

Department of Energy (DOE)
Office of Energy Efficiency and Renewable Energy (EERE)

Energy-Water Desalination Hub

Funding Opportunity Announcement (FOA) Number: DE-FOA-0001905

FOA Type: Initial

CFDA Number: 81.086

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| FOA Issue Date: | December 13, 2018 |
| Informational Webinar: | January 7, 2019 |
| Submission Deadline for Concept Papers: | February 7, 2019 5:00 pm ET |
| Submission Deadline for Full Applications: | May 7, 2019 5:00 pm ET |
| Expected Submission Deadline for Replies to Reviewer Comments: | June 28, 2019 5:00 pm ET |
| Expected Date for EERE Selection Notifications: | August 2019 |
| Expected Timeframe for Award Negotiations | 90 days maximum |

- Applicants must submit a Concept Paper by 5:00pm ET the due date listed above to be eligible to submit a Full Application.
- To apply to this FOA, applicants must register with and submit application materials through EERE Exchange at <https://eere-Exchange.energy.gov>, EERE's online application portal.
- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. If an application is selected for award negotiations, it is not a commitment to issue an award. It is imperative that the applicant/selectee be responsive during award negotiations and meet negotiation deadlines. Failure to do so may result in cancelation of further award negotiations and rescission of the Selection.

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I. Funding Opportunity Description

A. Background and Context for an Energy-Water Desalination Hub

i. Energy-Water Desalination Hub Background and Purpose

Water scarcity, variability, and uncertainty are becoming more prominent, leading to potential vulnerabilities in the U.S. energy infrastructure, which depends on water for energy harvesting and electricity generation.¹ Having an adequate, suitably-treated water supply for uses ranging from everyday drinking water for citizens to farming and industrial applications is a key economic and national security issue. At the national scale, flows of energy and water are intrinsically interconnected, largely due to the characteristics and properties of water that make it so useful for producing energy and the energy requirements for treating and distributing water.

Water sources are diverse and include fresh water (surface, lake and groundwater), brackish water, seawater, produced and extracted waters and waste water.

Fresh surface, lake, and ground water constitute only 3% of the total available resources. The global population depends primarily on fresh water that is easily accessible and has low purification requirements relative to other sources. As these fresh water sources are increasingly stressed, water supplies become less reliable. Water scarcity is a major humanitarian and economic challenge that impacts all sectors of society.

Addressing today's water security issues requires the consideration of the 97% of water sources beyond fresh water that have challenging purification requirements. New energy-efficient, water-efficient, low-cost desalination technologies are needed to treat these non-traditional sources of water (i.e. brackish water; seawater; produced and extracted water; utility, industrial, municipal, and agricultural waste waters) for a variety of beneficial end uses, such as drinking water, industrial process water, and irrigation.

The purpose of this funding opportunity announcement (FOA) is to establish an Energy Innovation Hub (referred to hereafter as the Energy-Water Desalination Hub, or the Hub) to address water security issues in the U.S. For

¹ As noted in the Department of Energy's 2014 Water-Energy report, which can be found at <https://energy.gov/under-secretary-science-and-energy/downloads/water-energy-nexus-challenges-and-opportunities>

the purpose of this FOA, “desalination” more broadly includes technologies that primarily remove salts. The Hub is a critical component of the Department of Energy’s (DOE) broader Water Security Grand Challenge which will use a coordinated suite of prizes, competitions, early stage research and development (R&D), and other programs to help address the nation’s water security needs.

Specifically, the Hub will:

- Address water security needs for a broad range of stakeholders including utilities, oil and gas production, manufacturing, agriculture, states and municipalities;
- Focus on early-stage R&D for energy-efficient and low-cost desalination technologies, including manufacturing challenges, for treating non-traditional water sources for beneficial end use applications with the goal of achieving pipe parity;²
- Establish a significant, consistent, and multidisciplinary effort (i.e. using a broad set of engineering and scientific disciplines) to identify challenges and opportunities;
- Enhance the economic, environmental, and energy security of the U.S.;³ and
- Lead to fundamental new knowledge to drive energy-efficient and low-cost technological innovations to the point that industry will further develop and enable U.S. manufacturing of these new technologies to be deployed into the global marketplace.

These technology advancements represent an opportunity for domestic suppliers of water desalination systems to manufacture critical components and parts, including the design and manufacture of small-modular and large-scale systems in the U.S. Therefore, industry representatives from across the supply chain should be closely involved to provide commercial expertise and to advise on relevant problems, technical and economic targets, operating parameters, and performance metrics needed to achieve desalination across multiple application domains (e.g., industrial, energy sector, municipal, and agricultural).

Energy Efficiency and Renewable Energy (EERE) will have substantial involvement in work performed under the award made as a result of this

² Pipe parity is defined as technology solutions that are cost competitive with existing water sources and end-use applications.

³ See. Section 206(b)(1) of the Department of Energy Research and Innovation Act, P.L. 115-246, as codified at 42 U.S.C. 18632(b)(1).

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FOA. EERE does not limit its involvement to the administrative requirements of the award. Instead, EERE will have substantial involvement in the direction and redirection of the technical aspects of the project as a whole. EERE anticipates hands-on participation and involvement in the Hub. See Section VI.B.ix, Statement of Substantial Involvement, for more details.

ii. Technology Space and Strategic Goals

The strategic goal for the Hub is to advance technologies that will enable pipe parity water for a range of non-traditional water sources using energy-efficient, water-efficient, cost-competitive, and manufacturable technologies. Pipe parity water varies depending on the water source, end-use application, and technology option -- and not all of the research, data, and analysis are available in order to benchmark all cases at this time.

Purifying water from a given source for any particular need requires energy and tends to become more challenging with increasing salinity. DOE's analysis has shown that the average energy intensity to purify seawater and brackish waters to pipe parity drinking water is approximately 3.2 kilowatt hour per cubic meter (kWh per m³), (ranging between 1.6 and 4.8 kWh per m³), and costs an average \$1.50 per m³.⁴ In comparison, pipe parity drinking water production from fresh water has an average energy intensity of 0.29 kWh per m³ and costs on average \$0.50 per m³ to extract, convey and treat.⁵

Water costs are not only affected by energy costs, which can vary regionally across the nation, but also by the energy intensity, which can vary significantly. Data collected to date demonstrates the energy intensity related to water costs is approximately 0.12 kWh per m³ to approximately 2.6 kWh per m³.⁶ This is driven in large part by energy to convey the water to the point of use, attributable to variations in distance, elevation and cost of energy by location.

While the composition of seawater (~35,000 parts per million (ppm) total dissolved solids (TDS)) as a source for desalination in the U.S. varies only slightly by location, brackish sources (~ 1,000 – 10,000 ppm of TDS) have significant variability of types and concentrations of dissolved solids by

⁴ Volume 1: Survey of Available Information in Support of the Energy-Water Bandwidth Study of Desalination Systems" <http://eta-publications.lbl.gov/sites/default/files/lbnl-1006424.pdf>

⁵ LBNL-1006424, "Volume 1: Survey of Available Information in Support of the Energy-Water Bandwidth Study of Desalination Systems," 2016, <http://eta-publications.lbl.gov/sites/default/files/lbnl-1006424.pdf>

⁶ Ibid.

region/aquifer.⁷ The average energy intensity of seawater/brackish water desalination in the U.S. (3.2 kWh per m³) is approximately an order-of-magnitude greater than the average energy intensity to provide municipal supplies from fresh water sources (0.29 kWh per m³). Variations by region require a disaggregated approach to assess the geospatial variation in pipe parity.

Even more complex is the desalination of produced water, where salinity can reach as high as 30% and may contain as high as 180,000 ppm of TDS. At these TDS levels, thermal technologies may be most effective, despite significantly higher desalination energy intensities (than for seawater/brackish waters).

In 2017, the DOE's Advanced Manufacturing Office (AMO) released a study, "Bandwidth Study on Energy Use and Potential Energy Savings Opportunities in U.S. Seawater Desalination Systems" (referred to hereafter as the AMO Desalination Bandwidth Study), that examined energy consumption and potential energy savings opportunities in U.S. seawater desalination plants.⁸ The study evaluated the state of technology and energy-savings improvement potential of seawater desalination for municipal water supplies. In the U.S. this is done with reverse osmosis membrane technology. Figure 1 summarizes some of the study's results, and estimates the current energy footprint of seawater desalination in the U.S. ("Current Typical"), the current opportunity to reduce the energy footprint, if commercially available state-of-the-art technologies were deployed ("State-of-the-Art"), and the future opportunity to reduce the energy footprint, if technologies currently under R&D globally are deployed in the future to produce the same volume of water ("Practical Minimum").

⁷ USGS, Professional Paper 1833, "Brackish Groundwater in the United States," 2017, <https://pubs.usgs.gov/pp/1833/pp1833.pdf>

⁸ DOE, "Bandwidth Study on Energy Use and Potential Energy Savings Opportunities in U.S. Seawater Desalination Systems," 2017, https://www.energy.gov/sites/prod/files/2017/12/f46/Seawater_desalination_bandwidth_study_2017.pdf

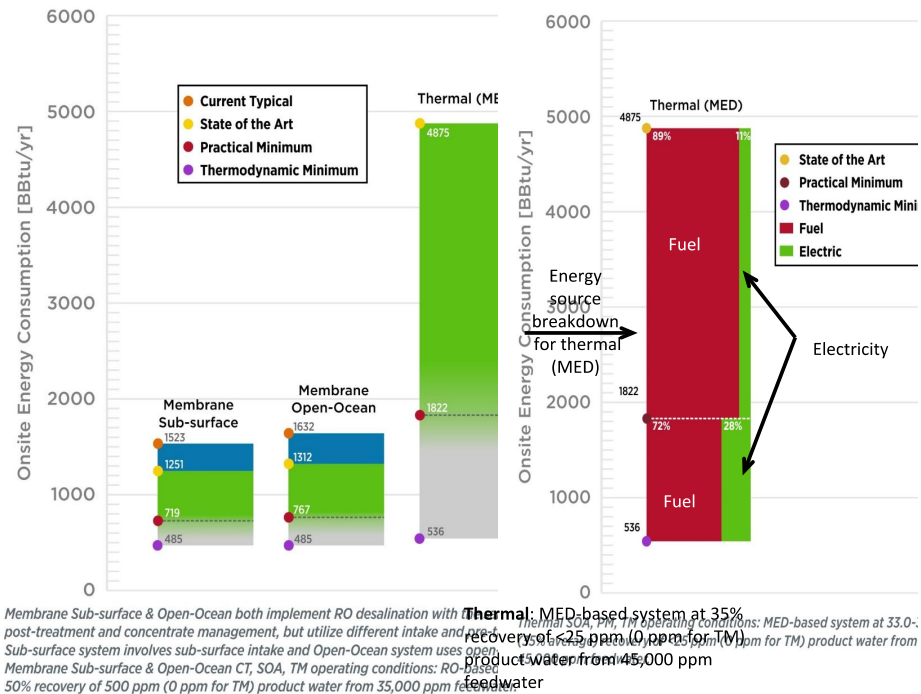


Figure 1. Results from DOE "Desalination Bandwidth Study. Note: TM = Thermodynamic Minimum; MED = Multi-Effect Distillation

This figure also shows the energy footprint if state-of-the-art thermal technologies not used in the U.S (i.e., multi-effect distillation (MED) were used instead of membrane technologies and it shows the energy source breakdown (i.e. fuel and electricity). This would result in approximately three times the current site energy consumption, mostly from on-site fuel consumption. However, while thermal technologies may not achieve the energy intensity performance of membrane technologies for seawater desalination, they can have a role where membranes are not viable, e.g., very high TDS water sources.

The AMO Desalination Bandwidth Study provides an example of the level of detail the Hub will need to assess energy usage and costs for other non-fresh water sources, applied and enabling technology options, and end use applications to achieve pipe parity, since each pathway will be inherently different. The Hub will need to perform additional analysis to evaluate and benchmark all non-fresh water sources to end use applications from a variety of innovative technologies, in order to prioritize the highest impact areas for research. Significant challenges will need to be identified and abated for energy-efficient and cost-effective desalination to be attained.

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The Hub will need to prioritize R&D, modeling, and analysis through the development of a Roadmap (see Section I.A.iv). The Roadmap will outline key water source to end use pathways to achieve the most energy/water/cost savings, based on the following performance metrics:

- Energy intensity (energy/m³ water);
- Levelized Cost of Water (\$/m³ water), including assumptions about discount rate, plant life;
- Water intensity (m³/unit of end product);
- Degree of utilization of unconventional water or energy sources, or exploiting synergies between processes/systems; and
- Water system security and resilience (risk of disruption, number of days of lost service).

iii. Hub Organization, Structure, and Operations

DOE conducted three stakeholder workshops and a Request for Information (RFI) from 2015 through 2017 and subsequently released a summary report in 2018, “Advanced Manufacturing Office Clean Water Processing Technologies Workshop Series Summary Report”.⁹ Stakeholder feedback as summarized in this report indicates that there are key technology platforms and pre-competitive areas of R&D, modeling, and analysis that cut across the water sources and sectors in an Energy-Water Desalination Hub. These shared technical challenges should be addressed in order to desalinate and clean water at the energy, cost, and other requirements comparable to today’s fresh water purification technologies. However, solutions other than those included in this report are eligible for consideration and not restricted to feedback received to date.

Based on input to date, DOE has organized the Hub into four topic areas: 1) Materials Research and Development, 2) New Process Research and Development, 3) Modeling and Simulation Tools, and 4) Integrated Data and Analysis, summarized below:

- **Materials Research and Development (R&D):** Materials R&D has the potential to improve materials used in specific components and in water treatment systems so as to improve energy efficiency and lower costs. Desalination and related water treatment technologies can benefit from materials improvements for a range of products,

⁹“Advanced Manufacturing Office Clean Water Processing Technologies Workshop Series Summary Report,” DOE <https://www.energy.gov/sites/prod/files/2018/03/f49/CW%20Workshop%20Series%20Report-Summary.pdf>

including membranes, pipes, tanks and pumps that dramatically increase their performance, efficiency, longevity and are durable and corrosion resistant.

- **New Process Research and Development:** Novel technology processes and system design concepts are needed to improve energy efficiency and lower costs for water treatment, including new technologies related to water pre-treatment systems (e.g., upstream from the desalination unit operation). New process technologies are also needed to address associated challenges such as water reuse, water efficiency, and high-value co-products.
- **Modeling and Simulation Tools:** Multi-scale models and simulation tools are needed to inform the R&D via performance forecasting, design optimization, and operation of desalination technologies and related water-treatment systems that will lead to improved energy efficiency and lower cost.
- **Integrated Data and Analysis:** In order to consistently define, track, and achieve pipe parity in the highest impact areas, central, strategic, non-biased, integrated data and analysis is needed to align the Hub's project-level activities in each of the four topic areas to the Hub goals and to measure technical success of both project-level activities and the overall Hub. There is also a need to develop information resources, studies, and analysis tools necessary to guide the Hub's strategic R&D portfolio.

The intent of this approach is to assemble the most highly qualified experts across the breadth and scope of the Hub's four topic areas. An ideal Hub application would include multi-disciplinary experts from across industry, manufacturers, university, non-profits, Federally Funded Research and Development Centers (FFRDC), states and municipalities, as well as other key stakeholders with expertise in advanced energy technology applicable to the Energy-Water Desalination Hub.

DOE intends to select and fund one application with the greatest likelihood of achieving the goals of all four topics of this FOA. The applicant selected will negotiate one award with DOE for all Hub activities. DOE will be substantially involved in the management of the award and in the establishment and operations of the Hub, as described in Section VI.B.ix Statement of Substantial Involvement. In selecting an application, DOE may fund the full scope of an application or fund a portion of the project scope of an application at a funding level that will be negotiated with the applicant.

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Applicants should further refine the technical challenges and opportunity space for desalination technologies in their applications. Applicants should identify the necessary R&D, modeling, and analysis activities, as well as the technical targets and performance metrics, to meet the Hub's strategic goal of pipe parity. To assist applicants as a starting point for further refinement, DOE has included an illustrative example of the technology opportunity space synthesized from the three workshops and RFI, included in Appendix B, though additional technologies and ideas will be considered.

iv. Development of a Roadmap

The Applicant will identify R&D, modeling, and analysis activities which will be further informed by the Hub's roadmapping activities that will be undertaken during the Hub's first year to identify and prioritize the highest impact areas from early-stage to applied R&D for a range of water sources, technology options, and beneficial end-uses. Applicants should include their vision for the development of a Roadmap including how the applicant has the subject matter expertise, resources, and facility capabilities to address the technical challenges and opportunities in the four topic areas.

As an outcome of roadmapping, the Hub will identify specific R&D, modeling and analysis activities and technical targets that align with the Roadmap priorities that would be negotiated with DOE into Budget Periods 2-5. The Hub will develop a consistent process to compete and select projects (e.g., Request for Proposal (RFP) process) to be recommended to DOE for negotiations into the award.

Note, the Hub's scope and budget are subject to change after Budget Period 1 based on year-to-year progress of the Hub's activities and project portfolio as well as ongoing alignment of the Hub's capabilities and expertise to the Roadmap priorities. See Section VI.B.xx Go/No-Go Reviews for more information.

v. Hub Consortium Agreement

The Hub should be a consortium of multi-disciplinary experts from across industry, manufacturers, universities, non-profits, FFRDCs, states and municipalities, as well as other key stakeholders with expertise in advanced energy technology applicable to the Energy-Water Desalination Hub. Please see Section III Eligibility for specific eligibility information. The intent of this

approach is to assemble the most highly qualified experts across the breadth and scope of the Hub's topic areas of interest.

The Hub must work closely with its members and DOE to establish and operate a coordinated Energy-Water Desalination Hub. To facilitate this collaboration, the Hub must operate subject to a binding consortium agreement entered into by each member of the consortium. The consortium agreement must document the partnership agreement and define the governance and management structure of the Hub.

As part of the Full Application, each applicant must submit a proposed consortium agreement (see Section IV.D.xvii.), such as an articles of collaboration, or similar agreement (See Appendix G for more information on the elements of a consortium agreement). It is expected that the applicant will have circulated the proposed consortium agreement amongst its proposed members prior to submitting it to DOE. Further, the binding consortium agreement must be in place before an award can be made.

The Hub must operate as a nonprofit organization.

vi. Required Actions Prior to Award

Before DOE can issue an award under this FOA, the following actions related to the Hub's governance and management documents need to be completed. As further described in Appendix G, one of the activities includes putting a binding consortium agreement in place. Some of the actions described below will be separate plans incorporated into the consortium agreement by reference or, in lieu of creating a separate plan, they may be included as specific provisions in the agreement itself. The Hub and its members have some flexibility to determine what structure makes sense for a particular Hub. Note, the agreement and associated documents are subject to DOE review and approval. Because the activities listed below are required prior to the issuance of an award and are not part of the activities performed under the award, the costs associated with these activities are not allowable for reimbursement (or allowable as cost share) under the award.

The following agreements, plans and procedures must be completed and in place prior to DOE issuing an award:

- Binding consortium agreement that documents (a) the partnership between the Hub members and (b) the Hub's governance and management structure;
- Conflict of Interest (COI) procedures with a consistent approach to identifying and mitigating COIs across the Hub and in agreement with DOE's procedures. See Appendix E – Key Elements of a COI Plan and Section VI.B.xii for more information;
- Intellectual Property Management Plan (IPMP) between the Hub and the members per Section VI.B.x;
- Final Data Management Plan for sharing data and software tools across the Hub and with the public;
- Export Control Plan for the Hub;
- Communications Plan for the Hub;
- Updated COI Statement as per Section VI.B.xi (due no later than seven (7) business days after notice of selection for award negotiations); and
- Foreign Entity Participation Plan per Section VI.B.xv.

vii. Expected Hub Activities During Budget Period 1

During the Hub's first year of operation, the Hub will work on a Roadmap and a number of start up activities with DOE as follows:

- Identify key representatives to participate in Hub meetings with DOE;
- Work closely with DOE to create, develop and make available to the public a Roadmap with prioritized R&D, modeling, and analysis activities;
- Develop and execute a competitive RFP process to solicit and secure new projects that support the Roadmap priorities;
- Map specific R&D, analysis, and modeling projects into the Roadmap;
- Develop project-level technology baselines, performance metrics, and technical targets that align with the Hub goal of pipe parity;
- Establish consistent guidelines, policies, agreements, processes, and strategy documents for the Hub, including but not limited to a conference management directive as discussed in Appendix H;
- Identify joint projects and develop a plan for implementation across the Hub;
- Support the Integrated Data and Analysis topic area in the development of consistent technology baselines, performance

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metrics, and technical targets to define and achieve pipe parity that will be used across the Hub; and

- Develop a continuation application with DOE for incorporating specific R&D, analysis, and modeling projects' scopes of work and budgets into the award for Budget Periods 2 including scope that will continue into Budget Periods 3, 4 and 5.

viii. Expected Hub Activities During Budget Periods 2 – 5

In subsequent budget periods, the Hub will work in a collaborative manner on R&D, modeling, and analysis priorities defined by the Roadmap and provide progress updates. The Hub will provide data to update the Roadmap, based on the outcomes of R&D, modeling, and analysis activities.

The Hub will provide a detailed outline and budget estimate for the R&D, modeling, and/or analysis activities for the remainder of the project period (Budget Periods 2-5). Note, the Hub's scope and budget are subject to change after Budget Period 1 based on year-to-year progress of the activities and project portfolio as well as ongoing alignment of the capabilities and expertise to the Roadmap priorities.

The Roadmap and supporting analysis conducted by the Integrated Data and Analysis topic area will track technological progress and inform how the Hub is performing against the technical baseline, track technological progress to targets, and performance metrics identified in this FOA and further developed during roadmapping to achieve pipe parity. DOE will use this information to assess how the Hub should adjust R&D, modeling, and analysis priorities. See Section VI.B.xx Go/No-Go Reviews for more information.

The DOE and Hub will work together to maintain a single Roadmap for the Hub as progress is made and various aspects evolve. The Hub must align and map R&D, modeling, and analysis activities and projects into the Roadmap.

Data and software tools generated by the R&D, modeling, and analysis activities conducted by Hub members must be shared with other members and, ultimately, the public. The data and software tools will be used by the Integrated Data & Analysis area to evaluate the Hub's R&D, modeling, and analysis activities and to disseminate the results of the Hub activities within the Hub and to the public. This includes updates to technology baselines, technological targets, and the Roadmap.

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Below is a more detailed description of the Hub's four topic areas. Applicants will apply to the entire Hub by submitting an application that addresses all four of the topic areas and the other requirements discussed in this section. DOE intends to select and fund one applicant with the greatest likelihood of achieving the goals of the FOA. For a description of what should be included in a Hub application, see Section IV.D.ii Technical Volume.

B. Topic Areas of the Energy-Water Desalination Hub

There are four interdependent topic areas for the Energy-Water Desalination Hub: 1) Materials Research and Development, 2) New Process Research and Development, 3) Modeling and Simulation Tools, and 4) Integrated Data and Analysis. Applicants are expected to develop their plan of work to address the progress they can make in these four topic areas as a portfolio of activities within the Hub. Other activities may be proposed, provided they are justified as being relevant to the Hub. All work under EERE funding agreements must be performed in the United States. See Section IV.J.iii and Appendix C.

Materials Research and Development:

Materials discovery has the potential to improve the performance and longevity of various components and processes in desalination applications, including water treatment, separations technologies, piping, tankage and pumps. This includes materials discovery for new processing technologies, such as improved membranes with high permeability that do not sacrifice water quality (i.e., highly selective membranes) and are resistant to fouling. Additional material needs are for pipes, tanks, and pumps that do not corrode and can withstand higher pressures and offer lower friction.

Materials innovations could improve heat transfer properties and thermal management in water purification desalination technologies. Opportunities to develop next generation heat exchanger materials could use lower cost materials leading to lower cost compact heat exchangers, as well as innovations to reduce chemical scaling on heat exchanger surfaces.

Advanced manufacturing technologies can be implemented towards the production of low cost and reliable water purification components. Structural materials such as piping systems that are lighter, stronger, and longer-lasting; that eliminate or greatly reduce the development of biofilms, corrosion, and scaling; and that cost less and are more efficient than currently used technologies are needed. There are several technologies being investigated

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to enable this, some of which were highlighted in the Multi-Year Program Plan (MYPP) published by the DOE Advanced Manufacturing Office.¹⁰ Such technologies include roll-to-roll processing, smart manufacturing, electrotechnologies, additive manufacturing, materials for harsh service conditions and others.

Technology solutions will not be limited to those identified in the MYPP. R&D in these new materials will be validated in industrially-relevant, integrated systems and provide data or other information in coordinated interface tasks and activities with other topic areas in the Hub as outlined in the roadmapping effort that would be conducted during Budget Period 1.

New Process Research and Development:

Novel technology concepts at lower cost and lower energy are needed for water desalination as well as treatment, water reuse, water efficiency, water replacements, and high-value co-products. This R&D will enable use of more water resources for industrial, agricultural, utility, and municipal end uses – including sources such as produced and extracted waters; seawater and brackish groundwater; and other non-traditional water sources.

To do this, a molecular level understanding of the complexity of non-traditional water sources is needed to inform approaches to their treatment through physical, chemical, or biological processes. The scope of this topic area includes the recovery of potentially valuable waste streams for co-product development. Additionally, the scope of this topic area includes advanced technologies needed for sensors and controls used in water purification systems.

Process control and monitoring are essential to enable optimal system-wide performance (intake, purification, power supply). It is desired to have energy-efficient, cost-effective, real-time, in-situ monitoring and control of water at all processing stages. Sensing of contaminant levels and types, temperature, pressure, and other operating parameters is critical to improve component resilience towards fouling, corrosion, clogging and allows for operation under optimized conditions for a given location, time, or water source.

¹⁰ DOE, “Advanced Manufacturing Office Multi-Year Program Plan for Fiscal Years 2017 through 2021,” 2016, https://www.energy.gov/sites/prod/files/2017/01/f34/Draft%20Advanced%20Manufacturing%20Office%20MYPP_1.pdf

Water purification can be optimized utilizing tools akin to those being developed for manufacturing processes in the Smart Manufacturing Section of the MYPP published by the DOE Advanced Manufacturing Office.¹¹ Water optimization tools are not be limited to those identified in the MYPP.

Data collection and analysis from sensors will be required for thorough process model development for feedback and enabling of dynamic adjustments for process optimization. Sensing and control components could also be a vital tool for optimizing performance and energy consumption. If multiple energy sources are used (solar, waste heat, grid), the variability may need to be compensated for in a smart way (e.g., sensing to schedule maintenance and part replacement resulting in more efficient operations and reduced down time).

This topic area also includes water efficiency improvements or water replacements in industrial, agricultural, utility, and municipal sectors. R&D of these novel technologies will be validated in industrially relevant, integrated systems and provide data or other information through interface tasks and activities with the other topic areas in the Hub as outlined in the roadmapping effort.

Modeling and Simulation Tools:

Multi-scale models to simulate processes need to be developed to predict performance and optimize design of new technology approaches. This work will ultimately provide feedback to researchers that will enable better quality and more cost effective materials and process development. The coupling of experimental outputs for multi-scale modeling is needed to assess R&D results and inform future R&D. The development of these experimental data-driven models are needed to understand and describe the properties and behaviors of complex processing systems.

Aqueous solution modeling and simulation tools can inform the Hub's ongoing and future R&D that will lead to advances in new energy-efficient and low-cost materials, separations, and other advanced processes for desalination. Multi-scale modeling is expected to extend from fundamental materials and process advancements to system-scale modeling that can address technology options at scale.

¹¹ See the Smart Manufacturing section in the AMO Multi-Year Program Plan, available here: <https://energy.gov/eere/amo/downloads/advanced-manufacturing-office-amo-multi-year-program-plan-fiscal-years-2017>

System-scale modeling is needed to assess the economies-of-scale implications of modular system designs versus large centralized system designs. The broader systems modeling and simulation will be expected to include system advances and technology integration implications resulting from advances in processes such as separations and treatment; fluids pumping; heat transfer and heat integration; and smart technologies.

It is of paramount importance that the Hub manage the interconnectedness of this topic area to provide data or other information through interface tasks and activities with the other topic areas in the Hub as outlined in the roadmapping effort.

As a condition for funding, an applicant must agree to make any model or simulation tool developed under the award available to the public through an open source license. DOE can approve an alternative to an open source license if the applicant can demonstrate that it has another method that would promote the dissemination and use of the modeling and simulation tools. As discussed in Section IV.D.xv, the Data Management Plan submitted with the application must discuss the applicant's plan for making the modeling and simulation tools available to the public.

Integrated Data and Analysis:

In order to consistently define, track, and achieve pipe parity performance metrics for desalination in the highest impact areas, central, strategic, non-biased, integrated data and analysis is needed to track the project level technical targets and the overall Hub performance metrics, and thus the Hub's success.

Key performance metrics such as energy efficiency, water efficiency, and cost listed in Section I.A.ii Technology Space and Strategic Goals are critical to planning, developing, tracking, and decision making by DOE and the Hub. The scope of this topic area includes developing state of technology baselines for each of the highest impact pathways, which will be used to identify the Hub's R&D, modeling, and analysis priorities during roadmapping. There is also a need to develop information resources, studies, and analysis tools necessary to guide the Hub's strategic R&D portfolio.

It is critical that technology roadmapping include integrated analysis to assess not only material and new process technologies separately, but their collective impact as pathways through the Hub; therefore, these efforts will

require close coordination with the modeling and simulation activities. As such, the Integrated Data and Analysis technical focus area will also be responsible for supporting the Roadmap efforts.

The integrated data and analysis effort will be used to inform Hub decisions in the evaluation of the R&D, modeling, and analysis portfolio by tracking project level technical targets and performance metrics (for Individual Hub Activity Go/No-Go decisions made by DOE) using a consistent methodology and identifying R&D, modeling, and analysis gap areas. Given the interconnectedness of this topic area, interface tasks and activities will be coordinated with other topic areas in the Hub and DOE as outlined in the roadmapping effort.

The Hub's Integrated Data and Analysis topic area will share data and software tools developed with DOE and the public. The Integrated Data and Analysis topic area must develop the means for effectively receiving and sharing data and tools with the Hub, DOE, and the public.

An effective application will address the challenges and opportunities related to desalination, as described in Section I.A. To achieve pipe parity, the Hub will need to prioritize R&D, modeling, and analysis through the development and publication of a Roadmap, outlining key water resources to end use pathways to achieve the most energy/water/cost savings, based on the performance metrics outlined in Section I.A.ii. Technology Space and Strategic Goals. Specifically, the applicant must explain how the activities in each topic area would address the scientific and technical challenges to advance the current state of technology for low-cost, energy-efficient desalination for a broad set of water source to end use applications. The applicant must develop technology baselines, performance metrics, and technical targets for the specific activities conducted in the topic areas that align with the Hub's goal to achieve pipe parity.

An effective application will include multi-disciplinary experts from industry, manufacturers, universities, non-profits, FFRDC, states, municipalities, and other key stakeholders with expertise in advanced energy technology applicable to the Energy-Water Desalination Hub that have the facility capabilities, and expertise to address the broad set of challenges. See Section III for specific eligibility information. The applicant must propose a governance and management structure, including technical leadership positions, for the Hub. This should include key representatives to participate in coordinating R&D, analysis and modeling activities across the Hub and with DOE.

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The Hub must develop a consistent RFP process that will be used across the Hub to compete projects to address high priority R&D, modeling, and/or analysis identified in the Roadmap. This process should be discussed and agreed to by the Hub and DOE. An effective RFP process will have the flexibility to adjust activities based on the Roadmap.

The Hub must agree to work cooperatively with other members in order to create an innovation ecosystem in the energy-water community. The application must include a proposed consortium agreement that documents the key elements of the consortium's partnership and defines the governance and management structure for the Hub (see Appendix G for further guidance). Among other things, the Hub members must agree to share data and software tools resulting from the R&D, modeling, and analysis activities under the award with the other Hub members, DOE, and the public. An effective application will explain how the data and tools will be received and shared with the Hub, DOE, and the public, through newly created or existing repositories and protocols.

The Hub must agree to work with members on general coordination activities including convening Hub related workshops and meetings, developing overall communications and publications, organizing quarterly technical updates of R&D, modeling, and analysis to assess progress against Roadmap priorities. The Hub must agree to work with subrecipients to establish consistent project-level reviews, tracking and reporting of progress and with members to establish consistent guidelines, policies, agreements, processes, and strategic documents for the Hub.

C. Teaming Partner List

An effective application will include multi-disciplinary experts from industry, manufacturers, universities, non-profits, FFRDCs, states, municipalities, and other key stakeholders with expertise in advanced energy technology applicable to the Energy-Water Desalination Hub that have the facility capabilities, and expertise to address the broad set of challenges.

EERE is compiling a Teaming Partner List to facilitate the widest possible national participation in the formation of the Hub for this FOA. The list allows organizations who may wish to participate in an application, but do not wish to apply as the Prime applicant to the Hub, to express their interest to potential applicants and to explore potential partners.

The Teaming Partner List will be available on EERE Exchange at <https://eere-Exchange.energy.gov> under FOA DE-FOA-0001905 during the time of its release through its closing. The Teaming Partner List will be updated at least weekly until the close of the Full Application period, to reflect new Teaming Partners who have provided their information. Any organization that would like to be included on this list should submit the following information to AMOWaterHub@ee.doe.gov, with the subject line “Teaming Partner Information”:

Organization Name, Contact Name, Contact Address, Contact Email, Contact Phone, Organization Type, Area of Technical Expertise, and Brief Description of Capabilities.

By submitting a request to be included on the Teaming Partner List, the requesting organization consents to the publication of the above-referenced information. By facilitating this Teaming Partner List, EERE does not endorse or otherwise evaluate the qualifications of the entities that self-identify themselves for placement on the Teaming Partner List. EERE will not pay for the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

D. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (See Section III.D of the FOA):

- Applications that fall outside the technical parameters specified in Section I.A and I.B of the FOA.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Applications that are outside Technology Readiness Levels (TRL) 2 – 4. See Appendix I for more information.
- Applications that only propose a single R&D project. As an example – an application that only includes one R&D project such as for a specific membrane technology for desalination to be conducted by a single Principal Investigator.

E. Authorizing Statutes

The programmatic authorizing statute is section 206 of the Department of Energy Research and Innovation Act, codified at 42 U.S.C. § 18632.

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Awards made under this announcement will fall under the purview of 2 Code of Federal Regulation (CFR) Part 200 as amended by 2 CFR Part 910.

II. Award Information

A. Award Overview

i. Estimated Funding

EERE expects to make a total of approximately \$100,000,000 of Federal funding available for one new five year award under this FOA, subject to the availability of appropriated funds.

EERE will establish 5 budget periods for the award, however only funding for Budget Period 1 will be authorized initially. Budget Period 1 will have a duration of approximately 12 months of the overall 5 year project period. The first budget period will provide resources, including supporting analysis, for roadmapping and other efforts to identify near and longer term R&D, modeling, and analysis efforts to be conducted by the Hub.

The following activities must not be included in the Statement of Project Objectives (SOPO) or budget for Budget Period 1: Any costs associated with the formation of an entity to become the Prime Recipient, including the entity's policies and procedures or with the formation of an accounting system. These activities must be completed before or during negotiations and must be in place prior to the Contracting Officer approving the award.

Applicants must propose a budget and SOPO to accomplish Budget Period 1 activities as discussed in Section I.A. Applicants should include a high level summary for the following 12 month (approximate) budget period for proposed initial technical work (Budget Period 2) (subject to change based on roadmapping outcomes). In addition, the application should include an outline of the SOPO and budget for the remaining budget periods (Budget Periods 3-5). All budget periods will be 12 months (approximate) in length. Additional detail will be required in the proposed SOPO and budget submitted as part of the continuation application required 90 days prior to the end of each budget period.

A total of up to \$20,000,000 in Federal funds is anticipated to be available for the award for each budget period. Funding for Budget Periods 2-5 is not

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guaranteed. Before the expiration of each budget period, EERE will perform a Project-Wide Go/No-Go decision review (See Section VI.B.xx).

The Hub's continuation applications must include proposed R&D, modeling, and analysis activities that align with the Roadmap priority areas. R&D, modeling, and analysis activities proposed that are not deemed high priority as a result of roadmapping would be re-scoped or removed.

ii. Period of Performance

EERE anticipates making one award that will run up to 60 months in length, comprised of multiple budget periods. Project continuation will be contingent upon satisfactory performance and the outcome of the Project-Wide Go/No-Go decision review. At the Project-Wide Go/No-Go decision point, EERE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, alignment to the Roadmap and overall contribution to the program goals and objectives. As a result of this evaluation, EERE will make a determination to continue funding the project, recommend re-direction of work under the project, place a hold on Federal funding for the project, or discontinue funding the project.

iii. New Applications Only

EERE will accept only new applications under this FOA. EERE will not consider applications for renewals of existing EERE-funded awards through this FOA.

B. EERE Funding Agreements

Through a Cooperative Agreements and other similar agreements, EERE provides financial and other support to projects that have the potential to realize the FOA objectives. EERE does not use such agreements to acquire property or services for the direct benefit or use of the United States Government.

i. Cooperative Agreements

EERE generally uses Cooperative Agreements to provide financial and other support to the Prime Recipient.

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

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EERE has substantial involvement in all projects funded via Cooperative Agreements. See Section VI.B.ix of the FOA for more information on what substantial involvement may involve.

ii. Funding Agreements with FFRDCs

In most cases, FFRDCs are funded independently of the Hub. The FFRDC then executes an agreement with any non-FFRDC Hub members to arrange work structure, project execution, and any other matters. Regardless of these arrangements, the entity that applied as the Prime Recipient for the project will remain the Prime Recipient for the project.

III. Eligibility Information

To be considered for substantive evaluation, an applicant's submission must meet the criteria set forth below. If the application does not meet these eligibility requirements, it will be considered ineligible and removed from further evaluation.

A. Eligible Applicants

As described above, the Hub is intended to be a consortium of multi-disciplinary experts. All members of the Hub consortium must meet the definition of "Qualifying Entities" provided in Section III.A.ii. The consortium does not need to be formally incorporated as a legal entity. If the consortium is an unincorporated group of qualifying entities working together, the consortium must designate one member to serve as the Prime Recipient/consortium lead. The consortium lead must be the entity that submits the Full Application. The Prime Recipient/consortium lead must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States.

If the applicant is an incorporated consortium or formally organized consortium, the consortium must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States. The applicant must provide a copy of the articles of incorporation or other organization documents with its Full Application.

i. Consortium

The Hub must be established and operated by a consortium of qualifying entities. To be eligible to receive an award for the establishment and

operation of the Hub, a consortium must:

1. Be composed of not fewer than two qualifying entities, as defined below;
2. Operate subject to a binding agreement, entered into by each member of the consortium; and
3. Operate as a nonprofit organization.

Each applicant must provide its proposed consortium agreement as part of its Full Application that addresses the elements stated in Appendix G. The binding consortium agreement does not need to be executed at the application stage, but it must be in place before an award can be made.

ii. Qualifying Entities

The term “qualifying entities” includes:

1. An institution of higher education;
2. An appropriate State or Federal entity, including a DOE/NNSA Federally Funded Research and Development Center (FFRDC);
3. A nongovernmental organization with expertise in advanced energy technology research, development, demonstration, or commercial application related to the Energy-Water Desalination Hub; or
4. Any other relevant entity the Secretary determines appropriate.

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.

iii. Foreign Entities

The Prime Recipient, subrecipients and Hub members must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States. If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the Prime Recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

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Foreign entities may request a waiver of the requirement to designate a subsidiary in the United States as the Prime Recipient in the Full Application (i.e., a foreign entity may request that it remains the Prime Recipient on an award). To do so, the applicant must submit an explicit written waiver request in the Full Application. Likewise, if the applicant seeks to include a foreign entity as a subrecipient or Hub member, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient or Hub member.

Appendix C lists the necessary information that must be included in a Foreign Entity Participation waiver request. The applicant and any proposed subrecipients do not have the right to appeal EERE's decision concerning a waiver request.

B. Cost Sharing

The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 2 CFR 200.306 and 2 CFR 910.130 for the applicable cost sharing requirements.)

To assist applicants in calculating proper cost share amounts, EERE has included a cost share information sheet as Appendix A to this FOA.

i. Legal Responsibility

Although the cost share requirement applies to the project as a whole, including work performed by members of the Hub other than the Prime Recipient, the Prime Recipient is legally responsible for paying the entire cost share. The Prime Recipient's cost share obligation is expressed in the Assistance 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 project period, 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 Hub and enforcing cost share obligation assumed by Hub members in subawards or related agreements.

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ii. Cost Share Allocation

Each Project is free to determine how best to allocate the cost share requirement among the members. The amount contributed by individual Project members may vary, as long as the cost share requirement for the project as a whole is met.

iii. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.J.i of the FOA. In addition, cost share must be verifiable if an applicant is selected for award negotiations. Verifiable cost share upon submission of the Full application is encouraged, but not required.

Projects may provide cost share in the form of cash or in-kind contributions. Cost share may be provided by the Prime Recipient, Subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/Contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Cash contributions include, but are not limited to: personnel costs, fringe costs, supply and equipment costs, indirect costs and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include, but are not limited to: the donation of volunteer time or the donation of space or use of equipment.

Projects may use funding or property received from state or local governments to meet the cost share requirement, so long as the funding 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 including, but not limited to:

- Revenues or royalties from the prospective operation of an activity beyond the project period;
- 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.

Projects 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. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same Federal regulations as Federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 for additional guidance on cost sharing.

iv. Cost Share Contributions by FFRDCs

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 another non-Federal source.

v. Cost Share Verification

Applicants are encouraged to provide written assurance of their proposed cost share contributions in their Full Applications.

Upon selection for award negotiations, applicants are required to provide additional information and documentation regarding their cost share contributions, including cost share commitment letters. Please refer to Appendix A of the FOA.

vi. Cost Share Payment

EERE requires the Prime Recipient to contribute the cost share amount incrementally over the life of the award. Specifically, the Prime Recipient's cost share for each billing period must always reflect the overall cost share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost sharing percentage negotiated). As FFRDC funding will

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be provided directly to the FFRDC(s) by DOE, the Prime Recipient will be required to provide project cost share at a percentage commensurate with the FFRDC costs, on a budget period basis, resulting in a higher interim invoicing cost share ratio than the total award ratio.

In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. Regardless of the interval requested, the Prime Recipient must be up-to-date on cost share at each interval. Such requests must be sent to the Contracting Officer during award negotiations and include the following information: (1) a detailed justification for the request; (2) a proposed schedule of payments, including amounts and dates; (3) a written commitment to meet that schedule; and (4) such evidence as necessary to demonstrate that the Prime Recipient has complied with its cost share obligations to date. The Contracting Officer must approve all such requests before they go into effect.

C. Compliance Criteria

Concept Papers and Full Applications must meet all compliance criteria listed below or they will be considered noncompliant. EERE will not review or consider noncompliant submissions, including Concept Papers, Full Applications, and Replies to Reviewer Comments that were: submitted through means other than EERE Exchange; submitted after the applicable deadline; and/or submitted incomplete. EERE will not extend the submission deadline for applicants that fail to submit required information due to server/connection congestion.

i. Compliance Criteria

1. Concept Papers

Concept Papers are deemed compliant if:

- The Concept Paper complies with the content and form requirements in Section IV.C of the FOA; and
- The applicant successfully uploaded all required documents and clicked the "Submit" button in EERE Exchange by the deadline stated in this FOA.

2. Full Applications

Full Applications are deemed compliant if:

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- The applicant submitted a compliant Concept Paper;
- The Full Application complies with the content and form requirements in Section IV.D of the FOA; and
- The applicant successfully uploaded all required documents and clicked the “Submit” button in EERE Exchange by the deadline stated in the FOA.

3. Replies to Reviewer Comments

Replies to Reviewer Comments are deemed compliant if:

- The Reply to Reviewer Comments complies with the content and form requirements in Section IV.E of the FOA; and
- The applicant successfully uploaded all required documents to EERE Exchange by the deadline stated in the FOA.

D. Responsiveness Criteria

All “Applications Specifically Not of Interest,” as described in Section I.D of the FOA, are deemed nonresponsive and are not reviewed or considered.

E. Other Eligibility Requirements

i. Requirements for DOE/ National Nuclear Security Agency (NNSA) Federally Funded Research and Development Centers (FFRDC) Listed as the Applicant

A DOE/NNSA FFRDC is eligible to apply for funding under this FOA if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application.

In addition to the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application in order to be eligible to apply for funding under this FOA.

The following wording is acceptable for the authorization:

Authorization is granted for the [Enter Laboratory Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the

laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory.
(end of acceptable authorization)

If a DOE/NNSA FFRDC is selected for award negotiation, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract.

ii. Requirements for DOE/NNSA and non-DOE/NNSA Federally Funded Research and Development Centers Included as a Subrecipient

DOE/NNSA and non-DOE/NNSA FFRDCs may be proposed as a Subrecipient on another entity's application subject to the following guidelines:

1. Authorization for non-DOE/NNSA FFRDCs

The Federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with its authority under its award.

2. Authorization for DOE/NNSA FFRDCs

The cognizant Contracting Officer for the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application.

In addition to the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application.

The following wording is acceptable for this authorization:

Authorization is granted for the [Enter Laboratory Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory.

3. Value/Funding

The value of and funding for the FFRDC portion of the work will not normally be included in the award to a successful applicant. Usually, DOE

will fund a DOE/NNSA FFRDC contractor through the DOE field work proposal system and non-DOE/NNSA FFRDC through an interagency agreement with the sponsoring agency.

4. Cost Share

Although the FFRDC portion of the work is usually excluded from the award to a successful applicant, the applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's and the FFRDC's portions of the project.

5. Responsibility

The Prime Recipient will be 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 the FFRDC contractor.

6. Limit on FFRDC Effort

The scope of work to be performed by the FFRDC may not be more significant than the scope of work to be performed by the applicant.

F. Limitation on Number of Concept Papers and Full Applications Eligible for Review

An entity may only submit one Concept Paper and Full Application for this FOA. If an entity submits more than one Concept Paper and Full Application, EERE will request a determination from the applicant's authorizing representative as to which application should be reviewed. Any other submissions received listing the same entity as the applicant will not be eligible for further consideration. This limitation does not prohibit an applicant from collaborating on other applications (e.g., as a potential subrecipient or partner) so long as the entity is only listed as the applicant on one Concept Paper and Full Application submitted under this FOA.

G. Questions Regarding Eligibility

EERE will not make eligibility determinations for potential applicants prior to the date on which applications to this FOA must be submitted. The decision whether to submit an application in response to this FOA lies solely with the applicant.

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Problems with EERE Exchange? Email EERE- EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.

IV. Application and Submission Information

A. Application Process

The application process will include two phases: a Concept Paper phase and a Full Application phase. **Only applicants who have submitted an eligible Concept Paper will be eligible to submit a Full Application.** At each phase, EERE performs an initial eligibility review of the applicant submissions to determine whether they meet the eligibility requirements of Section III of the FOA. EERE will not review or consider submissions that do not meet the eligibility requirements of Section III. All submissions must conform to the following form and content requirements, including maximum page lengths (described below) and must be submitted via EERE Exchange at <https://eere-exchange.energy.gov/>, unless specifically stated otherwise. **EERE will not review or consider submissions submitted through means other than EERE Exchange, submissions submitted after the applicable deadline, or incomplete submissions.** EERE will not extend deadlines for applicants who fail to submit required information and documents due to server/connection congestion. A control number will be issued when an applicant begins the EERE Exchange application process. This control number must be included with all application documents, as described below.

The Concept Paper, Full Application, and Reply to Reviewer Comments must conform to the following requirements:

- Each must be submitted in Adobe PDF format unless stated otherwise;
- Each must be written in English;
- All pages must be formatted to fit on 8.5 x 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 point or larger (except in figures or tables, which may be 10 point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement;
- 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; and
- Each submission must not exceed the specified maximum page limit, including cover page, charts, graphs, maps, and photographs when printed using the formatting requirements set forth above and single spaced. If

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applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages.

Applicants are responsible for meeting each submission deadline. **Applicants are strongly encouraged to submit their Concept Papers and Full 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 Concept Paper, Full Application, or Reply to Reviewer Comments. Once the Concept Paper, Full Application, or Reply to Reviewer Comments is submitted in EERE Exchange, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit the Concept Paper, Full Application, or Reply to Reviewer Comments before the applicable deadline.

EERE urges applicants to carefully review their Concept Papers, and Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V.A.ii of the FOA.

i. Additional Information on EERE Exchange

EERE Exchange is designed to enforce the deadlines specified in this FOA. The “Apply” and “Submit” buttons will automatically disable at the defined submission deadlines. Should applicants experience problems with EERE Exchange, the following information may be helpful.

Applicants that experience issues with submission PRIOR to the FOA deadline: In the event that an applicant experiences technical difficulties with a submission, the applicant should contact the EERE Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The EERE Exchange helpdesk and/or the EERE Exchange system administrators will assist applicants in resolving issues.

Applicants that experience issues with submissions that result in late submissions: In the event that an applicant experiences technical difficulties so severe that they are unable to submit their application by the deadline, the applicant should contact the EERE Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The EERE Exchange helpdesk and/or

the EERE Exchange system administrators will assist the applicant in resolving all issues (including finalizing submission on behalf of and with the applicant's concurrence). Please note, network traffic is at its heaviest during the final hours and minutes prior to submittal deadline. Applicants who experience this during the final hours or minutes and are unsuccessful in uploading documents will not be able to use this process.

B. Application Forms

The application forms and instructions are available on EERE Exchange. To access these materials, go to <https://eere-Exchange.energy.gov> and select the appropriate funding opportunity number DE-FOA-0001905.

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_Project_Part_1
ControlNumber_LeadOrganization_Project_Part_2

C. Content and Form of the Concept Paper

To be eligible to submit a Full Application, applicants must submit a Concept Paper by the specified due date and time.

i. Concept Paper Content Requirements

EERE will not review or consider ineligible Concept Papers (see Section III of the FOA).

The ideas and technologies proposed in a Concept Paper must all be relevant to the objectives of the FOA for Energy-Water Desalination Hub as described in Section I of the FOA.

The Concept Paper must conform to the following content requirements:

| Section | Page Limit | Description |
|------------|----------------|--|
| Cover Page | 1 page maximum | The cover page should include the project title, both the technical and business points of contact, names of all member organizations, and any statements regarding confidentiality. |

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| Technical Description and Impacts | 5 pages maximum | <p>Applicants are required to describe succinctly:</p> <ul style="list-style-type: none"> • The key technical opportunities and challenges as described in this FOA (in Section I.A and in Appendix B), and how the Hub will approach those challenges and opportunities in the four topic areas; and • How the Hub's proposed R&D, modeling, and/or analysis approach in the four topic areas is innovative and will overcome the shortcomings, limitations, and challenges compared to the current state of technology. This includes how the proposed activities will impact performance metrics and goals outlined in the FOA. |
| Hub and Resources | 5 pages maximum | <p>Applicants are required to describe succinctly:</p> <ul style="list-style-type: none"> • The organizations, key individuals, and their technical roles and responsibilities including Hub governance and management roles; • The skills, qualifications, and relevant experience of the organizations and key individual subrecipients that demonstrates the ability to succeed in the Hub's four topic areas; • The applicant's access to equipment and facilities necessary to accomplish the effort and/or clearly explain how the applicant intends to obtain access to the necessary equipment and facilities; • Prior experience leading the development of an R&D Roadmap, strategy, and coordinating a complex, large R&D portfolio in related technologies; • The applicant's prior experience which demonstrates an ability to perform tasks of similar risk and complexity; • How the applicant has worked with its partners on prior projects or programs; and • Experience in managing awards with subrecipients or other consortia. |
| Operations and Management Approach Description | 3 pages maximum | <p>Applicants are required to describe succinctly:</p> <ul style="list-style-type: none"> • The proposed management and operations structure and approach, including how the Hub would coordinate and collaborate across the Hub's four topic areas. Identify the technical leadership position(s) that are responsible for Hub governance and management; and • How the applicant will share data and other software tools in an open public platform for use as a national resource and address intellectual property management in order to create an innovative |

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| | | ecosystem within the Hub and with external stakeholders, as described in Section I.A. of the FOA. |
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EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.i of the FOA. EERE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application. An applicant who receives a “discouraged” notification may still submit a Full Application. EERE will review all eligible Full Applications. However, by discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project in an effort to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

EERE may include general comments provided from reviewers on an applicant’s Concept Paper in the encourage/discourage notification posted on EERE Exchange at the close of that phase.

D. Content and Form of the Full Application

Applicants must submit a Full Application by the specified due date and time to be considered for funding under this FOA. Applicants must complete the following application forms found on the EERE Exchange website at <https://eere-Exchange.energy.gov/>, in accordance with the instructions.

Applicants will have approximately 60 days from receipt of the Concept Paper Encourage/Discourage notification on EERE Exchange to prepare and submit a Full Application. Regardless of the date the applicant receives the Encourage/Discourage notification, the submission deadline for the Full Application remains the date and time stated on the FOA cover page.

All Full Application documents must be marked with the Control Number issued to the applicant. Applicants will receive a control number upon submission of their Concept Paper, and should include that control number in the file name of their Full Application submission (i.e., Control number_Applicant Name_Full Application)."

i. Full Application Content Requirements

EERE will not review or consider ineligible Full Applications (see Section III of the FOA).

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Problems with EERE Exchange? Email EERE- EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.*

Full Applications must conform to the following requirements:

| Submission | Components | File Name |
|--|--|--|
| Full Application (PDF, unless stated otherwise) | Technical Volume (See Chart in Section IV.D.ii) (100 page limit) | ControlNumber_LeadOrganization_TechnicalVolume |
| | Statement of Project Objectives (Microsoft Word format) (40 page limit) | ControlNumber_LeadOrganization_SOPO |
| | SF-424 Application for Federal Assistance (PDF format) | ControlNumber_LeadOrganization_App424 |
| | Budget Justification (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange) | ControlNumber_LeadOrganization_Budget_Justification |
| | Summary for Public Release (PDF format) (2 page limit) | ControlNumber_LeadOrganization_Summary |
| | Summary Slides (4 page limit, Microsoft PowerPoint format) | ControlNumber_LeadOrganization_Slide |
| | Subrecipient Budget Justification for Budget Period 1 only, if applicable (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange) | ControlNumber_LeadOrganization_Subrecipient_Budget_Justification |
| | Budget for FFRDC, if applicable (PDF format) | ControlNumber_LeadOrganization_FWP |
| | Authorization from cognizant Contracting Officer for FFRDC, if applicable (PDF format) | ControlNumber_LeadOrganization_FFRDCAuth |
| | Authorization from Director of Laboratory Policy (SC-32), if applicable (PDF format) | ControlNumber_LeadOrganization_SC-32Auth |
| | SF-LLL Disclosure of Lobbying Activities (PDF format) | ControlNumber_LeadOrganization_SF-LLL |
| | Foreign Entity and Performance of Work in the United States waiver requests, if applicable (PDF format) | ControlNumber_LeadOrganization_Waiver |
| | U.S. Manufacturing Plan (PDF format) | ControlNumber_LeadOrganization_USMP |
| | Data Management Plan (PDF format) | ControlNumber_LeadOrganization_DMP |
| | COI Statement (PDF format) | ControlNumber_LeadOrganization_COI |
| | Consortium Agreement (PDF format) | ControlNumber_LeadOrganization_Consortium_Agreement |

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| | Communications Plan (PDF format) | ControlNumber_LeadOrganization_Communications_Plan |
| | Compliance Matrix (PDF format) | ControlNumber_LeadOrganization_Matrix |

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_TechnicalVolume_Part_1
ControlNumber_LeadOrganization_TechnicalVolume_Part_2

EERE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

EERE provides detailed guidance on the content and form of each component below.

ii. Technical Volume

The Technical Volume must be submitted in Adobe PDF format. The Technical Volume must conform to the following content and form requirements, including maximum page lengths. If applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages. This volume must address the Merit Review Criteria as discussed in Section V.A.ii of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_TechnicalVolume".

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume.

The Technical Volume to the Full Application may not be more than **100 pages**, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all of the information in the table below. The applicant should consider the weighting of each of the evaluation criteria (see Section V.A.ii of the FOA) when preparing the Technical Volume.

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The Technical Volume should clearly describe and expand upon information provided in the Concept Paper.

The Technical Volume must conform to the following content requirements:

| SECTION/PAGE LIMIT | DESCRIPTION |
|--|--|
| Cover Page | The cover page should include the project title, both the technical and business points of contact, names of all member organizations, and any statements regarding confidentiality. |
| Overview, Strategy, and Alignment to the Hub (This section should constitute approximately 20% of the Technical Volume) | <p>The Overview, Strategy, and Alignment to the Hub should contain the following information:</p> <ul style="list-style-type: none"> • Overview: <ul style="list-style-type: none"> ○ A discussion of the background of all organizations involved with the Hub, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the four topic areas of the Hub; and ○ Include a technical structure with a graphical representation of the organization involved and responsibilities; • Hub Strategy and Goals: The applicant should explicitly define its R&D, modeling, and/or analysis strategy, goals, and targeted improvements over the baseline technologies related to the four topic areas of the Hub and the critical success factors in achieving those goals. This description should be linked back to the identified research topic areas and how the Hub is organized around those topic areas; and • Funding and Impact: Total funding requested including Federal and cost share. The impact that DOE funding would have on the topic areas of the Hub. Applicants should explain how their involvement in prior, current, or anticipated funding from other public or private sources will be leveraged under the Hub. |
| Technical Description, Innovation, and Impact (This section should constitute approximately 30% of the Technical Volume) | <p>The Technical Description section should emphasize how the proposed R&D, modeling, and analysis activities, innovations, and approach will enable achievement of the Hub goals and describe the impact on the Hub's performance metrics. Specifically, the Technical Description should describe:</p> <ul style="list-style-type: none"> • Baseline and State of the Art: The applicant should describe the current state of the art in the applicable field, the specific technical innovations in the R&D, modeling, and analysis needed, an outline of the advantages of the proposed technologies over current and emerging technologies, and the overall impact on advancing the state of the art/technical baseline, if successful; |

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| | <ul style="list-style-type: none"> • Relevance and Outcomes: The applicant should provide a detailed description of the proposed R&D, modeling, and analysis approach. This should include the highest impact research areas across the representative barriers/challenges in water for energy and energy for/from water. The applicant should identify the key scientific and other fundamental principles that will be pursued, and how those activities would be prioritized. This section should also describe the relevance of the proposed research, modeling, and analysis activities to achieve the goals and objectives of the FOA, including what potential impacts the activities will have on the candidate DOE performance metrics and other metrics proposed by the applicant. The applicant should clearly specify the expected outcomes and technical targets of the proposed R&D, modeling, and analysis activities to achieve pipe parity; • Technical Feasibility: The applicant should describe the scientific merit and feasibility of the proposed research activities and their capability of achieving the anticipated outcomes and technical targets, including a description of previous work done and prior research results. This should include leveraging of past, current, or future R&D, modeling, and/or analysis conducted outside of this award; • R&D, Modeling, and Analysis Coordination: Reflecting on the previous sections overall structure, the applicant should describe in more detail the barriers/challenges, the applicant's core competencies, and how the Hub will coordinate activities; and • Roadmap: The applicant should describe its vision for how the Hub will develop a comprehensive Roadmap to identify the technical and non-technical challenges across the four topic areas of the Hub. This will require the Hub to prioritize R&D, based on metrics outlined in this FOA. This Roadmap must ultimately lead to the Hub's R&D portfolio achieving pipe parity, which will vary depending on the water sources, end-use applications, and technology options. |
| Technical Qualifications and Resources (Approximately 20% of the Technical Volume) | <p>The Technical Qualifications and Resources should contain the following information:</p> <ul style="list-style-type: none"> • Qualifications: The unique qualifications and expertise of the lead organization to execute the proposed activities in the four topic areas as well as the qualifications and expertise of the key subrecipients; • Leadership: The key leadership and technical roles and responsibilities, the skills, expertise and prior relevant experience of the individuals identified for these roles and the level of time commitment of each individual in the four topic areas. Note: Attach one-page resumes for personnel proposed for key technical and leadership roles as an appendix. Resumes do not count towards the page limit. Multi-page resumes are not allowed. If a |

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| | <p>multi-page resume is submitted, DOE will only consider the first page of the resume;</p> <ul style="list-style-type: none"> • Facilities: The equipment and facilities necessary to accomplish the scope of work; include a justification of updates to or any new equipment or facilities requested as part of the initial work or how the Hub will access necessary equipment; • Leveraged Resources: Illustrate the specific ways in which DOE funding will enable acceleration of R&D, modeling, and analysis (e.g., complement existing physical infrastructure, human capital, intellectual property, or other resources) and thereby lead to outcomes that are more impactful than these resources would be in isolation. Describe how the Hub will utilize and leverage technical services to be provided by DOE/NNSA FFRDCs, national laboratories, and other government investments, if applicable; • Support: Attach any letters of support or cost share commitment letters from partners/end users as an appendix (1 page maximum per letter). Cost share commitment letters are encouraged, but not required with the Full Application. Letters of support and cost share commitment letters do not count towards the page limit; • Cost Share Summary: The Prime Recipient is responsible for overall cost share. The applicant must summarize the proposed cost share in a table in the Technical Volume, clearly defining cost share contributions (cash or in-kind) with a total calculation for each type of cost share. The cost share summary must also include a breakdown of the source of the funding showing total percent contribution by non-profits, industry, manufacturers, academia, states and others to the cost share total. Cost share commitment letters will be required prior to making an award; • Budget Summary: Provide an overall budget summary that supports the proposed activities, and can accommodate changes in strategic direction that may occur once the Hub's management and operations are formalized and aligned with the Hub's Roadmap; and • Organizational Resources: Explain the applicant's administrative and financial experience and capabilities necessary to execute complex Federally-funded research efforts; include a list of previous efforts and an explanation of how the Hub will execute and reimburse subcontracts in a timely manner. |
| <p>Operations and Management Approach (Approximately 30% of the Technical Volume)</p> | <p>The Operations and Management Approach should contain a description of the following:</p> <ul style="list-style-type: none"> • The Hub's overall management and operations approach, including: 1) an organizational chart that depicts the R&D, modeling, and analysis activities to be performed by the Hub, each PI and Key Participants; and 2) an engagement chart showing the key individual(s) that will interact with DOE, members, and stakeholders; |

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| | <ul style="list-style-type: none"> • Hub Coordination and Integration: The Hub will coordinate, share and establish best practices, and participate in Hub meetings with DOE, stakeholders, and other representatives. Applicants must describe: <ul style="list-style-type: none"> ○ How the proposed binding consortium agreement will enable the Hub members to operate as an integrated organization (shared facilities, activities, stakeholder engagement, and road-mapping efforts) to provide value that is greater than the sum of the individual efforts; ○ How the Hub will participate in development of a Roadmap with the other stakeholders and with DOE. The applicant should identify external stakeholders to involve in roadmapping; ○ How the Hub will work with DOE on an ongoing basis to align R&D, modeling, and analysis priorities across the Hub's four topic areas for the highest impact; ○ How the proposed Communications Plan will enable successful internal collaboration and external outreach activities for the Hub, including how learning/new knowledge from the Hub's activities will be disseminated; and ○ The proposed binding agreements and other business agreements that will be utilized between the applicant and different participants across the Hub, including non-disclosure agreements (NDA)s, intellectual property management, and Cooperative Research and Development Agreement (CRADA)s; • Data Management Plan: How the proposed Data Management Plan will make the results of the R&D, analysis and modeling tools activities available within the Hub, to DOE, and to the public. In the case of modeling and simulation tools, the commitment to make such tools available through an open source license or another method that promotes widespread use of such tools; • R&D, Modeling, and Analysis Portfolio Management: <ul style="list-style-type: none"> ○ Describe the vision for the annual Roadmap updates; R&D, modeling and analysis planning; and project review/assessment process for the Hub, which should include coordination with DOE; ○ Describe how the annual planning process will encourage new ideas and participants in the Hub's activities; ○ Describe the process for making decisions on scientific/technical direction including how R&D, modeling, and analysis projects and technical work in the Hub will be selected, prioritized, related back to roadmapping efforts; |
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| | <ul style="list-style-type: none"> ○ Describe the applicant’s vision for conflict resolution in the Hub; ○ Describe the plan to encourage openness, new ideas, and new participants as the Hub matures. Include plans to accommodate Roadmap updates and modify R&D, modeling, and analysis activities to keep the Hub relevant; ○ Describe how the Hub’s R&D, modeling, and analysis activities will be tracked and evaluated; ○ Describe how the Hub will work with DOE and stakeholders to evaluate the Hub’s overall performance metrics, how they will be tracked, and describe plans for program reviews. Include the frequency and methodology for how they will be conducted; <ul style="list-style-type: none"> • The applicant should discuss their proposed management plan for the initial proposed R&D, modeling, and analysis activities or technical work, including the following: <ul style="list-style-type: none"> ○ The overall approach to and organization for managing the individual work activities; ○ The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices; ○ The approach to project risk management; ○ A description of how project changes will be handled; ○ If applicable, the approach to quality assurance/control; and ○ How communications will be maintained among project members; • Foreign Entities: Describe how the Hub will handle participation of foreign entities and foreign individuals (including but not limited to subrecipients and individuals working on Hub projects), while ensuring the goal to strengthen U.S. manufacturing competitiveness is met; • Export Control: How the applicant will manage export control compliance for the Hub; and • Risk Mitigation: A risk assessment and mitigation plan for the technical, economic and operational aspects of the proposed Hub including intellectual property management and strengthening U.S. manufacturing competitiveness. |
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iii. Statement of Project Objectives

Applicants are required to complete a Statement of Project Objectives (SOPO). A SOPO template is available on EERE Exchange at <https://eere-Exchange.energy.gov/>. The SOPO, including the Milestone Table, must not exceed 40 pages when printed using standard 8.5 x 11 paper with 1” margins (top, bottom, left, and right) with font not smaller than 12 point. Save the

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SOPO in a single Microsoft Word file using the following convention for the title “ControlNumber_LeadOrganization_SOPO”.

Applicants should propose a SOPO to accomplish Budget Period 1 activities as discussed in Section I.A. Within the page limit, applicants should also include a high level summary for the following 12 month (approximate) budget period for proposed initial technical work (Budget Period 2) (subject to change based on roadmapping outcomes). In addition, the application should include an outline of the SOPO and budget for the remaining budget periods (Budget Periods 3-5). Detail will be required in the proposed SOPO submitted as part of the continuation application required 90 days prior to before the end of each budget period.

iv. SF-424: Application for Federal Assistance

Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period and not just the first project year, first phase or other subset of the project period. Save the SF-424 in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_App424”.

v. Budget Justification Workbook (EERE 335)

- Applicants are required to complete the Budget Justification Workbook. This form is available on EERE Exchange at <https://eere-Exchange.energy.gov/>.
- Prime Recipient 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.
- Applicants should include costs associated with required annual audits and incurred cost proposals in their proposed budget documents. The “Instructions and Summary” included with the Budget Justification Workbook will auto-populate as the applicant enters information into the Workbook.
- Applicants must carefully read the “Instructions and Summary” tab provided within the Budget Justification Workbook.

Questions about this FOA? Email AMOWaterHub@ee.doe.gov.

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- Save the Budget Justification Workbook in a single Microsoft Excel file using the following convention for the title “ControlNumber_LeadOrganization_Budget_Justification”.

Due to the nature of this FOA, the budgets submitted with the application are subject to change during negotiations. Award budgets and scopes will also be negotiated on an annual basis, based on updates to the Hub’s Roadmap, the outcome of project performance evaluations such as Individual Hub Activity Go/No-Go reviews, and the recommendations or outcomes of Hub peer reviews.

Subrecipient costs should be captured in the Contractual tab of the applicant’s Budget Justification (EERE 335) for all budget periods, including high level estimates for Budget Periods 2-5. An EERE 335 is required for each subrecipient that is expected to perform work estimated to be more than \$250,000 or 25 percent of the work effort (whichever is less) for Budget Period 1 costs only. The applicant is required to submit a complete EERE 335, which will include estimated costs for all 5 budget periods.

vi. Summary/Abstract for Public Release

Applicants are required to submit a one to two-page summary/abstract of their project. The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (e.g., benefits, outcomes), and major participants (i.e., key consortium members). This document must not include any proprietary or sensitive business information as DOE may make it available to the public after selections are made. The project summary must not exceed 2 pages when printed using standard 8.5 x 11 paper with 1” margins (top, bottom, left, and right) with font not smaller than 12 point. Save the Summary for Public Release in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_Summary”.

vii. Summary Slide

Applicants are required to provide up to four PowerPoint slides summarizing the proposed project. The slides must be submitted in Microsoft PowerPoint format. The slides are used during the evaluation process. Save the Summary

Slides in a single file using the following convention for the title “ControlNumber_LeadOrganization_Slide”.

The Summary Slides template requires the following information:

- A technology Summary;
- A description of the technology’s impact;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);
- The project’s key idea/takeaway;
- Project title, Prime Recipient, Principal Investigator, and Key Participant information; and
- Requested EERE funds and proposed applicant cost share.

viii. Subrecipient Budget Justification (EERE 335) (if applicable)

Applicants must provide a separate budget justification, EERE 335 (i.e., budget justification for each budget year and a cumulative budget) for each subrecipient that is expected to perform work estimated to be more than \$250,000 or 25 percent of the work effort (whichever is less) **for Budget Period 1 only**. The budget justification must include the same justification information described in the “Budget Justification” section above. Save each subrecipient budget justification in a Microsoft Excel file using the following convention for the title “ControlNumber_LeadOrganization_Subrecipient_Budget_Justification”.

ix. Budget for DOE/NNSA FFRDC (if applicable)

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, the applicant must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1, Work Authorization System. DOE Order 412.1 and DOE O 412.1 (Field Work Proposal form) area available at the following link, under “DOE Budget Forms”:
<https://www.directives.doe.gov/directives-documents/400-series/0412.1-BOrder-a-admchg1/@@images/file>. Save the FWP in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_FWP”.

x. Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

The Federal agency sponsoring the FFRDC must authorize in writing the use

of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with the contractor's authority under its award. Save the Authorization in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_FFRDCAuth".

xi. Authorization from Director of Laboratory Policy (SC-32), (if applicable)

In addition to the cognizant Contracting Officer, Office of Science Laboratories are required to provide written authorization from the Director of Laboratory Policy (SC-32) with the application. Save the Authorization in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_SC-32Auth".

xii. SF-LLL: Disclosure of Lobbying Activities (required)

Prime Recipient and subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

The Prime Recipient and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-Federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the 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.

Save the SF-LLL in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_SF-LLL".

xiii. Waiver Requests: Foreign Entities and Performance of Work in the United States (if applicable)

1. Foreign Entity Participation

As set forth in Section III.A.iii, the Prime Recipient, subrecipients and Hub

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members under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the necessary information that must be included in a request to waive this requirement.

2. Performance of Work in the United States (Foreign Work Waiver)

As set forth in Section IV.J.iii, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. Appendix C lists the necessary information that must be included in a request to waive the Performance of Work in the United States requirement.

Save the Waivers in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_Waiver”.

xiv. U.S. Manufacturing Commitments

Pursuant to the Department of Energy Determination of Exceptional Circumstances dated September 9, 2013, each applicant is required to submit a U.S. Manufacturing Plan as part of its application. The U.S. Manufacturing Plan represents the applicant's measurable commitment to support U.S. manufacturing as a result of its award.

Each U.S. Manufacturing Plan must include a commitment 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 applicant can show to the satisfaction of DOE that it is not commercially feasible to do so (referred to hereinafter as “the U.S. Competitiveness Provision”). The applicant further agrees to make the U.S. Competitiveness Provision binding on any sub-awardee and any assignee or licensee or any entity otherwise acquiring rights to any subject invention, including subsequent assignees or licensees. A subject invention is any invention conceived of or first actually reduced to practice under an award.

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Due to the lower technology readiness levels of this FOA, DOE does not expect the U.S. Manufacturing Plans to be tied to a specific product or technology. However, in lieu of the U.S. Competitiveness Provision, an applicant may propose a U.S. Manufacturing Plan with more specific commitments that would be beneficial to the U.S. economy and competitiveness. For example, an applicant may commit specific products to be manufactured in the U.S., commit to a specific investment in a new or existing U.S. manufacturing facility, keep certain activities based in the U.S. or support a certain number of jobs in the U.S. related to the technology. An applicant which is likely to license the technology to others, especially universities for which licensing may be the exclusive means of commercialization the technology, the U.S. Manufacturing Plan may indicate the applicant's plan and commitment to use a specific licensing strategy that would likely support U.S. manufacturing.

If DOE determines, at its sole discretion, that the more specific commitments would provide a sufficient benefit to the U.S. economy and industrial competitiveness, the specific commitments will be part of the terms and conditions of the award. For all other awards, the U.S. Competitiveness Provision shall be incorporated as part of the terms and conditions of the award as the U.S. Manufacturing Plan for that award.

The U.S. Competitiveness Provision is also a requirement for the Class Patent Waiver that applies to domestic large business under this FOA (see Section VIII.L. Title to Subject Inventions).

Save the U.S. Manufacturing Plan in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_USMP".

xv. Data Management Plan

Each applicant is required to submit a Data Management Plan (DMP) with its Full Application. The DMP is a document that outlines the proposed plan for data sharing or preservation. Submission of a DMP with the Full Application is required; failure to submit a complete DMP may result in a determination of non-compliance for the Full Application.

The DMP must address sharing data and software tools within the Hub and with the public. For model or simulation tools developed under the award,

the applicant must agree to make the model or simulation tools available to the public through an open source license, unless the applicant can demonstrate that it has another method that would promote the dissemination and use of the modeling and simulation tools.

The DMP must provide how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication.

Appendix D of the FOA provides additional guidance for preparing a Data Management Plan.

Save the Data Management Plan in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_DMP”.

xvi. Conflict of Interest (COI) Statement

Due to the high profile nature of this Hub and its impact on U.S. manufacturing, it is important that any COIs, whether actual or perceived, affecting the key personnel for the Hub be identified and a mitigation plan be developed. Examples of conflicts of interest include, but are not limited to: financial holdings, business relationships, professional affiliations, and personal relationships and/or affiliations that currently exist or arise during the operation of the Hub involving foreign and domestic institutions and individuals.

The applicant must provide a COI Statement for all key Hub management and technical personnel. Identify potential, apparent, or actual organizational and individual conflicts of interest. This shall include applicants, their members, and senior/key personnel named in the application. Negative responses are also required.

Save the COI Statement in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_COI”.

If an applicant is selected for award negotiations, the applicant must submit an Updated COI Statement. See Section VI.B.xi - Updated COI Statement.

xvii. Consortium Agreement

Applicants must provide a “Consortium Agreement”. See Appendix G for information on the required content.

Save the Consortium Agreement in a single PDF file using the following convention for the title

“ControlNumber_LeadOrganization_Consortium_Agreement”.

xviii. Communications Plan

Applicants must provide a “Communications Plan” that describes the communication and outreach plan for the Hub, include a dissemination plan for learning/new knowledge from Hub’s activities.

Save the Communications Plan in a single PDF file using the following convention for the title

“ControlNumber_LeadOrganization_Communications_Plan”.

xix. Compliance Matrix

Applicants must provide a “Compliance Matrix” in table format (separate and exempt from total page count) that explains how and where each merit review criteria are addressed in the Project Narrative and Application documentation. The table’s format is at the discretion of the applicant.

Save the Compliance Matrix in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_Matrix”.

E. Content and Form of Replies to Reviewer Comments

EERE will provide applicants with reviewer comments following evaluation of all eligible Full Applications. Applicants will have a brief opportunity to review the comments and to prepare a short Reply to Reviewer Comments responding to comments however they desire or supplementing their Full Application. The Reply to Reviewer Comments is an optional submission; applicants are not required to submit a Reply to Reviewer Comments. EERE will post the Reviewer Comments in EERE Exchange. The expected submission deadline is on the cover page of the FOA; however, it is the applicant’s responsibility to monitor EERE Exchange in the event that the expected date changes. The deadline will not be extended for applicants who are unable to timely submit their reply due to failure to check EERE Exchange

or relying on the expected date alone. Applicants should anticipate having approximately seven (7) business days to submit Replies to Reviewer Comments.

EERE will not review or consider ineligible Replies to Reviewer Comments (see Section III of the FOA). EERE will review and consider each eligible Full Application, even if no Reply is submitted or if the Reply is found to be ineligible.

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 ten pages in length, EERE will review only the first ten (10) pages and disregard any additional pages.

| SECTION | PAGE LIMIT | DESCRIPTION |
|-----------------|-------------|--|
| Text | 9 pages max | Applicants may respond to one or more reviewer comments or supplement their Full Application. |
| Optional | 1 page max | Applicants may use this page however they wish. Text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable. |

F. Post-Selection Information Requests

If selected for award, EERE reserves the right to request additional or clarifying information regarding the following (non-exhaustive list):

- Indirect cost information;
- Other budget information;
- Commitment Letters from Third Parties Contributing to Cost Share, if applicable;
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5);
- Representation of Limited Rights Data and Restricted Software, if applicable;
- Environmental Questionnaire;
- Management and governance documents, See Section I.A.vi - Required Actions Prior to Award; and
- Accounting System Survey.

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G. Dun and Bradstreet Universal Numbering System Number and System for Award Management

Each applicant (unless the applicant is an individual or Federal awarding agency that is excepted from those requirements under 2 CFR §25.110(b) or (c), or has an exception approved by the Federal awarding agency under 2 CFR §25.110(d)) is required to: (1) Be registered in the System for Award Management (SAM) at <https://www.sam.gov> before submitting its application; (2) provide a valid Dun and Bradstreet Universal Numbering System (DUNS) number in its application; and (3) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency. DOE may not make a Federal award to an applicant until the applicant has complied with all applicable DUNS and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a Federal award, the DOE will determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

H. Submission Dates and Times

Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted in EERE Exchange no later than 5pm ET on the dates provided on the cover page of this FOA.

I. Intergovernmental Review

This FOA is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

J. Funding Restrictions

i. Allowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles.

Refer to the following applicable Federal cost principles for more information:

- Federal Acquisition Regulation (FAR) Part 31 for For-Profit entities; and

- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

ii. Pre-Award Costs

Selectees must request prior written approval to charge pre-award costs. Pre-award costs are those incurred prior to the effective date of the Federal award directly pursuant to the negotiation and in anticipation of the Federal award where such costs are necessary for efficient and timely performance of the scope of work. Such costs are allowable only to the extent that they would have been allowable if incurred after the date of the Federal award and **only** with the written approval of the Federal awarding agency, through the Contracting Officer assigned to the award.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis. Pre-award costs can only be incurred if such costs would be reimbursable under the agreement if incurred after award.

Pre-Award expenditures are made at the Selectee's risk. EERE is not obligated to reimburse costs: (1) in the absence of appropriations; (2) if an award is not made; or (3) if an award is made for a lesser amount than the Selectee anticipated.

1. Pre-Award Costs Related to National Environmental Policy Act (NEPA) Requirements

EERE's decision whether and how to distribute Federal funds under this FOA is subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to EERE completing the NEPA review process.

EERE does not guarantee or assume any obligation to reimburse costs where the Prime Recipient incurred the costs prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Likewise, if an application is selected

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for negotiation of award, and the Prime Recipient elects to undertake activities that are not authorized for Federal funding by the Contracting Officer in advance of EERE completing a NEPA review, the Prime Recipient is doing so at risk of not receiving Federal Funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

iii. Performance of Work in the United States

1. Requirement

All work performed under EERE Awards must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment; however, the Prime Recipient should make every effort to purchase supplies and equipment within the United States (See Section IV.J.vi on Equipment and Supplies). The Prime Recipient must flow down this requirement to its subrecipients.

2. Failure to Comply

If the Prime Recipient fails to comply with the Performance of Work in the United States requirement, EERE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The Prime Recipient is responsible should any work under the award be performed outside the United States, absent a waiver, regardless of if the work is performed by the Prime Recipient, Subrecipients, contractors or other project partners.

3. Waiver

There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit a written waiver request to EERE. Appendix C lists the necessary information that must be included in a request to waive the Performance of Work in the United States requirement.

The applicant must demonstrate to the satisfaction of EERE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. EERE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled "ControlNumber_LeadOrganization_Waiver". The applicant does not have the right to appeal EERE's decision concerning a waiver request.

iv. Construction

Funding from this FOA (including required cost share) is NOT permitted (or allowed) for construction of new buildings, for construction of new facilities for the Hub, or for major renovation of existing buildings.

Construction of a test bed or renovations to existing buildings or facilities for the purpose of research may be authorized where the test bed or renovations are limited to a scope and scale necessary for the research to be conducted. Recipient must obtain advance written authorization from the Contracting Officer before incurring such costs.

v. Foreign Travel

If international travel is proposed for your project, please note that your organization must comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 USC 40118), commonly referred to as the "Fly America Act," and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between, or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a U.S. flag carrier, if service is available. Foreign travel costs are allowable only with the written prior approval of the Contracting Officer assigned to the award.

vi. Equipment and Supplies

To the greatest extent practicable, all equipment and products purchased with funds made available under this FOA should be American-made. This requirement does not apply to used or leased equipment.

Property disposition will be required at the end of a project if the current fair market value of property exceeds \$5,000. The rules for property disposition are set forth in 2 CFR 200.310 – 200.316 as amended by 2 CFR 910.360.

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vii. Lobbying

The Recipient and subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

The Recipient and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities"

(<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-Federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the 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.

viii. Risk Assessment

Prior to making a Federal award, the DOE is required by 31 U.S.C. 3321 and 41 U.S.C. 2313 to review information available through any Office of Management and Budget (OMB)-designated repositories of government-wide eligibility qualification or financial integrity information, such as SAM Exclusions and "Do Not Pay."

In addition, DOE evaluates the risk(s) posed by applicants before they receive Federal awards. This evaluation may consider: results of the evaluation of the applicant's eligibility; the quality of the application; financial stability; quality of management systems and ability to meet the management standards prescribed in this part; history of performance; reports and findings from audits; and the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

In addition to this review, DOE must comply with the guidelines on government-wide suspension and debarment in 2 CFR 180, and must require non-Federal entities to comply with these provisions. These provisions restrict Federal awards, subawards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

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ix. Invoice Review and Approval

DOE employs a risk-based approach to determine the level of supporting documentation required for approving invoice payments. The Recipient may be required to provide some or all of the following items with its requests for reimbursement:

- Summary of costs by cost categories;
- Timesheets or personnel hours report;
- Invoices/receipts for all travel, equipment, supplies, contractual, and other costs;
- UCC filing proof for equipment acquired with project funds by for-profit recipient and subrecipients;
- Explanation of cost share for invoicing period;
- Analogous information for some subrecipients; and
- Other items as required by DOE.

V. Application Review Information

A. Technical Review Criteria

i. Concept Papers

Concept Papers are evaluated based on consideration of the following factors. All sub-criteria are of equal weight.

Criterion 1: Technical Description and Impacts (40%)

This criterion involves consideration of the following factors:

- Demonstrates knowledge of the key technical opportunities and challenges associated with the Energy-Water Desalination Hub (discussed in Section I.A and Appendix B) and how the applicant will approach those challenges in the four topic areas;
- The applicant's understanding of the current state-of-technology, including key opportunities and challenges;
- Innovativeness of the proposed R&D, modeling, and/or analysis approach and likelihood that they will overcome the shortcomings, limitations, and challenges; and
- Extent to which the proposed R&D, modeling, and/or analysis approach will impact the FOA performance metrics and goals.

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Criterion 2: Hub and Resources (30%)

This criterion involves consideration of the following factors:

- Extent to which the roles and responsibilities are well-defined and organized around the key technical challenges;
- Whether the proposed Hub has the skill, qualifications, and relevant experience needed to successfully execute on addressing the technical challenges related to the four topic areas of the Hub; and
- Whether the proposed Hub has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explains how they intend to obtain access to the necessary equipment and facilities.

Criterion 3: Operations and Management Approach Description (30%)

This criterion involves consideration of the following factors:

- Extent to which the proposed management and operations structure and approach will support the Hub's goals;
- Ability and willingness to collaborate with other stakeholders in order to create an innovation ecosystem within the Hub; and
- Ability and willingness to share data, software tools, or other results within the Hub, with DOE, and with the public.

ii. Full Applications

Full applications will be evaluated against the merit review criteria shown below. All sub-criteria are of equal weight.

Criterion 1: Technical Merit, Innovation, and Impact (40%)

This criterion involves consideration of the following factors:

- Degree to which the technical approach and R&D, modeling and/or analysis priorities have been clearly described and thoughtfully considered to address the necessary gaps in the four topic areas of the Hub;
- The scientific and technical quality of the proposed R&D, modeling, and/or analysis activities, including:
 - Degree to which it is comprehensive, well-balanced, and at the forefront of the current state of technology;

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- Degree to which the current state of the technology and the proposed advancements are clearly and convincingly described;
- Ability to overcome scientific, engineering, and technical obstacles/risk to achieve the objectives outlined in the FOA; and
- Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious and revolutionary, including relevant data, calculations and discussion of prior work in the literature with analyses that support the viability of the proposed work.
- The degree to which the application includes specific performance parameters and technical targets informed by key industry partnerships to facilitate and expedite further development and commercial deployment of the proposed technologies.

Criterion 2: Technical Qualifications and Resources (30%)

This criterion involves consideration of the following factors:

- The clarity of the organizational structure, roles and responsibilities, and adequacy of the roles and intellectual contributions of the Principal Investigator(s) and the proposed senior/key personnel;
- The quality of the Principal Investigator(s) and the proposed members to address all aspects of the proposed work with a high probability of success. This includes the qualifications, relevant expertise, and time commitment of the individuals;
- The demonstrated record of success in R&D, modeling, and/or analysis in the four topic areas of the Hub;
- The degree of access to, and quality of, existing research facilities and instrumentation at the applicant and Hub members that will be provided for Hub activities;
- Previous experience in management of multidisciplinary teams, in efforts of comparable scope and magnitude including the administrative and financial capabilities necessary to support the management of a Federally-funded complex, multi-year applied research effort; and
- The reasonableness of the requested operating budget for the proposed R&D, modeling, and/or analysis activities, including the ability of the requested budget to establish the Hub in a cost-effective

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manner, such as the costs of acquiring and preparing the space to house the Hub and any required equipment and instrumentation.

Criterion 3: Operations and Management Approach (30%)

This criterion involves consideration of the following factors:

- The degree to which the management approach articulates an organizational structure with clearly delineated roles and responsibilities of senior/key personnel;
- The ability of the management plan to encourage synergy and cohesion among the Hub's principal investigators, particularly those from multi-disciplinary fields across the breadth and scope of the Hub's technology opportunity space described in Section I.A, and to encourage a high-risk, high-reward R&D, modeling, and/or analysis program;
- The ability to adapt its R&D, modeling, and/or analysis focus based on roadmapping, including annual and other relevant updates to the Roadmap;
- Ongoing commitment to coordinate across the Hub, with DOE, and Hub members;
- The extent the proposed binding consortium agreement documents (a) the partnership between the Hub members and (b) the Hub's governance and management structure (See Appendix G);
- The extent there is a reasonable path to gain member acceptance of the binding consortium agreement and to execute the agreement with the members in a timely manner so as not to delay award execution;
- The extent the Communications Plan ensures close coordination and integration of Hub activities (if Hub members will not be located at one centralized location);
- The adequacy of plans for external collaborations and partnerships, including the leveraging of DOE and other Federal user facilities;
- The adequacy and appropriateness of the plan for recruiting Hub members and additional scientific, engineering and technical personnel;
- The adequacy of the submitted Data Management Plan to make the results of the R&D, analysis and modeling tools activities available within the Hub, with DOE, and with the public and, in the case of modeling and simulation tools, the commitment to make such tools

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available through an open source license or another method that promotes widespread use of such tools;

- The appropriateness and adequacy of the approach to measuring the Hub's R&D, modeling, and analysis progress against the technical targets and performance metrics;
- The adequacy of the performance monitoring systems to ensure the overall project is operated within proposed scope, cost and schedule; and
- The extent to which the applicant has existing business relationships and/or the ability to seamlessly initiate new business relationships.

iii. Criteria for Replies to Reviewer Comments

EERE has not established separate criteria to evaluate Replies to Reviewer Comments. Instead, Replies to Reviewer Comments are attached to the original applications and evaluated as an extension of the Full Application.

B. Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance," effective April 14, 2017, which is available at:

<https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current>.

C. Other Selection Factors

i. Program Policy Factors

In addition to the above criteria, the Selection Official may consider the following program policy factors in determining which Full Applications to select for award negotiations:

- The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA;
- The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives;

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- The level of industry involvement and demonstrated ability to accelerate commercialization and overcome key market barriers;
- The degree to which the proposed project is likely to lead to increased employment and manufacturing in the United States;
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty; and
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).

D. Evaluation and Selection Process

i. Overview

The evaluation process consists of multiple phases; each includes an initial eligibility review and a thorough technical review. Rigorous technical reviews of eligible submissions are conducted by reviewers that are experts in the subject matter of the FOA. Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, in determining which applications to select.

ii. Pre-Selection Interviews

As part of the evaluation and selection process, EERE may invite one or more applicants to participate in Pre-Selection Interviews. Pre-Selection Interviews are distinct from and more formal than pre-selection clarifications (See Section V.D.iii of the FOA). The invited applicant(s) will meet with EERE representatives to provide clarification on the contents of the Full Applications and to provide EERE an opportunity to ask questions regarding the proposed project. The information provided by applicants to EERE through Pre-Selection Interviews contributes to EERE's selection decisions.

EERE will arrange to meet with the invited applicants in person at EERE's offices or a mutually agreed upon location. EERE may also arrange site visits at certain applicants' facilities. In the alternative, EERE may invite certain applicants to participate in a one-on-one conference with EERE via webinar, videoconference, or conference call.

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EERE will not reimburse applicants for travel and other expenses relating to the Pre-Selection Interviews, nor will these costs be eligible for reimbursement as pre-award costs.

EERE may obtain additional information through Pre-Selection Interviews that will be used to make a final selection determination. EERE may select applications for funding and make awards without Pre-Selection Interviews. Participation in Pre-Selection Interviews with EERE does not signify that applicants have been selected for award negotiations.

iii. Pre-Selection Clarification

EERE may determine that pre-selection clarifications are necessary from one or more applicants. Pre-selection clarifications are distinct from and less formal than pre-selection interviews. These pre-selection clarifications will solely be for the purposes of clarifying the application, and will be limited to information already provided in the application documentation. The pre-selection clarifications may occur before, during or after the merit review evaluation process. Information provided by an applicant that is not necessary to address the pre-selection clarification question will not be reviewed or considered. Typically, a pre-selection clarification will be carried out through either written responses to EERE's written clarification questions or video or conference calls with EERE representatives.

The information provided by an applicant to EERE through pre-selection clarifications is incorporated in its application and contributes to the merit review evaluation and EERE's selection decisions. If EERE contacts an applicant for pre-selection clarification purposes, it does not signify that the applicant has been selected for negotiation of award or that the applicant is among the top ranked applications.

EERE will not reimburse applicants for expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

iv. Recipient Integrity and Performance Matters

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313).

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The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM.

DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 2 C.F.R. § 200.205.

v. Selection

The Selection Official may consider the technical merit, the Federal Consensus Board's recommendations, program policy factors, and the amount of funds available in arriving at selections for this FOA.

E. Anticipated Notice of Selection and Award Dates

EERE anticipates notifying applicants selected for negotiation of award by Summer 2019 and making awards by Fall 2019.

VI. Award Administration Information

A. Award Notices

i. Ineligible Submissions

Ineligible Concept Papers and Full Applications will not be further reviewed or considered for award. The Contracting Officer will send a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange. The notification letter will state the basis upon which the Concept Paper or the Full Application is ineligible and not considered for further review.

ii. Concept Paper Notifications

EERE will notify applicants of its determination to encourage or discourage the submission of a Full Application. EERE will post these notifications to EERE Exchange.

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, EERE 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 encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project. Please refer to Section IV.J.ii of the FOA for guidance on pre-award costs.

iii. Full Application Notifications

EERE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, EERE may notify one or more applicants that a final selection determination on particular Full Applications will be made at a later date, subject to the availability of funds or other factors.

iv. Successful Applicants

Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by EERE to issue an award. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the Prime Recipient in FedConnect.

The award negotiation process will take approximately 90 days. Applicants must designate a primary and a backup point-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. The applicant must be responsive during award negotiations (i.e., provide requested documentation) and meet the negotiation deadlines. If the applicant fails to do so or if award negotiations are otherwise unsuccessful, EERE will cancel the award negotiations and rescind the Selection. EERE reserves the right to terminate award negotiations at any time for any reason.

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

v. Alternate Selection Determinations

In some instances, an applicant may receive a notification that its application

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was not selected for award and EERE designated the application to be an alternate. As an alternate, EERE may consider the Full Application for Federal funding in the future. A notification letter stating the Full Application is designated as an alternate does not authorize the applicant to commence performance of the project. EERE may ultimately determine to select or not select the Full Application for award negotiations.

vi. Unsuccessful Applicants

EERE shall promptly notify in writing each applicant whose application has not been selected for award or whose application cannot be funded because of the unavailability of appropriated funds.

B. Administrative and National Policy Requirements

i. Registration Requirements

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

1. EERE Exchange

Register and create an account on EERE Exchange at <https://eere-Exchange.energy.gov>.

This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission. Applicants should also designate backup points of contact so they may be easily contacted if deemed necessary. **This step is required to apply to this FOA.**

The EERE Exchange registration does not have a delay; however, **the remaining registration requirements below could take several weeks to process and are necessary for a potential applicant to receive an award under this FOA.**

2. DUNS Number

Obtain a Dun and Bradstreet DUNSnumber (including the plus 4 extension, if applicable) at <http://fedgov.dnb.com/webform>.

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3. System for Award Management

Register with the SAM at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an Marketing Partner ID Number (MPIN) are important steps in SAM registration. Please update your SAM registration annually.

4. FedConnect

Register in FedConnect at <https://www.fedconnect.net>. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf.

5. Grants.gov

Register in Grants.gov (<http://www.grants.gov>) to receive automatic updates when Amendments to this FOA are posted. However, please note that Concept Papers, and Full Applications will not be accepted through Grants.gov.

6. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the Department of Energy, including EERE Exchange and FedConnect.net, constitutes the authorized representative's approval and electronic signature.

ii. Award Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR Part 200 as amended by 2 CFR Part 910.

The programmatic authorizing statute is section 206 of the Department of Energy Research and Innovation Act, codified at 42 U.S.C. § 18632.

iii. Foreign National Access to DOE Sites

All applicants that ultimately enter into an award resulting from this FOA will be subject to the following requirement concerning foreign national involvement. Upon DOE's request, the Prime Recipient must provide information to facilitate DOE's responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. A foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has

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not been naturalized under U.S. law. If the Prime Recipient or subrecipients, contractors or vendors under the award, anticipate utilizing a foreign national person in the performance of an award, the Prime Recipient is responsible for providing to the Contracting Officer specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval.

iv. Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR Part 170. The Prime Recipient must register with the new FFATA Subaward Reporting System database and report the required data on its first tier subrecipients. The Prime Recipient must report the executive compensation for its own executives as part of their registration profile in SAM.

v. National Policy Requirements

The National Policy Assurances that are incorporated as a term and condition of award are located at: <http://www.nsf.gov/awards/managing/rtc.jsp>.

vi. Environmental Review in Accordance with National Environmental Policy Act (NEPA)

EERE's decision whether and how to distribute Federal funds under this FOA is subject to the National Environmental Policy Act (42 USC 4321, *et seq.*). NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at <http://nepa.energy.gov/>.

While NEPA compliance is a Federal agency responsibility and the ultimate decisions remain with the Federal agency, the Prime Recipient selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to its proposed project. If DOE determines certain records must be prepared to complete the NEPA review process (e.g., biological evaluations or environmental assessments), the costs to prepare the necessary records may be included as part of the project costs.

vii.Applicant Representations and Certifications

1. Lobbying Restrictions

By accepting funds under this award, the Prime Recipient agrees that none of the funds obligated on the award shall be expended, directly or indirectly, to influence Congressional action on any legislation 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.

2. Corporate Felony Conviction and Federal Tax Liability Representations

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

- a. It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months; and
- b. 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 non-profit organizations.

3. Nondisclosure and Confidentiality Agreements Representations

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

- a. 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

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Federal department or agency authorized to receive such information.

- b. 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:

(1) *“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.”*

(2) The limitation above shall not contravene requirements applicable to Standard Form 312 Classified Information Nondisclosure Agreement (<https://fas.org/sgp/othergov/sf312.pdf>), Form 4414 Sensitive Compartmented Information Disclosure Agreement (<https://fas.org/sgp/othergov/intel/sf4414.pdf>), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(3) Notwithstanding the provision listed in paragraph (a), a nondisclosure or 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 disclosures 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.

viii. Statement of Federal Stewardship

EERE will exercise normal Federal stewardship in overseeing the project activities performed under EERE Awards. Stewardship Activities include, but are not limited to, conducting site visits; reviewing performance and financial reports; providing assistance and/or temporary intervention in unusual circumstances to correct deficiencies that develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

ix. Statement of Substantial Involvement

EERE has substantial involvement in work performed under awards made as a result of this FOA. EERE does not limit its involvement to the administrative requirements of the award. Instead, EERE has substantial involvement in the direction and redirection of the technical aspects of the project as a whole. Substantial involvement includes, but is not limited to, the following:

1. EERE shares responsibility with the Recipient for the management, control, direction, and performance of the project.
2. EERE may intervene in the conduct or performance of work under the award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
3. EERE may redirect or discontinue funding the project based on the outcome of EERE's evaluation of the Project at the Project-Wide Go/No-Go decision point(s).
4. EERE may redirect or discontinue funding for individual Hub Activities based on the outcome of EERE's evaluation of those activities at the Individual Hub Activity Go/No-Go decision points.

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5. EERE participates in major project decision-making processes to include but not limited to:
 - a. Completion of Roadmap;
 - b. Selection of Hub Activities;
 - c. Individual Hub Activity Go/No-Go reviews; and
 - d. Project redirection based on progress reviews.
6. EERE will appoint DOE Federal Government representatives to participate in any Hub governance or management entities that may be established.
7. The Recipient will provide EERE the opportunity to participate in the planning of technical, strategic, and operations events such as Workshops and roadmapping activities.
8. The Recipient will obtain a positive compliance recommendation from EERE prior to adopting any Hub-related documents and subsequent changes to such documents. The Recipient will provide EERE with a minimum of five business days to review for compliance with the award. This includes but is not limited to Strategic Plans, RFP processes, CRADAs, the consortium agreement, the IPMPs, the Data Management Plan, the COI Plan, the Export Control Plan, the Communication Plan, NDA/COI form, Foreign Entity Participation Plan, conference management directive, planning documents listed in the SOPO, and other key documents or policies for the Hub.
9. The Recipient will notify EERE of Hub related publicity information regarding the Recipient's organization and the Hub and provide a minimum of five business days to review and offer input. Related publicity information includes materials developed by the Recipient, subrecipient, or other participant.
10. The Recipient will provide EERE a minimum of five business days to review any Project and Hub Activity-specific risk mitigation and corrective action plans.
11. To adequately monitor project progress and provide direction to the Hub, the Recipient must provide EERE the opportunity to participate in the Hub's activities including Hub meetings, key reviews and experiments, and project management and monitoring activities. The Recipient must notify EERE a minimum of ten business days before the Hub activity and provide all appropriate documentation for EERE review.

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12. EERE may choose to engage a private, independent engineering (IE) firm or third party consultant to assist in assessing the progress of the project and provide timely and accurate reports to EERE. The Recipient will ensure that the IE or consultant has access to any and all relevant documentation sufficient to allow the IE or consultant to provide independent evaluations to EERE on the progress of the project. The Recipient may require the IE or consultant to sign a NDA and will negotiate the agreement in good faith and in a timely manner. Consultants to EERE may not provide technical direction to the Recipient.
13. In addition to the list above, the Recipient must obtain Government Approval in the following situations:
- a. Scope changes, including but not limited to, any change in plans that may result in a need for additional Federal funding;
 - b. NEPA-related documents and compliance activities;
 - c. Requests for Proposals for Hub Activities funded under the Hub;
 - d. Selection of new Hub Activities;
 - e. Selection of Key Personnel; and
 - f. Foreign Entity Participation and Foreign Work Waivers.
14. EERE reserves the right to make modifications and/or additions to this list based on future risk assessments and/or the specific Hub management approach enlisted by the Recipient.

x. Intellectual Property Management Plan

Prior to award, the Recipient must submit an executed IPMP between the Hub and Hub members.

The award will set forth the treatment of and obligations related to intellectual property rights between EERE and the Hub, including individual Hub members. The IPMP should describe how the and Hub members will handle intellectual property rights and issues between themselves while ensuring compliance with Federal intellectual property laws, regulations, and policies (see Sections VIII.L-VIII.O of this FOA for more details on applicable Federal intellectual property laws and regulations).

The following is a non-exhaustive list of examples of items that the IPMP may cover:

- The treatment of confidential information between the Hub and Hub members (e.g., the use of NDAs);

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- The treatment of background intellectual property (e.g., any requirements for identifying it or making it available);
- The treatment of inventions made under the award (e.g., any requirements for disclosing to the other members on an application, filing patent applications, paying for patent prosecution, and cross-licensing or other licensing arrangements between the members);
- The treatment of data produced, including software, under the award (e.g., any publication process or other dissemination strategies, copyrighting strategy or arrangement between members);
- Any technology transfer and commercialization requirements or arrangements between the members;
- The treatment of any intellectual property issues that may arise due to a change in Hub membership; and
- The handling of disputes related to intellectual property between members.

xi. Updated Conflict of Interest Statement

Due to the high profile nature of this Hub and its impact on U.S. manufacturing, it is important that any COIs, whether actual or perceived, affecting the key personnel for the Hub be identified and a mitigation plan be developed. Examples of conflicts of interest include, but are not limited to: financial holdings, business relationships, professional affiliations, and personal relationships and/or affiliations that currently exist or arise during the operation of the Hub involving foreign and domestic institutions and individuals.

In addition to the COI Statement submitted with the Full Application (see Section IV.D.xvi), the Selectee must submit an Updated COI Statement that further identifies any and all potential conflicts of interest beyond those submitted with the application for the Hub members and the leadership on an individual basis, with any proposed mitigation efforts. This information will be due to EERE no later than seven (7) business days after notice of selection for award negotiations. All conflicts must be identified, documented and resolved through a COI mitigation and avoidance plan approved by the Contracting Officer. The Selectee must obtain this approval from the Contracting Officer prior to involvement by any representatives in any negotiations with EERE or Hub activities.

The Recipient has an ongoing responsibility throughout the award to provide COI Statement for Key Personnel, when there are staffing changes or changes to an individual's circumstances that result in newly identified COIs. As the

Recipient becomes aware, the Recipient must promptly notify the DOE Contracting Officer within ten (10) calendar days of any significant COI issues concerning the Recipient, subrecipients, contractors or Hub Members. The notification must include: 1. A copy of the current COI policy; 2. A detailed description of the COI; and 3. A COI management plan that contains all the information and actions the applicant/recipient plans to take and has taken in order to manage, eliminate, neutralize, mitigate or otherwise resolve the COI.

xii. Conflict of Interest Plan for the Hub

The Hub must establish a comprehensive COI Plan for the overall Hub. DOE will review and approve the COI Plan prior to award. The plan must establish COI procedures, consistent with DOE's COI procedures. The procedures must set forth a consistent approach to identifying and mitigating Conflicts of Interest across the Hub members and include the key elements set forth in Appendix E – Key Elements of a COI Plan.

xiii. Risk Mitigation Plan

If selected for award negotiations, the details of the Recipient's Risk Mitigation Plan will be subject to review and approval by EERE. The Risk Mitigation Plan will need to address control of sensitive information within the Hub and outside the Hub. Risks will be re-evaluated and the Risk Mitigation Plan updated in response to changes in policy.

Components for the Risk Mitigation Plan should include: (1) vetting of staff working on projects, and (2) identifying, handling, and managing sensitive information. As part of a Risk Mitigation Plan, EERE will require the following conditions be included:

- EERE reserves the right for final determination of identification, categorization and treatment of information generated through the Hub activities; and
- The Recipient must document to the satisfaction of the Contracting Officer that the Recipient has properly vetted all individuals proposed to participate in Hub projects in accordance with the Risk Mitigation Plan. This documentation must be provided to EERE with sufficient time for review prior to individuals' participation in project activities.

xiv. Export Control

Export control laws are in place to protect U.S. national security, foreign policy, and economic interests without imposing undue regulatory burdens

on legitimate international trade. Some of the results of the research conducted under this award are expected to be restricted for proprietary reasons and not published and shared broadly within the scientific community.

Some projects within the Hub may be subject to export control restrictions per the applicable laws and regulations. It is the Prime Recipient's responsibility to determine applicability with export control laws and regulations and ensure compliance. Export control laws and regulations may apply to individual research projects, depending on the nature of the research tasks.

Under no circumstances may foreign entities (organizations, companies or persons) receive access to export controlled information unless proper export procedures have been satisfied and such access is authorized pursuant to law or regulation. The Hub will address participation by foreign entities (organizations, companies or persons) on a case-by-case basis, and will ensure measures that properly protect export controlled information are in place.

If an applicant is selected for award negotiations, the applicant will be required to submit an Export Control Management Plan during the award negotiations phase for review and approval by EERE. The Export Control Management Plan should adequately demonstrate that the applicant has a strong understanding of and an adequate plan to manage export control compliance. The Export Control Management Plan should outline the specific compliance safeguards the Hub will implement across the Hub's activities.

xv. Foreign Involvement

The Recipient, subrecipients and Hub members must be incorporated (or otherwise formed) under the laws of a State or territory of the United States with majority domestic ownership or control and have a physical place of business in the United States (See Section III).

A foreign entity may be eligible to be a recipient, subrecipient or Hub member, if the entity demonstrates to the satisfaction of the Hub's leadership (applicable to proposed foreign entity subrecipients and Hub members) and DOE that: 1) its participation is in the best interest of the Hub, U.S. industry, and U.S. economic development; 2) adequate Intellectual Property (IP) and data protection protocols exist between the U.S. subsidiary and its foreign parent organization; 3) the work is conducted within the U.S. and the entity acknowledges the U.S. Manufacturing Plan; and 4) the foreign

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entity will satisfy other conditions that may be deemed necessary by the Hub or DOE to protect U.S. government interests. Appendix C lists the necessary information that must be included in a Foreign Entity Participation waiver request.

If an applicant is selected for award negotiations, the applicant must develop a Foreign Entity Participation Plan that describes how it will handle the participation of foreign entities and individuals that engage in Hub activities while ensuring alignment with the overall Hub's goals to enhance the economic, environmental, and energy security of the U.S. The Foreign Entity Participation Plan must be incorporated into the consortium agreement by reference or as a provision within the agreement itself. The Foreign Entity Participation Plan is subject to DOE review and approval.

xvi. Limitations on Compensation Costs

For an award issued under this FOA, the annual compensation costs allowable for an individual proposed as a direct cost under the award are limited to \$250,000, equivalent to an hourly rate of \$120/hour (i.e., \$250,000, or \$120/hour, is the maximum amount that EERE will reimburse a Recipient for any one individual's annual compensation and EERE will not recognize such costs above \$250,000, or \$120/hour as Recipient cost share).

This limitation does not restrict the Recipient or its subrecipients from providing annual compensation to an individual that exceeds \$250,000, or \$120/hour. However, any amount above \$250,000, or \$120/hour cannot be included as a direct cost in the total project costs (i.e., Federal share or Recipient cost share).

For purposes of the applicable award term only, the term "annual compensation costs" is defined to include the total amount of wages, salary and monetary bonuses paid to the employee, which have been approved by the Contracting Officer.

Compensation for individual vendor/contractor services must be reasonable and consistent with that paid for similar services in the marketplace. The allowable vendor/contractor rate is limited to \$960/day or \$120/hour. This limitation does not restrict the Recipient or its subrecipients from providing a vendor/contractor rate that exceeds the \$960/day or \$120/hour. However, any amount above the \$960/day or \$120/hour cannot be included as a direct cost in the total project costs (i.e. Federal share or Recipient cost share).

Consultants with substantial programmatic interest, control or authority will be treated as subrecipients and may not incur fee or profit for their work under the DOE Cooperative Agreement. For consultants without substantial programmatic interest, control or authority, see vendor/contractor rate limitations above.

xvii. Subject Invention Utilization Reporting

In order to ensure that the Prime Recipient and subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, EERE may require that the Prime Recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to EERE on the utilization of the subject invention and efforts made by Prime Recipient or their licensees or assignees to stimulate such utilization. The reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Prime Recipient, and such other data and information as EERE may specify.

xviii. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at:

<https://www.energy.gov/eere/funding/eere-funding-application-and-management-forms><https://www.energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

xix. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, attached to the award agreement. This helpful EERE checklist can be accessed at <https://www.energy.gov/eere/funding/eere-funding-application-and-management-forms>. See Attachment 2 Federal Assistance Reporting Checklist, after clicking on “Model Cooperative Agreement” under the Award Package section.

In addition to the reporting requirements included in the Federal Assistance Reporting Checklist, the Hub must submit an annual report to DOE summarizing the activities of the Hub, including –

- Detailing organizational expenditures; and
- Describing each project undertaken by the Hub.

xx. Go/No-Go Review

The award selected under this FOA will be subject to a periodic evaluation referred to as a Go/No-Go Review. The terms and conditions of the award will establish two types of Go/No-Go decision points: The Hub “Project-Wide” and “Individual Hub Activity-level” (See Glossary in Appendix F for definitions). For each Go/No-Go decision point, EERE must determine whether the Recipient has fully and satisfactorily completed the work described in the SOPO. At the Go/No-Go decision points, EERE will evaluate performance, schedule adherence, meeting milestone objectives, compliance with reporting requirements, strategic plan execution, alignment to the Roadmap, commitment to collaboration agreements, and overall coordination and contribution to the EERE program goals and objectives.

As a result of a Project-Wide Go/No-Go review, in its discretion, EERE may take one of the following actions:

1. Authorize Federal funding for the next budget period for the Project;
2. Recommend redirection of work under the Project;
3. Discontinue providing Federal funding for the Project beyond the current budget period as the result of insufficient progress, change in strategic direction, or lack of available funding; or
4. Place a hold on the Federal funding for the Project, pending further supporting data.

As a result of an Individual Hub Activity Go/No-Go review , in its discretion, EERE may take one of the following actions:

1. Authorize funding (Federal share and cost share) for the next budget period for the Hub Activity;
2. Recommend redirection of work under the Hub Activity;
3. Discontinue providing funding for the Hub Activity beyond the current budget period as the result of insufficient progress, change in strategic direction, or lack of available funding; or
4. Place a hold on the funding (Federal share and cost share) for the Hub Activity, pending further supporting data.

As part of a Project-Wide Go/No-Go review, EERE may consider the outcome of an Individual Hub Activity Go/No-Go review. However, except where the Individual Hub Activity has a detrimental or significant impact on the Project as whole, the decision to discontinue Federal funding for an Individual Hub Activity will not in itself result in a decision to discontinue Federal funding for the Project as whole.

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Federal funding beyond the Go/No Go decision point (continuation funding) is contingent upon: (1) availability of Federal funds appropriated by Congress for the purpose of this program; (2) the availability of future-year budget authority; (3) Recipient's technical progress compared to the Milestone Summary Table stated in Attachment 1 of the award; (4) Recipient's submittal of required reports (see Section VI.B.xix); (5) Recipient's compliance with the terms and conditions of the award; (6) EERE's Project-Wide Go/No-Go decision; (7) the Recipient's submission of a continuation application; and (8) written approval of the continuation application by the Contracting Officer.

The Project-Wide Go/No-Go decision is distinct from a non-compliance determination. In the event a recipient fails to comply with the requirements of an award, EERE may take appropriate action, including but not limited to, redirecting, suspending or terminating the award.

xxi. Conference Spending

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed \$20,000, thereby circumventing 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 conference.

See Appendix H for further requirements concerning conference spending directly and programmatically related to the purpose of an award issued under this FOA.

xxii. Uniform Commercial Code (UCC) Financing Statements

Per 2 CFR 910.360 (Real Property and Equipment) when a piece of equipment is purchased by a for-profit recipient or subrecipient with Federal funds, and when the Federal share of the financial assistance agreement is more than \$1,000,000, the recipient or subrecipient must:

Properly record, and consent to the Department's ability to properly record if the recipient fails to do so, UCC financing statement(s) for all equipment in

excess of \$5,000 purchased with project funds. These financing statement(s) must be approved in writing by the Contracting Officer prior to the recording, and they shall provide notice that the Recipient's title to all equipment (not real property) purchased with Federal funds under the financial assistance agreement is conditional pursuant to the terms of this section, and that the Government retains an undivided reversionary interest in the equipment. The UCC financing statement(s) must be filed before the Contracting Officer may reimburse the recipient for the Federal share of the equipment unless otherwise provided for in the relevant financial assistance agreement. The recipient shall further make any amendments to the financing statements or additional recordings, including appropriate continuation statements, as necessary or as the Contracting Officer may direct.

VII. Questions/Agency Contacts

Upon the issuance of a FOA, EERE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the FOA except through the established question and answer process as described below. Specifically, questions regarding the content of this FOA must be submitted to: AMOWaterHub@ee.doe.gov. Questions must be submitted not later than 3 business days prior to the application due date and time.

All questions and answers related to this FOA will be posted on EERE Exchange at: <https://eere-exchange.energy.gov>. **Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA.** EERE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

VIII. Other Information

A. FOA Modifications

Amendments to this FOA will be posted on the EERE Exchange website and the Grants.gov system. However, you will only receive an email when an amendment or a FOA is posted on these sites if you register for email notifications for this FOA in Grants.gov. EERE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

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B. Informational Webinar

EERE will conduct one informational webinar during the FOA process. It will be held after the initial FOA release but before the due date for Concept Papers.

Attendance is not mandatory and will not positively or negatively impact the overall review of any applicant submissions. As the webinar will be open to all applicants who wish to participate, applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project. Specific dates for the webinar can be found on the cover page of the FOA.

C. Government Right to Reject or Negotiate

EERE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

D. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either express or implied, is invalid.

E. Treatment of Application Information

In general, EERE will only use data and other information contained in applications for evaluation purposes, unless such information is generally available to the public or is already the property of the Government.

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the FOA.

The use of protective markings such as “Do Not Publicly Release – Trade Secret” or “Do Not Publicly Release – Confidential Business Information” is encouraged. However, applicants should be aware that the use of protective markings is not dispositive as to whether information will be publicly released pursuant to the Freedom of Information Act, 5 U.S.C. §552, et. seq., as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. (See Section VIII.I of this document, “Notice of Potential Disclosure Under the Freedom of Information Act (FOIA)” for additional information regarding the public release of information under the Freedom of Information Act.

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Problems with EERE Exchange? Email EERE- EERE-ExchangeSupport@hq.doe.gov Include FOA name and number in subject line.*

Applicants are encouraged to employ protective markings in the following manner:

The cover sheet of the application must be marked as follows and identify the specific pages containing trade secrets or commercial or financial information that is privileged or confidential:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is privileged or confidential, and 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.
[End of Notice]

The header and footer of every page that contains trade secrets or commercial or financial information that is privileged must be marked as follows: “May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure.”

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

F. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Project-Wide Go/No-Go Review, the Individual Hub Activity Go/No-Go review and Peer Review, the Government may seek the advice of qualified non Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities, including EERE contractors. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign COI and NDAs prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a NDA.

G. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this FOA include those which describe and promote the understanding of scientific and technical aspects of specific energy and water technologies, but not those which encourage or support political activities such as

the collection and dissemination of information related to potential, planned or pending legislation.

H. Notice of Right to Conduct a Review of Financial Capability

EERE reserves the right to conduct an independent third party review of financial capability for the applicant that is selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

I. Notice of Potential Disclosure Under Freedom of Information Act (FOIA)

Under the FOIA, 5 U.S.C. §552, et. seq., as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175, any information received from the applicant is considered to be an agency record, and as such, subject to public release under FOIA. The purpose of the FOIA is to afford the public the right to request and receive agency records unless those agency records are protected from disclosure under one or more of the nine FOIA exemptions. Decisions to disclose or withhold information received from the applicant are based upon the applicability of one or more of the nine FOIA exemptions, not on the existence or nonexistence of protective markings or designations. Only the agency's designated FOIA Officer may determine if information received from the applicant may be withheld pursuant to one of the nine FOIA exemptions. All FOIA requests received by DOE are processed in accordance with 10 C.F.R. Part 1004.

J. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of all information requested. Any failure to make a full and complete disclosure of the requested information may result in:

- 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.

K. Retention of Submissions

EERE 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 EERE for funding, applicants consent to EERE's retention of their submissions.

L. 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 inventions unless a waiver is granted (see below);
- Class Patent Waiver: DOE has issued a class waiver that applies to this FOA. Under this class 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 waiver, a domestic large business must agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States; and
- Determination of Exceptional Circumstances (DEC): Each applicant is required to submit a U.S. Manufacturing Plan as part of its application. If selected, the U.S. Manufacturing Plan shall be incorporated into the award terms and conditions for domestic small businesses and nonprofit organizations. DOE has determined that exceptional circumstances exist that warrants the modification of the standard patent rights clause for small businesses and non-profit awardees under Bayh-Dole to the extent necessary to implement and enforce the U.S. Manufacturing Plan. Any Bayh-Dole entity (domestic small business or nonprofit organization) affected by this DEC has the right to appeal it.

M. Government Rights in Subject Inventions

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

i. 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.

ii. 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 to a third party. In addition, the Government may grant licenses for use of the subject invention when a Prime Recipient, subrecipient, or their assignees and exclusive licensees refuse to do so.

DOE may exercise its march-in rights only 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 satisfied manner;
- The owner has not met public use requirements specified by Federal statutes in a reasonably satisfied manner; or
- The U.S. Manufacturing requirement has not been met.

Any determination that march-in rights are warranted must follow a fact-finding process in which the recipient has certain rights to present evidence and witnesses, confront witnesses and appear with counsel and appeal any adverse decision. To date, DOE has never exercised its march-in rights to any subject inventions.

N. 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.

“Limited Rights Data”: The U.S. Government will not normally require delivery of confidential or trade secret-type 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.

Government Rights in Technical Data Produced Under Awards: The U.S. Government retains unlimited rights in technical data produced under Government financial assistance awards, including the right to distribute to the public. One exception to the foregoing is that invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

O. Copyright

The Prime Recipient and subrecipients may assert copyright in copyrightable works, such as software, first produced under the award without EERE approval. When copyright is asserted, the Government retains a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and to perform publicly and display publicly the copyrighted work. This license extends to contractors and others doing work on behalf of the Government.

P. Personally Identifiable Information (PII)

All information provided by the applicant must to the greatest extent possible exclude Personally Identifiable Information (PII). The term “personally identifiable information” refers to information which can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name (See OMB Memorandum M-07-16 dated May 22, 2007, found at: <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-16.pdf>

By way of example, applicants must screen resumes to ensure that they do not contain PII such as personal addresses, phone/cell numbers, personal emails and/or SSNs. In short, if the PII is not essential to the application, it should not be in the application.

Q. Annual Independent Audits

If a for-profit entity is a Prime Recipient and has expended \$750,000 or more of DOE awards during the entity's fiscal year, an annual Compliance Audit performed by an independent auditor is required. For additional information, please refer to 2 C.F.R. § 910.501 and Subpart F.

If an educational institution, non-profit organization, or state/local government is a Prime Recipient or subrecipient and has expended \$750,000 or more of Federal awards during the non-Federal entity's fiscal year, then a Single or Program-

Specific Audit is required. For additional information, please refer to 2 C.F.R. § 200.501 and Subpart F.

Applicants and subrecipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. EERE will share in the cost of the audit at its applicable cost share ratio.

Appendix A – Cost Share Information

Cost Sharing or Cost Matching

The terms “cost sharing” and “cost matching” are often used synonymously. Even the DOE Financial Assistance Regulations, 2 CFR 200.306, use both of the terms in the titles specific to regulations applicable to cost sharing. EERE almost always uses the term “cost sharing,” as it conveys the concept that non-federal share is calculated as a percentage of the Total Project Cost. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here “cost matching” for the non-federal share is calculated as a percentage of the Federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC costs must be included in Total Project Costs. Following is an example of how to calculate cost sharing amounts for a project with \$1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

- Formula: Federal share (\$) divided by Federal share (%) = Total Project Cost
Example: \$1,000,000 divided by 80% = \$1,250,000;
- Formula: Total Project Cost (\$) minus Federal share (\$) = Non-federal share (\$)
Example: \$1,250,000 minus \$1,000,000 = \$250,000; and
- Formula: Non-federal share (\$) divided by Total Project Cost (\$) = Non-federal share (%)
Example: \$250,000 divided by \$1,250,000 = 20%

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under an EERE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- FAR Part 31 for For-Profit entities, (48 CFR Part 31); and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, EERE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, EERE generally does not allow pre-award costs prior to the signing of the Selection Statement by the EERE Selection Official.

General Cost Sharing Rules on a DOE award

1. Cash Cost Share - encompasses all contributions to the project made by the recipient or subrecipient(s), for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project.
2. In Kind Cost Share - encompasses all contributions to the project made by the recipient or subrecipient(s) that do not involve a payment or reimbursement and represent donated items or services. In Kind cost share items include volunteer personnel hours, donated existing equipment, donated existing supplies. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share section of the project Budget Justification (EERE 335). All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out the In Kind cost share section of the Budget Justification (EERE 335).
3. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC subrecipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients must be provided with the original application.

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4. Fee or profit, including foregone fee or profit, are not allowable as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

DOE Financial Assistance Rules 2 CFR Part 200 as amended by 2 CFR Part 910

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

- (A) Acceptable contributions. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the Prime Recipient's cost sharing if such contributions meet all of the following criteria:
 - (1) They are verifiable from the recipient's records.
 - (2) They are not included as contributions for any other federally-assisted project or program.
 - (3) They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.
 - (4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:
 - a. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A-122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the FAR, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations; and
 - b. Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.
 - (5) They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.
 - (6) They are provided for in the approved budget.

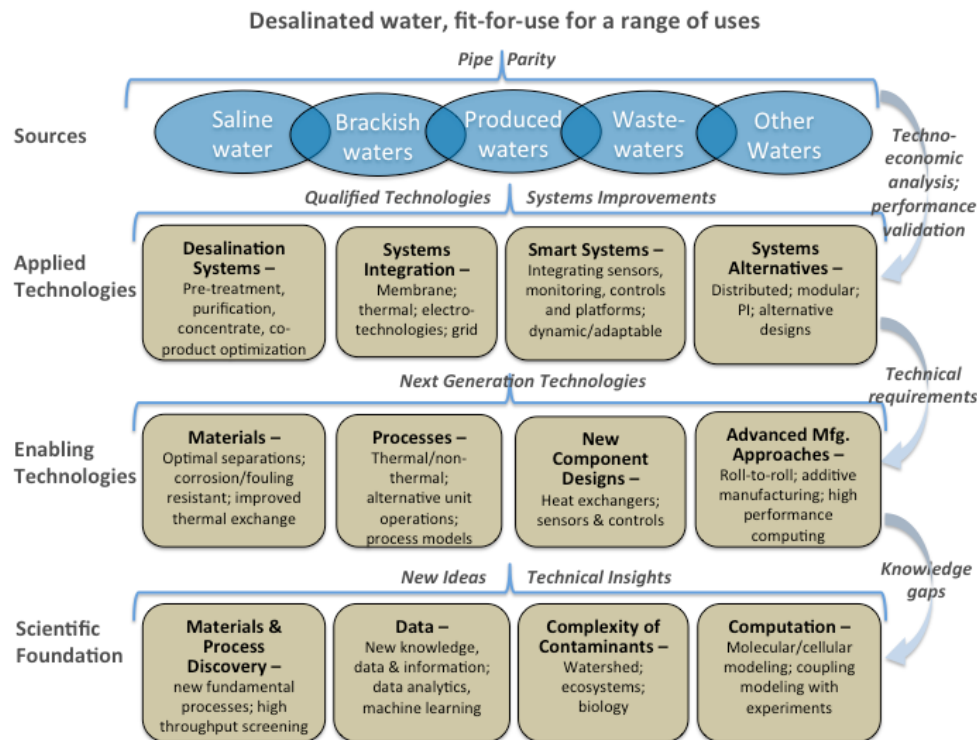
(B) Valuing and documenting contributions

- (1) Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:
 - a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
 - b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.
- (2) Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.
- (3) Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.
- (4) Valuing property donated by third parties.
 - a. Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

- b. Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:
 - i. The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
 - ii. The value of loaned equipment must not exceed its fair rental value.
- (5) Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:
- a. Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
 - b. The basis for determining the valuation for personal services and property must be documented.

Appendix B – Illustrative Example of the Energy-Water Desalination Hub Technical Opportunity Space

Below is an illustrative example of the Energy-Water Desalination Hub Technical Opportunity Space, based on stakeholder feedback from three workshops and an RFI. This example is not meant to be comprehensive or representative of the Hub's defined structure. It includes examples of the types of wide-ranging activities that could be addressed by the Hub in each of the four topic areas. Moreover, efforts in each technology space must be done in close coordination with others, so that needs in one space can inform R&D work in another. The Hub will be expected to span from early to applied R&D, with higher TRL activities informing lower TRL research in order to accelerate the technology development process.



Questions about this FOA? Email AMOWaterHub@ee.doe.gov.

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Appendix C – Waiver Requests and Approval Processes: 1. Foreign Entity Participation; and 2. Performance of Work in the United States (Foreign Work Waiver)

1. Waiver for Foreign Entity Participation

As set forth in Section III.A.iii, the Prime Recipient, subrecipients and Hub members must be incorporated (or otherwise formed) under the laws of a State or territory of the United States and must have a physical location for business operations in the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Waiver Criteria

EERE invests in research and development as part of the DOE's broad portfolio approach to addressing our Nation's energy and environmental challenges. Specific to the Energy-Water Desalination Hub, EERE seeks to address water security issues in the U.S. To ensure that purpose is not frustrated by foreign involvement, foreign entities seeking to participate in the Hub must demonstrate to the satisfaction of the Hub leadership (applicable to proposed foreign entity subrecipients and Hub members) and DOE that:

- a. its participation is in the best interest of the Hub, U.S. industry, and U.S. economic development;
- b. adequate Intellectual Property (IP) and data protection protocols exist between the U.S. subsidiary and its foreign parent organization;
- c. the work is conducted within the U.S. and the entity acknowledges the U.S. Manufacturing Plan; and
- d. the foreign entity will satisfy other conditions that may be deemed necessary by the Hub or DOE to protect U.S. government interests.

Content for Waiver Request

A Foreign Entity Participation waiver request must include the following:

- a. Information about the entity: name, point of contact, and proposed type of involvement with the Hub, and DUNS number for the proposed foreign participant and any foreign parent organization;

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- b. Country of incorporation, the extent of the ownership/level control by foreign entities, whether the entity is state owned or controlled, a summary of the ownership breakdown of the foreign entity and the percentage of ownership/control by foreign entities, foreign shareholders, foreign state or foreign individuals;
- c. The rationale for proposing a foreign entity participate in the Hub (must address the waiver criteria stated above);
- d. A description of the project's anticipated contributions to the U.S. economy:
 - How the foreign entity's participation will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
 - How the foreign entity's participation will promote domestic American manufacturing of products and/or services;
- e. A description of why the foreign entity's participation is essential to the project;
- f. A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP; and
- g. Countries where the work will be performed (Note: if any work is proposed to be conducted outside the U.S., the applicant must also complete a separate request for waiver of the Performance of Work in the United States requirement).

DOE may also require:

- A risk assessment with respect to IP and data protection protocols should include the export control risk based on the data protection protocols, the technology being developed and the foreign entity and country. These submissions could be prepared by the project lead, but the Prime Recipient must make a representation to DOE as to whether it believes the data protection protocols are adequate and make a representation of the risk assessment – high, medium or low risk of data leakage to a foreign entity or any other concerns with export controls.
- Additional language may be necessary to be added to any agreement or subagreement to protect IP, complete export control determinations, mitigate risk, etc.

EERE may require additional information before considering the waiver request.

The applicant does not have the right to appeal EERE's decision concerning a waiver request.

2. Waiver for Performance of Work in the United States (Foreign Work Waiver)

As set forth in Section IV.J.iii, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient

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should make every effort to purchase supplies and equipment within the United States. There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to perform work outside of the United States. A request to waive the *Performance of Work in the United States* requirement must include the following:

- a. The rationale for performing the work outside the U.S. (“foreign work”);
- b. A description of the work proposed to be performed outside the U.S.;
- c. An explanation as to how the foreign work is essential to the project;
- d. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the US economy:
 - The associated benefits to be realized and the contribution to the project from the foreign work;
 - How the foreign work will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
 - How the foreign work will promote domestic American manufacturing of products and/or services;
- e. A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
- f. The total estimated cost (DOE and Recipient cost share) of the proposed foreign work;
- g. The countries in which the foreign work is proposed to be performed; and
- h. The name of the entity that would perform the foreign work.

EERE may require additional information before considering the waiver request.

The applicant does not have the right to appeal EERE’s decision concerning a waiver request.

Appendix D - Data Management Plan

The Data Management Plan (DMP) is required with the Full Application. A DMP explains how data generated in the course of the work performed under an EERE award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication. This includes data that are displayed in charts, figures, images. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other DOE facilities can be found in the additional guidance from the sponsoring program.

The DMP must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all laws (i.e., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Principal Investigator should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as “protected data”) and what types of data that DOE should be able to release immediately. Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential (referred to as “limited rights data”). Any use of limited rights data or labeling of data as “protected data” must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

Data Types and Sources: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

Content and Format: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

Sharing and Preservation: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections,

systems, software, expertise) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation.

Protection: A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

Rationale: A discussion of the rationale or justification for the proposed Data Management Plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Additional Guidance

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements, and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, EERE encourages the citation of publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, EERE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

EERE's Digital Data Management principles can be found at: [EERE Digital Data Management Department of Energy](#)

Data Management Plan Definitions

Data Preservation: Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

Data Sharing: Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

Digital Research Data: The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.”

Validate: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.

Appendix E – Key Elements of a Conflict of Interest Plan

Prior to award, the Hub must establish COI procedures with a consistent approach to identifying and mitigating COIs across the Hub and in agreement with DOE's procedures. Throughout the FOA, this is referred to as the COI Plan. The COI procedures can be defined in a stand-alone document that is incorporated into the consortium agreement by reference, or the procedures could be a provision in the body of the consortium agreement itself. The COI Plan is subject to DOE review and approval.

In preparing the Hub's COI Plan, the plan should:

1. Define what constitutes a COI. (At a minimum, should cover financial conflicts, organizational conflicts, and close relationships – actual and apparent)
2. Identify what positions are covered by the COI Plan.
3. Provide the means for individuals to disclose information that may help identify COIs (e.g., annual disclosure forms) and identifies who is responsible for collecting this information.
4. Identify the level at which determinations of whether a conflict exists are made, and level at which actual conflicts are reviewed and how they will be reviewed.
5. Describe what records will be maintained in relation to COIs and the time period for maintaining those records.
6. Include procedures for managing COIs. Provides examples of possible mitigation measures for guidance in developing specific mitigation plans.
7. Include adequate enforcement mechanisms and provides for sanctions where appropriate.
8. Include procedure for providing required COI disclosures and proposed mitigation/avoidance plan to DOE. Disclosures to DOE should be in writing and include: 1) A copy of the current COI plan; 2) A detailed description of the COI; and 3) the individual COI mitigation plan that contains the actions to be taken in order to manage, eliminate, neutralize, mitigate or otherwise resolve the COI.
9. Provide for acknowledgement by persons covered by the COI Plan that he/she has read and understands the plan, and agrees to promptly disclose any potential COIs that may arise.
10. Satisfy the requirements of 2 CFR 200.318 (e.g., recipient must have written standards of conduct covering COI and governing the performance of its employees engaged in the selection, award, and administration of contracts and written standards regarding organizational conflicts).
11. Ensure the appropriate disclosures of financial ties to foreign universities, private entities and governments are reported to the appropriate entities, including DOE.

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Once a COI is identified, one course of action is to establish a COI Mitigation Plan. In some instances (e.g., COIs involving key personnel for the Hub) it may be necessary to submit the COI Mitigation Plan to DOE. A COI Mitigation Plan should:

1. Detail what the specific COI is;
2. Describe specific mitigation measures that will be taken for the identified COI;
3. Discuss what corrective actions will be taken should the covered party fail to adhere to the mitigation plan; and
4. Provide for acknowledgement by the covered party that he/she has read, understands, and agrees to comply with the plan.

Appendix F – Glossary

Applicant – The lead organization submitting an application under the FOA.

Continuation application – A non-competitive application for an additional budget period within a previously approved project period. At least ninety (90) days before the end of each budget period, the Recipient must submit to EERE its continuation application, which includes the following information:

- i. A report on the Recipient’s progress towards meeting the objectives of the project, including any significant findings, conclusions, or developments, and an estimate of any unobligated balances remaining at the end of the budget period. If the remaining unobligated balance is estimated to exceed 20 percent of the funds available for the budget period, explain why the excess funds have not been obligated and how they will be used in the next budget period.
- ii. A detailed budget and supporting justification if there are changes to the negotiated budget, or a budget for the upcoming budget period was not approved at the time of award.
- iii. A description of any planned changes from the negotiated Statement of Project Objectives and/or Milestone Summary Table.

Cooperative Research and Development Agreement (CRADA) – a contractual agreement between a national laboratory contractor and a private company or university to work together on research and development. For more information, see <https://www.energy.gov/gc/downloads/doe-cooperative-research-and-development-agreements>

Federally Funded Research and Development Centers (FFRDC) - FFRDCs are public-private partnerships which conduct research for the United States Government. A listing of FFRDCs can be found at <http://www.nsf.gov/statistics/ffrdclist/>.

Go/No-Go Decision Points: –

Project-Wide Go/No-Go Decision Point - a decision point at the end of a budget period that defines the overall objectives, milestones and deliverables to be achieved by the Hub in that budget period. As a result of EERE’s review, EERE may take one of the following actions for the Hub: 1) authorize federal funding for the next budget period; 2) recommend redirection of work; 3) discontinue providing federal funding beyond the

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current budget period; or 4) place a hold on federal funding pending further supporting data.

Individual Hub Activity-level Go/No-Go Decision Point - a decision point at the end of a budget period that defines the objectives, milestones and deliverables to be achieved by an individual project activity within the Hub in that budget period. As of a result of EERE's review, EERE may take one of the following actions for the individual activity: 1) authorize federal funding for the next budget period; 2) recommend redirection of work; 3) discontinue providing federal funding beyond the current budget period; or 4) place a hold on federal funding pending further supporting data.

Hub – a consortium that functions as a coordinated cohesive Energy Innovation Hub in the area of Energy-Water Desalination. A Hub includes the consortium of organizations that join up together as part of an application under this FOA and are selected for award negotiations.

Hub Activity – The scope associated with a specific R&D, modeling or analysis activity/work contained in the Recipient's Statement of Project Objectives.

Hub member – an organization (e.g., FFRDC, university, industry, manufacturers, non-profit) that is a qualifying entity¹² and part of an application under the FOA or joins later.

Project – The entire scope of the cooperative agreement which is contained in the recipient's Statement of Project Objectives.

Recipient or "Prime Recipient" – A non-Federal entity that receives a Federal award directly from a Federal awarding agency to carry out an activity under a Federal program. The term recipient does not include subrecipients.

Subrecipient – A non-Federal entity that receives a subaward from a pass-through entity to carry out part of a Federal program; but does not include an individual that is a beneficiary of such program. A subrecipient may also be a recipient of other Federal awards directly from a Federal awarding agency. Also, a DOE/NNSA and non-DOE/NNSA FFRDC may be proposed as a subrecipient on another entity's application. See section III.E.ii.

¹² See. Section 206(a)(3) of the Department of Energy Research and Innovation Act, P.L. 115-246, as codified at 42 U.S.C. 18632(b)(1).

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Appendix G – Elements of the Binding Consortium Agreement

The Hub will work closely with its members and DOE to establish and operate a coordinated Energy-Water Desalination Hub. To facilitate this collaboration, the Hub must operate subject to a binding consortium agreement entered into by each member of the consortium. The consortium agreement documents the proposed partnership between the Hub and its members and defines the Hub's governance and management structure.

As part of the Full Application, each applicant must submit a draft consortium agreement, such as an articles of collaboration, or similar agreement. The draft consortium agreement will be evaluated as part of DOE's rigorous merit review procedures.

To help the applicants prepare a consortium agreement, below is a list of key elements that should be included:

1. The rights and responsibilities of the Hub and the members;
2. The governance and management structure of the Hub;
3. The charter and mission of the Hub;
4. How the Hub and members will work together to collaborate to achieve the overall Hub mission and goals;
5. Provisions for members' cost sharing contributions;
6. Means of ensuring and overseeing members' efforts for the Hub;
7. Data Sharing and publication policies (the draft consortium agreement can incorporate the Data Management Plan submitted with the Full Application or at the very least needs to be consistent with the Data Management Plan submitted with the Full Application); and
8. Other terms or articles the consortium deems necessary.

Additional Reminders

Circulate Agreement with Members: Please keep in mind that the binding consortium agreement must be in place before an award can be made. To avoid delays, applicants are strongly encouraged to circulate the proposed consortium agreement amongst its proposed members prior to submitting it to DOE during the application phase.

Incorporate Key Plans: The final binding consortium agreement will need to explain how intellectual property, export control, communications, foreign participation, and conflicts of interest will be managed across the Hub and ensure the provisions are binding on the members. The final binding consortium agreement can incorporate the Intellectual Property Management Plan, the Data Management Plan, the Export Control Plan, the Communications

Plan, the Foreign Participation Plan, and the COI Plan by reference. Alternatively, the applicant may consider including the provisions directly into the consortium agreement, depending on the length of the provisions.

Only the Communications Plan and Data Management Plan are required as part of the Full Application and should be addressed in the draft consortium agreement submitted with the application. Applicants are encouraged to also include provisions in the draft consortium agreement for managing intellectual property, export control, foreign participation, and conflicts of interest, but are not required to do so at the application stage.

Include DOE Involvement: When defining the proposed governance and management structure of the Hub, applicants should consider the following. To effectively establish and operate a coordinated Hub, DOE anticipates the overall Hub will have a governance and management structure. DOE will have a substantial involvement in the overall governance and management of the Hub. The proposed consortium agreement should reflect DOE's involvement.

Appendix H – Conference Spending Plan for Hub

A. General. The Recipient, and any subrecipient at any tier, must comply with all applicable laws, regulations, policies, and DOE guidance (including specific cost limits, prior approval and reporting requirements, where applicable) governing the use of project funds for expenses related to conferences (as that term is defined by DOE), including the provision of food and/or beverages at such conferences, and costs of attendance at such conferences.

B. Definition. Conference is defined broadly to include meetings, retreats, seminars, symposia, events, and group training activity. A conference typically is a prearranged formal event with at least some of the following characteristics: designated participants and/or registration; a published substantive agenda; and scheduled speakers or discussion panels on a particular topic.

C. Prior Approval. The Recipient must obtain prior approval from the DOE Contracting Officer where the conference costs are \$50,000 or more. Conference costs mean all costs using project funds associated with planning, hosting, sponsoring, or otherwise holding any conference, including all of the categories of costs listed below:

- Conference meeting space (including rooms for breakout sessions);
- Audio-visual equipment and services;
- Printing and distribution;
- Meals provided at the event (generally unallowable);
- Refreshments (generally unallowable);
- Meals and incidental expenses (M&IE portion of per diem);
- Lodging;
- Air travel to/from conference;
- Local transportation (e.g., rental car, privately owned vehicle to-and-from-the airport, taxi);
- Logistical conference planner;
- Programmatic conference planner;
- Trainers, instructors, presenters, or facilitators;
- Other costs which must be identified individually;
- Staff time associated with planning and holding the conference; and
- Indirect costs/overhead rates applied to direct costs associated with the conference. (In accordance with negotiated agreements, all indirect costs associated with a conference must be applied to the above categories as appropriate and reported as conference costs.)

Requests for conferences costing \$50,000 or more must be submitted to the DOE Contracting Officer 45 calendar days in advance of the earliest of the following:

- Start date of the conference;
- Deadline for signing conference-related contracts, or
- Obligation of funds for conference costs (except for minimal costs required to assemble and submit the approval request).

Approval Requests Submitted Less than the Required Number of Days in Advance (as noted above)—DOE Contracting Officer may, in their sole discretion, consider requests that are submitted late, but cannot assure that these requests will receive a decision in time to avoid having to cancel the conference (particularly if there are any issues that arise with specific items of cost in the request). Cancellation costs associated with conferences that are submitted for late prior approval may be determined to be unallowable costs by DOE.

No conference (regardless of the number of attendees) can proceed, nor can conference-related contracts (e.g., hotel contracts and travel arrangements/reservations) be signed, or conference implementation funding be obligated/work authorized (whether performed by cooperative agreement staff or outside staff), until the cooperative agreement Recipient has obtained DOE Contracting Officer's approval in writing.

D. Trinkets (items such as hats, mugs, portfolios, t-shirts, coins, gift bags, regardless of whether they include the conference name logo) must not be purchased with project funds as giveaways for conferences.

E. The Recipient must develop a conference management directive that addresses conference planning, sets reasonable cost thresholds for such events, and establishes process to ensure such costs are reasonable and absolutely necessary.

F. Use of DOE Logo or Seal. The Hub may not use the DOE logo or official seal without the required review and explicit approval by the authorized DOE official. Please see the following link for more information on the approval process.

<https://www.energy.gov/eere/communicationstandards/using-doe-logo-seal-or-identifier-non-federal-products>

Appendix I – Definition of Technology Readiness Levels

| | |
|--------|--|
| TRL 1: | Basic principles observed and reported |
| TRL 2: | Technology concept and/or application formulated |
| TRL 3: | Analytical and experimental critical function and/or characteristic proof of concept |
| TRL 4: | Component and/or breadboard validation in a laboratory environment |
| TRL 5: | Component and/or breadboard validation in a relevant environment |
| TRL 6: | System/subsystem model or prototype demonstration in a relevant environment |
| TRL 7: | System prototype demonstration in an operational environment |
| TRL 8: | Actual system completed and qualified through test and demonstrated |
| TRL 9: | Actual system proven through successful mission operations |

Appendix J – List of Acronyms

| | |
|----------------|--|
| AMO | Advanced Manufacturing Office |
| COI | Conflict of Interest |
| CT | Current Typical (energy intensity) |
| DEC | Determination of Exceptional Circumstances |
| DMP | Data Management Plan |
| DOE | Department of Energy |
| DOI | Digital Object Identifier |
| EERE | Energy Efficiency and Renewable Energy |
| FAR | Federal Acquisition Regulation |
| FFATA | Federal Funding and Transparency Act of 2006 |
| FOA | Funding Opportunity Announcement |
| FOIA | Freedom of Information Act |
| FWP | Field Work Proposal |
| IPMP | Intellectual Property Management Plan |
| kWh | Kilowatt hour |
| m ³ | Cubic meter |
| MED | Multi-effect Distillation |
| MPIN | Marketing Partner ID Number |
| MYPP | Multi-Year Program Plan |
| NDA | Non-Disclosure Agreement |
| NEPA | National Environmental Policy Act |
| NNSA | National Nuclear Security Agency |
| OMB | Office of Management and Budget |
| OSTI | Office of Scientific and Technical Information |
| PII | Personal Identifiable Information |
| PM | Practical Minimum (energy intensity) |
| PPM | Part Per Million |
| R&D | Research and Development |
| R&D | Research and Development |
| RFI | Request for Information |
| RFP | Request for Proposal |
| RO | Reverse Osmosis |
| SAM | System for Award Management |
| SOPO | Statement of Project Objectives |
| SOTA | State-of-the-art |
| TDS | Total Dissolved Solids |
| TDS | Total Dissolved Solids |
| TM | Thermodynamic Minimum |
| TRL | Technology Readiness Level |
| UCC | Uniform Commercial Code |

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