



PLANET A* STRATEGIESSM

**Because there is no Planet B*

PA*S GREEN NOTE

When It Comes to Offshore Wind, It's the Electricity, S*****

Disagreements over off-shore wind (OSW) infrastructure development, both in public policy debates and on-the-ground project buildouts, have been missing the salient factor regarding whether to invest in such systems: are consumers being asked to pay for OSW electricity generation and transmission systems that may not reliably deliver enough electricity when and as needed at reasonable prices in accordance with law? Given the nation's dependence on electricity for its economy, health, and security, reliability is mandated under laws codifying the *obligation to serve*. This means the basic math of demand and supply underlying the reliability is the critical determinant, and the primary factor in the new Administration's suspension of the off-shore wind leasing program pending review.

Adequate, Efficient, Reasonable

In spite of the legal mandates governing its production, there is a tendency to take electricity for granted, even though the United States gulped down 4,000 terawatt hours (TWh) of it in 2023 to sustain our day-to-day lives. Electricity is required to run the commerce, business and industry making up the economy; to deliver vital public services like education, transportation, sanitation, communication, health, and safety; and to live and work in our homes. Electricity is on demand, and must be delivered all day, every day, to all users at the same time.

Those 4,000 TWh is the same as 4,000,000,000,000 (4 trillion) kilowatt hours (kWh), the measurement used in home meters. To illustrate, one home typically uses about 10,000 kWh a year, while the five East Coast mass transit systems in Boston, New York, New Jersey, Pennsylvania, and the District of Columbia, along with Amtrak's NE Corridor Service, together use 5,000,000,000 (5 billion) kWh every year. Yet few, if any, citizens (or elected officials and policy makers for that matter) are fully informed as to just how much infrastructure, planet, people, and money is required to assure such massive volumes of electricity can be reliably produced at affordable prices. Though rarely top of mind except in emergencies, assuring sufficient and reliable electricity supplies is actually so important that it has been codified in federal law and the laws of every state in the nation under utility "obligation to serve" statutes.

In some states, the "obligation to serve" is established by ten words in the law: "Every public utility shall furnish adequate, efficient, and reasonable service." Other states detail the obligation in multiple code sections governing public utilities that can include various caveats and dependencies. In California, Public Utility Code §451 provides that every public utility "shall furnish and maintain such adequate, efficient, just and reasonable service, instrumentalities, equipment and facilities...". In New Jersey, the law states "No public utility shall provide or maintain any service that is unsafe, improper, or inadequate..." and NY Code requires "...every electric corporation...shall furnish and supply such service, instrumentalities and facilities as shall be safe, and adequate and in all respects just and reasonable."

Meeting this obligation is now a serious challenge. In a clear statement to the 2024 Reliability Technical Conference held in October, the electricity grid regulator North American Electric Reliability Corporation (NERC) warned that “[i]n North America, by 2033, summer peak demand for electricity is forecast to increase 10%, while electricity generation is only expected to grow by 4%.” The NERC statement left no doubt as to the root cause of electricity reliability threats, noting “At its most basic level, the reliability challenge in North America is a simple math problem: **the supply of electricity is not growing fast enough to meet the growing demand for electricity**” (emphasis in original).

NERC’s [Long Term Reliability Assessment](#) released in December of 2024 confirmed the severity of the supply risks, warning that more than half of US power grids face shortfalls that could mean blackouts over the next decade. The report notes that the growing gap between projected electricity demand and available supply is being driven by three main issues: unexpected surges in energy use (data centers, EVs, and building electrification); barriers to transmission development; and planned retirement of 115 GW of fossil generation. Importantly, the report confirms one of the most persistently misleading aspects of “renewable” generation switch out—solar PV, wind, and other variable energy resources (VER) contribute only a fraction of their nameplate capacity output to serving demand because of limited energy-producing inputs (e.g., solar irradiance, wind speed). Supplanting steadily operating, controllable fossil with variable and weather-dependent generation sources means, quite simply and dangerously, less electricity gets made unless much higher volumes of installed capacity are built.

“Spin, baby, spin.”

In spite of these known risks of growing electricity supply gaps, the Department of Interior’s Bureau of Ocean Energy Management (BOEM) approved eleven commercial scale OSW projects over the last four years totaling 19 megawatts (MW) of installed turbine capacity. Perhaps due to some confirmation bias inherent in projects deemed part of a “green energy transition,” the various required environmental and permitting reviews were facially inadequate on multiple grounds, including the segmentation of each project’s analysis from other turbine installations, and from the vast networks of integrated infrastructure construction of the transmission, port, and storage facilities needed to operate OSW systems; such segmentation lead to totally inadequate analysis of these projects’ cumulative effects.

In a strange reversal, opponents of these OSW projects have filed the court challenges normally taken up by the established green lobby when large infrastructure development will damage or interfere with valuable flora and fauna, maritime assets, or land, air, and water assets used in upstream production processes (such as rare earth metal extraction and processing). Lawsuits filed by local organizations have alleged turbine system approvals violate multiple federal environmental and administrative procedure laws including the National Environmental Policy Act, Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Coastal Zone Management Act, National Historic Preservation Act, Outer Continental Shelf Lands Act, Clean Water Act, Rivers and Harbors Act of 1899, and the Administrative Procedures Act.

Although the Ocean Wind 1 Project off New Jersey was canceled soon after multiple Cape May plaintiffs filed their 2023 litigation on the environmental and administrative grounds described above, judicial actions are mostly delaying industrial wind projects but not defeating them. Recently, the Supreme Court declined to hear an appeal of a First Circuit decision that rejected plaintiff claims that the Vineyard Wind 1 Project off Massachusetts failed to consider cumulative impacts to the endangered North Atlantic right whale.

The South Coast Wind Project off the coasts of Rhode Island and Massachusetts approved in December was the last OSW project signed off by the outgoing Administration. As with all off-shore wind projects before it, the sole electricity measure of merit was the number of homes powered—this time 840,000—in two states containing over 3 million homes. No mention was made of how the hospitals, waste water treatment plants, universities, mass transit, supermarkets, or stadia would get their electricity, illustrating the very problem NERC keeps warning about: The Math.

Doing the Numbers

On January 20, 2025, the White House issued a Presidential Action entitled *Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects*. Addressed to the Secretaries of the Treasury, Interior, Agriculture, Energy, the Attorney General, and the Administrator of the Environmental Protection Agency, Section 1 of the Action temporarily withdraws from disposition all wind energy leasing areas defined by the Outer Continental Shelf Lands Act. The Action states this withdrawal is *lead by the need to foster an energy economy capable of meeting the country's growing demand for reliable energy* (emphasis added), and directs a comprehensive review that could result in terminating or amending any existing wind energy leases. Recommendations to the President will be processed through the Assistant to the President for Economic Policy.

As NERC makes clear, reliability is a math problem, and numbers from New Jersey provide a striking example of failed reliability arithmetic when it comes to OSW. In 2023, NJ Governor Phil Murphy issued his aspirational Executive Order 315 mandating 100% of electricity sold in the state be derived from clean sources by 2035 (an order he now wants codified). In parallel, the Governor has also established a goal of securing electricity from 11 GW of installed OSW capacity by 2040, ostensibly as part of reaching the all-clean E.O. deadline.

New Jersey currently has slightly more than 18 GW of installed capacity statewide, 12.3 GW of which are in 53 natural gas facilities that produce over 33,000 GWh of electricity—just over half the state's annual output of about 65,000 GWh. (A mere 3.6 GW of nuclear provides another 40% of the State's power, but that's arithmetic for another day). With these numbers as a foundation, the reliability math is fairly straightforward.

First, the E.O. 315 mandated closure of the 12.3 GW of existing gas power-producing facilities eliminates 33,000 GWh of NJ's electricity. Second, the entire hoped-for 11,000 MW of OSW installed capacity operating at 40% capacity (the worldwide OSW average) could produce about 39,000 GWh, a potential net increase of 6,000 GWh. So far, seemingly good, except that 11 GW of installed OSW is over a third of the entire 30 GW goal of the 2021 Biden Executive Order 14008; is more than half the capacity of approved projects; and some of the planned capacity in the region is slated to go to New York.

Even if New Jersey's 11 GW of OSW were to materialize, a third factor crashes the math. The 2024 PJM Load Forecast Report (from the Pennsylvania/New Jersey/Maryland Independent System Operator) indicates demand from just four NJ utility areas (Atlantic Electric, Jersey Central Power and Light, Rockland Electric, and Public Service Electric and Gas) will increase by about 30,000 GWh by 2039 as electrification of vehicles, buildings, and data systems proceeds apace. The Murphy Plan that essentially switches out natural gas with OSW without factoring in demand growth leaves New Jersey with a net/net electricity supply of negative 24,000 GWh by the 2040 OSW goal year.

The looming reliability failures are compounded by the unnecessary costs citizens of New Jersey will bear if working facilities (gas) are prematurely retired and replaced with partially working facilities (OSW). And all this in a state whose per capita greenhouse gas emissions were the sixth lowest in the nation in 2021, which begs the question, to what purpose is all this expenditure of treasure, both financial and planetary? Shouldn't these investments be targeted to states still burning coal?

Similar failed math plagues California OSW dreamin'. Meeting its 100% zero-carbon electricity goal by 2045 would close 41 GW of natural gas generation that produces 96,000 of California's total annual requirement for 287,220 GWh. Planned installation of 25 GW of OSW could produce approximately 87,000 GWh, leaving a net reduction of 9,000 GWh. The California Energy Commission reports the demand estimate for 2035 will be 348,713 GWh, adding another 61,493 GWh to the supply deficit, bringing it to about 70,000 GWh when the gas is gone, almost as much as California already imports from nearby states (83,962 GWh)

Share the Numbers

Reliability issues are emerging in multiple areas of the country as two inescapable mathematical realities proceed on a collision course. The expansion of electricity as the operational energy for homes and vehicles coupled with the exponential increase in data management demand means electricity requirements are growing and will continue to do so over the foreseeable future. Yet states (particularly those with the lowest per capita greenhouse gas emission rates) are displacing high production, steady-state electricity generation like natural gas or nuclear with variable, weather-dependent sources like off-shore wind.

The different physical and operating characteristics of the variable producers compared to the generators they are replacing, as well as the reduction in output, mean these systems are driving the reliability risks NERC is warning about and falling afoul of the standards of adequacy, efficiency, and reasonableness necessary to meet the legal obligation to serve. The Presidential Action has created breathing room for better assessment and evaluation of OSW projects, but as the Action itself makes clear, assuring electricity reliability under obligation to serve mandates is the strongest road to preventing unnecessary harm and cost from industrializing the ocean.

As litigation focused on marine life and inadequate analysis requirements faces headwinds, the time has come to oppose intermittent, weather dependent, and damage-vulnerable offshore wind systems on the straightforward grounds confirmed by NERC: they cannot mathematically meet the legal obligation to serve requirements, no matter how many "homes" a wind plant claims it can power.

The new Administration seems to agree that reliability and obligation to serve are top considerations and determinants in energy policy going forward. The numerics underlying these requirements is the evidence needed by federal agencies reviewing OSW leasing under the program suspension. OSW opponents can make the mathematical case to both federal and state governments, along with utility commissions, on the primary energy economics issue identified by the White House—reliability (adequate, efficient, reasonable). It's still the electricity, folks, and as they say, go figure.