



Nuclear New York

Response to Questions on New Nuclear Generation in New York

September 2025

Nuclear New York is a non-profit, non-partisan, volunteer-based organization working for a prosperous decarbonized future and nature conservation. Comprised of scientists, environmentalists, engineers, educators, and advocates for social justice, we support the peaceful use of nuclear technology to generate reliable, carbon-free energy while providing quality family-sustaining jobs that foster economic growth and healthy communities. Nuclear energy not only supports the reshoring of American industry, but can lift people out of poverty by addressing the burgeoning demand for energy in the developing world.

We are acutely aware that our planet is in danger of suffering the worst impacts of climate change. Further, rising emissions from the electricity sector, increased fossil fuel combustion, and faltering public support for efforts to date are evidence that New York's clean energy strategy is at risk of failing. There is a growing global consensus that nuclear power is essential to achieving deep decarbonization while meeting the energy needs of modern society. We believe that by including advanced nuclear technology in the state's energy portfolio, Governor Hochul is positioning New York for success.

The following is offered in response to a set of questions publicly posed shortly after Governor Hochul's June 23, 2025 announcement directing the New York Power Authority to develop an advanced nuclear power plant in upstate New York.

Nuclear New York

Independent Advocates

for Reliable Carbon-Free Energy

3961 47th St, Sunnyside, NY 11104

NuclearNY.org

Executive Summary

- Nuclear energy and renewables are not competitors but essential partners in building a reliable, affordable, zero-emission grid. Without firm, carbon-free nuclear power, New York risks long-term reliance on fossil fuels. Advanced nuclear offers compact, high-capacity, 24/7 generation without the need for extensive storage, transmission, or backup generation. Cost overruns at Vogtle stemmed from first-of-a-kind challenges, whereas future projects will benefit from standardized designs, improved supply chains, and lessons learned. International experience demonstrates that nuclear costs drop sharply with repeat builds, making it a cost-effective tool for deep decarbonization.
- Meeting New York’s climate targets requires timely action. New nuclear builds can contribute meaningfully by 2040 if planning begins now, with global examples showing average build times of six to seven years. Siting at existing energy facilities can also accelerate deployment. Cooperative efforts like the Advanced Nuclear State Collaborative and First Movers Initiative put New York in a leadership position for deployment in the mid-2030s.
- Waste management is safe and proven. Modern nuclear plants store spent fuel securely in NRC-licensed dry casks. Advanced reactors and recycling can reduce waste volume and toxicity, while deep geological disposal offers a permanent solution. West Valley’s legacy issues occurred before today’s strict standards and should not be seen as representative of commercial nuclear operations.
- Alternatives to nuclear for addressing renewable intermittency—such as batteries, pumped hydro, and geothermal storage—face scale, cost, and geographic constraints. Even with a massive renewable buildout, studies by NYSERDA and NYISO confirm a need for firm generation comparable to or exceeding the power capacity of the state’s fossil fuel fleet. Advanced nuclear uniquely delivers continuous and dispatchable carbon-free power without such challenges.
- Advanced nuclear can be sited responsibly with informed community consent. Support tends to be strongest in existing host communities due to familiarity with the technology and economic benefits. Consent-based siting, environmental justice principles, and tangible community benefits can ensure nuclear projects strengthen rather than burden disadvantaged communities.

With ambitious climate goals at stake, New York must adopt all available clean energy tools. Pairing renewables with firm nuclear capacity can ensure reliability, protect public health, reduce emissions, and foster economic development. Modern reactor designs, responsible regulation, effective waste strategies, and community engagement will make advanced nuclear an equitable and affordable part of our resilient low-carbon future.

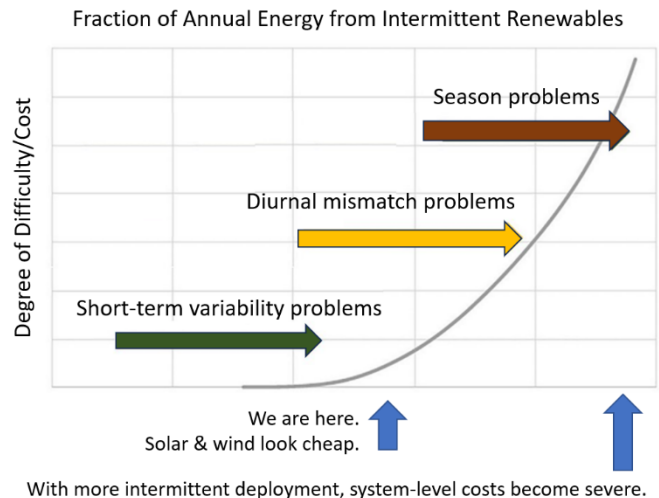
Response to Questions on New Nuclear Generation in New York

Question: *Is [nuclear power] the most cost-effective use of our clean energy dollars, or would they be better spent building out proven, genuinely renewable technologies?*

Nuclear energy and renewables are complementary, not competing, technologies. Both are contemplated in state energy planning efforts, including the Scoping Plan prepared by New York’s Climate Action Council. Understanding their unique attributes, however, is essential to designing a grid that is functional, reliable, and cost effective.

While primed for near-term deployment, renewables like solar and wind are intermittent, low-power-density, low-capacity-factor facilities that require substantial physical resources (land and materials) for the amount of electricity generated.¹ They require more capacity to make the same energy over time than generators that operate consistently; and since their output fluctuates with time of day and the weather rather than in response to demand, they require substantial storage to move electricity from *when it is produced* to *when it is needed*. Likewise, since renewables are distributed across large areas, often far from load centers, they require more transmission to move electricity from *where it is produced* to *where it is consumed*. Solar and wind typically require two to four times more transmission than other generation, so this is a critical bottleneck.² Most importantly, there will be times when renewables are unavailable and batteries are depleted. This necessitates duplicative “firm” Dispatchable Emission-free Resources (DEFs), which must be built and maintained as backup.³ With less synchronous (spinning) generation to provide grid inertia, additional equipment is required to ensure frequency stability as well.

All of this translates into system-level complexity and cost to consumers.⁴ Moreover, the challenges of ensuring a stable functioning grid grow exponentially with higher levels of intermittent deployment. These formidable barriers jeopardize climate goals, make implementation increasingly difficult and costly as more intermittent generation is deployed, and threaten the state with a future in which dirty (but reliable) fossil fuels are locked in as an unavoidable long-term component of our electric grid.⁵



¹ Power density refers to the amount of power produced by a system of a certain size. Capacity factor is the ratio of energy output over a given period of (typically annually) to the total energy that could hypothetically be produced over that time if operated continuously at full capacity. Due to its nearly continuous operation, the typical capacity factor of nuclear is about 93%. Rooftop solar may have a DC capacity factor of 14%. The average AC capacity factor of solar in New York is about 20%.

² <https://www.terraxis.org/publications/risks-to-the-energy-transition>

³ “Firm” generation describes a power source that can be relied upon to produce electricity at any time for as long as needed. For the purposes of this document, firm generation includes both baseload and dispatchable sources.

⁴ Notably, these system-level costs are not reflected in the commonly-cited Levelized Cost of Electricity (LCOE) metric.

⁵ <https://www.nber.org/digest/oct16/role-fossil-fuels-renewable-energy-diffusion>

Nuclear power can save New York from this future. Reliable, scalable, and compact, advanced nuclear is able to operate in baseload (24/7) or dispatchable configurations without significant amounts of expensive ancillary facilities and infrastructure. Instead of pursuing a resource-intensive strategy that overbuilds solar, wind, and batteries while attempting to rely on firm generation as a last resort, New York can succeed by optimizing the use of firm capacity—not merely as *backup* for intermittent sources, but as part of the *backbone* of an effective decarbonization strategy. Indeed, firm high-capacity-factor generation—nuclear and hydropower—is the reason the upstate grid is already 90% carbon-free. Nuclear is also built to last. Unlike solar, wind, and batteries that require frequent replacement, a properly maintained reactor can operate 80 years or more.

When evaluating cost, it is necessary to consider the system-level facilities and infrastructure needed to support a functional grid, as well as the performance attributes that different sources provide. Doing so, nuclear becomes a wise, cost-effective solution that lets New York “finish the job” of grid decarbonization, rather than just partial fossil fuel displacement.

We recognize that cost overruns associated with two recently built reactors in Georgia have been cited by critics. However, this is not a valid predictor of the future. As the first commercial nuclear project started in thirty years, Vogtle Units 3 and 4 experienced issues with immature supply chains, workforce training, and—most critically—design blueprints that were incomplete before construction began. Nonetheless, lessons were learned and issues resolved during completion of that first-of-a-kind project. Project management, procedures, workforce, and supply chain improvements were made and regulatory familiarity was gained with the AP1000 reactor design that will accrue to future nuclear builds. (Even Unit 4 benefited from this with efficiency and cost improvements over Unit 3.)⁶

Despite overruns, the U.S. Department of Energy (DOE) Loan Programs Office has determined that with clean energy Investment Tax Credits adopted during the Biden-Harris administration, electricity delivered from Vogtle 3 and 4 in today’s dollars would be \$102 per MWh.⁷ By comparison, many of New York’s offshore wind projects collapsed despite NYSERDA signing contracts at \$150/MWh, a price that does not include additional costs of storage, transmission, or backup generation that intermittent wind requires.⁸

As seen with the rollout of other technologies, the cost of building new reactors will drop as more are built using standard designs. Comprehensive analyses, including by the Gateway for Accelerated Innovation in Nuclear (GAIN) and Professor Koroush Shirvan of MIT, estimate that nuclear costs will decrease by 50% or more as construction experience and supply chains are established.⁹ An even more recent study by Idaho

⁶ Southern Company reports that the construction of Vogtle unit 4 is approximately 30% more efficient and 20% cheaper than unit 3 (U.S. DOE 2024 Nuclear Liftoff report).

⁷ https://climateprogramportal.org/wp-content/uploads/2025/02/LIFTOFF_DOE_AdvNuclear-vX7.pdf

⁸ https://www.nysERDA.ny.gov/About/Newsroom/2024-Announcements/2024_06_04-Governor-Hochul-Announces-The-Finalization-of-Contracts-For-Two-Offshore-Wind ; These figures are comparable because the NYSERDA contracted price for offshore wind was with federal ITC subsidies. Vogtle 3 and 4 were built without ITC subsidies, but after passage of the IRA, nuclear became eligible for the same support that solar and wind have received for decades.

<https://www.politico.com/news/2024/04/19/new-york-offshore-wind-canceled-00153319>

⁹ <https://www.osti.gov/biblio/2371533>; <https://web.mit.edu/kshirvan/www/research/ANP201%20TR%20CANES.pdf>

National Laboratory for the DOE predicts that construction costs of the AP1000 will drop by over 50% by the fourth new twin-unit build.¹⁰ This aligns with evidence internationally. South Korea's nuclear program achieved dramatic cost reductions through standardized, repeat construction of the same reactor design.¹¹ Similar costs savings have been calculated for recent programmatic builds of Barakah reactors in the UAE.¹² This is also how France was able to build out its reactor fleet in little more than a decade, one of the fastest decarbonization initiatives in history.

An excellent resource that delves into these topics in more detail is the **Pathways to Commercial Liftoff: Advanced Nuclear** report issued by the DOE in September 2024 under the Biden-Harris administration.¹³ We also recommend watching the presentation by the report's lead author, Julie Kozeracki, who spoke at Nuclear Symposium 2024, co-organized by Nuclear New York, Cornell Atkinson Center for Sustainability, and Generation Atomic.¹⁴

The New York Power Authority (NYPA) has an impressive history of ensuring that New Yorkers have access to clean, reliable, and affordable electricity. That is why we agree with the Governor that NYPA is well suited to the task of responsibly bringing advanced nuclear to our state. This is also consistent with its mission as a public power authority. Notable, the American Public Power Association (APPA), which has existed since 1940 as the voice of not-for-profit, community-owned utilities powering approximately 2,000 towns and cities nationwide, is a strong supporter of nuclear energy.¹⁵

Finally, we wish to address the implication that nuclear power is a departure from proven, genuinely renewable technologies. Nuclear power has operated successfully in the United States for six decades and is responsible for half of the country's carbon-free electricity. Generation III+ advanced reactors build upon the same proven foundational technology that reactors throughout the country have used for years. Likewise, the technology associated with many new sodium-cooled or molten-salt reactor designs was developed and proven years ago in our national labs. Even when uranium mining is included, nuclear has the lowest lifecycle emissions, the lowest land requirements, and the lowest material requirements of any energy source, including solar and wind. As we discuss in the answer to another question, spent nuclear fuel can even be recycled. Please see the fully documented comparison of different energy sources on the "Why Nuclear" page of our website.¹⁶

¹⁰ In a "moderate" scenario (accounting for relative inactivity following Vogtle), the second, third, and fourth two-unit AP1000 plants are projected to have an overnight capital cost of \$10,000/kWe, \$7,800/kWe, and \$6,200/kWe, and be built in 7 years, 6 years, and 5.5 years, respectively.

https://sai.inl.gov/content/uploads/29/2025/06/M3_SAI-AP1000_Lessons_Rev6-nocomments-002.pdf

¹¹ <https://www.sciencedirect.com/science/article/pii/S0301421516300106>

¹² <https://www.lucidcatalyst.com/the-eti-nuclear-cost-drivers> (full report)

¹³ https://climateprogramportal.org/wp-content/uploads/2025/02/LIFTOFF_DOE_AdvNuclear-vX7.pdf

¹⁴ <https://www.youtube.com/watch?v=tyOX5AY65j4>

¹⁵ <https://www.publicpower.org/policy/nuclear-power>

¹⁶ <https://www.nuclearny.org/why-nuclear/>

Question: *Can the process of planning, siting, and building new facilities be completed in a short enough time frame to have a material impact on our short-and medium-term generation and emissions-reduction needs?*

In responding to this question, we assume that “short-term”, “medium-term”, and “long-term” refer to the 2030, 2040, and 2050 timeframes identified in the CLCPA. We also note that NYSERDA has determined that the state will be unable to meet the CLCPA’s short-term goal of 70% renewable generation by 2030 and a reduction of greenhouse gas emissions by 40% from 1990 levels by 2030.

Events that have transpired since adoption of the CLCPA reveal that New York underestimated the difficulties associated with a large-scale buildout of renewables. Even more challenging is designing a grid with sufficient support infrastructure to accommodate that buildout. Success requires understanding the limitation of models and an appreciation for real-world risks involving factors such as land, transmission, public support, escalating effects, and logistics. Derisking can be achieved by pursuing strategies that make efficient use of existing assets like land and transmission, and that employ technologies with inherently high power density, capacity factor, and reliability.¹⁷ By including advanced nuclear in its clean energy portfolio, New York can ensure that decarbonization efforts do not stall out in the future.

Since nuclear power is not defined as renewable in the CLCPA, it is unable to contribute to the state’s 70% renewable goal. However, continued operation of New York’s existing nuclear plants will help prevent the state from backsliding on greenhouse gas reduction. With respect to the state’s 2040 target for zero-emission electricity, yes, the development of additional nuclear facilities can meaningfully contribute. Governor Hochul has set a goal of building, with NYPA assistance, at least a gigawatt of advanced nuclear power within that timeframe. Accounting for capacity factor, a single gigawatt reactor would generate the annual electricity of nearly 30,000 acres of solar panels or over 700 large land-based wind turbines.¹⁸ Moreover, this would be useful electricity, deliverable 24/7 when needed.

With programmatic planning, nuclear plants can be deployed quickly. France, Spain, and China are all examples of this with average build times ranging from five to seven years. In fact, on a per capita basis, the deployment of nuclear power has made some of the most rapid contributions to decarbonization.¹⁹ Despite outlier cases cited by critics, the speed with which individual nuclear plants have been constructed has not slowed. Median construction time is 6.3 years.²⁰

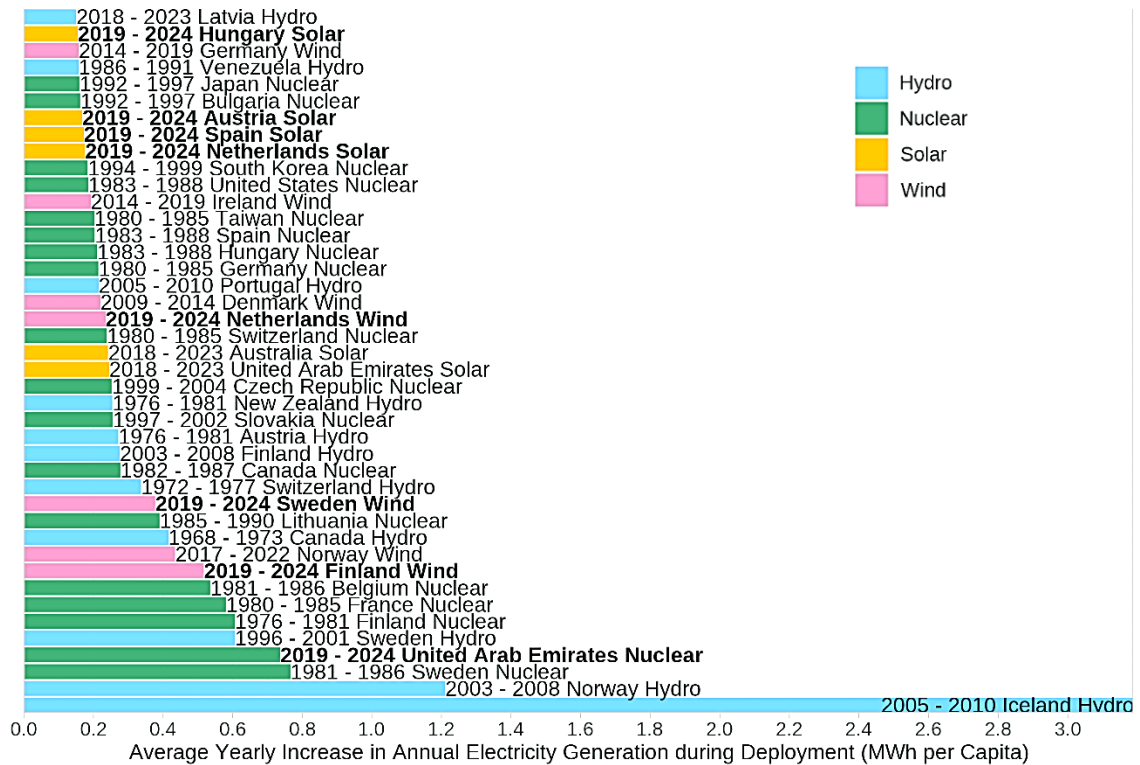
¹⁷ <https://www.terraxis.org/publications/risks-to-the-energy-transition>

¹⁸ Annual energy with nuclear, solar, and wind AC capacity factors of 93%, 20% (AC), and 29% respectively; solar facility land occupation of 6 acres per MW; land-based wind turbine with rated power output of 4.5 MW.

¹⁹ <https://www.energyinst.org/statistical-review>; chart by Grant Chalmers
<https://x.com/grantchalmers/status/1939158764076310629?s=46>

²⁰ <https://www.sustainabilitybynumbers.com/p/nuclear-construction-time>

Largest 5-year deployments of low-carbon electricity generation



DataViz: @GrantChalmers | Source: Statistical Review of World Energy June 2025
 Note: generation data does not account for planning times for any generators, it is the increase in generation over the period

Average construction time of nuclear reactors by decade

Reactors are grouped by the decade that construction started. Includes all of the world's reactors that came into operation by 2023. Construction times are measured in years from the first placement of cement.

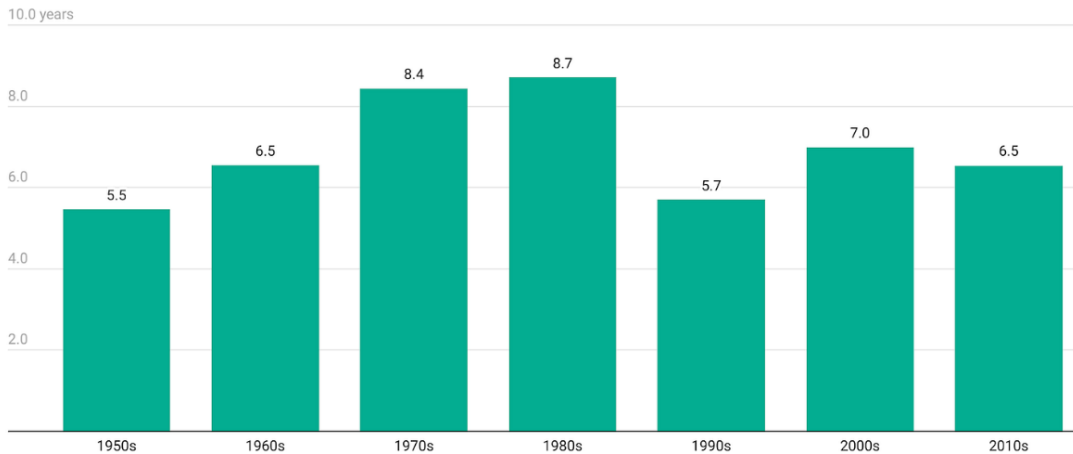


Chart: Hannah Ritchie • Source: IAEA Power Reactor Information System (PRIS) and Wikipedia • Created with Datawrapper

In Congress, there is broad bipartisan agreement that allowing foreign entities like China and Russia to lead in the development and export of commercial nuclear technology is not in our national interest. So, whether to curb climate change, promote economic development, or support energy security, states across the country are now preparing for a future that includes advanced nuclear power. Once construction commences, and supply chains and workforces are established, the timeframe for new builds is expected to be much shorter than recent experience.

Small Modular Reactors (SMRs) and microreactors that employ modular construction and factory fabrication are being specifically designed for rapid deployment. Supporting this effort, Idaho National Laboratory (INL) has been testing several microreactors and is preparing to host SMR prototypes to demonstrate that nuclear energy can be deployed quickly, safely, and affordably. Locating new reactors at existing or retired energy sites with infrastructure will also accelerate deployment.

Notably, the first SMR projects in the United States and Canada are now scheduled to come online in the early 2030's, with several companies, industry leaders, and states actively planning for widescale deployment in the mid 2030's. With prudent planning, siting, and construction, it should be possible for New York to join them and bring more than a gigawatt of new nuclear online in the mid-2030's.

Indeed, our state is well-positioned to do this. New York has already joined with other states in leading an Advanced Nuclear State Collaborative (ANSC) and a First Movers Initiative which offer a framework for sharing information and expertise, accelerating projects, establishing supply chains, and developing collaborative financial structures.²¹ These efforts are consistent with the Accelerated Deployment of Versatile Advanced Nuclear for Clean Energy (ADVANCE) Act, adopted in 2024 with overwhelming bipartisan support of Congress and signed into law by President Biden. They are also consistent with an international agreement announced at the COP28 climate conference by the Biden administration and 22 other countries to triple global nuclear power capacity.²² With expertise from institutions like Rensselaer Polytechnical Institute, the University of Buffalo, and Excelsior University, as well as talent from Knoll's Atomic Power Laboratory near Schenectady where reactors are designed for the U.S. Navy, New York is well-equipped to become a crucible for advanced nuclear innovation.²³

For an excellent discussion of advanced nuclear technologies and the steps that several states—including New York—are taking to further progress, we recommend reading **New Nuclear Energy Guide for State Policy Makers**, recently published by the Nuclear Innovation Alliance (NIA).²⁴

²¹ <https://www.naseo.org/issues/electricity/nuclear> ; <https://www.naseo.org/issues/electricity/firstmovers>

²² <https://www.weforum.org/publications/a-collaborative-framework-for-accelerating-advanced-nuclear-and-small-modular-reactor-deployment/>

²³ <https://news.rpi.edu/2025/03/31/rensselaer-polytechnic-institute-unveiled-nuclear-training-center-ribbon-cutting/>;
<https://engineering.buffalo.edu/home/school/about/how/whittaker-newmark-medal.html>;
<https://www.excelsior.edu/article/what-can-you-do-with-a-nuclear-engineering-technology-degree/>;
<https://navalnuclearlab.energy.gov/>

²⁴ <https://nuclearinnovationalliance.org/new-nuclear-energy-guide-state-policymakers>

Finally, we wish to emphasize that the importance of nuclear energy goes beyond the stated question of near-term or medium-term objectives. Whether new plants take 6, 8, or 10 years to build, advanced nuclear is an investment in the future. A reactor lasts 80 years or more. In the absence of adequate firm high-capacity-factor generation that is carbon-free, New York will find itself unable to retire its fleet of fossil fuel power plants by 2040 or 2050—and it may even need to build more. By investing in reliable carbon-free nuclear today, New York can position itself for long-term economic prosperity and climate success.

Question: Can the radioactive material be disposed of in a satisfactory way, or will New Yorkers be stuck dealing with more long-term storage sites like West Valley?

Yes, it can. West Valley was a federal demonstration project for fuel reprocessing in the 1960's—built before modern environmental laws and regulatory standards. It should not be viewed as indicative of how commercial nuclear power plants operate or how radioactive material is handled today.

The West Valley facility began operating prior to creation of the Nuclear Regulatory Commission (NRC) or even the Environmental Protection Agency. It preceded technology for vitrification, immobilization of radioactive material, and robotic/remote systems. Two substandard disposal areas were built, but not dedicated to high-level waste. Stakeholders at the time assumed there would be a permanent disposal facility elsewhere, but eventually in-situ solutions were developed. Mistakes occurred sixty years ago at West Valley. However, the activities there cannot be repeated because modern regulations and industry practices prohibit it. The NRC now requires that any future reprocessing facility or nuclear power plant be prepared to store waste or spent fuel onsite long-term.

Today commercial nuclear power plants safely store spent fuel in dry cask containers—massive, heavily shielded steel and concrete cylinders licensed by the NRC. These casks are designed to withstand seismic events and a myriad of extreme conditions—containing radiation safely for more than a century. The U.S. Navy also uses dry cask storage for spent nuclear fuel from submarines and aircraft carriers, particularly at the Naval Reactors Facility in Idaho. This reinforces national confidence in dry cask technology and demonstrates its long-term safety and reliability. Unlike fossil fuels, which release their waste into the atmosphere, causing climate change and millions of premature deaths every year, storage of spent nuclear fuel is manageable and takes up little space. In fact, all of the spent fuel produced over the entire history of commercial nuclear power in the United States could fit into a single Walmart Supercenter.²⁵ Nobody has ever been harmed by this type of spent nuclear fuel storage.

For new reactors in New York, a responsible and transparent waste plan would include:

- On-site, NRC-licensed dry cask storage
- Participation in regional or national efforts on recycling and long-term disposal
- Fully-funded decommissioning and waste management trusts
- Independent environmental monitoring and public transparency

²⁵ <https://www.powermag.com/congress-wants-to-solve-nuclear-waste-the-solutions-are-known/>

Generation IV reactors—molten salt, sodium cooled, and high-temperature gas-cooled designs—are being developed with new fuel forms and integrated waste strategies. Some use liquid fuels, allowing for on-line reprocessing, improved fuel utilization, and reduced long-lived radioactive material. Reprocessing also occurs in countries like France and Japan, where fissionable material is extracted for reuse from spent fuel. In the United States, research and development are actively underway to develop safe recycling methods that can reduce both the volume and longevity of high-level waste.²⁶ Roughly 95% of spent nuclear fuel described as “waste” actually has the potential to become fuel for new and existing reactors—thereby avoiding mining and closing the fuel cycle.²⁷

Deep Geological Disposal (DGD) is the internationally-recognized standard for the permanent isolation of high-level radioactive waste. It involves placing sealed canisters several hundred meters underground in stable geologic formations like granite, clay, or salt beds. Multiple engineered (metal canisters, clay buffers) and natural barriers (layers of rock) work together to ensure that radioactive material will remain safely contained and isolated from the biosphere. Once sealed, the repository does not require maintenance and is passively safe. Countries like Finland and Sweden are already licensing or operating DGD facilities, while Canada is not far behind.²⁸ That said, advances in dry cask storage and fuel recycling may delay or reduce the need for DGD. Many experts advocate for a flexible, science-based approach to waste policy that balances immediate safety, future technological progress, and community consent.

Question: Is there no alternative to nuclear, or are there other options to address renewable intermittency, like battery storage, pumped hydro, or geothermal storage?

Storing energy for later use is as challenging or more challenging than generating it—and as with making electricity from sunshine and wind, the challenge is a matter of scale. Batteries, pumped hydro, and geothermal storage can help address renewable intermittency. There are also other storage methods like hydrogen, compressed air, and gravity blocks. However, they all have limitations relating to power, energy density, and duration.

Often cited as the largest battery in the world, the Moss Landing Energy Storage Facility in California can provide 750 MW of power for 4 hours.²⁹ By comparison, NYISO estimates a statewide peak winter demand in 2045 of 47 GW (47,000 MW). In a scenario in which hydropower is the only source of firm generation, this would leave a power shortfall of 43 GW, nearly sixty times the capacity of Moss Landing. Furthermore, this does not begin to address gaps in the duration of intermittent generation lasting several days or capacity needed to quickly recharge batteries once depleted.

²⁶ <https://www.exodysenenergy.com/>

²⁷ <https://world-nuclear.org/nuclear-essentials/what-is-nuclear-waste-and-what-do-we-do-with-it>

²⁸ <https://group.vattenfall.com/press-and-media/newsroom/2023/finland-to-open-the-worlds-first-final-repository-for-spent-nuclear-fuel>

²⁹ Storage facilities like Moss Landing can deliver power for longer than 4 hours, but at reduced capacity. For example, with an overall storage limit of about 3000 MWh, the Moss Landing facility could supply 250 MW of power for 12 hours.

Batteries are expensive, require large amounts of mined materials, and the type commonly used for grid storage today—lithium-ion—need frequent replacement. (Texas found that the batteries which back up their wind systems must be replaced after just 8 years.)³⁰ However, the most important limitation of batteries is that they must be charged in order to be useful. In a system relying on intermittent solar and wind, this requires expanding those resources several-fold so they not only provide power when the sun is shining and the wind is blowing, but generate enough excess energy to charge the batteries for overnight use and even multi-day use, when days are cloudy and wind is absent. This vastly increases land and material requirements, as well as cost. Most grid-scale batteries are only intended for 4 or 8-hour operation. While “long-duration storage” is advancing, building enough at scale to save large amounts of solar energy in the summer for winter use would be prohibitive expensive.

Because of these limitations, NYSERDA and NYISO have determined that even with a copious buildout of solar, wind, and batteries, a Dispatchable Emission-Free Resource (DEFR) must be provided as backup with a deliverable capacity of 20 GW to 45 GW—an enormous investment, comparable to or exceeding the size of today’s entire fossil fuel fleet. Our own studies come to this same conclusion.³¹

In its 2022 Integration Analysis for the CLCPA, NYSERDA considered a scenario in which “green” hydrogen (produced from renewables using electrolysis) provides backup generation serving just 2% of annual demand. Yet even in those unlikely circumstances, New York would have to replace nearly all of its fossil fuel plants with hydrogen-burning turbines, import half of the hydrogen needed from unknown sources, develop massive electrolyzers and underground caverns to store hydrogen gas, and build 400 miles of new hydrogen-grade pipelines across the state.³² Moreover, “round-trip” storage losses associated with converting power to hydrogen gas and back to power would be greater than 50%.³³

Pumped hydropower is limited by geography, requiring specific terrain and water availability. New York’s Blenheim-Gilboa pumped storage facility can produce 1,160 MW of power with total storage of about 12,000 MWh, or roughly 10 hours at full capacity. Although four times more storage than Moss Landing, this is miniscule compared to what would be required to convert intermittent electricity from solar and wind to reliable electricity serving real-time demand for the whole state. Provided there was support to dramatically alter large ecological landscapes, a few more pumped storage facilities could potentially be constructed at great expense, but they would be inadequate to compensate for intermittent generation.

Several opportunities exist for geothermal technology in the future, including possibly geothermal storage. However, geothermal storage for electricity production is still being researched and the technology may only be viable in certain areas. Systems that can be scaled to provide seasonal storage and gigawatts of

³⁰ Paula Gold-Williams, CEO, CPS Energy, Our Energy Policy Webinar Sept 30, 2020
<https://www.youtube.com/watch?v=FxrRrx9cUv8> (38:10)

³¹ https://www.nuclearny.org/wp-content/uploads/2024/06/Filling_the_Gap_in_New_Yorks_Decarbonization_Plan-LRodberg.pdf

³² Climate Action Council Scoping Plan, Integration Analysis, and appendixes. <https://climate.ny.gov/resources/scoping-plan>

³³ <https://www.sciencedirect.com/science/article/abs/pii/S0360319924019360>

sustained power are not proven. Similarly, compressed air and gravity blocks require significant plant development, with only a few small-scale demonstration projects in existence.

By contrast, energy-dense nuclear delivers abundant, carbon-free electricity 24/7 regardless of the weather. This makes it uniquely suited to provide baseload or dispatchable energy essential for the grid and emerging large loads like manufacturing hubs and data centers.

It is important to understand that there is no silver bullet for storage. Whether based on chemical processes, heat, pressure, or the mechanical movement of fluids or weights, storage is a significant adder to the challenges and cost of building a functioning, reliable grid. Having the ability to produce electricity when needed—and for as long as needed—is a tremendous advantage of firm generation whether from hydropower, fossil fuels, or nuclear. For a more in-depth discussion of technologies with potential for contributing to the state’s zero-emission goal, we recommend reading **Closing New York’s Firm Clean Energy Gap**, comments submitted by Nuclear New York in response to a zero-emission technical conference hosted by the Department of Public Service in December 2023.³⁴

Ultimately, a reliable and resilient zero-emission grid will require a diversity of resources, including firm generation to anchor it and protect against volatility. Currently, that is mostly natural gas. In the future it can be nuclear power. Rather than viewing nuclear as a last resort if no other alternative exists, we recommend considering the many benefits the technology offers, including its contribution to a robust, efficient carbon-free energy system.

Question: Can new nuclear be sited with full informed consent from impacted communities and avoid further burdening disadvantaged communities?

Yes, and it must. Nuclear New York advocates for a consent-based siting process, and we were pleased that the Governor emphasized in her press conference with NYPA that siting would only be considered in host communities that support the technology. Notably, this is a departure from the current process with which the state Office of Renewable Siting (ORES) reviews and approves renewable energy projects, at times contrary to the wishes of communities and local governing bodies.

Support for nuclear power actually tends to be highest where existing reactors are located because host communities understand rather than fear the technology, value the high-wage family-sustaining jobs created, and appreciate the tax revenue and economic benefits received. Oswego County’s vocal support for new advanced nuclear is a prime example of this phenomenon.³⁵ Based on research by the DOE, the United States could nearly double its nuclear capacity by simply adding reactors on available land within the fence-line of existing facilities.³⁶ That said, other upstate communities—from the North Country to western

³⁴ <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B609B9A8E-0000-C739-B123-F44D298C3A12%7D>

³⁵ https://www.oswegocounty.com/news_detail_T17_R3728.php

³⁶ <https://www.energy.gov/ne/articles/could-nations-nuclear-power-plant-sites-support-new-reactor-builds>

New York—have also responded with enthusiasm to the possibility of hosting advanced nuclear plants.³⁷ We believe communities that wish to benefit from nuclear technology should not be deprived of the opportunity.

We also note that support for nuclear across the country is on the rise as people are educated about the technology and experience its benefits. A recent survey by *Public Attitudes toward Clean Energy* found that more Americans support nuclear than oppose it, including in New York.³⁸ Similarly, a recent poll by Moxie Strategies finds that a majority of New Yorkers support expanding nuclear.³⁹

A major advantage of nuclear power is that it is compact, requiring very little space to produce a tremendous amount of electricity. That extremely small footprint allows farmland and nature to be protected. It also provides the ability for nuclear power to make a significant contribution to our state energy needs through a siting process that focuses on communities that welcome the technology, rather than imposing it on those that do not.

The development of nuclear energy, and all forms of energy, should adhere to principles of environmental justice, transparency, and informed consent. These includes:

- Meaningful community engagement early in the planning process
- Full environmental review and public disclosure
- State-level oversight and local advisory boards
- Community benefits, including local jobs, tax revenue, and infrastructure investment

The loss of nuclear power serving downstate New York has had an adverse impact on our ability to achieve climate goals, resulting in higher greenhouse gas emissions for electricity generation, the burning of more fossil fuels in power plants downstate, and more expensive electricity.⁴⁰ These were impacts disproportionately felt by disadvantaged communities.⁴¹ Unless New York invests in additional nuclear, fossil fuel power plants—including those serving the downstate region—will likely operate well into the future.

Meanwhile opposition to large-scale renewable energy projects is on the rise. Proposals for the widespread development of industrial-scale solar and wind have fueled a growing resentment of CLCPA mandates within upstate communities, aggravating what has been described by the New York State Bar Association as the “ever-present upstate-downstate, rural-urban divide.”⁴² We suggest that by taking a more balanced approach that involves a rational expansion of both renewables and nuclear, New York can meet its climate goals, protect public health, grow its economy, and build an energy system that the public supports.

³⁷ <https://northcountrynow.com/stories/nypa-officials-offer-update-on-planned-nuclear-facility-county-voices-support-for-project,315948> ; <https://www.observertoday.com/news/top-stories/2025/06/state-eyeing-nuclear-plant-for-upstate-borrello-wants-it-in-dunkirk/>

³⁸ <https://www.radiantenergygroup.com/reports/us-public-attitudes-toward-clean-energy-2024-nuclear>

³⁹ https://www.linkedin.com/posts/moxie-strategies_majority-of-new-yorkers-support-expanding-ugcPost-7347998534853427203-R2xs/

⁴⁰ <https://www.city-journal.org/article/the-tragedy-of-indian-point>

⁴¹ <https://www.cleangroup.org/wp-content/uploads/Dirty-Energy-Big-Money.pdf>

⁴² <https://nysba.org/preempting-local-zoning-codes-fuels-opposition-to-renewable-energy-in-new-york/>

Conclusion

New York has some of the most ambitious climate goals in the country, and meeting them will require all available tools. We are not repeating mistakes of the past. We are building the clean, resilient grid of tomorrow. Nuclear energy is essential to a low-carbon future, and with modern reactor designs, appropriate regulations, an effective waste management strategy, and community engagement, it can be a safe, affordable, equitable solution for New York.