

# DIRECTION

## THE FUTURE OF WIND

Transmission backlog has become a major bottleneck for project development. (Courtesy: Berkeley Lab)

# Berkeley Lab research: Transmission connections backlog grew in 2023

The backlog of new power generation and energy storage seeking transmission connections across the U.S. grew again in 2023, with nearly 2,600 GW of generation and storage capacity now actively seeking grid interconnection, according to new research from Lawrence Berkeley National Laboratory (Berkeley Lab).

Active capacity in U.S. interconnection queues increased nearly eight-fold over the last decade and is now more than twice the total installed capacity of the existing U.S. power plant fleet.

The queues indicate particularly strong interest in solar, battery storage, and wind energy, which together accounted for more than 95 percent of all active capacity at the end of 2023.

But this growing backlog has become a major bottleneck for project development: Proposed projects are mired in lengthy and uncertain interconnection study processes, and most interconnection requests are ultimately canceled and withdrawn.

The Federal Energy Regulatory Commission (FERC) adopted major interconnection reforms in 2023 that have not yet taken effect in most regions; project developers continue to cite grid interconnection as a leading cause of project delays and cancellations.

Submitting an interconnection request and completing the requisite grid studies is only one of many steps in the development process; projects must also have agreements with landowners and communities, power purchasers, equipment suppliers, and financiers, and may face transmission upgrade requirements. Data from these queues nonetheless provide a general indicator for mid-term trends in power-sector activity and energy-transition progress.

Berkeley Lab compiled and analyzed data from the seven organized electricity markets (RTO/ISOs) in the U.S. and an additional 44 balancing ar-

reas outside of RTO/ISOs, which collectively represent more than 95 percent of currently installed U.S. electricity generation.

“It is promising to see the unprecedented interest and investment in new energy and storage development across the U.S., but the latest queue data also affirm that grid interconnection remains a persistent bottleneck,” said Joseph Rand, an energy policy researcher at Berkeley Lab and lead author of the study.

“The new rules from FERC will be a step in the right direction when implemented, but it is increasingly clear that additional solutions to interconnection problems are essential to maintain grid system reliability amidst rising electricity demand and utility- and state-level clean-energy goals.”

U.S. electric demand is projected to increase considerably in coming years, with a resurgence in U.S. manufacturing alongside demand from new data centers, electric vehicles, and building electrification.

**MORE INFO** [www.lbl.gov](http://www.lbl.gov)

## BOEM initiates wind-project review near Nantucket

In support of the Biden-Harris administration’s goal of deploying 30 GW of offshore wind energy capacity by 2030, the Bureau of Ocean Energy Management (BOEM) will initiate an environmental review of Vineyard Northeast’s proposed offshore wind energy project, 29 miles offshore Nantucket, Massachusetts, at its closest point.

BOEM estimates the proposed project would generate up to 2,600 MW of electricity, enough to power more than 900,000 homes with clean renewable energy.

BOEM published a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the Construc-

tion and Operations Plan (COP) submitted by Vineyard Northeast, LLC. This is the 13th COP review initiated under the Biden-Harris administration.

“The Biden-Harris administration is steadfast in our dedication to collaborating with Tribal nations, government agencies, environmental groups, local communities, and ocean stakeholders,” said BOEM Director Elizabeth Klein. “Through collective effort, we can establish a robust, sustainable offshore wind sector that guarantees communities nationwide reap the rewards of domestically sourced clean, reliable renewable energy.”

The Lease Area, consisting of about 132,370 acres, is about 29 miles from Nantucket and approximately 39 miles offshore Martha’s Vineyard, Massachusetts.

Highlights from Vineyard Northeast’s proposal include the following:

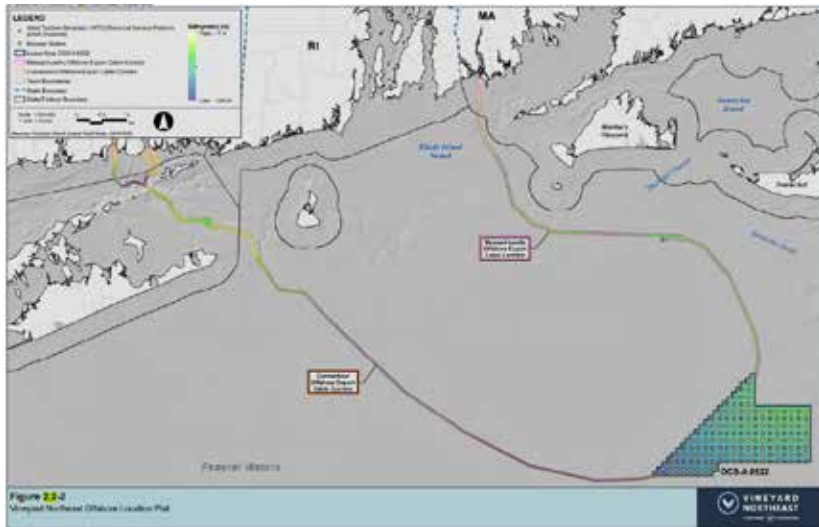
- Installation of up to 160 wind-turbine generators, up to three electrical service platforms (ESPs), and one booster station in an adjacent lease area.

- Two offshore export cable corridors, one to Connecticut and one to Massachusetts, and associated onshore transmission systems.

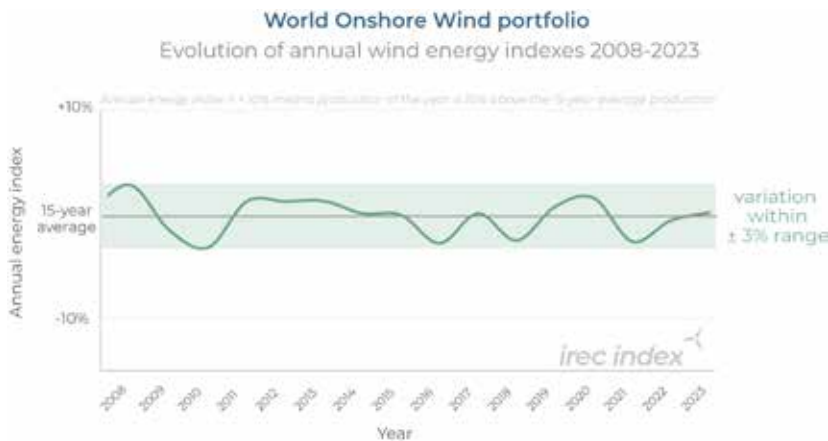
Since the start of the Biden-Harris administration, the Department of the Interior has approved the nation’s first six commercial scale offshore wind projects, held four offshore wind lease auctions — including a record-breaking sale offshore New York and the first-ever sale offshore the Pacific and Gulf Coasts, initiated environmental review of 13 offshore wind projects, and advanced the process to explore additional Wind Energy Areas in Oregon, Gulf of Maine, and Central Atlantic.

The Department has also taken steps to evolve its approach to offshore wind to drive towards union-built projects and a domestic based supply chain.

**MORE INFO** [www.boem.gov](http://www.boem.gov)



A proposed project could provide power to Massachusetts and Connecticut communities. (Courtesy: BOEM)



The Global Index covers geographical areas that host about 80 percent of the world's operating onshore wind farms as of 2023. (Courtesy: Eoltech)

## Study: Wind production annual variations within 3%

A study by Eoltech, a leading wind and solar resource assessment consultancy, shows that worldwide wind production is very predictable.

The study was aimed at assessing the variations of the global wind resource over the last 15 years. The data show that worldwide wind-power production's annual variations remain within a  $\pm 3$  percent range. These results are based on irec index, the wind-energy index covering 80 percent

of the world's onshore wind farms installed as of 2023.

The study combines the irec wind energy indexes that Eoltech releases each month for the 300 geographical areas worldwide with the highest number of farms. By aggregating and weighting this data, Eoltech was able to generate a "Global" as well as a "European" wind-energy index and provide an overview of global wind resource trends over the past 15 years.

The Global Index covers geographical areas that host about 80 percent of the world's operating onshore wind farms as of 2023, while the European Index covers 97 percent of the conti-

nent's operating wind farms. The European Index shows that wind resource annual variations are within a  $\pm 7$  percent range in Europe, compared to  $\pm 3$  percent worldwide.

"Operating wind farms experience a large diversity of wind regimes, which cause on a local scale significant resource variability from one year to another," said Habib Leseney, Eoltech CEO. "Locally, the production of a wind farm can differ significantly from one year to another, up to 25 percent, due to the variation of the wind resource. But on a larger scale (Europe, World), cumulated production is much more stable. It should also be noted that our analysis does not show any downward trend over the last 15 years in the global wind resource. Yes, the wind does always blow somewhere on the planet, and it is good news for wind power going forward."

Irec design includes ERA5 data, one of the latest climate reanalysis data sets produced by the European Centre for Medium-Range Weather Forecasts (ECMWF). This indicator is mainly used by asset managers and wind-farm owners to compare their production variation from one period to another. Such tools are crucial to assess the production capacity of their portfolio regardless of the wind-speed variation level and enable to identify drift affecting the portfolio value over time.

**MORE INFO** [www.eoltech.fr](http://www.eoltech.fr)

## DNV report: Energy pros confident about growth

DNV, the independent energy expert and assurance provider, revealed a resilient optimism within the energy sector, despite prevailing caution. According to DNV's annual Industry Insight Survey, 73% percent of senior energy professionals express confidence in the industry's growth trajectory for the upcoming year, a figure that has remained steady at about 74 percent since 2022, reflecting a resolute stance amid turbulence.



Positive sentiment about the energy sector remains steady at 74 percent. (Courtesy: DNV)

“The transition toward a sustainable energy future is not just desirable; it’s imperative,” said Ditlev Engel, CEO Energy Systems at DNV. “Key drivers of optimism include the relentless march toward decarbonization and electrification, offering long-term clarity amid near term uncertainty. Understanding this shift as a necessary progression aligns with the industry commitments under the Paris Agreement, reinforcing its determination to drive meaningful change. Consequently, the industry’s optimism about the path ahead is well-founded – especially since the requisite technologies are already within our reach.”

However, beneath this apparent stability lies a complex landscape of shifting dynamics. While the industry as a whole maintains a positive outlook, specific sectors, such as electric power and renewables, have witnessed notable declines from previous peaks.

DNV’s survey stresses nearly two-thirds of the energy sector view global political uncertainty as the primary threat to success over the coming year. Specifically, DNV’s study reveals nearly two-thirds (62 percent) of respondents perceive the 2024 wave of elections and potential policy shifts as one of the steepest barriers to growth. Political uncertainty, which ranked as the 13th major concern in 2022, surged to sixth place in 2023.

2024 marks a record year for elections, with more than 2 billion people heading to the polls. The prospect of continued policy upheaval is of particular concern in the Americas, with 71 percent of Latin American and 67 percent of North American energy professionals highlighting political issues, reflecting the polarized landscape of energy and climate politics. Given its importance to the global energy sector, the outcome of the upcoming elections in the United States holds particularly significant implications for energy industry sentiment and strategic planning.

“For decades, the energy sector has faced enduring political risks, evolving from localized tensions to global challenges affecting every aspect of the industry,” Engel said. “A key challenge is to secure lasting regulatory support and clear visibility into the future to rapidly deploy existing technologies.”

Optimism among respondents in electrical power has dipped from 87 percent to 76 percent, while renewables have experienced a similar downward trend, from 87 percent to 78 percent. This decline mirrors a broader shift in industry growth expectations and organizational confidence, with rising costs and supply chain disruptions pose significant hurdles to project viability and the pace of energy transition. Notably, the electric power industry faces a pronounced shortage of skilled talent, hindering progress in energy transition, and digital initiatives. Meanwhile, renewables grapple with regulatory hurdles and intensifying market competition. ↴

**MORE INFO** [www.dnv.com](http://www.dnv.com)



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