

Testimony for the Record
Nuclear Energy Institute
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I am Maria Korsnick, President and Chief Executive Officer of the Nuclear Energy Institute (NEI). I appreciate the opportunity to testify before the committee and would like to thank Chairman Carper, Ranking Member Capito, and the rest of the full Committee for having me today to discuss the critical role of nuclear energy in the United States. During my testimony, I will highlight the importance of nuclear energy and two pieces of legislation that are currently before the Committee, the American Nuclear Infrastructure Act (S.2373) and the STRANDED Act (S.1290)

The most recent United Nations IPCC report is clear that we must act now to prevent the worst consequences of climate change. To protect our environment, our economy, and future generations, we must rapidly reduce greenhouse gas emissions from all aspects of our society. This future will be centered around a clean energy system that utilizes numerous carbon-free technologies, of which nuclear will play a key role.

At the core of decarbonizing the economy is decarbonizing the electricity sector. Given the variety of mature, carbon-free technologies available in this space, we are closer than ever to achieving this goal. However, it's not enough that the grid be carbon-free, it must also be reliable and cost effective. As we've seen recently in places like Texas and California, it is all too easy to take reliable electricity for granted until a disaster strikes. In November 2021, NEI signed onto the U.N. 24/7 Carbon-free Energy Compact to help solve the issue of intermittency in carbon-free energy supplies. Making progress to a net-

zero world will require that we ensure carbon-free energy is not only available, but available 24 hours a day, 7 days a week.

Dozens of utilities are demonstrating leadership on decarbonization through significant emission-reduction pledges, and many of these same utilities are already well positioned for a low-carbon future by virtue of their existing nuclear generation. Supporting existing nuclear generation will be critical for the U.S. to achieve a net-zero future; however, new nuclear will also be needed, particularly as we add increasing shares of intermittent wind and solar generation to the grid. Exciting new nuclear reactor projects are already underway in Wyoming, Idaho, and Washington, while many other states are exploring the option of new nuclear power. Notably, West Virginia recently repealed their decades-long prohibition on nuclear energy in the state. NEI is supporting efforts to expand nuclear energy adoption, but to truly realize the full potential of nuclear energy, continued congressional support is vital.

Achieving Carbon Reduction Goals

At the U.N. Climate Change Conference in 2021, delegates from nearly 200 countries met to reaffirm the global commitment to combat climate change. Following the event, world leaders announced or reiterated their plans to reduce carbon emissions. President Biden released a strategy for achieving a net-zero economy in the U.S. by 2050. These ambitious goals will take carbon-free energy of all types to achieve. It's not enough to continue on the path we've been traveling; to combat climate change we will need bold leadership and dramatic new investments. Carbon-free nuclear energy is available now to help propel the world into a carbon-free future.

Nuclear energy already generates nearly 20 percent of U.S. electricity and half of our carbon-free electricity. The carbon-free and baseload attributes of nuclear energy are easy to take for granted. Since the first nuclear power plants were built in the 1950s, nuclear has quietly provided nearly 30 trillion kilowatt hours of carbon-free electricity, or enough electricity to power every home in the U.S. for 20 years. Nuclear

plants run 24 hours a day, 7 days a week producing power with unmatched reliability and have the added benefit of having all their fuel on site for an entire 18-to-24-month operating cycle. Nuclear plants are hardened facilities that are protected from physical and cyber threats, helping to ensure we have a resilient electricity system. And our nation's nuclear power plants provide tens of thousands of well-paying, long-term jobs.

While nuclear energy has operated for decades in the U.S., that cannot be taken for granted. Unfortunately, the past decade has seen the premature retirement of a dozen nuclear power reactors, with several more slated to close. As nuclear power plants are closed, fossil fuels are stepping up to meet electricity demands. This trend is moving us the wrong direction in our fight against climate change. Maintaining the current operating fleet of nuclear reactors is not only a sensible approach to meeting our climate targets, but failure to prevent early retirements will jeopardize the progress we have already made.

The U.S. Energy Information Administration (EIA) forecasts the retirement of 111 gigawatts of coal capacity by 2050 in the U.S.¹ In addition, the EIA estimates that demand for electricity in the U.S. will expand by around 35 percent during that time. And this estimate is at the low end. Many studies show that to fully decarbonize our economy by the President's 2050 goal, electricity production in the U.S. will need to be significantly higher. We are clearly going to need today's nuclear plants as well as a new generation of reactors to complement rising shares of wind and solar to meet this goal.

As we explore new technologies to decarbonize the economy, nuclear once again offers several promising solutions. Innovative advanced reactor designs, including small modular reactors (SMRs), are capable of solving some of the hardest decarbonization challenges. For example, industrial processes require heat that traditional reactors and other

¹ U.S. Energy Information Administration – 2021 Corporate goal Case: Annual Energy Outlook 2021 Issues in Focus: Table 1.

carbon-free sources cannot provide. Advanced reactors offer modular construction, smaller footprints, and in some cases increased operating temperatures; all of which can help displace fossil fuels currently providing this industrial heat. In addition, advanced reactors, both water and non-water cooled, are ready to be deployed to fill demand left behind by retiring coal plants. As mentioned, we already have examples of these projects underway in Wyoming, Washington, and Idaho, and more are expected to follow.

NEI recognizes that it will take a full suite of carbon-free technologies to reach net-zero. We do not expect nuclear to be the only solution to combating this crisis. However, for too long policymakers left nuclear energy on the backburner as a tool to fight climate change. Policies supporting existing reactors and new reactors are our best option in this fight and there is no better time for action than now.

U.S. National Security

While many discussions about nuclear energy have recently focused on its carbon-free attributes, it's important to remember that U.S. leadership in nuclear has substantial national security benefits. During the 20th century, U.S. leadership allowed us to promote the highest global standards for nuclear safety, security, and nonproliferation; to protect our friends and allies against energy insecurity and adverse foreign influences; and to maintain a healthy domestic supply chain that could also benefit our nuclear Navy and major DOE programs. Unfortunately, in recent years the U.S. has been overtaken on the international stage as Russia and China rush to gain market share in new builds around the world. In fact, there are more than 50 new nuclear power reactors under construction worldwide, only two of which are in the United States.² Preserving and expanding our nation's use of clean and reliable nuclear

² <https://pris.iaea.org/PRIS/home.aspx>

energy is essential to advancing not only America's clean energy future, but also our national security interests.

With the development and deployment of advanced reactors well underway, the U.S. is at an inflection point for our future on the international nuclear stage. It is imperative that we act now to successfully complete the demonstrations underway and deploy additional advanced reactors. The lower cost, enhanced safety features, and wider applications of advanced reactor designs make nuclear power a practical option for many countries that already use nuclear energy and many potential new adopters looking to decarbonize their economies or forge strategic partnerships with the U.S. The supplier of these next generation reactors will forge a special relationship with these countries over the century-long life of its nuclear program – from site characterization to regulatory development, training, engineering and construction, operations and maintenance, security services, and finally decommissioning. More broadly, the dominant global supplier will exert considerable influence on nuclear safety, security, and nonproliferation policies and practices.

If the U.S. is to reestablish its leadership in global nuclear safety, security, and nonproliferation; if we are to continue helping our friends and allies against foreign influence through energy supply; if we are to maintain the domestic supply chain that supplies our plants and benefits our nuclear Navy; and if we are to meet our climate goals, then we must lead in the development and commercialization of advanced nuclear reactors.

Preserving the Existing Fleet

From the dawn of the Atomic Age to the beginning of the 21st century, America was the leader in nuclear energy both domestically and abroad. However, this leadership has waned as U.S. nuclear reactors prematurely close while Russia and China rush to advance themselves to the forefront of the industry. The American Nuclear Infrastructure Act

(ANIA) is essential to help reestablish the U.S. as the global leader in nuclear energy.

America's current nuclear fleet is responsible for approximately 20 percent of the electricity demand and avoiding over 470 million metric tons of CO2 emissions every year. This is the equivalent of taking 100 million cars off the road. Not only does nuclear energy avoid more carbon emissions than any other source of energy, but it does so while providing reliable power at over a 90 percent capacity factor. This baseload attribute allows carbon-free energy to continue flowing on the grid when intermittent sources are not available. While these attributes are essential to a functioning electric grid in a net-zero world, current markets do not fully value these attributes. This, combined with cheap natural gas, has forced a number of nuclear power plants to close prematurely and several others to face the same prospect.

The trend of premature nuclear plant closures threatens America's ability to decarbonize and further erodes U.S. nuclear leadership abroad. We are grateful that the authors of ANIA addressed this issue directly, by proposing an EPA program to provide funding to enable continued operation of at-risk nuclear plants. The need for this program was obviated by the inclusion of both authorization and appropriations for a similar program, the DOE Civil Nuclear Credit Program, in the Infrastructure Investment and Jobs Act signed into law late last year. We appreciate the ANIA sponsors' strong leadership on this issue as the ANIA bill spotlighted the crucial need to preserve nuclear energy generation to meet our climate goals and help ensure the U.S. remains on the nuclear main stage globally.

Accelerating Nuclear Energy Innovation

While existing reactors create the bedrock for a net-zero future, new reactors are needed to replace existing fossil fuels and help ensure system reliability. Advanced nuclear designs offer enhanced capabilities enabling nuclear to provide more than just electricity in the future. Advanced reactors will support the decarbonization of industrial and

transportation sectors that fossil fuels currently dominate. The ANIA will help pave the way for this future by requiring the NRC to prepare a report identifying licensing issues specific to non-electric nuclear operations. This type of early action and planning is essential to support the deployment of advanced nuclear for applications other than electricity production.

To make these innovative designs a reality, we must have government support for research, development, licensing, demonstration, and early-stage deployment. The ANIA's program for Advanced Nuclear Reactor Prizes is a unique approach to spur and reward innovation by providing a cash prize to the first advanced reactors licensed by NRC in three different categories. The cash prize is equivalent to the fees paid to the NRC during the licensing process. Navigating the regulatory process is expensive and time consuming for both the developer and licensee. To further spur innovation and accelerate the deployment of advanced nuclear, the financial burden during the licensing process must be reduced. The industry looks forward to working with the committee to further address this issue in the future.

Many communities will suffer challenges as a result of the planned shutdown of coal generating facilities over the coming years. These sites and the associated transmission infrastructure could be reused for an advanced reactor. This could potentially mitigate the financial burden and job losses associated with retiring coal generating facility. NEI suggests the inclusion, in the ANIA, of a grant program for communities with retiring coal assets to study the potential deployment of advanced nuclear would help enable a smoother transition for these communities.

U.S. Leadership in Nuclear Energy

As mentioned earlier, American leadership in nuclear energy has been deteriorating in recent decades. A driver of this trend is the prevalence of state sponsored enterprises competing in the global market. U.S. nuclear energy companies come to the international table at a disadvantage. State-run nuclear companies are able to offer innovative financing and

geopolitical benefits to customers that private U.S. companies cannot match. Leveling this playing field is of the utmost importance if the U.S. is to regain its position as the global leader in nuclear energy.

The ANIA empowers NRC to focus on nuclear energy export and innovation activities. Increasing the NRC's focus on these commercial activities will help to support U.S. national security. By positioning the NRC to accelerate the acceptance and penetration of U.S. nuclear energy technologies internationally, U.S. companies are better able to compete with state enterprises in the global marketplace. In addition, the ANIA takes a significant step in enabling increased investment in U.S. nuclear energy infrastructure by our allies. This change will accelerate demonstration and deployment activities domestically and abroad, further strengthening American leadership.

While there is no silver bullet for solving climate change, the nuclear energy support in the ANIA is a solid step in the right direction. The passage of the ANIA would signal to the world that America is ready to take back the lead in nuclear energy.

Communities Affected by Plant Closures

Communities can be adversely affected when a nuclear plant shuts down. They lose the economic benefits that existed when the plant was producing carbon-free electricity, including hundreds of well-paying jobs and a significant portion of the local tax base. Even after the plant is decommissioned and the site is restored, there can be the loss of economic opportunities that would be available to redevelop the site if it were not for the continued storage of used nuclear fuel. The ANIA and STRANDED Act includes provisions to assist with local economic development activity while the STRANDED Act also provides additional financial assistance to local governments for the used nuclear fuel stored at a decommissioned nuclear site.

The best way to avoid the impacts of premature plant closures is to prevent those closures. Many states have done their part on this front by

enacting programs to recognize the valuable attributes provided by nuclear generation. With the bipartisan enactment of the DOE Civil Nuclear Credit Program, similar to ANIA's credit program, Congress has appropriately followed suit. Although there is considerably more work to be done to avoid premature plant closures—and the impacts they can have on local communities—I again express my gratitude for the Committee's leadership in this area.

When plants do close, however, it is important to remember that the nuclear industry manages its assets better than any other industry. Throughout the operating life of a nuclear plant funds are set aside to provide for its decommissioning. Today, after plants shut down, they are expeditiously dismantled, radioactive components are shipped to established low-level waste disposal sites, and the former reactor sites are restored for future use. The only thing that remains is the spent nuclear fuel, which is safely stored in multi-layered storage canisters designed to withstand disasters such as earthquakes, tornados, and wildfires.

Industry has done its part in restoring the sites and assuring the long-term safety of the dry cask storage systems. It is the federal government's responsibility to remove these transportable storage systems and ultimately dispose of the used fuel. NEI is supportive of federal efforts to satisfy its long overdue obligations to remove used nuclear fuel from nuclear power plant sites. We are encouraged by DOE's recent efforts to develop a consent-based process to identify sites where these dry cask storage systems can be consolidated for more efficient storage until disposal capability is available. There are also two private initiatives underway seeking to provide consolidated interim storage capability. Congress should support efforts to move fuel from shut down reactor sites so that the owners of the restored sites can again create opportunities that benefit the communities. We look forward to continuing to work with lawmakers to reach bipartisan consensus on the best approach for the long-term management of the nation's used fuel.

Conclusion

I want to thank the Committee considering the importance of nuclear in meeting our climate goals and preserving our national security. The Committee's support for nuclear is arguably more important now than it has ever been and we at NEI are encouraged by the thoughtful legislation being proposed. The ANIA tackles many of the challenges advanced nuclear reactor designs have faced in recent years and makes significant strides in setting up the U.S. to regain nuclear energy leadership globally. It also is important to continue advancing long-term solutions for used nuclear fuel management. The Committee's focus on meeting the government's obligations is crucial and we look forward to making progress. Finally, I would like to end on an optimistic note. While the challenges of climate change and regaining our leadership on the nuclear stage may seem to be tall tasks, it has been shown time and time again that a bet against American determination is faulty. With the help of the members of this committee and the broader Congress, I have no doubt that we can become the world leader in nuclear energy once again and enjoy all of the benefits associated with that position. Thank you.