other than the Contracting Officer, either explicit or implied, is invalid.

ARPA-E awards may not be transferred, assigned, or assumed without the prior written consent of a Contracting Officer.

G. REQUIREMENT FOR FULL AND COMPLETE DISCLOSURE

Applicants are required to make a full and complete disclosure of the information requested in the Business Assurances & Disclosures Form. Disclosure of the requested information is mandatory. Any failure to make a full and complete disclosure of the requested information may result in:

- The rejection of a Concept Paper, Full Application, and/or Reply to Reviewer Comments;
- The termination of award negotiations;
- The modification, suspension, and/or termination of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of Federal contracts, subcontracts, and financial assistance and benefits; and
- Civil and/or criminal penalties.

H. RETENTION OF SUBMISSIONS

ARPA-E expects to retain copies of all Concept Papers, Full Applications, Replies to Reviewer Comments, and other submissions. No submissions will be returned. By applying to ARPA-E for funding, Applicants consent to ARPA-E's retention of their submissions.

I. MARKING OF CONFIDENTIAL INFORMATION

ARPA-E will use data and other information contained in Concept Papers, Full Applications, and Replies to Reviewer Comments strictly for evaluation purposes.

Concept Papers, Full Applications, Replies to Reviewer Comments, and other submissions containing confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

The cover sheet of the Concept Paper, Full Application documents, Reply to Reviewer Comments, or other submission must be marked as follows and identify the specific pages containing confidential, proprietary, or privileged information:

Notice of Restriction on Disclosure and Use of Data:

Pages [___] of this document may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure." In addition, every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

J. EXPORT CONTROL INFORMATION

Do not include information subject to export controls in any submissions, including Concept Papers, Full Applications, and Replies to Reviewer Comments – whether marked as subject to US export control laws/regulations or otherwise. Such information may not be accepted by ARPA-E and may result in a determination that the application is non-compliant, and therefore not eligible for selection. This prohibition includes any submission containing a general, non-determinative statement such as "The information on this page [or pages _ to_] may be subject to US export control laws/regulations", or similar. Under the terms of their award, awardees shall be responsible for compliance with all export control laws/regulations.

K. COMPLIANCE AUDIT REQUIREMENT

A prime recipient organized as a for-profit entity expending \$750,000 or more of DOE funds in the entity's fiscal year (including funds expended as a Subrecipient) must have an annual compliance audit performed at the completion of its fiscal year. For additional information, refer to Subpart F of: (i) 2 C.F.R. Part 200, and (ii) 2 C.F.R. Part 910.

If an educational institution, nonprofit organization, or state/local government is either a Prime Recipient or a Subrecipient, and has expended \$750,000 or more of Federal funds in the entity's fiscal year, the entity must have an annual compliance audit performed at the completion of its fiscal year. For additional information refer to Subpart F of 2 C.F.R. Part 200.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

L. REAL PROPERTY AND EQUIPMENT

Real property and equipment purchased with project funds (federal share and recipient cost share) are subject to the requirements at 2 CFR 200.310, 200.311, 200.313, and 200.316 (non-Federal entities, except for-profit entities) and 2 CFR 910.360 (for-profit entities). For projects selected for award under this FOA, the recipient may (1) take disposition action on the real property and equipment; or (2) continue to use the real property and equipment after the conclusion of the award period of performance, with Contracting Officer approval.

The recipient's written Request for Continued Use must identify the property and include: a summary of how the property will be used (must align with the authorized project purposes); a proposed use period, (e.g., perpetuity, until fully depreciated, or a calendar date where the recipient expects to submit disposition instructions); acknowledgement that the recipient shall not sell or encumber the property or permit any encumbrance without prior written ARPA-E approval; current fair market value of the property; and an Estimated Useful Life or depreciation schedule for equipment.

When the property is no longer needed for authorized project purposes, the recipient must request disposition instructions from DOE. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316.

VIII. GLOSSARY

Applicant: The entity that submits the application to ARPA-E. In the case of a Project Team, the Applicant is the lead organization listed on the application.

Application: The entire submission received by ARPA-E, including the Concept Paper, Full Application, Reply to Reviewer Comments, and Small Business Grant Application (if applicable).

ARPA-E: The Advanced Research Projects Agency – Energy, an agency of the U.S. Department of Energy.

Commercialization Partner: Partners that make a contribution of cash, in-kind (e.g., a field validation site, intellectual property, etc.) or via other justifiable means that will be integral to the success of the project. Commercialization Partners are expected to actively participate in the project.

Cost Sharing: Is the portion of project costs from non-Federal sources that are borne by the Prime Recipient (or non-Federal third parties on behalf of the Prime Recipient), rather than by the Federal Government.

Covered Individual: An individual who contributes in a substantive, meaningful way to the scientific development or execution of an R&D project proposed to be carried out with an award from ARPA-E. This includes, but is not limited to, the PI, Co-PI, Key Personnel, and technical staff (e.g., postdoctoral fellows/researchers and graduate students). ARPA-E may further designate covered individuals during award negotiations or the award period of performance.

Deliverable: A deliverable is the quantifiable goods or services that will be provided upon the successful completion of a project task or sub-task.

DOE: U.S. Department of Energy

DOE/NNSA: U.S. Department of Energy/National Nuclear Security Administration.

Financial Partner: An investing organization willing to provide the Applicant with funding for the cost share contribution to the project.

FFRDCs: Federally Funded Research and Development Centers

FOA: Funding Opportunity Announcement

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Foreign Affiliation: A funded or unfunded academic, professional, or institutional appointment or position with a foreign government or government-owned entity, whether full-time, part-time, or voluntary (including adjunct, visiting, or honorary).

Foreign Countries of Concern: The People's Republic of China, the Democratic People's Republic of Korea, the Russian Federation, the Islamic Republic of Iran, Burma, Eritrea, Pakistan, Saudi Arabia, Tajikistan, and Turkmenistan.

For-Profit Organizations (Other than Small Businesses) (or large businesses): Means entities organized for-profit other than small businesses as defined elsewhere in this Glossary.

GOCOs: U.S. Government Owned, Contractor Operated laboratories.

GOGOs: U.S. Government Owned, Government Operated laboratories.

Institutions of Higher Education (or educational institutions): Has the meaning set forth at 20 U.S.C. 1001.

Malign Foreign Talent Recruitment Program: The meaning given such term in section 10638 of the Research and Development, Competition, and Innovation Act (division B of Public Law 117-167) or 42 USC 19237, as of October 20, 2022.

Milestone: A milestone is the tangible, observable measurement that will be provided upon the successful completion of a project task or sub-task.

Nonprofit Organizations (or nonprofits): Has the meaning set forth at 2 C.F.R. § 200.70.

Prime Recipient: The signatory to the funding agreement with ARPA-E.

PI: Principal Investigator.

Project Team: A Project Team consists of the Prime Recipient, Subrecipients, and others performing or otherwise supporting work under an ARPA-E funding agreement.

Small Business: Small businesses are domestically incorporated entities that meet the criteria established by the U.S. Small Business Administration's (SBA) "Table of Small Business Size Standards Matched to North American Industry Classification System Codes" (NAICS) (<http://www.sba.gov/content/small-business-size-standards>).

Standalone Applicant: An Applicant that applies for funding on its own, not as part of a Project Team.

Subject Invention: Any invention conceived or first actually reduced to practice under an ARPA-E funding agreement.

Questions about this FOA? Check the Frequently Asked Questions available at <http://arpa-e.energy.gov/faq>. For questions that have not already been answered, email ARPA-E-CO@hq.doe.gov (with FOA name and number in subject line); see FOA Sec. VII.A. Problems with ARPA-E eXCHANGE? Email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

Subrecipient: An entity (not an individual) that receives a subaward from the Prime Recipient to carry out part of the ARPA-E award.

Task: A task is an operation or segment of the work plan that requires both effort and resources. Each task (or sub-task) is connected to the overall objective of the project, via the achievement of a milestone or a deliverable.

Total Project Cost: The sum of the Prime Recipient share and the Federal Government share of total allowable costs. The Federal Government share generally includes costs incurred by GOGOs, FFRDCs, and GOCOs.