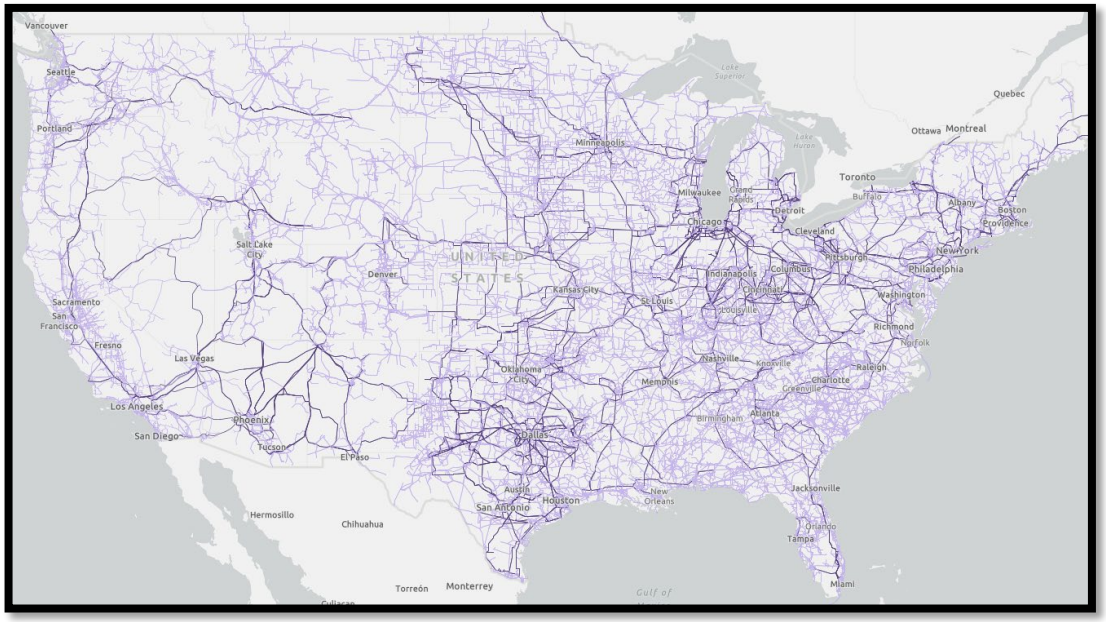
U.S. DEPARTMENT OF ENERGY | Grid Deployment Office

Grid Deployment Office: Transmission Division

October 2022 | Tribal Clean Energy Summit

Today's Grid

- 70% of transmission and power transformers are >25 years old
- Insufficient capacity to transfer power across regions
- Increasing frequency of extreme weather events
- Need to expand transmission systems **by 60% by 2030** and **triple those systems by 2050***



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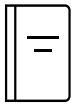
Building a Better Grid

Engagement and collaboration

- Tribal Nations
- Federal agencies
- States
- ISO/RTOs
- EROs
- Stakeholders



Enhanced transmission planning

- Transmission Needs Study
- National Transmission Planning Study
- Atlantic Offshore Wind Transmission Convening and Study

Federal financing tools ($20+B)

- Transmission Facilitation Program ($2.5B)
- Smart Grid Investment Grant Program ($3B)
- Grid resilience grants for states, Tribes, and utilities ($5B)
- Grid Resilience Innovation Program ($5B)
- Transmission Facility Loans ($760M)

Transmission permitting process

- Improve federal permitting regimes with federal agency partners
- Public private partnerships
- Designation of national interest electric corridors

Transmission-related R&D

- "Next generation" electricity delivery technologies
- Supporting activities

Transmission Facilitation Program

Transmission Facilitation Program (40106)

TFP is a $2.5B revolving fund to facilitate the construction of electric power transmission lines and related facilities

Legislation allows DOE to engage with *eligible entities* through:

- **Capacity Contracts** to buy up to 50% of planned eligible project *commercial* capacity (*ATC*) for up to 40 years
- **Public Private Partnerships** where DOE participates in designing, developing, maintaining or owning an eligible project
- **Loans** to carry out eligible projects

Transmission Facilitation Program (40106): Scope and Priorities

Eligible project:

- **Construction** of a new or replacement transmission line of at least 1000 megawatts;
- **Upgrade** of an existing transmission line or construction of a new transmission line in an existing transmission, transportation, or telecommunication infrastructure corridor of at least 500 megawatts; or
- **Connection** of an isolated microgrid to an existing transmission, transportation, or telecommunications infrastructure corridor located in Alaska, Hawaii, or a U.S. territory.

Project prioritization:

- Use **technology that enhances** the capacity, efficiency, resilience, or reliability of an electric power transmission system, including the use of advanced technology;
- Improve the **resilience and reliability** of an electric power transmission system;
- Facilitate **interregional transfer capacity** that supports strong and equitable economic growth; and
- Contribute to national or subnational goals to **lower electricity sector greenhouse gas emissions**.

Transmission Facilitation Program (40106): Implementation

DOE issued an NOI/RFI seeking comment on program design – comment period closed June 13

DOE is planning its **first solicitation (Phase 1)** to be limited to capacity contracts in **Fall 2022**. Phase 2 will follow in Fall 2023.

Phase 1: Capacity Contracts

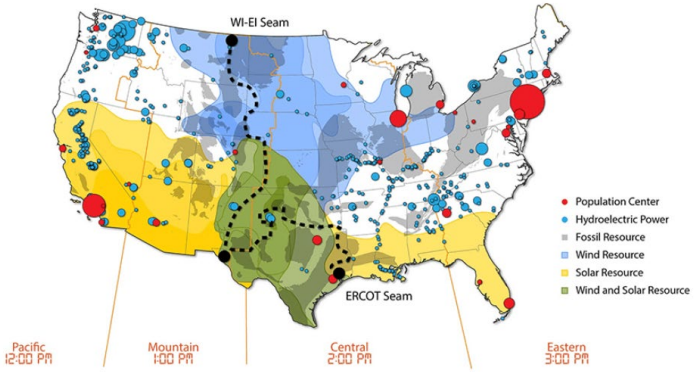
Phase 2: Capacity contracts, Loans and PPP

National Transmission Planning Study

National Transmission Planning Study: Project team

This study is being conducted by a joint **National Renewable Energy Laboratory (NREL)** and **Pacific Northwest National Laboratory (PNNL)** project team

This study builds on past projects and expertise at NREL and PNNL with the support and direction of DOE's Office of Electricity



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Office of Electricity

North American Energy Resilience Model

https://www.energy.gov/oe/national-transmission-planning-study

National Transmission Planning Study: Objectives

1. Identify **interregional and national strategies** to accelerate cost-effective **decarbonization** while maintaining system reliability

2. Inform regional and interregional transmission planning processes, particularly by **engaging stakeholders** in dialogue

3. Identify **viable and efficient** transmission options that will provide broad-scale benefits to electric customers

National Transmission Planning Study: Desired outcomes

- Results help **prioritize future DOE funding** for transmission infrastructure support
- Results help **fill existing gaps** within interregional transmission planning
- Study provides a framework for stakeholders to discuss **desired grid outcomes** and **address barriers** to achieving them

Transmission Needs Study

Transmission Needs Study

Objective: Review current and anticipated future needs of the grid

"Needs" include:

- Reliability and resilience
- Congestion
- Transfer capacity limits
- New generation delivery

Analysis includes:

- Historic transmission and generation installations
- Historic wholesale electricity prices
- Review of nearly 40 industry, academic, lab reports
- Results of capacity expansion models

Study serves as DOE's triennial state of the grid report

NeedsStudy.Comments@hq.doe.gov

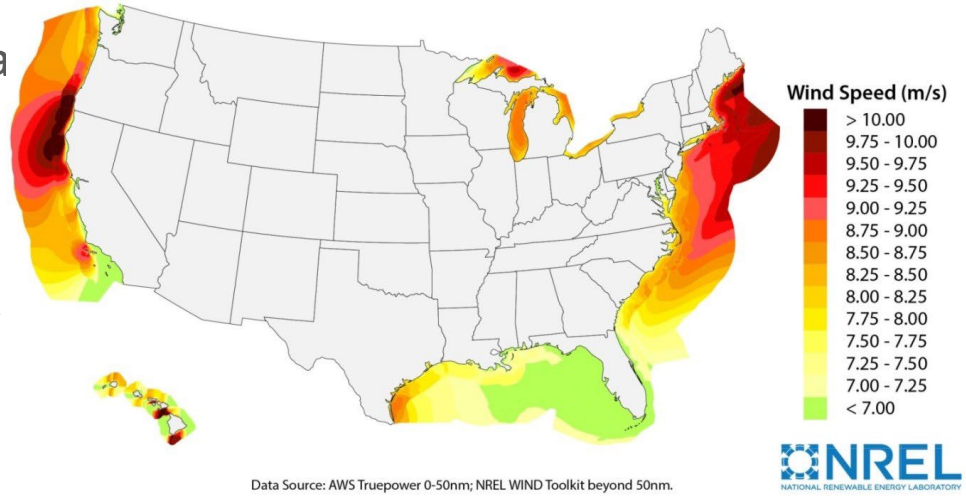
Offshore Wind Transmission

Overview

Biden Administration's goal is 30 GW by 2030 for offshore wind (OSW) deployment; Transmission constraints were identified as a centra potential impediment.

The White House requested that the **DOE** and U.S. Department of Interior's Bureau of Ocean Energy Management (**BOEM**) develop a plan for addressing these challenges.

Thus far Agency efforts have been primarily **focused on the Atlantic Coast** but work on the West Coast will be starting in fall 2022, to be followed by the Gulf of Mexico, Great Lakes, and Gulf of Maine regions.



Data Source: AWS Truepower 0-50nm; NREL WIND Toolkit beyond 50nm.

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GDO GRID DEPLOYMENT OFFICE

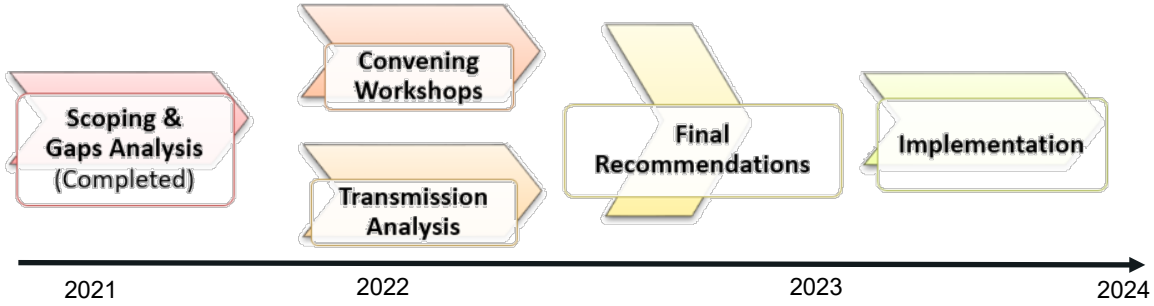
LPO LOAN PROGRAMS OFFICE

U.S. DEPARTMENT OF THE INTERIOR
BOEM Bureau of Ocean Energy Management

NREL Transforming ENERGY

Pacific Northwest NATIONAL LABORATORY

DOE & BOEM Coordinated OSW Transmission Effort



Scoping & Gaps Analysis: Tribal Nations who participated in the scoping calls:

- Mashantucket Pequot Tribal Nation
- Delaware Nation
- Chickahominy Tribe Eastern Division
- Rappahannock Tribe
- Wampanoag Tribe of Gay Head (Aquinnah)
- Mashpee-Wampanoag Tribe

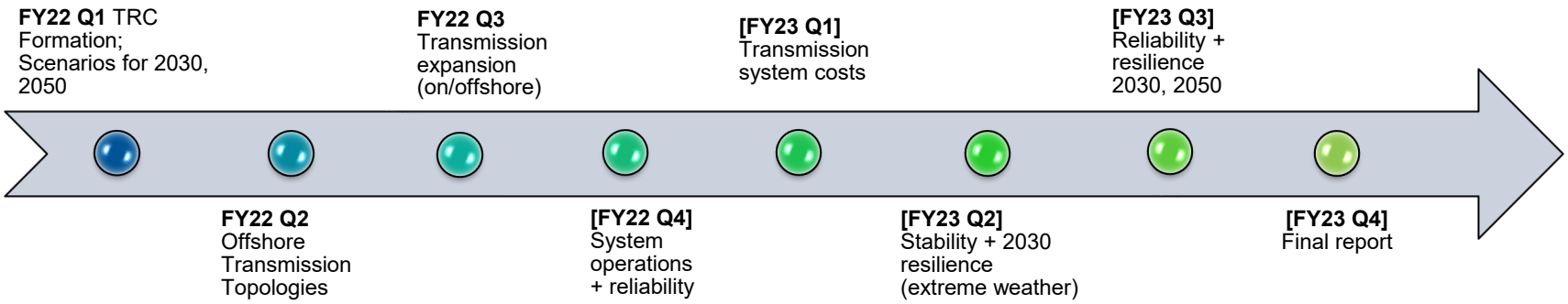
Convening Workshops: DOE and BOEM are conducting a series of convening workshops, in consultation with FERC and other federal agencies, to develop a set of recommendations for OSW transmission development, planning policy, and permitting policy for the Atlantic Coast.

- Tribal Nations, states, regional transmission operators, developers, ocean users, and other stakeholders are being engaged.
- 9 Workshops are planned, 6 of which are already complete.

Transmission Analysis: DOE is completing the Atlantic OSW Transmission (AOSWT) Study which is a comprehensive analysis that compares transmission buildout scenarios while considering grid operability, reliability and resilience, and environmental impacts.

Recommendations Report: These recommendations and a time-bound action plan will be documented in a report at the conclusion of the convening workshops.

Atlantic Offshore Wind Transmission Study



PURPOSE: Conduct comprehensive transmission analysis that compares costs and benefits of transmission buildout scenarios while considering grid operability, reliability and resilience, and environmental impacts. *The data and results have been informing the convenings.*

LEAD: DOE's Wind Energy Technologies Office with analysis led by National Labs NREL and PNNL

OBJECTIVES:

Through multiple scenarios of inter-state, inter-regional transmission topologies evaluate multiple pathways for OSW deployment across the Atlantic coast in support of the national 30 GW by 2030 & 110 GW by 2050 goal.

Evaluate reliability and resilience of the power system in the near-term (2030) and long-term (2050), including component reliability, cable failures, and resulting costs.

Identify if there is a crossover point (either in time or in GW) at which the benefits of a coordinated transmission framework will outweigh the benefits of radial interconnections, identifying critical decision points given uncertainties.