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Chairman Bowman, Ranking Member Weber, Chairman Foster, Ranking Member Obernolte, and Members of the Subcommittees, it is an honor to appear before you today to discuss the Department of Energy's ("the Department" or "DOE") nuclear energy research, development, and demonstration (RD&D) programs.

The Administration's climate policy is informed by science, and the science tells us that the time for climate action is now. Nuclear energy is a key element of President Biden's plan to put the United States on a path to a net-zero carbon future by 2050. The United States pioneered the development of nuclear power to produce electricity in the late 1940s. Since then, U.S. leadership in nuclear energy technology has given us the benefit of clean, reliable electricity for seven decades. In the United States, nuclear energy provides about 20% of our electricity and over 50% of the nation's annual clean electricity production, making it the largest and the most reliable source of clean, carbon-free electricity, operating with 92% availability, the highest in the world for nuclear generation and higher than any other generation source.

To meet our ambitious carbon reduction goals and rebuild U.S. leadership globally, the Biden-Harris Administration is prioritizing activities that preserve the existing fleet of nuclear power plants, deploy advanced reactor technologies, and expand nuclear energy to markets beyond electricity. Nuclear energy will play a major role in the transition to a clean energy economy by fundamentally underpinning our nation's target for clean, carbon-free electricity as well as non-electric energy markets. We also have the potential to decarbonize many industrial sectors in the United States and abroad.

At home, nuclear power plants serve as bedrocks for communities across the country. Nuclear power plants drive local economies, often serving as the largest employer and economic engine in small communities. It is imperative we preserve these plants not only to support access to clean energy but also to sustain good-paying clean energy jobs.

The Office of Nuclear Energy (NE) serves a vital role in addressing these challenges. As an applied energy research, development, and demonstration organization, we enable innovation, support unique research infrastructure, and solve crosscutting challenges facing the nuclear energy sector. NE invests in RD&D that the private sector or other non-governmental stakeholders are unable or unwilling to perform alone due to uncertainty, cost, scale, or timeframes. NE funds and creates opportunities for world-class researchers in industry,

academia, and the DOE National Laboratories to collaborate and solve pressing scientific and engineering challenges. NE programs leverage private-public partnerships, university collaborations, and our national laboratory system to make nuclear energy more cost effective, accelerate advanced reactor deployment, make nuclear fuel cycles more sustainable, encourage a resilient supply chain, and promote a strong nuclear workforce.

The current U.S. fleet of more than 90 reactors is imperative to solving our climate challenges. We must ensure that these reactors remain online and find new ways of using them to solve energy transition challenges. The Light Water Reactor Sustainability Program conducts RD&D in support of light water reactor (LWR) technologies so that the existing fleet of LWR power plants can continue to provide safe, clean, and reliable energy. Our goal is to work with industry to enhance the efficient and economic performance of current nuclear power plants while enabling their extended operation. For example, NE partnered with industry to demonstrate control room and plant modernization to combat aging and obsolescence of existing analog instrumentation and controls to improve plant efficiency. Additionally, NE supports RD&D to reduce the emissions of energy-intensive non-electric applications such as clean hydrogen production for the transportation and industrial sectors, while improving the economics of nuclear energy. NE also supports development of multiple accident tolerant fuel concepts, which offer real potential for substantially improved economics and safety margins for our existing fleet as well as advanced reactors.

The United States pioneered the development and peaceful use of nuclear power to produce around-the-clock, emissions-free baseload electricity generation as well as the development of the civilian nuclear fuel cycle. NE's work advances the effort to move new and innovative advanced reactors, small modular reactors, and microreactors from the conceptual and development stages into commercial deployment. More than 20 U.S. developers are pursuing advanced reactor technologies that will make nuclear energy more efficient and affordable to construct, operate, and maintain. With help from DOE and the National Laboratories, a new generation of reactors will be demonstrated by the end of the decade.

The Energy Act of 2020 is an important piece of legislation to ensure nuclear energy is a key element in meeting our aggressive climate goals, now and in the future. The Department is advancing these goals with the Advanced Reactor Demonstration Program (ARDP), designing the Versatile Test Reactor (VTR), and implementing the Integrated Energy System subprogram within NE, following the direction under Title II of the Act. In addition, the Department worked to implement, to the maximum extent practicable, dedicating 20% of our nuclear energy research and development funding for the Nuclear Energy University Program. The President's Budget for fiscal year 2022 requests funding to formally start new programs, such as the High-Assay, Low Enriched Uranium (HALEU) Availability program, and International Nuclear Energy Cooperation has been restored as a standalone program.

At the Department, we are particularly optimistic about ARDP. ARDP has set an aggressive timeline to develop, license, and build two operational advanced reactors. These two reactors, X-energy's Xe-100 high-temperature reactor and TerraPower's Natrium reactor will be sited in the states of Washington and Wyoming, respectively. Terrapower's Natrium reactor will be built at a retiring coal power plant and utilize the existing infrastructure and workforce in the area. This is

the type of coal-to-nuclear transition demonstration that will help us achieve our climate goals while ensuring a just energy transition for the local workforce. Through ARDP, we are also working to lower the risk of other promising technologies that could be commercialized in the 2030s along with R&D on additional concepts to help build a future pipeline of U.S. nuclear power reactors that will offer significant improvements over today's reactors.

These innovative advanced reactors are being designed to be smaller and scalable, and to operate with more flexibility and resilience. They should enable new product choices to utility customers and communities around the United States, and around the world. Additionally, these advanced reactors will be designed to adjust their electricity output to match demand and to pair with sources of renewable energy to provide around-the-clock, emissions-free electricity. With the transition towards clean, carbon-free electricity, including intermittent renewables such as wind and solar, the need for a reliable source of baseload generation capacity will only increase in the future, and nuclear energy can address that need. Furthermore, these advanced reactors have the potential to expand the benefits of nuclear energy beyond electricity generation by providing high quality heat for district heating, to generate hydrogen, to decarbonize the industrial and transportation sectors, and to generate clean drinking water from desalination plants, making these reactors key to meeting the U.S. and interested countries' climate targets as we work to decarbonize economy-wide.

An economic and reliable supply of the fuel that will be required to operate many of the innovative reactor technologies under development within the United States is also important. Many of these advanced reactor technologies are being designed to use HALEU, including the two ARDP reactors. HALEU is not currently commercially available from any domestic source. The Department is actively working to establish the HALEU Availability program, and we look forward to working with Congress as we advance HALEU availability. We are soliciting input from stakeholders and developing implementation plans.

As we move from demonstrations to widespread commercialization, we need a fast neutron test reactor that can support research for all stages of technology development - including the existing fleet of commercial reactors. With the bipartisan support of Congress and key members of this Committee, DOE is designing VTR to provide an advanced fission environment - specifically, a high flux, fast neutron environment - to support accelerated fuels and materials development and qualification over the next 60 years.

The proposed VTR would be the tool that, in harmony with demonstration reactors, would help us discover, test, and advance the innovative nuclear energy technologies that are needed to help our planet achieve zero carbon emissions. The proposed VTR would provide a unique opportunity for our nation to modernize the nuclear energy research infrastructure crucially needed to support new technologies that could re-energize the U.S. nuclear energy industry around the world.

Having a fast neutron test source in the United States would not only be an investment in our nuclear innovators but set the nation up for success in a future clean energy market that is estimated to be worth billions both domestically and internationally. Advanced nuclear can help grow our economy, reduce emissions, and create new jobs for our American workers. Without a

fast neutron source in the U.S. like the VTR, U.S. innovation will fall behind other countries which have fast neutron test reactors, and we simply cannot let that happen.

The Office of Nuclear Energy understands that one of the purposes of this hearing is a concern regarding NE's past use of sole source contracting during previous years. Specifically, we are aware of the Committee's concerns regarding the sole source awards for the following programs and projects:

- The High-Assay Low Enriched Uranium Demonstration Program and the resulting sole source award to American Centrifuge Operating LLC, a subsidiary of the Centrus Energy Corporation, for a total of $144M, with a government share of $115M, from FY2019 to FY2021, approved on May 31, 2018, and executed on December 30, 2018;

- The NuScale Small Modular Reactor First-of-a-Kind Nuclear Demonstration Readiness Project, and the resulting sole source award to NuScale Power, for $700M, with a government cost-share of $350M, from FY2019 to FY2024, approved on November 5, 2019, and executed on February 4, 2020;

- The Commercialization and Deployment of the First NuScale Power Small Modular Reactor in the United States, referred to as the Carbon Free Power Project, and the resulting sole source award to the Carbon Free Power Project, LLC, a wholly owned division of Utah Associated Municipal Power Systems, for $6B, with a government cost-share of $1.38B, from FY2020 to FY2030, approved on September 14, 2020, and executed on October 16, 2020; and,

- The Nuclear Industry Safety System Digital Upgrade Project, and the resulting sole source award to the Exelon Generation Company, for $92.5M, with a government cost-share of $50M, from FY2021 to FY2025, approved on January 12, 2021, and executed on September 30, 2021.

These four sole source awards were prepared in accordance with the applicable regulations governing federal acquisitions and cooperative agreements; were thoroughly reviewed and approved by the Department's Office of Management and the Office of the General Counsel; and were documented and executed legally. Additionally, we agree with the premise that fair and open competition is the best practice for federal procurement and financial assistance. Early and open expression of interest by the Department ensures the greatest number of market participants for competition.

We take seriously the concerns expressed about the use of sole source awards and are committed to communicating clearly with Congress about the need to use such awards. The use of sole source awards may apply in limited circumstances when such awards can serve the public interest or be in the best interest of the federal government and the taxpayer. The Department will ensure there is a very high bar for using such an exception to the competitive process. Should the Department determine that the pursuit of a sole source award meets such criteria at some point in the future, we will commit to communicating early with Congress.

Congress has placed their trust in the Office of Nuclear Energy to advance nuclear energy as a key solution to tackle the climate crisis, at home and abroad, as illustrated by the broad support for new authorities granted in the Energy Act of 2020. NE is ready to take on that role, and pledges that these programs will be developed and managed with the utmost integrity, openness, and transparency, which are key tenets of the Biden-Harris Administration.

Overall, it is an extremely exciting time to be involved in nuclear energy. We have not just a role but an essential role to play in fighting climate change and reducing carbon emissions. If we all work together, we can make it happen.

Thank you for the opportunity to be here today. I am happy to answer your questions.