

November 8, 2024

Doreen M. Harris  
President and Chief Executive Officer  
New York State Energy Research and Development Authority  
17 Columbia Circle  
Albany, NY 12203-6399

**RE: Draft Blueprint for Consideration of Advanced Nuclear Technologies**

Dear President Harris:

Constellation Energy Generation, LLC (“Constellation”) welcomes this opportunity to comment on the *Draft Blueprint for Consideration of Advanced Nuclear Technologies* (the “Blueprint”). The Blueprint, prepared by The Brattle Group for the New York State Energy Research and Development Authority (“NYSERDA”), examines the untapped potential of advanced nuclear technologies.<sup>1</sup> Recognizing that nuclear energy “has demonstrated the lowest lifecycle emissions of any generation technology,”<sup>2</sup> the report explores the potential for these new technologies to complement existing nuclear generation, wind, solar, and other clean resources in the pursuit of a zero-emission grid by 2040 (the “2040 Target”).

According to the Climate Action Council’s Scoping Plan, electricity demand in New York will more than double by 2050 as many sectors of the economy pursue mass electrification.<sup>3</sup> This increased demand, combined with the transition away from fossil fuels, will require substantial investment in clean generation in the coming years. New York Independent System Operator, Inc. (“NYISO”) estimates that at least 20 gigawatts (“GW”) of new, zero-emission resources will need to come online in the next five to six years to remain on track, and as much as 45 GW of dispatchable emissions-free resources or “DEFERs” will be needed by 2040.<sup>4</sup>

While Constellation strongly supports the consideration, development, and deployment of advanced nuclear technologies to meet New York’s nation-leading clean energy goals, the state’s existing nuclear fleet will continue to form the backbone of these efforts. The recent Biennial Review reveals that Constellation’s zero-emission nuclear portfolio in the Empire State—Nine Mile Point Clean Energy Center (“NMP 1” and “NMP 2”), James A. Fitzpatrick Clean Energy Center (“Fitzpatrick”), and R.E. Ginna Clean Energy Center (“Ginna”)—provides *nearly half* of the state’s zero-emission

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<sup>1</sup> The term “advanced nuclear” is generally described in Section 3 of the Blueprint.

<sup>2</sup> Blueprint at 3 (*citing* United Nations Economic Commission for Europe, *Carbon Neutrality in the UNECE Region: Integrated Life-cycle Assessment of Electricity Resources* (2022)).

<sup>3</sup> N.Y. State Climate Action Council, *Scoping Plan*, at 13, <https://climate.ny.gov/resources/scoping-plan> (“Scoping Plan”).

<sup>4</sup> NYISO, *2021-2040 System & Resource Outlook*, at 5-13 (Aug. 8, 2022), [https://www.nyiso.com/documents/20142/32663964/2021-2040\\_System\\_Resource\\_Outlook\\_Report\\_DRAFT\\_v15\\_ESPWG\\_Clean.pdf/99fb4cbf-ed93-f32e-9acf-ecb6a0cf4841](https://www.nyiso.com/documents/20142/32663964/2021-2040_System_Resource_Outlook_Report_DRAFT_v15_ESPWG_Clean.pdf/99fb4cbf-ed93-f32e-9acf-ecb6a0cf4841).

electricity production.<sup>5</sup> To avoid backsliding from its zero-emissions goals or significantly increasing ratepayer costs, any new programs created to reach the 2040 Target should be predicated on retaining the existing fleet.<sup>6</sup> Constellation’s enthusiasm for the existing nuclear fleet is reflected in its plans to pursue multiple subsequent license renewals to extend the license lives from 60 to 80 years, including announced plans to submit subsequent license renewal for Ginna and NMP 1 subject to sufficient economic or policy support.

Not only are these assets critical to reliability and clean energy goals, but they also provide a unique platform to derisk future nuclear development and support economic growth across the state. Participants at the recent Future Energy Economy Summit acknowledged that co-locating advanced nuclear projects at the existing upstate nuclear sites would be ideal for building the next generation of nuclear technologies. With access to land, existing transmission networks, and supportive communities, New York’s existing nuclear facilities are prime locations to drive economic development and help spur investment in new nuclear generation facilities.

Below we provide comments for your consideration on several of the topics covered in the Blueprint. Please do not hesitate to contact the undersigned with any questions; we look forward to continuing this important discussion.

### ***Technological Readiness***

The U.S. Nuclear Regulatory Commission (“NRC”) has already demonstrated its willingness and ability to effectively license new technologies as demonstrated by the issuance of a standard design certification for the NUSCALE Small Modular Reactor and the issuance of the Kairos construction permit for the Hermes demonstration reactor. NRC has also been developing a technology neutral framework—the so-called “Part 53” (10 C.F.R. Part 53)—which should create additional efficiencies in licensing.

### ***Safety Risks and Perceptions***

Section 4.2.1 of the Blueprint emphasizes that “Statistics indicate that the U.S. commercial nuclear industry’s safety record has been strong and improving, with the lowest level of overall safety-related impacts of any major energy source.”<sup>7</sup> Indeed, America’s existing nuclear power plants are among the safest and most secure industrial facilities in the world, having demonstrated an outstanding safety record over 60 years of operation. Numerous factors lead to the industry’s extraordinary safety record:

- **Multiple Safety Systems/Robust Designs:** Existing nuclear plants (light water reactors or “LWRs”) are designed with multiple layers of safety systems, often referred to as “defense-in-depth.” These layers include physical barriers, redundant safety systems, and backup power supplies to ensure the reactor remains safe even if one system fails. Over the decades of nuclear operations, plant designs have evolved significantly,

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<sup>5</sup> See NYSERDA and N.Y. Dep’t of Pub. Serv., *Draft Clean Energy Standard Biennial Review*, at 8-9 (July 1, 2024), <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Clean-Energy-Standard/A00194900000C313A126877CFFAA2B0C.pdf>.

<sup>6</sup> The Scoping Plan determined that retiring the existing nuclear fleet in the state at the end of their current 60-year licenses would increase power sector decarbonization costs by \$7.6 billion. Scoping Plan, Appendix G, at 83-84.

<sup>7</sup> Blueprint at 13.

learning from operational experiences such as the accidents at Three Mile Island 2 and Fukushima Daiichi. This experience has resulted in additional layers of defense-in-depth and new strategies to predict and protect against risks considered to be outside the original design bases.

- **Stringent Regulatory Requirements:** The NRC is an independent regulatory authority that plays an important role in ensuring the safety of the nuclear fleet. The NRC has long maintained a robust regulatory framework that established the baseline for ensuring adequate protection of the public. The NRC also has a long history of evolving its regulatory programs to enhance safety, and the nuclear industry and the NRC routinely analyze operational events worldwide to identify possible lessons for U.S. plants. For example, after the 2011 accident at the Fukushima Daiichi nuclear plant in Japan, the NRC carefully analyzed what additional safety improvements could be made to U.S. nuclear power plants and issued new requirements for plants to implement measures to mitigate the effects of extreme natural events.
- **Stringent Regulatory Oversight:** In addition to the regulatory framework itself, NRC maintains a robust inspection program. In addition to the NRC inspectors stationed at each facility who have day-to-day oversight of all aspects of plant operation and maintenance, NRC conducts several thousand hours of “baseline” inspections at each nuclear power plant every year.
- **Robust Training Programs:** Operators and staff at nuclear plants undergo extensive training and continuous education to handle both routine operations and emergency situations effectively.
- **Emergency Preparedness:** Nuclear plants have comprehensive emergency preparedness plans in place. These plans are regularly tested through drills and exercises involving plant staff, local authorities, and emergency responders.

The record shows that the U.S. nuclear power industry has consistently improved performance over the past 20 years. There are many factors influencing this improvement, including the cultivation of a strong safety and reliability culture by nuclear operators, a strong, independent nuclear regulator in the NRC, an independent industry excellence organization in the Institute of Nuclear Power Operators (“INPO”), and the NRC’s adoption of a risk-informed safety focus. Over the past 20 years, improving plant performance has been coupled with the enhanced safety provided by a risk-informed approach that focuses resources on the most significant safety issues. Today, the U.S. nuclear industry is performing at the highest levels of safety and reliability in the world.

Taking into account the full life cycle needed to produce energy—from the mining, fabrication, and construction of facilities, through the operations, maintenance, and ultimately the decommissioning of that plant—studies in the U.S. and abroad have found that nuclear is as safe as (or safer than) any other type of energy resource in terms of the impacts to both workers and the public. Multiple safety systems, the industry’s commitment to comprehensive safety procedures, robust training programs, and stringent federal regulation keep nuclear plants and neighboring communities safe.

As the largest operator of nuclear power plants in the United States, Constellation’s first priority is safety, and that focus pervades every part of our business. Constellation—along with the entire U.S. nuclear power industry—takes the responsibility for safety very seriously, and safe operations will always be paramount. Constellation’s nuclear power fleet in New York is no exception

to the industry's exemplary safety record. Constellation's New York fleet has consistently stayed in the NRC's and INPO's top categories of performance. Further, the NRC has performed rigorous oversight of our facilities. Since 2020, the NRC has averaged over 5,000 hours of inspection annually at each of Constellation's nuclear power plants in New York.

### ***Physical Security***

With respect to nuclear power plant security, the Blueprint asks in Section 4.2.2, "Do advanced nuclear facilities pose any significant physical security risks for the State, and if so, how can they be managed?" and "Do recent cyber security events in other sectors highlight a need to assess potential cyber security risks for advanced nuclear facilities?" While Constellation cannot speak to the physical or cyber security of any proposed advanced reactor designs, it can speak to the security of the current fleet. In addition to being among the safest industrial facilities in the world, the existing nuclear power plants in the U.S. are also the most secure facilities in the world, and we cannot foresee that advanced reactors would be any less secure in this regard. Key security features of current U.S. nuclear power plants include:

- **Physical Security:** Nuclear plants have robust physical security systems, including well-armed and well-trained security personnel who are on duty 24/7. By regulation, these facilities are protected by intrusion detection systems, fences, barriers, and surveillance cameras. By law, each nuclear power plant is subjected to rigorous force-on-force exercises overseen by the NRC every three years.
- **Cyber Attacks:** NRC was one of the first regulators in the world to impose a comprehensive framework for the protection of U.S. nuclear power plants from cyber attacks. Nuclear power plants employ several robust measures to protect against cyber attacks, including:
  - **Isolation of Critical Systems:** Critical digital safety and security systems at nuclear facilities are isolated from external networks, including the Internet. This "air-gapping" ensures that these systems are not directly accessible from outside the plant.
  - **Defense-in-Depth Strategy:** As with safety-related systems, nuclear cyber security involves multiple layers of security controls throughout the network.
  - **Continuous Monitoring:** Nuclear facilities employ continuous monitoring of their networks to detect and respond to any suspicious activities in real-time.
  - **Regulatory Oversight:** The NRC mandates strict cybersecurity regulations and guidelines that nuclear plants must follow, including regular inspections and compliance checks to ensure that all cybersecurity measures are up to date and effective.

In this light, Constellation's expectation is that future nuclear reactor technologies will be subject to the same rigorous set of considerations to ensure both physical and cyber security and will achieve the same successful track record.

### ***Siting Challenges and Opportunities***

Constellation also sees opportunities to locate the next generation of advanced nuclear reactors at existing nuclear sites. As Constellation President and CEO Joe Dominguez noted earlier this year, "We're looking to partner with others to locate new technologies, including new nuclear at our existing sites. These sites already have, of course, community support and existing infrastructure for nuclear

energy. And we think our simple thesis is this, if new nuclear is going to be built anywhere where we do business, it's going to be built on sites where there already is existing nuclear because that's where communities love the technology and have the capability to support more. So, we believe that we're uniquely suited to provide this value and grow the industry.”<sup>8</sup>

Co-location at existing sites that have safely and securely hosted nuclear power plants for decades demonstrates certain advantages over greenfield siting by leveraging the infrastructure and expertise already in place to deploy advanced nuclear technologies more efficiently. The Biden Administration and Congress recognized these potential advantages when they passed the “Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act” of 2024 (“ADVANCE Act”), which included several provisions directing the NRC to specifically examine licensing efficiencies for co-locating new reactors.<sup>9</sup>

Co-location of new nuclear units with existing units includes a number of specific advantages:

- **Infrastructure Utilization:** Existing nuclear sites already have the necessary infrastructure, such as transmission lines, cooling systems, rail and road access, and security measures. Co-location could reduce overall costs by, for example, leveraging existing security training/management.
- **Regulatory Efficiency:** Sites with existing nuclear plants are already subject to extensive regulatory scrutiny. Co-location can streamline the approval process for new reactors, as many of the safety and environmental considerations associated with siting a nuclear power plant have been previously addressed. As noted, the ADVANCE Act directed the NRC to identify licensing efficiencies for co-location with existing reactors, including streamlining of federal environmental review processes.
- **Community Acceptance:** Communities around existing nuclear plants are often more familiar with and supportive of nuclear energy and the value these emissions-free, safe, reliable assets contribute to the community. This familiarity can lead to positive community relations and less opposition to new projects.
- **Operational Synergies:** Co-locating new reactors with existing ones may allow for shared resources, such as workforce, maintenance facilities, and emergency response teams.
- **Environmental Benefits:** Utilizing existing sites minimizes the environmental impact compared to developing new sites.

Overall, co-locating new nuclear power plants on existing sites is a strategic approach that leverages existing assets and infrastructure as well as supportive communities, which in turn should help accelerate the deployment of advanced nuclear technologies.

The NRC's experience in licensing nuclear power plants is unparalleled. The NRC has overseen the construction and commencement of operation of well over 100 nuclear power plants during the industry's history. With two exceptions, all of the existing nuclear fleet was licensed under

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<sup>8</sup> *Constellation Energy Corporation Earnings Call, Q1 2024* (May 9, 2024), <https://investors.constellationenergy.com/events/event-details/q1-2024-constellation-energy-corporation-earnings-conference-call>.

<sup>9</sup> *See, e.g.*, Section 207, Combined License Review Procedures, Section 505, Nuclear Licensing Efficiency, and Section 506, Modernization of Nuclear Reactor Environmental Reviews.

the NRC’s “two step” process (or 10 C.F.R. Part 50 process), involving first obtaining a construction permit and then an operating license. In an effort to make nuclear licensing more efficient and predictable, the NRC later developed the “one step” licensing process, or Combined Licensing (“COL”) process (or 10 C.F.R. Part 52 process), which was recently used to license the two new Vogtle AP1000 units. Regardless of which process is used to license a new nuclear plant, the rigor and thoroughness are the same. Here are some key aspects that highlight the rigor of NRC licensing processes:

- **Comprehensive Safety Review:** The NRC conducts an exhaustive review of all aspects of a nuclear power plant’s design, construction, and operation, including safety systems, emergency preparedness, and security measures.
- **Environmental Assessments:** Pursuant to its obligations under the National Environmental Policy Act (“NEPA”), the NRC performs rigorous environmental reviews to ensure that it adequately understands any significant impacts to the environment. NRC’s environmental review processes are only going to become more efficient in the coming years due to changes to NEPA brought on by the Fiscal Responsibility Act of 2023 and the ADVANCE Act.
- **Public Involvement:** The NRC ensures transparency and public involvement throughout the process. Public meetings, hearings, and comment periods allow stakeholders to provide input and raise concerns.
- **Nuclear Security:** The applicant’s plans to ensure that a proposed nuclear facility is protected from hostile attacks are thoroughly examined through the licensing process.
- **Emergency Preparedness:** The NRC requires detailed emergency preparedness plans, including coordination with local, state, and federal agencies to ensure effective response in the event of an incident.

Overall, the NRC’s licensing process is designed to ensure that nuclear power plants operate safely and securely, protecting both the public and the environment.

### ***Environmental and Climate Justice***

Constellation is deeply committed to environmental and climate justice, recognizing the disproportionate impact of pollution and climate change on marginalized communities. We strive to build inclusive and transparent partnerships to address these issues. Our commitment is strongly evident in our investment in nuclear energy. As a leading provider of carbon-free electricity, and the largest operator of nuclear power plants in the United States, our nuclear fleet plays a crucial role in reducing greenhouse gas emissions and providing reliable, clean energy. By leveraging the environmental benefits of our nuclear fleet, Constellation can deliver consistent and safe power, further reinforcing the dedication to environmental stewardship and climate justice. More about Constellation’s commitment to protecting the environment and advancing environmental justice can be found in the Constellation annual Sustainability Report<sup>10</sup> and our Environmental Justice Policy.<sup>11</sup>

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<sup>10</sup> Available at <https://www.constellationenergy.com/our-impact/resources/constellation-sustainability-report.html>.

<sup>11</sup> Available at <https://www.constellationenergy.com/our-impact/resources/policy-statements-and-sustainability-resources.html>.

With respect to its licensing reviews of existing and new nuclear plants, the NRC of course has a comprehensive environmental review process, which is a critical part of the overall licensing procedure and fully compliant with the NRC's obligations under NEPA. Through that process, there are ample opportunities for stakeholder engagement, including the state in which the project will be operated. State participation in the NRC's environmental review processes is an important aspect of ensuring comprehensive and inclusive evaluations. For example, states can and should participate in the scoping process, where they can provide input on the significant environmental issues that should be addressed in the Environmental Impact Statement ("EIS"). States, along with other stakeholders, should also review and comment on the draft EIS because their input into the environmental impacts of the project is critical.

The NRC is actively working to make its environmental review processes more efficient through several key initiatives.<sup>12</sup> In a policy paper released in May 2024, the NRC proposed a series of sweeping changes to its environmental review processes based on changes to NEPA dictated by the Fiscal Responsibility Act of 2023. The changes were designed to "enhance clarity and reliability in NRC's implementing regulations and to consider opportunities to improve the efficiency and effectiveness of environmental reviews in light of the NEPA amendments."<sup>13</sup>

A key aspect of this initiative is the NRC's plans to update its policies on interagency, including state, cooperation on environmental reviews. Enclosure 4 to the policy paper mentioned above specifically recommends to the NRC that it "would draft a new policy statement to outline expectations around lead, participating, and cooperating agencies, consistent with the NEPA amendments."<sup>14</sup> Constellation encourages the State of New York to participate in the NRC's processes to develop its new policy statement on interagency cooperation.

It is also important to acknowledge that the ADVANCE Act (discussed earlier) is expected to further streamline the NRC's environmental review process for new reactors. While many of the changes outlined in SECY-24-0046 are subject to the NRC's discretion, Section 506 of the ADVANCE Act mandates the NRC to improve the effectiveness and efficiency of its environmental reviews. For example, the ADVANCE Act directs the NRC to improve the efficiency, timeliness, and predictability of NEPA environmental reviews. This directive includes the expanded use of categorical exclusions, environmental assessments, and generic environmental impact statements. It also includes updating the NRC's regulations to reduce redundancies and streamline the review process. The ADVANCE Act also authorizes increased staffing for NRC reviews, which helps expedite the environmental review process by ensuring that there are sufficient resources to handle the workload.

Importantly for New York's consideration, the ADVANCE Act directs the NRC to consider as part of its enhancement review "opportunities to streamline formal and informal consultations and coordination with other Federal, State, and local governmental permitting agencies during environmental reviews of applications described in subsection (a) by the Commission."

In sum, the NRC's environmental review processes under NEPA have decades of track record demonstrating their thoroughness, effectiveness, and inclusivity of all stakeholder views. Constellation strongly encourages New York, to the extent that it is not already engaged, to actively participate in the

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<sup>12</sup> See SECY-24-0046, *Implementation of the Fiscal Responsibility Act of 2023 National Environmental Policy Act Amendments*, <https://www.nrc.gov/docs/ML2407/ML24078A013.html>. Of note, the policy recommendations outlined in this paper have not been approved by the NRC as of the time of this comment.

<sup>13</sup> *Id.*

<sup>14</sup> See *id.* at Enclosure 4, available at <https://www.nrc.gov/docs/ML2407/ML24078A011.pdf>.

NRC's current efforts to maximize the efficiency and effectiveness of its environmental review processes.

### *Waste Generation and Disposal*

Constellation agrees with the Blueprint's statement that the volume of spent nuclear fuel overall "is not large" but that "proper handling, storage, and disposal of the fuel is critical to ensuring public safety."<sup>15</sup> Constellation emphasizes its strong commitment to managing nuclear waste safely and responsibly. Our spent nuclear fuel is stored in compliance with the NRC's stringent safety and security regulations.

The Blueprint asks, "How can the State work with the federal government to manage nuclear waste?" In his testimony to the United States Senate in 2023,<sup>16</sup> Constellation President and CEO Joe Dominguez emphasized several points that are important to keep in mind when considering this question:

- The Federal government's program to site a permanent repository is not broken; it's effectively nonexistent. We owe it to nuclear communities, whether they are commercial reactor sites, national labs, or Federal facilities, to do more than wait for volunteers to step up to host a site.
- While we wait for Federal action to identify a permanent disposal site, Constellation and the rest of the nuclear industry will continue to safely manage and store spent fuel at our sites. There has never been any unplanned radiation released from the casks, and they are designed to produce less radiation than a frequent flyer receives in a year. While we advocate for a permanent repository, these dry casks are safe for hundreds of years and do not pose a risk to the public.
- Nuclear is the only large-scale energy producing technology that takes full responsibility for all of its waste, plans for its eventual disposal, and prefunds plant retirement obligations. When it comes to spent fuel, we know where every gram of spent fuel is located and how it is packaged, tagged, and tracked.

With these basic facts in mind, the industry (through the Nuclear Energy Institute) has issued its Policy Principles for Used Nuclear Fuel Management.<sup>17</sup> Three key elements of those Principles are that (1) a new management and disposal organization outside the U.S. Department of Energy ("DOE") should be created and should be dedicated solely to executing a high-level radioactive waste program and empowered with the authority and resources to succeed; (2) the federal government should develop a consolidated storage facility in a willing host community and state; and (3) the NRC should complete its review of the Yucca Mountain deep geologic repository.

Constellation recommends that New York help to effectuate these three goals by strongly advocating with the Administration and DOE to continue to aggressively pursue long term solutions to spent nuclear fuel. In addition, New York can work with its elected representatives at the federal level to advance legislation to effectuate these solutions. For example, over the last five years, several bills have been introduced in Congress that would create an independent authority to manage spent nuclear

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<sup>15</sup> Blueprint at 22.

<sup>16</sup> Testimony of Joseph Dominguez, Constellation President and CEO (Mar. 9, 2023), <https://www.energy.senate.gov/services/files/0E076807-6F7F-4C0A-8D21-8E7E0A7ACF25>.

<sup>17</sup> Available at <https://www.nei.org/resources/reports-briefs/policy-principles-for-used-nuclear-fuel-management>.

fuel and which would give DOE the authority to take possession of nuclear fuel to store it on an interim basis. However, all of these bills have stalled in the Congress. State-level advocacy of the value of advancing these legislative solutions would be invaluable.

New York has an impressive record of establishing innovative, nation-leading public policies to combat the effects of climate change. As the state that advanced the nation's first state-sponsored nuclear support program, exploring programs to preserve the existing nuclear fleet and incentivize advanced nuclear technologies will help New York meet its clean energy objectives and would be consistent with the state's legacy of leadership. Constellation looks forward to continuing the discussion and its longstanding partnership with New York state.

Sincerely,

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Constellation Energy Generation, LLC