Here is the text version of the webinar, "Energy-Water Desalination Hub FOA," presented in January 2019.

Melissa Klembara:
Presentation cover slide:
Hi. Welcome, everyone. This is Melissa Klembara with the Department of Energy's Advanced Manufacturing Office. I just want to welcome everyone. Please as a reminder mute yourselves. We were hoping that it would do it automatically, but I believe there might be some folks not on mute, so if you could do that, that would be great. I'm going to get started. We're live. Good afternoon and welcome to our webinar. Thank-you for your interest in the U.S. Department of Energy's efforts on renewable energy and energy efficiency. You're joining us for the informational webinar for applicants and other interested parties for the Energy-Water Desalination Hub funding opportunity announcement, or FOA, which was issued on December 13, 2018. My name is Melissa Klembara, and I'm a technology manager in the Advanced Manufacturing Office within the Department of Energy's Office of Energy Efficiency and Renewable Energy, Advanced Manufacturing Office. I'm joined by my colleague, Bill Prymak, a technical project officer. So we're going to be trading off presentation slides to you today. We hope to cover the basic aspects of the funding opportunity announcement during this webinar. Before we begin, I'd like to draw your attention to the email address on the left-hand side of this cover page: AMOWaterHub@ee.doe.gov. This is the official mailbox to direct all of your questions during the entire FOA process. Please do not contact EERE individuals directly with questions, including myself. All questions received at this mailbox are posted publicly at the QA section of the FOA page on EERE Exchange in an anonymous way. The official answers to your questions will typically also be posted within three business days. Please be careful not to submit any language that might be business-sensitive, proprietary, or confidential. Also note, we will not be having a live QA period at the end of the webinar, so please submit all of your questions to the email address shown on the cover page. We also are recording this webinar and it's being transcribed. It will be available in EERE Exchange soon after this presentation is completed. Also, just to be clear, there are no particular advantages or disadvantages to applications in the application evaluation process with respect to participating on this webinar today. Your participation is completely voluntary. Let's get started. And just one more reminder: Please mute yourselves if you haven't already been automatically muted. Much appreciated. Next slide, please.

First slide:
So this slide shows the anticipated schedule for the FOA. The FOA has already been posted, and we are conducting the FOA informational webinar now. Please note that there are a few requirements that we will go over in this presentation that are different than in past funding opportunity announcements, such as replies to reviewer comments. We will cover all requirements for this FOA later in the presentation. Note the next deadline is the submission for concept papers, which are due February 7, 2019.

Next slide:
All applicants are strongly encouraged to carefully read the funding opportunity announcement, DE-FOA-0001905, and adhere to the stated submission requirements. This presentation summarizes the contents of the FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the control document, and applicants should rely on the FOA language and seek clarification from EERE. If you believe there are inconsistencies, please contact AMOWaterHub@ee.doe.gov.

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So no new information other than that provided in the FOA will be discussed in this webinar. There are no particular advantages or disadvantages to the application evaluation process with respect to participating on the webinar today. Again, your participation is completely voluntary.

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The agenda for this presentation is as follows: FOA Description, Topic Areas, Award Information, Statement of Substantial Involvement, Cost-Sharing, Preselection Interviews, Concept Papers, Full Applications, Merit Review and Selection Process, and Registration Requirements.

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We encourage you to have a copy of the FOA in front of you for reference as we go through the presentation. ... This is the description of the FOA. Energy-Water Desalination Hub Background and Purpose. The purpose of this funding opportunity announcement 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 United States. For 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 broader Water Security Grand Challenge, which will use a coordinated suite of prizes, competitions, early-stage research and development, and other programs to help address the nation's water security needs.

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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 nontraditional water sources, for beneficial and end-use applications with the goal of achieving pipe parity. Establish the 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 United States, 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. Pipe parity is defined as technology solutions that are cost-competitive with existing water sources and end-use applications.

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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 United States. Therefore, industry representatives across the supply chain should be involved to provde 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, such as industrial, energy sector, municipal, and agricultural.

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

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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 nontraditional 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 the research, data, and analysis are available in order to benchmark all cases at this time.

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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 enegy intensity to purify seawater and brackish waters to pipe parity drinking water is approximately 3.2 kilowatt hours per cubic meter (kilowatt hour per meter cubed), ranging from 1.6 to 4.8 kilowatt hour per meter cubed, and costs an average of $1.50 per meter cubed. In comparison, pipe parity drinking water production from fresh water has an average energy intensity of 0.29 kilowatt hour per meter cubed, and costs an average of 50 cents per meter cubed to extract, convey, and treat. In 2017, DOE released a bandwidth study on energy use and potential energy-savings opportunities in the U.S. seawater desalination system that examined energy consumption and potential energy-savings opportunities in the U.S. seawater desalination plan. 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.

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Figure 1 summarizes some of the study's results and estimates the current energy footprint of seawater desalination in the United States ("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 (or "Practical Minimum").

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A link to the DOE Desalination Bandwidth Study is included in the funding opportunity announcement. The Desalination Bandwidth Study provides an example of the level of detail the Hub will need to assess energy usage and cost for other non-freshwater 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-freshwater 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 obtained.

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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 measured in energy per meter cubed water. Levelized cost of water in dollars per meter cubed water, including assumptions about discount rate, plant life. Water intensity in meter cubed per unit of end product. Degree of utilization of unconventional water / energy sources, or exploiting synergies between processes / systems. And water system security and resilience, risk of disruption, number of days of lost service.

Next slide:
Bill, my colleague, is going to take over slides.

Bill Prymak:
I'm ready.

Melissa Klembara:
OK.

Bill Prymak:
Hub Organization, Structure, and Operations. DOE conducted three stakeholder workshops and a request for information, or RFI, from 2015 to 2017, and subsequently released a summary report in 2018 entitled, "Advanced Manufacturing Office Clean Water Processing Technologies Workshop Series Summary Report." 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 technology challenges should be addressed in order to desalinate and clean water at an energy, cost and other requirements comparable to today's freshwater purification technologies. However, solutions other than those included in this report are eligible for consideration and not restricted to feedback received to date.

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A link to the workshop series summary report is included in the FOA. Based on input to date, DOE organized the Hub into four topic areas: Materials Research and Development, New Process Research and Development, Modeling and Simulation Tools, and Integration and Data Analysis, which are summarized below.

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For Materials Research and Development (R&D). Materials R&D has the potential to improve materials used in specific components in water treatment systems so as to improve energy efficiency and lower cost. Desalination and related water-treatment technologies can benefit from materials improvement for a range of products, including membranes, pipes, tanks, and pumps, that dramatically increase their performance, efficiency, longevity, and are durable and corrosion resistant.

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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 pretreatment systems such as upstream from the desalination unit operation. New process technologies also needed to address associated challenges such as water reuse, water efficiency, and high-value coproducts.

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Modeling and Simulation Tools. Multiscale model and simulation tools are needed to inform 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.

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Integrated Data and Analysis. In order to consistently define and track and achieve pipe parity in the highest-impact areas, central, strategic, nonbiased, integrated data and analysis is needed to align the

Hub's project-level activities in order for the four topic areas to achieve the Hub goals and to measure technical success of both project-level activities and the overall Hub. There is a need to develop information resources, studies, and analysis tools necessary to guide the Hub's strategic R&D portfolio.

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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 multidisciplinary experts from across industry, manufacturers, universities, nonprofits, federally funded research and development centers or FFRDCs, 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 topic areas 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 establishment of 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 application. 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 three workshops and RFI, included in Appendix B, though additional technologies and ideas will be considered.

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And Appendix B is an illustrative example on the Energy-Water Desalination Hub technology space. The diagram is an illustrative example of the Energy-Water Desalination Hub technology space, based on stakeholder feedback from the workshops and the RFI. This example is not meant to be comprehensive or represent 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 the needs from one space can inform R&D work in another. The Hub will be expected to stand from early applied R&D with higher TRL activities, informing lower TRL research in order to accelerate the technology development process.

Next slide:
Melissa?

Melissa Klembara:
OK. 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, 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 will be negotiated with DOE into the budget periods 2 through 5. The Hub will develop a consistent process to compete and select projects (for

example, requests for proposals process) to be recommended to DOE for negotiations into the award. Note the Hub 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.

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Hub Consortium Agreement. The Hub should be a consortium of multidisciplinary experts from across industry, manufacturers, universities, nonprofits, 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.

Next slide:
This slide shows Appendix G, the 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 process. To help the applicants prepare a consortium agreement, below is a list of key elements that should be included: The rights and responsibilities of the Hub and the members. The governance and management structure of the Hub. The charter and mission of the Hub. How the Hub and members will work together to collaborate to achieve the overall Hub mission and goals. Provisions for members' cost-sharing contributions. Means of ensuring and overseeing members' efforts for the Hub. Draft 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 other terms or articles the consortium deems necessary. Additional reminders are listed in Appendix G.

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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 included 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 structures make

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 procedures and 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 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 VI.B.xi (due no later than seven business days after notice of selection for award negotiation). And foreign entity participation plan per Section VI.B.xv.

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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's goal of pipe parity. Establish consistent guidelines, policies, agreements, processes, and strategy documents for the Hub, included 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 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 project scope of work and budget into the award for budget period 2, including scope that will continue into budget periods 3, 4, and 5.

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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 estimates for the R&D, modeling, and / or analysis activities for the remainder of the project period, budget periods 2 through 5. Note the Hub 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 the Hub members must be shared with other members and ultimately the public. The data and software tools will be used by the integrated data and analysis team area to evaluate the Hub's R&D, modeling, and analysis activities and to disseminate the results of the Hub's activities within the Hub and to the public. This includes updates to technology baselines, technical targets, and the roadmap.

Bill Prymak:
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We're now on slide 30. We're going to now discuss topic areas. Applicants will apply to the entire Hub by submitting an application that addresses all four topic areas and the other requirements. DOE intends to select and fund one applicant with the greatest likelihood of achieving the goals of the FOA, as we've mentioned. For a description of what should be included in the Hub application, see Section IV.D.ii, Technical Volume. There are four interdependent topic areas for the Energy-Water Desalination Hub, as has been mentioned: Materials Research and Development, New Process Research and Development, Modeling and Simulation Tools, and 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 portfolio activities within the Hub. Other activities may be proposed provided they are justified as being relevant to the Hub. All work under EERE fund agreements must be performed in the United States. See Section IV.J.iii and Appendix C.

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On the topic area 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 treatments, separations technologies, piping, tankage, and pumps. This includes materials discovery for new process 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 toward 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 to enable them, some of which were highlighted in the Multiyear Program Plan published by the DOE Advanced Manufacturing Office. Such technologies include roll-to-roll processing, smart manufacturing, eletroctechnologies, 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 by industrially relevant, integrated systems and provide data and other information in coordinated interface tasks and activities with other topic areas in the Hub as outlined in the roadmap effort that would be conducted during budget period 1.

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Note that a link to AMO's MYPP is included in the FOA. New Process Research and Development. Novel technology concepts at lower cost and energy -- lower energy -- are needed for water desalination as well as treatment, water reuse, water efficiency, water replacement, and high-value coproducts. This R&D will enable use of more water resources for industrial, agriculture, utility, and municipal end uses,

including sources such as produced and extracted waters, seawater and brackish groundwater, and other nontraditional water sources. To do this, a molecular-level understanding of the complexity of nontraditional 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 coproduct 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 systemwide performance, such as from intake, purification, and 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 containment levels and types, temperature and pressure and other operating parameters is critical to improve component resilience toward fouling, corrosion, clogging, and allows for operation under optimal conditions for a given location, time, and water source. 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. Water optimization tools are not to be limited to those identified in the MYPP. Data collection and analysis from sensors will be required for thorough process modeling, development for feedback and enabling 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, such as solar, waste heat, grid, the variability may need to be compensated for in a smart way, e.g. with sensing to schedule maintenance and for parts replacement resulting in more efficient operations and reduced down time. This topic area also includes water efficiency improvement or water replacements for 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 interfaced tasks and activities with the other topic areas as outlined in the roadmapping effort.

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Note a link to the Smart Manufacturing Section of the MYPP is included in the FOA. Modeling and Simulation Tools. Multiscale 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 from multiscale modeling is needed to assess R&D results and inform future R&D. Development of these experimental-driven, data-driven models are needed to understand and describe the properties and behaviors of complex processing systems. Aqueous 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, separation and other advanced processes for desalination. Multiscale modeling is expected to extend from fundamental materials and in process advancement to system-scale modeling that can address technology options at scale. System-scale modeling is needed to assess the economies of scale implications of modular system design versus large, centralized system design. The broader systems modeling and simulation will be expected to include advances in technology integration implications resulting from advances in processes, such as separation 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 and 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, the 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 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.

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The Integrated Data and Analysis topic area. In order to consistently define, track, and achieve pipe parity, performance metrics for desalination in the highest-impact areas, central, strategic, nonbiased, integrated data and analysis is needed to track project-level technical targets and 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 data 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 the technology roadmapping include integrated data and analysis to assess not only material and new process technology separately, but their collective impact as pathways to the Hub. Therefore, these efforts will require close coordination with the modeling and simulation activities. As such, integrated data and analysis technical focus area will also be responsible for supporting the roadmap efforts. Integrated data and analysis effort will be used to inform Hub decisions and evaluation of R&D, modeling, and analysis portfolio tracking, level of technical targets and performance metrics, such as for individual Hub activities, go / no-go decisions made by DOE, using a consistent methodology in identifying R&D, modeling, and analysis gap areas. Given the interconnectedness of this topic area, interfaced tasks and activities will be coordinated with other 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 within the Hub, DOE, and the public.

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And this is slide 35 for information for all topic areas. 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 of a publication of a roadmap outlining key water resources to end-use pathways to achieve the most energy / water / cost savings on performance metrics outlined in Section I.A.ii, Technology Space and Strategic Goals. Specifically, the applicant must explain how each of the activities in a topic area must address the scientific and technical challenges to address the current state of technology for low-cost, energy-efficient desalination for a broad set of water end-use applications. The applicant must develop technology baselines, performance metrics, technology targets for the specific activities conducted in the topic areas that align with the Hub's goal of achieving pipe parity. An effective application will include multidisciplinary experts from industry and manufacturing, universities, nonprofits, FFRDCs, states, municipalities, and other key stakeholders with expertise in advanced technology applicable to the Energy-Water Desalination Hub that have facility capability 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 for participating and coordinating R&D, analysis, and modeling activities across the Hub and with DOE. 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 activities 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.

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And continued with information for all topic areas. The Hub must agree to work cooperatively with other members in order to achieve an innovative ecosystem in the energy-water community. The application must include a proposed consortium agreement that documents key elements from the consortium partnership, and defines the governance and management structure for the Hub. See Appendix G for further guidance. Among other things, the Hub must agree to share data and software tools resulting from the R&D, modeling, and analysis activities under the award with 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 or protocols. The Hub must agree to work with members on general coordination activities including convening Hub-related workshops and meetings, develop the overall communications and publications, organizing quarterly technical updates of R&D, modeling, and analysis, to assess progress against roadmap activities. The Hub must agree to work with the 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.

Next slide:
Melissa?

Melissa Klembara:
Teaming Partner List. An effective application will include multidisciplinary experts from industry, manufacturers, universities, nonprofits, 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 of 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 this 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 organizations that would like to be included on the list should submit the following information to AMOWaterHub@ee.doe.gov with the subject line "Teaming Partner Information": Organizational name, contact name, contact address, contact email, contact phone, organization type, areas of technical expertise, and brief description of capabilities. By submitting your 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.

Next slide:
Applications Specifically Not of Interest. The following types of applications will be deemed nonresponsive and will not be viewed 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, for example, violating the law of thermodynamics. Applications that are outside technology readiness levels 2 through 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.

Next slide:
This slide shows the summary of the award information. The total amount to be awarded is 100 million dollars in federal funding. The average award amount: EERE anticipates making only one award. The types of funding agreements are possibly cooperative agreements, funding agreements with FFRDCs, and interagency agreements. The period of performance is 60 months, or five years. The cost-share requirement is 20 percent of the total project cost. This is subject to the availability of appropriated funds.

Next slide:
Award Information (continued). EERE will establish five 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 five-year budget period. The first budget period will provide resources, including supporting analysis for roadmapping and other efforts, to identify near and long-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, 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 months (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 period, budget periods 3 through 5. All budget periods will be 12 months approximately in length. Additional detail will be required in the proposed SOPO and budget submission as part of the continuation application, required 90 days prior to the end of each budget period. A total of up to 20 million dollars in federal funds is anticipated to be available for the award for each budget period. Funding for budget periods 2 through 5 is not guaranteed. Before the expiration of each budget period, EERE will perform a projectwide go / no-go decision review. See Section VI.B.xx for more information. The Hub's continuation application 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 the roadmapping will be rescoped or removed.

Next slide:
Statement of Substantial Involvement. Under cooperative agreements, there will be what is known as substantial involvement between EERE and the recipient during the performance of the project. EERE has substantial involvement in the 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: EERE shares responsibility with the recipient for the management, control, direction, and performance of the project. 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. EERE may redirect or discontinue funding the project based on the outcomes of EERE's evaluation of the project at the projectwide go / no-go decision point. EERE may redirect or discontinue

funding for individual Hub activities based on the outcomes of EERE's evaluation of those activities at the individual Hub activity go / no-do decision points. EERE participates in major project decision-making processes to include but not limited to completion of roadmap, selection of Hub activities, individual Hub activity go / no-go reviews, and project redirection based on progress reviews. EERE will appoint DOE federal government representatives to participate in any Hub governance or management entities that may be established. The recipient will provide EERE the opportunity to participate in the planning of technical, strategic, and operations events such as workshops and roadmapping activities. The recipient will obtain a positive compliance recommendation from EERE prior to adoption of 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, data-management plan, conflict of interest plan, export control plan, the communications plan, NDA / COI forms, foreign entity participation plan, conference management directive, planning documents listed in the SOPO, and other key documents or policies for the Hub.

Next slide:
Continuing with the list of Statement of Substantial Involvement. Number 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 participants. The recipient will provide EERE a minimum of five business days to review any project or Hub activity-specific risk mitigation and corrective action plans. 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 review and experiments, and project management and monitoring activities. The recipient must notify EERE a minimum of 10 business days before the Hub activities and provide all appropriate documentation for EERE review. EERE may choose to engage a private, independent engineer 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 IE or consultant has access to any and all relevant documentation sufficient to allow the IE or consultant to provide independent evaluation to EERE on the progress of the project. The recipient may require the IE or consultant to sign an 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. In addition to the list above, the recipient must obtain government approval in the following situations: Scope changes including but not limited to any changes in plans that may result in a need for additional federal funding. NEPA-relevant documents and compliance activities. Requests for proposals for Hub activities funded under the Hub. Selection of new Hub activities. Selection of key personnel. And foreign entity participation and foreign work waivers. EERE reserves the right to make modifications and / or additions to this list based on future risk assessments and / or specific Hub management approach enlisted by the recipient.

Next slide:
Cost-Sharing Requirements. The cost share must be at least 20 percent of the total allowable cost for research and development projects, i.e. the sum of government share including FFRDC costs as applicable and the recipient's share of allowable costs equals the total allowable cost of the project, and must come from nonfederal 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.

Next slide:

Cost-Share Contributions. The total budget presented in the application must include both federal and nonfederal portions, thereby reflecting total project cost proposed. All costs must be verifiable from the recipient's records and be necessary and reasonable for the accomplishment of the project. Contributions must be specific in the project budget, verifiable from the prime recipient's records, necessary and reasonable for proper and efficient accomplishment of the project. Every cost-share contribution must be reviewed and approved in advance by the contracting officer and incorporated into the project budget before expenditures are incurred.

Next slide:
Allowable Cost Share. Cost share must be allowable and must be verifiable upon selection for award -- for award negotiations. I'll repeat that: Cost share must be allowable and must be verifiable upon selection for award negotiations. Refer to the following as applicable federal cost principles. For-profit entities are FAR Part 31. All other nonfederal entities are 2 CFR Part 200 Subpart E, Cost Principles.

Next slide:
Allowable Cost Share. Cash contributions may be provided by the prime recipient, subrecipient, or a third party. In-kind contributions can include but are not limited to personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third-party in-kind contribution.

Next slide:
Unallowable Cost Share. Be aware that there are items that are considered unallowable cost share. If a cost is considered unallowable, it cannot be counted as cost share. The prime recipient may not use the following sources to meet its cost-share obligation, including but not limited to: Revenues and 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. Expenditures reimbursed under a separate federal technology office. Independent research and development funds. The same cash or in-kind contributions for more than one project or program.

Next slide:
Cost-Share Payment. Recipients must provide documentation of the cost-share contribution, incrementally over the life of the award. The cumulative cost-share percentage provided on each invoice must reflect, at a minimum, the cost-sharing percentage negotiated. 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. See Section III.B.vi of the FOA.

Bill Prymak:
Next slide:
Now discussing the FOA timeline on slide 49. EERE's evaluation and selection process is shown in blue here. EERE will review concept papers, reply to reviewer comments, which we'll cover later during this presentation, in "Full Applications." The gray boxes represent actions that apply to applicants through the process. As noted before, concept papers due February 7, 2019. You should expect to receive encourage / discourage notifications for concept papers on March 7, 2019. Full applications are due May 7, 2019. You should expect to receive reviewer comments by June 19, 2019. And then reply to reviewer comments due on June 28, 2019. Then you should receive selection notification or nonselection around August 2019. And then EERE anticipates making an award within 90 days of selection notification.

Next slide:
Preselection Interviews. EERE may invite one or more applicants to participate in preselection interviews. All interviews will be conducted in the same format. EERE will not reimburse applicants for travel or other expenses related to preselection interviews, nor will these costs be eligible for reimbursement as pre-award costs. Participation in preselection interviews with EERE does not signify that applicants have been selected for award negotiation.

Next slide:
Concept Papers. Applicants must submit a concept paper. The ideas and technologies proposed in 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 include the following section (and see Section IV.C of the FOA): A technology description and impacts description. Hub and resource description. Operations and management approach, limited to three pages. Concept papers must be submitted by February 7, 2019, at 5 p.m. Eastern time through EERE Exchange and must comply with the content and form requirements of Section IV.C of the FOA. EERE provides applicants with an encourage or discourage notification and the reviewer comments.

Next slide:
Concept Paper Review. Concept papers are evaluated based on consideration of the following factors. All subcriteria are of equal weight. Criterion 1, Technical Description and Impacts, at 40 percent. Demonstrates the knowledge of the key technical opportunities and challenges associated with the Energy-Water Desalination Hub discussed in Section I.A and Appendix B of the FOA, 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 the extent to which the proposed R&D, modeling, and / or analysis approach will impact the FOA's performance, metrics, and goals. Criterion 2, Hub and Resources, at 30 percent. Extent to which the roles and responsibilities are well-defined and organized around the key technical challenges. Whether the proposed Hub has the skills, qualification, 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, at 30 percent. 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, and other results within the Hub with DOE and the public. EERE will provide applicants with either an encouraged or discouraged notification and the reviewer comments, as noted before. Please note that regardless of the date applicants receive the encourage / discourage notifications, the submission deadline for the full application remains the date as stated on the FOA cover page.

Next slide:
The full applications must include the technical volume, statement of project objectives, the SF-424 Application for Federal Assistance, Budget Justification Workbook (EERE 335 form), a summary for public release, summary slide, Subrecipient Budget Justification (EERE 335) if applicable, budget for DOE / NNSA FFRDC if applicable, authorization for the non-DOE / NNSA FFRDCs also if applicable, Authorization from the Director of Laboratory Policy (SC-32) if applicable, an SF-LLL form (Disclosure of Lobbying Activities) is required, waiver requests: foreign entities and performance of work in the United States if

applicable, U.S. manufacturing commitments, data-management plan, conflict of interest statement, consortium agreement, communications plan, and a compliance matrix.

Next slide:
On slide 54, talking about the full applications, the technical volume content, technical volume is the key component of the full application. 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, photo, and other graphics, and must include all information in the table below. The applicant should consider the weighting of each evaluation criteria. See Section V.A.ii of the FOA when preparing the technical volume. The content of the technical volume and suggested percentages of the technical volume are as follows: Cover page, one-page overview and strategy and alignment to the Hub, about 20 percent. Technical description, innovation, impact, around 30 percent. Technical qualifications and resources, around 20 percent. And operations and management approach at 30 percent.

Next slide:
Full Application Eligibility Requirements. Applicants must submit a full application by May 7, 2019. Full applications are eligible for review if the applicant is an eligible entity. See Section III.A of the FOA. The applicant submitted an eligible concept paper. The cost-share requirement is satisifed per Section III.B of the FOA. The full application is compliant with Section III.C of the FOA. The full application is responsive to the FOA. See Section III.D of the FOA. The entity meets the limitation on the number of concept papers and full applications eligible for review, Section III. F of the FOA. And the full applications meet any other eligibility requirements listed in Section III of the FOA.

Melissa Klembara:
Next slide:
Who is Eligible to Apply? The Hub is intended to be a consortium of multidisciplinary 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 its 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 the 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.

Next slide:
Continuing on Who is Eligible to Apply. 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.

Next slide:
Qualifying Entities. The term "qualifying entities" includes an institute of higher education; an appropriate state or federal entity, including an DOE / NNSA federally funded research and development center (FFRDC); a nongovermental organization with expertise in advanced energy technology research, development, demonstration, or commercial application related to the Energy-Water Desalination Hub; or 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.

Next slide:
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 the domestic subsidiary or affiliate. 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 a 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. Applicants and any proposed subrecipients do not have the right to appeal EERE's decision concerning a waiver request.

Next slide:
Limitation on the 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, for example, as a potential subrecipient or partner, so long as the entity is only listed as the applicant on one concept paper and one full application submitted under this FOA.

Next slide:
Merit Review and Selection Process for Full Applications. The merit review process consists of multiple phases that each include an initial eligibility review and a thorough technical review. Rigorous technical reviews 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 to make the selection decisions.

Bill Prymak:
Next slide:
And now we'll cover the technical merit review criteria starting on slide 62. Criterion 1, Technical Merit Innovation, and Impact, at 40 percent. Degree to which the technical approach and R&D and modeling and analysis activity 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 analysis activities including the degree to which it is comprehensive, well-balanced, and at the forefront of the current state of technology. Degree to which the current state of technology and proposed advancements are clearly and convincingly described. The ability to overcome scientific, engineering, and technical obstacles and risks to achieve the objectives outlined in the FOA. And sufficiency of the technical detail on 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 analysis that supports the viability of the proposed work. And 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 proposed technologies.

Next slide:
Criterion 2, Technical Qualifications and Resources, at 30 percent. The clarity of the organizational structure, roles and responsibilities, and adequacy of the roles and intellectual contributions of the principal investigators and proposed senior key personnel. The quality of the principal investigators and proposed members to address all aspects of the proposed work with a high probability of success. This includes the qualifications, relevant experience, and time commitment of the individuals. Demonstrated record of success in R&D, modeling, and / or analysis in the four topic areas of the Hub. Degree of access to and quality of existing research facilities and instrumentation at the applicant and Hub members that will provide 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, multiyear, 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 manner such as costs of acquiring and preparing the space to house the Hub and any required equipment and instrumentation.

Next slide:
Criterion 3, Operations and Management Approach, at 30 percent. 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 multidisciplinary fields across the breadth and scope of the Hub's technology opportunity space as described in Section I.A of the FOA, 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 and the members, and b) the Hub's governance and management structure (see Appendix G). The extent to which 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. And the extent the communications plan ensures close communication and integration of Hub activities, if the members will not be located in one centralized location.

Next slide:
Criterion 3, Operations and Management continued. The adequacy of plans for external collaborations and partnerships, including the leveraging of DOE and other federal facilities. The adequacy and appropriateness of the plan for recruiting of 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 tool activities available within the Hub, with DOE, and with the public. In the case of modeling and simulation tools, the commitment to make such tools available through an open-source license or other method that promotes widespread use of such tools. The appropriateness and adequacy of the approach to measure the Hub's R&D, modeling, and analysis progress against technical targets and performance metrics. The adequacy of performance monitoring systems to ensure the overall project is operating within proposed scope, costs, and schedule. And extent to which the applicant has existing business relationships and the ability to seamlessly initiate new business relationships.

Melissa Klembara:
Next slide:
OK, just as a heads-up, we have about 10 more slides left, starting with Replies to Reviewer Comments, slide 66. The full applications are reviewed by experts in the FOA topic areas. After those experts review the applications, EERE will provide applicants with reviewer comments. Applicants will have a brief opportunity to review the comments and prepare a short reply to reviewer comments, responding to comments however they desire. The reply to reviewer comments is due by the date and time provided on this slide. Applicants should anticipate receiving the independent reviewer comments approximately three business days before this due date. The reply to reviewer comments is an optional submission. Applicants are not required to submit a reply to reviewer comments. This is a customer-centric process that provides applicants with a unique opportunity to correct misunderstandings and misinterpretations and to provide additional data that might influence the selection process in their favor. The replies are considered by the reviewers and the selection official. Replies to reviewer comments must conform to the content and form requirements listed here, including maximum page length. If a reply to reviewer comments is more than 10 pages in length, EERE will review only the first 10 pages and disregard any additional pages. Please see Section V.F and V.A.iii for additional information regarding replies to reviewer comments.

Next slide:
Selection Factors. The selection official may consider the merit review recommendations, program policy factors, and the amount of funds available in arriving at selections for this FOA.

Next slide:
Program Policy Factors. In addition to the 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. 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.

Next slide:

Next slide. 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. Such as: DUNS number. Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number. System for Award Management: Register with a System for Award Management (SAMS), designating an electronic business point of contact and obtaining a special password called an MPIN, are important steps in SAM registration. Please update your SAM registration annually. FedConnect: Register in FedConnect to create an organization account. Your organization SAM / MPIN is required. For more information about the SAM, MPIN, or other registration requirements, review the FedConnect "Ready, Set, Go" guide on the FedConnect site. Grants.gov: Register in Grants.gov to receive an automatic update when amendments to this FOA are posted. However, please note that concept papers and full applications will not be accepted through Grants.gov.

Next slide:
Means of Submission. Concept papers, full applications, and replies to reviewer comments must be submitted through EERE Exchange at https://eere-exchange.energy.gov. EERE will not review or consider applications submitted through other means. The user's guide for applying to the Department of Energy EERE funding opportunity announcements can be found at https://eere-exchange.energy.gov/manual.aspx.

Next slide:
Key Submission Points. Check entries in EERE Exchange. Submissions could be deemed ineligible due to an incorrect entry. EERE strongly encourages applicants to submit one to two days prior to the deadline to allow for full upload of application documents and to avoid any potential technical glitches with EERE Exchange. Make sure you hit the submit button. Any changes made after you hit submit will unsubmit your application, and you will need to hit the submit button again. For your records, print out the EERE Exchange confirmation page at each step, which contains the application's control number.

Next slide:
Applicant Point of Contact. Applicants must designate primary and backup points of contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. 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.

Next slide:
And this is the last slide. Questions about this FOA must be emailed to AMOWaterHub@ee.doe.gov. All questions and answers related to this FOA will be posted on EERE Exchange. You must select this specific FOA number in order to review the questions and answers. EERE will attempt to respond to a question within three business days, unless a similar question and answer has been posted on the website. Problems logging into EERE Exchange or uploading and submitting application documents with EERE Exchange should be emailed to EERE-ExchangeSupport@hq.doe.gov. Include the FOA name and number in the subject line. Thank-you for your participation in today's webinar, and that is the end of our webinar today. Thanks, everyone.