Cost of New Nuclear Generation In New Jersey

by

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Executive Summary

The 2024 NJ Energy Master Plan (EMP) continues the call for 100% carbon free electricity by 2035. Unlike the earlier 2019 EMP which envisioned reliance on renewables, and in particular offshore wind (OSW). to replace fossil generation, the 2024 EMP now embraces a Clean Energy Standard (CES) approach which includes expanding nuclear power in the state.

In support of this change in strategy, proposed legislation has been introduced in the NJ Senate calling for the BPU to solicit proposals and award contracts for a minimum of 1100 MW of new nuclear generation in the state on a schedule permitting an award in 2027. It is the purpose of this study to estimate the cost of such new nuclear generation as compared with other EMP endorsed renewable sources including solar, battery storage, onshore and offshore wind. The following are the report's main findings and conclusions:

Levelized Cost of Energy (LCOE)

Assuming a new 1000 MW nuclear project would receive Federal loan guarantees and tax credits as provided by current legislation, the following is the expected LCOE for the range of capital cost and construction schedule considered in the analysis:

	LOW	MEDIUM	HIGH
Commercial Operation Date	2034	2036	2038
Capital Cost ($ billions)	8	10	12
Construction Schedule (yrs)	6	8	10
LCOE ($/MWH)	85	100	125

At the Low end the unit would be in service by 2034 at a LCOE of $85/MWH, for the Medium estimate, in service by 2036 at $100/MWH and, at the High end of the range, in service by 2038 at $125/MWH[1].

Cost Comparison With Renewables

As a baseload power source with a 95% capacity factor that can be sited at existing sites with installed transmission infrastructure, a new nuclear unit compares favorably on an all-in cost basis with other renewables, which

[1] The LCOE values assume no ratepayer funding of construction costs through the Advanced Nuclear Development Charge (ANDC) but only revenue received through the Advanced Nuclear Energy Credit (ANEC).

must incur significant additional costs for grid backup and interconnection, as indicated below:

	Capacity (MW)	Capacity Factor (%)	Economic Life (yrs)	**LCOE ($/MWH)**	**LCOE with Grid Backup Cost**	**LCOE with Grid Backup and Interconnect Cost**	**PJM Market Price ($/MWH)**	**LCOE Price Subsidy ($/MWH)**
Utility Solar	150	25%	35	**74**	**122**	**131**	**67**	**64**
Onshore Wind	250	42%	30	**77**	**118**	**121**	**70**	**51**
Offshore Wind	1000	47%	30	**250**	**292**	**317**	**72**	**245**
Battery Storage	100	14%	10-20	**142**	**142**	**163**	**75**	**88**
Nuclear	1000	95%	60	**85-125**	**85-125**	**86-126**	**86**	**0-40**

Furthermore, the value of PJM[2] market offset revenue for nuclear is higher because of its higher capacity factor which results in higher capacity payments which are passed through to ratepayers. This results in a significant reduction in the ratepayer subsidy required for each MWH of nuclear generation produced, approaching zero at the Low end of the estimated nuclear costs and less than that needed to support solar, offshore wind or battery storage even at the High end.

Emissions Comparison with Renewables

Because it will require replacement by generation from other sources in the regional PJM grid when not operating, for any source of carbon free generation, the higher the capacity factor, the lower the total emissions associated with the unit. Based on the expected capacity factors, the following are the comparative annual carbon emissions for an equivalent 1000 MW of nuclear and renewable generation in NJ:

Generating Source	**Capacity Factor**	**Annual CO2 Emissions (million tons/yr)**
Nuclear	95%	0.1
Offshore Wind + Battery	61%	1.2
Onshore Wind + Battery	56%	1.3
Utility Solar + Battery	39%	1.8

[2] PJM is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in New Jersey and all or parts of 12 other states and the District of Columbia.

Thus, because it runs almost all the time, nuclear power results in far less supplementary carbon emissions than do the intermittent renewables.

Conclusions

Nuclear power has several inherent advantages for fulfilling New Jersey's desire for clean, reliable electricity as set forth in the EMP:

- It provides carbon free baseload power, serving peak load and annual demand almost 100% of the time.
- It has a useful economic life of 60 years or more.
- New generation can be sited at existing sites with transmission infrastructure in place.
- It will create numerous good paying jobs during construction and operation.

The foregoing analysis demonstrates that new nuclear generation can be built at lower cost to ratepayers than other carbon free renewables while resulting in fewer overall carbon emissions. However, this outcome depends on achieving cost and schedule goals that will be challenging and are yet to be demonstrated.

To achieve these goals will require the project owners to secure Federal loan guarantees and tax credits that are available under current legislation and to avoid the cost overruns and schedule delays that have plagued other recent nuclear projects. This means executing permitting and licensing, engineering and design, supply chain management, procurement and construction to high standards of performance throughout the entire project development period.

If the projects can meet the challenging but achievable financing, cost and schedule and operational performance goals set forth herein, it will deliver reliable, affordable and carbon free power to serve New Jersey's needs far into the future while contributing large benefits to the state's economy and employment.

The legislature should proceed to enact the proposed Energy Reliability and Affordability Act and the BPU should then move expeditiously to solicit proposals and award contracts for new nuclear power. It is also hoped that the incoming Governor will support the expansion of nuclear generation. Without these legislative, regulatory and executive actions in the year 2026, the goals of the EMP for expanded NJ nuclear generation will not be met.

Cost of New Nuclear Generation in New Jersey

1.0 Introduction

In November 2025 the New Jersey Board of Public Utilities (BPU) issued an update of the NJ Energy Master Plan (EMP)[3] which continues the call for 100% carbon free electricity by 2035. Unlike the earlier 2019 EMP which envisioned reliance on renewables, and in particular offshore wind (OSW), to replace fossil generation, the 2024 EMP now embraces a Clean Energy Standard (CES) approach which includes expanding nuclear power in the state.

In support of this change in strategy, the proposed New Jersey Energy Reliability and Affordability Act[4] was introduced, calling for the BPU to solicit proposals and award contracts for a minimum of 1100 MW of new nuclear generation in the state on a schedule permitting an award in 2027. It is the purpose of this study to estimate the cost of such new nuclear generation as compared with other EMP endorsed renewable sources including solar, battery storage, onshore and offshore wind.

2.0 Nuclear Power in New Jersey

NJ was at the forefront of nuclear power development in the US. The 650 MW Oyster Creek plant in Lacey Township began operation in 1969 as the first commercial nuclear power plant in the country. Additional plants came on line at the two 1150 MW unit Salem site in 1977 and 1981. They were joined by the adjacent 1172 MW Hope Creek plant in 1986.

Additional units were planned at Forked River (1070 MW) adjacent to Oyster Creek and Hope Creek Unit 2 (1100 MW) as well as the Atlantic Nuclear Power Plant which was to include four floating nuclear plants off Atlantic City providing over 4000 MW of power. Due to collapsing demand for electricity and increasing costs and inflation after the 1973 oil embargo, followed by the 1979 Three Mile Island accident, these and other units throughout the US were cancelled in the 1970s and 1980s.

Prior to 2018 nuclear power provided over 40% of generation in NJ. In 2018 Oyster Creek was shut down in response to NJ Department of Environmental Protection (DEP) requirements to retrofit cooling towers, the cost of which would render the plant uneconomic. As indicated below, the remaining 3457 MW at Salem and Hope Creek currently provide about 20% of peak (18,000 MW) and annual demand (72,000 GWH) in NJ.

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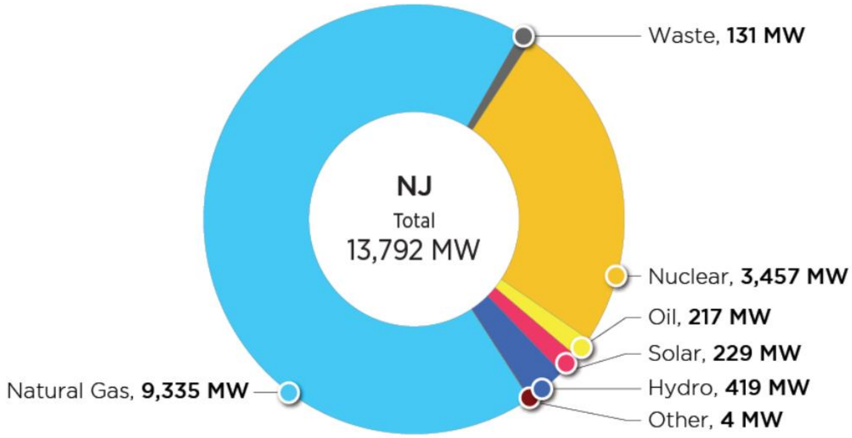
[3] New Jersey Energy Master Plan 2024, November 2025.

[4] Senate Bill No.4876, December 1, 2025.

Figure 2-1 – NJ Electric Generating Capacity[5]



With the 1999 de-regulation of electric generation in NJ, the operating nuclear plants were transferred from utility ownership to non-utility power producers. Salem and Hope Creek ownership was transferred to PSEG Nuclear, a non-regulated subsidiary of the Public Service Enterprise Group in 1999. Oyster Creek was sold to Amergen (a Joint venture of PECO and British Nuclear), then acquired by Exelon who operated it until the 2018 shutdown. The plant and site were then acquired by Holtec International in 2019.

From 1999-2018 the NJ nuclear units operated as merchant power suppliers relying on PJM market revenues without ratepayer subsidy. In 2018, concerns for the continued economic viability of Salem and Hope Creek prompted BPU to initiate the Zero Energy Certificate (ZEC) program which provided these units with an additional subsidy of about $1/MWH. The ZEC subsidy was terminated in 2025 as the nuclear units became eligible for the Production Tax Credit (PTC) under the Federal Inflation Reduction Act[6].

The owners of the existing nuclear sites have indicated their intent to develop new nuclear units at those locations. Holtec plans to build four of its 300 MW Small Modular Reactor (SMR) design at Oyster Creek[7]. PSEG would like to add two large plants such as the AP 1000 MW units at Salem/Hope Creek[8]. Fulfillment of those plans would help meet the goals of the 2024 EMP for new nuclear capacity which envisions 1000 MW of new nuclear capacity by 2035 and an additional 2000–4000 MW by 2050[9].

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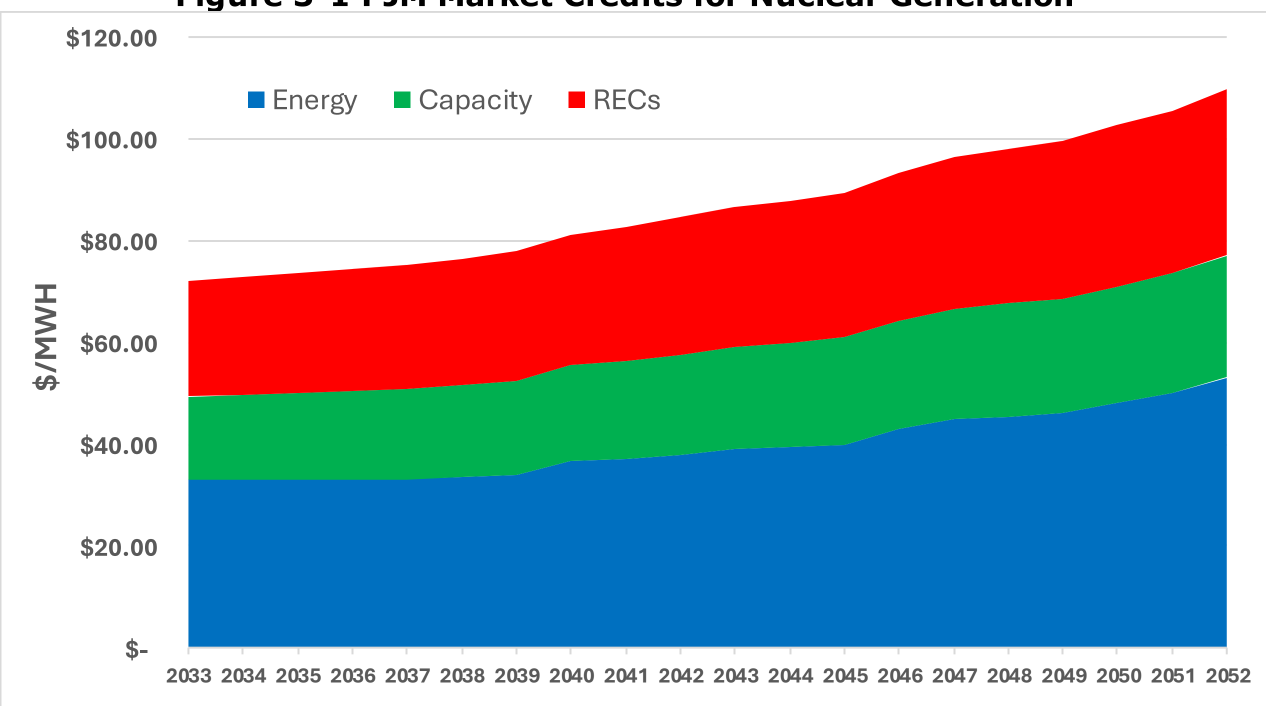
[5] NJ State Infrastructure Report, PJM June 2024.
[6] Federal Inflation Reduction Act, 2022
[7] Holtec CEO Kris Singh Testimony before NJ Joint Energy and Environment Committee, August 2025.
[8] Remarks of PSEG CEO Ralph LaRossa, NJBIA Conference on Energy and Environment, October 2025.
[9] 2024 EMP Figure 12.

3.0 Proposed Framework for New Nuclear Generation

In support of these goals, the proposed New Jersey Energy Reliability and Affordability Act (ERAA) calls for the BPU to solicit proposals and award contracts for at least 1100 MW of new nuclear generation in the state on a schedule that would result in awards in 2027. The structure of the ERAA is similar to that of the Offshore Wind Economic Development Act (OWEDA)[10]. The ERAA bill authorizes BPU to issue Advanced Nuclear Energy Certificates (ANECs) which would pay an approved nuclear project an above market price for each MWH of power produced and would require utilities to purchase that power and pass the cost through to retail customers. The bill also allows ratepayer funding of construction costs through an Advanced Nuclear Development Charge (ANDC) but in this analysis we have not assumed any ratepayer revenue before operation and then only through the ANEC charge.

The ANEC approach is similar to the Offshore Wind Energy Credit (OREC) mechanism authorized by OWEDA and employed in each of the BPU offshore wind solicitations. As with ORECs, the nuclear project receiving the ANECs would be required to return revenue received from the sale of power in the PJM wholesale markets, thus offsetting the ANEC price. The PJM market credits include revenue received for energy, capacity and Renewable Energy Credits (RECs) which are set in periodic PJM auctions. Figure 3-1 below shows the expected value of those credits for a nuclear plant in the period 2033-2052.

Figure 3-1 PJM Market Credits for Nuclear Generation



[10] OWEDA, NJSA 48;3-87. C. 57. Eff. August 19, 2010: amended by 2018 c. 440, 2.

It should be noted that existing nuclear plants do not receive REC payments. They instead received Zero Energy Credits (ZECs) until June 2025. Because nuclear power is now included in the EMP under the new CES, it is assumed that new nuclear units will receive REC payments as they will qualify as carbon free clean generation sources on an equal basis with other renewables such as wind or solar.

In Figure 3-1 above, energy credits are based on the Levitan Associates evaluation of awards in the Third BPU OSW Solicitation[11]. Capacity prices are based on the most recent PJM 2026-2027 capacity auction ($329/MW-day) escalated at 2.5%/yr and the PJM Electric Load Carrying Capability (ELCC) for nuclear units (95%). REC prices are based on the current NJ REC auction price ($22.25.MWH) escalated at 2.5%.

The projected PJM Market credits have a Levelized Cost of Energy (LCOE)[12] value over this period of $86/MWH. The extent to which approved ANEC prices exceed this value represents a ratepayer subsidy for nuclear generation.

4.0 New Nuclear Generation Cost Analysis

There is little recent actual cost data for building nuclear plants. The last two units constructed, Vogtle Units 3 and 4 in South Carolina, were completed in 2023 and 2024. The large AP1000 MW plants were originally scheduled to be online in 7 years (2016) but took 14 years. Delays were due to design changes, poor quality, inadequate workforce and Westinghouse bankruptcy in 2017.

The Vogtle units also experienced large cost overruns, from an initial estimate of $14 billion ($7 million/MW) to $36.8 billion ($18.4 million/MW) for a LCOE of $180/MWH. That level of costs would not be acceptable for new nuclear capacity in NJ as it would entail unacceptable ratepayer subsidies. While that LCOE is comparable to OREC prices for OSW projects approved by BPU, those projects have been cancelled or deferred due to their cost.

If a new nuclear project can avoid these problems, it can be built at an acceptable cost to ratepayers. The two concepts being proposed have features that potentially could meet acceptable cost and schedule targets. SMRs are as yet unproven, but the application of modular fabrication and construction could reduce both cost and schedule to completion. The large AP1000 design has been approved by NRC and units are being built in China and elsewhere. Lessons learned from this and experience at Vogtle should reduce cost and schedule for new units in NJ.

[11] Evaluation Report NJ Offshore Wind Solicitation #3, January 10, 2024, Levitan and Associates Inc.

[12] LCOE = Present Value of Generation Revenue/Present Value of Generation, over the period of interest.

In the absence of actual data, it is necessary to rely on available forecasts of cost and schedule estimates for new nuclear units. In developing our estimates we have relied on various sources including Lazard, the World Nuclear Association (WANO), US Department of Energy (DOE), Nuclear Energy Institute (NEI), Idaho National Laboratory (INL)[13,14] and others. The following are the base assumptions for operating costs and financing used in this analysis:

Table 4-1 Cost Analysis Assumptions

Operating Parameters	
Unit Size (MW)	1000
Capacity Factor	95%
Operating Cost Assumptions	
O&M Cost ($ millions/yr)	150
Fuel Cost ($/MWH)	7
Decommissioning Cost ($ millions)	1000
Financial Assumptions	
Equity Share	20%
Debt Share	80%
Interest Rate	5.0%
Investment Tax Credit	40%
Tax Rate	21%
Inflation Rate	2.5%
Target Internal Rate of Return (IRR)	12%
Weighted Average Cost of Capital (WACC)	5.56%

The results are less sensitive to operating costs than to the financial parameters. This analysis assumes that the project will be financed through the DOE loan guarantee program[15] providing up to 80% of the capital cost at an interest rate of 5% over 30 years. In addition, it is assumed the project will qualify for a 40% Investment Tax Credit (ITC) under the OBBA. This includes a 10% bonus ITC for the project meeting IRS requirements for either domestic content or energy community bonus in addition to the base 30% ITC. These are key features of the financial structure which support the economic viability of the project and allows achieving the required weighted average cost of capital and rate of return on equity investment.

[13] Nuclear Energy Cost Estimate for Net Zero World Initiative, Idaho National Laboratory, 2024.
[14] Meta-Analysis of Advanced Nuclear Reactor Cost Estimations, Idaho National Laboratory, July 2024.
[15] DOE Energy Dominance Financing Program, Section 1706 of Inflation Reduction Act.2022.

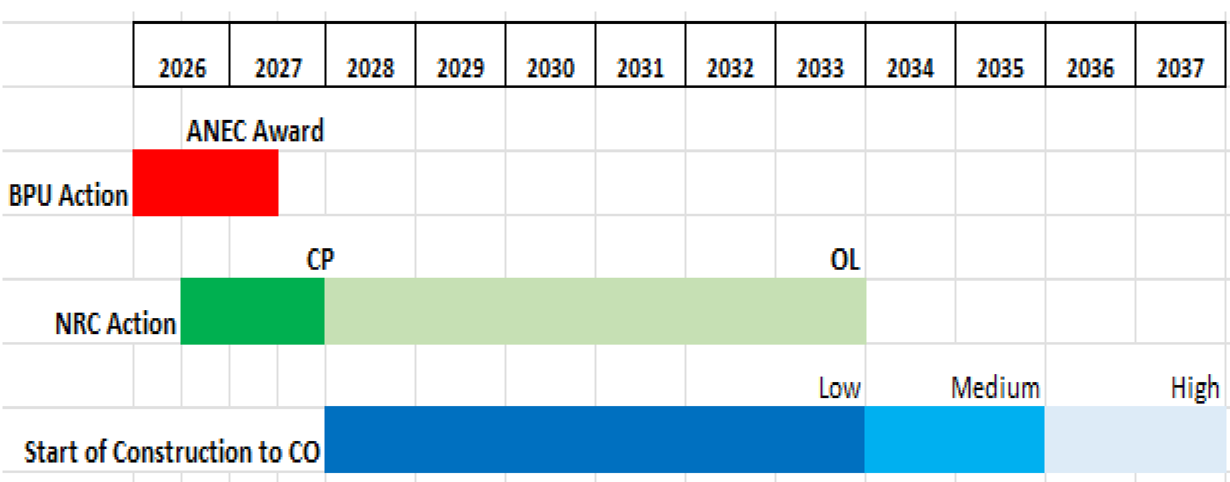
Beyond these assumptions, the capital cost and schedule are the most critical as well as the most uncertain parameters affecting the LCOE of the project and thus its financial viability. For these critical items we have adopted a range of values:

Table 4-2 Capital Cost and Schedule Assumptions

	LOW	MEDIUM	HIGH
Capital Cost ($ billions)	8	10	12
Construction Schedule (yrs)	6	8	10

Ideally a new nuclear unit could be built in the Low range of 6 years so if one were approved by BPU under this bill, it would be on line by 2034 assuming construction start by 2028. But slippage may push it out several years. If it takes the Medium range of 8 years, commercial Operation (CO) would be reached in 2036 and at the High end taking 10 years, the unit would not be operational until 2038. The following displays the schedule assumptions used.

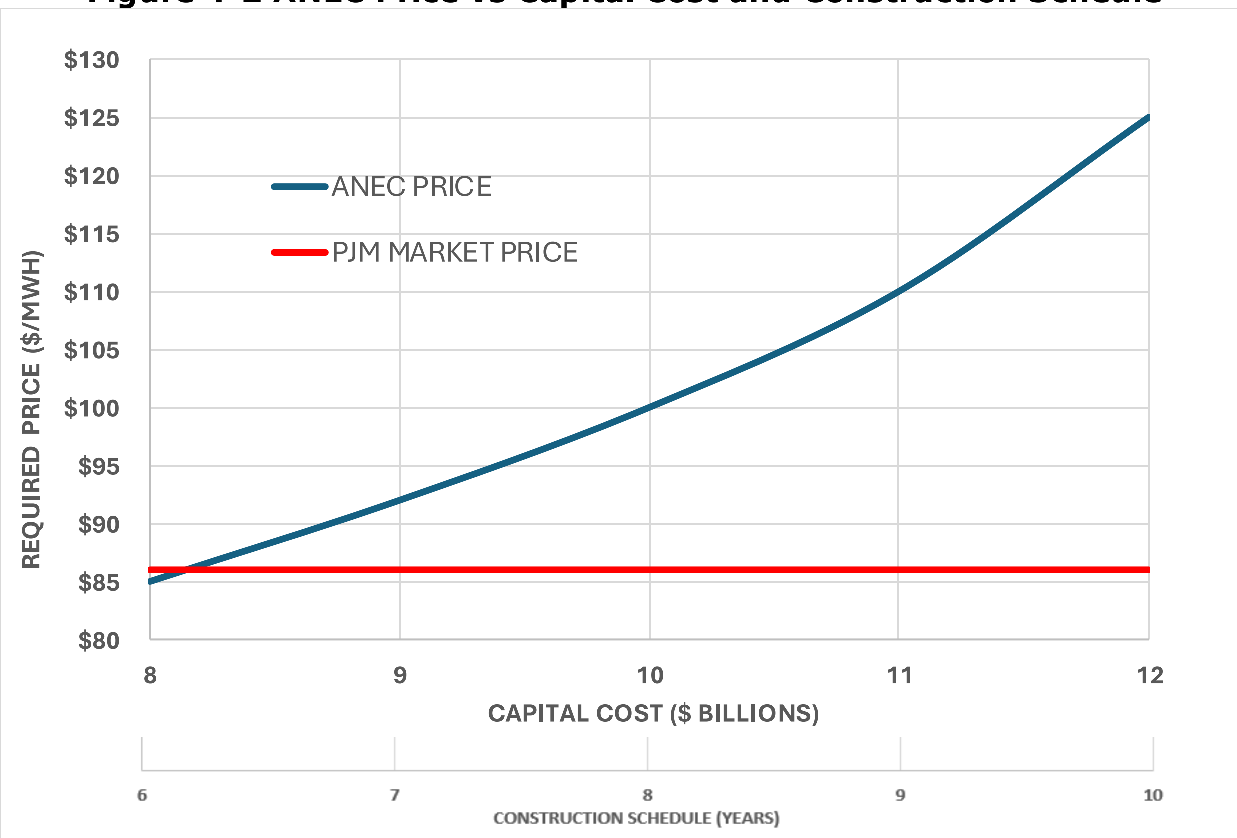
Figure 4-1 Nuclear Project Schedule



As noted, this assumes the ERAA is enacted in early 2026 and the BPU issues a solicitation within 270 days, followed by submittal of proposals within 90 days and ANEC award within an additional 270 days in 2027. It further assumes that the awarded project will submit an application for an NRC Construction Permit (CP) in 2026 which will be issued within 18 months. These assumptions would allow start of construction in 2028 with issuance of an NRC Operating License (OL) and Commercial Operation 6-10 years later.

Based on these assumptions, we have calculated the levelized LCOE and ANEC price that would be required to cover costs and deliver the target IRR of 12%, assuming the ANEC payments cover the first 20 years of operation, which is the case for OREC prices approved by BPU. The following chart displays the required ANEC pricing under the range of capital cost and construction schedule assumptions:

Figure 4-2 ANEC Price vs Capital Cost and Construction Scheule



As indicated, at the Low range of assumptions, if a 1000 MW unit can be built in 6 years at a cost of $8 billion, the project would require a levelized ANEC price of $85/MWH, essentially at the same level as the PJM market offset price, meaning that no ratepayer subsidy would be required. At the Medium cost ($10 billion) and schedule (8 years), the ANEC price is $100/MWH, and at the High end ($12 billion and 10 years) the ANEC price would have to reach $125/MWH.

This range of ANEC prices compares favorably with levels of subsidized energy prices approved by BPU for other technologies. OREC prices in the Third OSW Solicitation were at $140-165/MWH[16] with potential for further increases up to 15% for inflation. The current price for Solar Renewable Energy Credits (SRECs) is $170/MWH.

[16] BPU Order of January 24, 2024 Docket No. QO22080481.

5.0 Cost Comparison With Renewables

To provide further perspective on the level of cost for new nuclear generation, it is useful to compare the estimated ANEC prices with comparable costs for renewables, including solar, battery storage, onshore and offshore wind which are envisioned in the 2024 EMP as being required to meet the goal of zero carbon power by 2035.

We have previously undertaken a study of the LCOE of various generating sources including the renewables called for in the EMP[17]. That report relies in large part on the most recent study by Lazard[18] which reports LCOE values both with and without the Federal tax credits previously available through the 2022 Inflation Reduction Act. With the passage of the One Big Beautiful Act (OBBA)[19] solar and wind facilities will no longer be eligible for such credits after July 2026. Thus, only nuclear and battery storage would receive the tax credits after that date. Without the tax credits the LCOE is $74/MWH for utility solar projects, $77/MWH for onshore wind and $250/MWH for offshore wind.

While this renders offshore wind (OSW) clearly not viable, it would appear to leave solar and onshore wind as cheaper than nuclear or even the PJM wholesale market price. However, there are additional costs associated with renewables that are not captured in the base LCOE value that are passed through to ratepayers. These involve the cost of grid backup and interconnection which are discussed below.

Grid Backup Cost

In order to compare LCOE values among generating sources with widely varying capacity factors, as between nuclear and renewables, it is necessary to adjust these values to reflect an equivalent source capable of providing the same MW capacity 95% of the time. Thus, intermittent sources such as solar and wind must be backed up by base load or dispatchable sources to provide replacement capacity during peak demand conditions when the sun is not shining or the wind not blowing. In Lazard's reports this is called the Cost of Firming Intermittency (COFI) and is reported for solar and wind in the various regional grid areas.

Lazard has computed this cost for the PJM region based on the Effective Load Carrying Capability (ELCC) assigned to each source type. The ELCC reflects the capacity credit which PJM will count on to be available during peak demand conditions. For solar and onshore wind, the 2033-2034 PJM ELCC values are 4% and 17% respectively. This means that, of 1000 MW of nameplate capacity, only 40 MW of solar and 170 MW of wind can be counted on to be available during peak conditions.

To compare the LCOE of these sources with base load units such as nuclear which are given an ELCC of 95%, Lazard computes the additional cost which must be paid

[17] A Comparison of the LCOE of Various Generating Sources, Whitestrand Consulting, December 2025.
[18] Levelized Cost of Energy (LCOE) Report, Lazard, June 2025.
[19] One Big Beautiful Act, July 2025.

to units backing up the intermittent source based on the Cost of New Entry (CONE) for dispatchable resources which would be needed to serve peak load when the intermittent source is unavailable. For PJM this is the net cost (capital and operating costs less expected market revenue) for a natural gas peaking unit at $10.29/kw-month[20].

Based on this assumption, for wind and solar, the COFI is $48/MWH for solar and $42/MWH for wind which are added to the base LCOE for solar and wind units. No such cost is required by nuclear units which are base loaded and thus available for peak demand.

Interconnection Costs

Another added cost which must be considered in comparing LCOEs for generating sources is the cost to interconnect those sources to the regional grid. This varies greatly based on technical requirements and siting considerations. Solar and land-based wind require relatively remote locations which may or may not have access to transmission corridors. New nuclear units could be placed at Oyster Creek, Salem or Hope Creek with existing transmission infrastructure and additional capacity could be added at minmal cost.

In January 2023 Berkeley Lab published a study[21] which estimated the cost of interconnecting various generating sources based on actual experience in the PJM region. The study estimated costs of $24/kw for nuclear and natural gas units, $253/kw for solar, $136/kw for onshore wind and $335/kw for battery storage. Based on assumed cost recovery in rates and unit capacity factors, these values are the equivalent of $1/MWH for nuclear, $9/MWH for solar, $3/MWH for onshore wind and $19/MWH for battery storage.

Offshore wind entails a unique and unprecedented interconnection challenge, requiring transmission through high voltage undersea cables from 10-40 miles offshore, to landfall locations to onshore substations and converters, then through new or upgraded transmission corridors to load centers far removed from the coast. Studies of interconnection costs for offshore wind in NJ[22] and NY[23] have estimated the cost at $1300/kw which translates into $25/MWH.

Table 5-1 below summarizes the comparable costs for renewable and nuclear units, as well as the applicable offsetting PJM market price and net ratepayer subsidy paid for the power.

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[20] $\text{COFI} = \dfrac{\text{Nameplate Capacity (kw) x (1-ELCC *\%)) x Net CONE (\$/kw-month) x 12 months}}{\text{Nameplate Rating (MW) x Regional Capacity Factor (\%) x 8760 Hours}}$

[21] Interconnection Cost Analysis in the PJM territory, Berkeley Lab, January 2023.

[22] NJ State Agreement Approach for Offshore Wind Transmission: evaluation Report, Bratelle Group, 2023.

[23] NYISO MMU Evaluation of the Long Island Offshore Wind Export PPTP Report, Potomac Economics, 2023.

Table 5-1 Comparison of Costs of Nuclear and Renewable Generation

	Capacity (MW)	Capacity Factor (%)	Economic Life (yrs)	**LCOE ($/MWH)**	**LCOE with Grid Backup Cost**	**LCOE with Grid Backup and Interconnect Cost**	**PJM Market Price ($/MWH)**	**LCOE Price Subsidy ($/MWH)**
Utility Solar	150	25%	35	**74**	**122**	**131**	**67**	**64**
Onshore Wind	250	42%	30	**77**	**118**	**121**	**70**	**51**
Offshore Wind	1000	47%	30	**250**	**292**	**317**	**72**	**245**
Battery Storage	100	14%	10-20	**142**	**142**	**163**	**75**	**88**
Nuclear	1000	95%	60	**85-125**	**85-125**	**86-126**	**86**	**0-40**

As indicated, the all-in LCOE cost for nuclear compares favorably with the other renewable generation sources when the additional costs for grid backup and transmission interconnection are included. Furthermore, the value of PJM market offset for nuclear is higher because of its higher capacity factor which results in higher capacity payments which are passed through to ratepayers. This results in a significant reduction in the ratepayer subsidy required for each MWH of nuclear generation produced, approaching zero at the Low end of the estimated nuclear costs and less than that needed to support solar, wind or battery storage even at the High end.

5.0 Emissions Comparison

Although nuclear and renewables are considered carbon free sources of generation, when considering their respective capacity factors, they do not produce carbon free power at 100% of the time and must be supplemented with grid power for periods when they are not operating. As other NJ and PJM sources include a mix of generation, including natural gas and coal, there are carbon emissions associated with this supplementary power.

In order to compare the resulting emissions from new nuclear and renewables on a common basis, we assume that 75% of supplementary power will be from NJ sources and 25% from PJM imports. NJ sources currently emit an average of 507 lbs/MWH[24] of CO2 while PJM imports average 732 lbs/MWH[25], owing to their greater reliance on coal generation. Based on these parameters, we assume that each MWH of supplementary power will generate an average of 674lbs/MWH.

[24] NJ Electricity Profile, US Energy Information Agency (EIA), 2024

[25] Emissions Data, PJM, September 2025.

For any 1000 MW of carbon free generation, the higher the capacity factor, the lower the emissions associated with the unit. Based on the expected capacity factors, and assuming wind and solar would be backed up for 4 hours by battery storage, the following are the comparative annual carbon emissions for an equivalent 1000 MW of new nuclear and renewable generation in NJ:

Table 6-1 Comparison of Carbon Emissions

Generating Source	Capacity Factor	Annual CO_2 Emissions (million tons/yr)
Nuclear	95%	0.1
Offshore Wind + Battery	61%	1.2
Onshore Wind + Battery	56%	1.3
Utility Solar + Battery	39%	1.8

Thus, because it runs almost all the time, nuclear power results in far fewer supplementary carbon emissions than do the intermittent renewables.

7.0 Conclusions

Nuclear power has several inherent advantages for fulfilling New Jersey's desire for clean, reliable electricity as set forth in the EMP:

- It provides carbon free baseload power, serving peak load and annual demand almost 100% of the time.
- It has a useful economic life of 60 years or more.
- New generation can be sited at existing sites with transmission infrastructure in place.
- It will create numerous good paying jobs during construction and operation.

The foregoing analysis demonstrates that new nuclear generation can be built at lower overall cost to ratepayers than other carbon free renewables while resulting in fewer overall carbon emissions. However, this outcome depends on achieving cost and schedule goals that will be challenging and are yet to be demonstrated.

To achieve these goals will require the project owners to secure Federal loan guarantees and tax credits that are available under existing legislation and to avoid the cost overruns and schedule delays that have plagued other recent nuclear projects. This means executing permitting and licensing, design engineering, supply chain management, procurement and construction to high standards of performance throughout the entire project development period.

If the projects can meet the challenging but achievable financing, cost and schedule and operational performance goals set forth herein, it will deliver reliable, affordable and carbon free power to serve New Jersey's needs far into the future while contributing large benefits to the state's economy and employment.

The legislature should proceed to enact the proposed Energy Reliability and Affordability Act and the BPU should then move expeditiously to solicit proposals and award contracts for new nuclear power. It is also hoped that the incoming Governor will support the expansion of nuclear generation. Without these legislative, regulatory and executive actions in the year 2026, the goals of the EMP for expanded NJ nuclear generation will not be met.

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The Author

Edward P. O'Donnell is a principal in Whitestrand Consulting LLC. He has spent 35 years in the nuclear power industry as an engineer, manager and executive with responsibilities for design and licensing of numerous plants in the US and abroad. He was also responsible for engineering, corporate planning and rate matters for a NJ nuclear utility and has testified in utility rate proceedings before the NJ BPU.

He was responsible for managing the successful sale of nuclear units in NJ and PA and as a consultant for advising clients on the sale and purchase of nuclear plants. In this role he forecasted future costs and performance of plants for re-financing as merchant power suppliers in a de-regulated electrical energy market and performed analyses of the economic viability of nuclear plants in comparison with alternative fossil and renewable energy facilities.

Mr. O'Donnell holds an M.S. in Nuclear Engineering from Columbia University and has been a licensed Professional Engineer in NJ. He is also a registered Enrolled Agent, authorized to represent individual and business entities before the IRS on tax matters.

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