

State of New Jersey Board of Public Utilities
New Jersey Zero Emission Certificate Program for Eligible Nuclear Power Plants
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Testimony for the Record
Nuclear Energy Institute

Maria Korsnick, President and CEO
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I thank President Fiordaliso and all of the Commissioners for giving me the opportunity to provide testimony to the New Jersey Board of Public Utilities (BPU). I am Maria Korsnick, President and CEO of the Nuclear Energy Institute. I have spent my entire career in the nuclear industry operating and managing these plants. I was a senior reactor operator, site vice president, chief nuclear officer of Constellation Energy Nuclear Group and, before I joined NEI in 2015, senior vice president of Exelon's northeast operations, responsible for the Nine Mile Point and Ginna plants in upstate New York and the Calvert Cliffs plant in Maryland. I am proud to represent this industry and excited about the role nuclear power can play in New Jersey and across the nation.

In May, Governor Murphy signed into law a set of policies to promote clean electricity in New Jersey that had passed the Legislature with broad bipartisan support. The legislation ensures that wind, solar and nuclear will work in concert to meet New Jersey's ambitious clean energy goals. The law establishes a zero-emission credit (ZEC) program that would allow the state's largest source of non-emitting generation, nuclear energy, to continue serving as the backbone of efforts to reduce emissions. In doing so, New Jersey joined a vanguard of states that have recognized the vital role that nuclear energy plays in a clean energy future.

The BPU is well-positioned to follow through in creating and administering ZECs as they are similar to the renewable energy certificate programs that New Jersey has established for solar and wind generation. ZECs are a way to value the non-emitting attribute provided by nuclear generation just as the SRECS do for solar production. These programs are complementary tools in creating a diversified clean electricity portfolio for New Jersey.

This program is timely as a broad swath of nuclear plants is facing the risk of early closure. Wholesale markets that only focus on short-term operational costs have not been designed to reflect the broader social benefits of environmental protection, fuel diversity and grid resilience that nuclear plants provide. With the closure of Oyster Creek, we now have seen seven reactors prematurely shutdown since 2013. Of the remaining 98 units operating today, 12 have announced their intention to close early. PJM is at the epicenter of these challenges. Over 10,000 megawatts of nuclear capacity failed to clear the most recent capacity auction.

The risk of closure is real. We are seeing it play out in slow motion across the region. By establishing a ZEC program, New Jersey is exercising control over its energy future rather than allowing incomplete market signals to determine the shape of its electricity system. In doing so, New Jersey has joined New York, Illinois and Connecticut as states that have acted to preserve the non-emitting generation that nuclear provides. These policies are having a meaningful impact. Once the New Jersey program is in place, these four states will have preserved over 11,000 megawatts of nuclear capacity from early retirement. Those plants will generate over 90 million megawatt-hours of electricity every year. That is more than all of the solar power produced by U.S. utilities in 2017.

The states that have acted to preserve nuclear's benefits have taken one of two paths to date. Connecticut is using a state-run clean energy procurement that will allow a portion of the output from the state's nuclear plant to compete in that process.

New York and Illinois established ZEC programs, which are designed to work in parallel with REC programs that had been part of the policy framework in those states for years. The two state programs have similar features. Load-serving entities are required to purchase a certain number of ZECs from qualified nuclear generators to meet state goals based on a number of factors. The value of the ZECs is based upon the value of the emissions avoided by running the nuclear plant. This value is derived from the 2016 estimate of the social cost of carbon, about \$42 per ton of carbon avoided, and translated into a dollar-per-megawatt-hour rate. Finally, there is a consumer protection mechanism that reduces the value of the ZEC if wholesale power prices rise above a certain level.

In crafting a policy with many similar features, New Jersey is on sound legal footing. Both the New York and Illinois programs were challenged in U.S. District Courts, which upheld the programs. Judge Valerie Caproni dismissed the challenge in New York. Judge Caproni drew a clear connection between the establishment of RECs for renewable generation and ZECs for nuclear electricity: "Like RECs, ZECs are credits for the environmental attributes of energy production." The challenge to the Illinois program was also rejected in U.S. District Court. Each case was appealed and, in each case, the U.S. Court of Appeals upheld the ZEC programs.

Saving nuclear plants has a big impact on a clean energy future. One recent study estimated that the closure of nuclear plants at risk of early retirement would remove 228 million megawatt-hours of clean electricity from the U.S. grid. That is more than two-thirds of all wind and solar power produced in the country last year. The U.S. has made incredible investments to deploy these non-emitting technologies but, if we let our nuclear fleet close, then we will have been running in place.

When nuclear plants in other states have closed recently, the immediate response has been consistent – nuclear generation has been replaced by natural gas with attendant emission increases. For example, nuclear generation in ISO New England declined by 5.3 million MWh in 2015 compared to 2014 when Vermont Yankee was in operation. This was offset by natural gas use increasing by 5.7 million MWh and carbon emissions by 5 percent in New England in 2015 following the loss of Vermont Yankee.¹ The closure of the San Onofre Nuclear Generating Station resulted in higher electricity bills and increased emissions. California consumers paid \$350 million more for electricity following the closure, and carbon emissions increased by 9 million tons.²

Nuclear energy is a vital component for New Jersey’s decarbonization goals. The Salem and Hope Creek plants save almost 14 million tons of carbon dioxide every year. That is equivalent to the emissions from all of the cars in the state.

The ZEC program will ensure that New Jersey will continue to build on its commitment to clean electricity. Last year, the state invested almost \$500 million to expand the use of solar energy in addition to \$100 million for Class I and II renewables. The ZEC program will more than triple the amount of New Jersey’s clean electricity, and this expansion will cost around half of the existing programs.

By acting to preserve nuclear energy for New Jersey, the state stands to reap benefits beyond clean electricity. Nuclear plants are part of a diverse portfolio of generating technologies that can help to provide a reliable and resilient grid. With the pressures leading to coal and nuclear plant closures, the Mid-Atlantic is growing increasingly reliant on a single fuel – natural gas – for its electricity as well as home heating.

Earlier this year, NEI sponsored a study to assess the role that PJM’s nuclear fleet plays in maintaining a resilient electricity system. NEI commissioned the well-regarded experts at ICF to model the impact that a significant natural gas disruption could have on the region’s ability to provide power to all customers. The study found that, in the face of widespread nuclear closures, the region could face over 200 hours in which customers would not receive electricity with much of that concentrated in New Jersey. The study also found, however, that there was no expected

¹ ISO New England generation data available at: <http://www.iso-ne.com/isoexpress/web/reports/operations/-/tree/daily-gen-fuel-type>; Emissions data from U.S. Environmental Protection Agency available at: <https://ampd.epa.gov/ampd/>.

² Lucas Davis and Catherine Hausman, “Market Impacts of a Nuclear Power Plant Closure,” *American Economic Journal: Applied Economics*, 8(2): 92-122, 2016 available at: <http://dx.doi.org/10.1257/app.20140473>; Lucas Davis and Catherine Hausman, “The value of transmission in electricity markets: Evidence from a nuclear power plant closure,” June 16, 2014, available at: <http://voxeu.org/article/value-electricity-transmission-evidence-power-plant-closure>.

loss of service when the nuclear fleet was retained. New Jersey's actions have helped to create a resilient power system.

More broadly, maintaining nuclear as a major contributor to the nation's electric generation capacity enhances fuel diversity. This provides important economic benefits and protects the grid from becoming too dependent on any one fuel source. A diverse portfolio of fuels and technologies serves as a hedge against price volatility and supply disruptions, and is critical to any resiliency program. The North American Electric Reliability Corporation (NERC), America's reliability watchdog organization, has said, "Reliable operation of the BPS (Bulk Power System) requires dependable capacity with fuel assurance to address consumer needs, impacts of extreme weather conditions, and sudden disturbances on the system" and policymakers should "consider the reliability and resilience attributes provided by coal and nuclear generation to ensure that the generation resource mix continues evolving in a manner that maintains a reliable and resilient BPS." Numerous reports and analyses, as well as common sense, demonstrate that fuel diversity within a region or market is important for the ability of the electric grid to withstand and recover from stresses caused by weather or man-made disruptions.

Nuclear energy is a strong contributor to system reliability because of its strong track record of performance. Nuclear power plants provide around-the-clock baseload electricity without emitting greenhouse gases and other pollutants. They run with capacity factors above 90 percent, far outpacing the availability of other generation sources. Nuclear stations also provide important benefits to the grid, including reactive power and voltage support that keep the entire electricity system functioning.

The investments that we make in our plants are with an eye toward the long-term operation of these units. These plants are well-maintained, which has enabled almost all of the U.S. nuclear fleet to receive a license renewal that allows them to operate for up to 60 years. Some of our plants are in the process of seeking a second license renewal that would allow for 80 years of life. America's nuclear plants are part of the nation's long-term infrastructure that supports economic growth. Acting in a timely fashion is vital as nuclear plants cannot be mothballed. Once a nuclear plant is closed, there is no pathway back to operation.

Acting to preserve nuclear as part of the generation portfolio will have economic impacts, as well. When nuclear plants close, electricity prices rise. This is a consequence of the way electricity prices are set in competitive wholesale markets like PJM, which covers New Jersey. After ranking all of the plants from lowest to highest cost to operate, the market price is set by the most expensive plant needed to meet demand. If nuclear plants close, the replacement power will come from plants that were previously too expensive to be dispatched by PJM. Two separate economic analyses have each estimated that New Jersey customers will pay an

additional \$400 million each year in higher power prices if Salem and Hope Creek retire. These estimates are consistent with what we have seen in other parts of the country. California consumers in the state paid \$350 million more for their electricity after the San Onofre Nuclear Generating Station shut down. Estimates for losing nuclear plants in Illinois, New York, and Pennsylvania show costs increasing by hundreds of millions of dollars annually for consumers in those states.

Governor Murphy and the Legislature have shown great leadership in charting the direction for New Jersey's electricity future. With nuclear energy as part of New Jersey's generating portfolio, baseload non-emitting electricity will work in concert with wind and solar to deliver the clean energy that will propel the state for decades to come. The BPU now has the opportunity to ensure the benefits of nuclear energy are preserved for the citizens of New Jersey. I urge you to implement a program that will allow for the continued investment in the nuclear plants that will contribute to this future.

