## West Coast Offshore Wind Transmission Convening Series Kickoff Meeting

January 17, 2024





# Housekeeping

Questions?

Please submit all presentation questions through the chat box.

If you have technical questions – please put them in the chat box for the host.







- 10:00AM PT Welcome and Keynote Remarks
- 10:20AM PT Kickoff Meeting Purpose and Goals
- 10:40AM PT Tribal Nation Technical Assistance Program
- 10:45AM PT West Coast Offshore Wind Transmission Convening Series Overview
- 11:05AM PT West Coast Offshore Wind Transmission Study Overview
- 11:30AM PT Lessons Learned from the Atlantic

11:55AM PT Closing Remarks



## **Maria Robinson**



Director, Grid Deployment Office, U.S. Department of Energy



# **Grid Deployment Office Mission**

Invest in electric infrastructure by...

Maintaining and investing in critical generation facilities
 Improving and expanding transmission and distribution system
 Developing high-capacity electric transmission lines nationwide
 Providing access to technical assistance and national laboratory expertise, modeling, and analytical capabilities



# **DOE's Grid Deployment Office**



The **Generation Credits Division** works with existing generation facilities to ensure resilience and reliability and works to improve electricity markets at the wholesale and distribution level.



The **Transmission Division** fully utilizes DOE's unique tools and authorities for coordination, planning, financing, and permitting to drive transmission investment.



The **Grid Modernization Division** oversees activities that prevent outages and enhance the resilience of the electric grid.



### **Liz Klein**



#### Director, Bureau of Ocean Energy Management, U.S. Department of the Interior



# **Jocelyn Brown-Saracino**



Offshore Wind Lead, Wind Energy Technologies Office, U.S. Department of Energy



## Offshore Wind Transmission U.S. Department of Energy

Jocelyn Brown-Saracino: January 17, 2024





#### **Biden Administration Goal of 30 GW of Offshore Wind by 2030**





#### **Global Floating Offshore Wind Deployment and U.S. Potential**

#### Rapid growth of the floating global pipeline

2/3 of U.S. wind resource is over deep waters



Source: Offshore Wind Market Report: 2023 Edition

Source: NREL







The *Floating Offshore Wind Shot*<sup>™</sup> will drive U.S. leadership in floating offshore wind design, manufacturing, and deployment to decarbonize our economy and revitalize our coastal economies.

Reduce the cost of floating offshore wind electricity by >70% in deep waters by 2035\*





>70% Reduction

BOEM also announced an associated deployment goal of 15GW floating offshore wind by 2035.

\*70% cost reduction to \$45 per megawatt hour (MWh).



### **Key Needs for Offshore Wind Development**



#### **Cost Reductions**

#### Expanded, Just, and Sustainable Deployment

#### **Domestic Supply Chains, Including Ports**

#### **Transmission Development**

#### **Co-Generation Applications**



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# **DOE and Other Agency Roles**



#### **Grid Deployment Office**

-Transmission planning and funding

#### Wind Energy Technologies Office

- Research and development

#### Loan Programs Office

- Public financing

#### **Office of Electricity**

- Grid research



Energy development on the outer continental shelf



Management of fisheries, protected species, and their habitats



Supports vessel construction and operations, port development and operations



Workplace safety and environmental compliance



### **West Coast Transmission Analysis**

- Transmission analysis
- Regional convenings
- Producing an action plan





Image: National Renewable Energy Laboratory



# **Thank You**

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#### Mark Severy Advisor to DOE, Pacific Northwest National Laboratory

#### **Jennifer Miller**

Renewable Energy Section Chief, Bureau of Ocean Energy Management, U.S. Department of the Interior



## Introduction to West Coast Offshore Wind Transmission Convening Series

Mark Severy, PNNL: January 17, 2024





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# **Convening Series Overview**

The purpose of today's kickoff is to launch the West Coast Offshore Wind Convening Series.

- Context: The West Coast lacks existing transmission infrastructure to accommodate large-scale offshore wind development to meet Federal and State goals.
- DOE andLeading a convening series in 2024 to engage Tribal Nations,BOEMstates, independent system operators, developers, oceanAction:users, and others to develop collaborative solutions for offshore<br/>wind transmission.
- Output: A set of time-bound actions that will lead to efficient transmission planning and implementation for offshore wind on the West Coast.





# **Scope of Convening Series**



OFFSHORE WIND TRANSMISSION COMPONENTS

The scope of the convening series include offshore and onshore transmission systems and components related to offshore wind energy development, including:

- Transmission system design and topology
- Technology standardization and advancement
- Community values, impacts, benefits from transmission
- Cost allocation and risk
- Interregional coordination and planning
- Siting and permitting of infrastructure



# **Convening Series Output**

Through the convening series, DOE and BOEM will solicit feedback to inform recommendations intended to help direct future actions and decisions in the areas of:



The final set of recommendations will be published as a West Coast addendum to "An Action Plan for Offshore Wind Transmission Development in the U.S. Atlantic Region".

# This effort will not result in any official siting decisions or regulatory actions.



www.energy.gov/gdo/atlantic-offshore-wind-transmission-action-plan



# **Scoping & Gaps Analysis**

In early 2023, DOE analyzed the needs and gaps for offshore wind transmission planning on the West Coast.

| Scoping Call |  | Literature Review and Gaps Analysis |  |
|--------------|--|-------------------------------------|--|
| When:        | Meeting January 2023   | When:                               | Published February 2023  |
| What:        | Meeting to inform scope and need for<br>convening series   | What:                               | Literature review on 13 past and ongoing transmission analyses for offshore wind   |
| Themes:      | <ul> <li>Improved interregional coordination is needed</li> <li>Prioritize engagement and energy equity for Tribal Nations</li> <li>Benefits need to flow to local communities and grids</li> <li>Collaboration among Tribal, Federal, and State governments will be critical for permitting and environmental review</li> <li>Technology development and standardization is a barrier that needs industry investment</li> </ul> | Themes:<br>Link:                    | <ul> <li>Coastal interconnection points lack<br/>capacity</li> <li>Studies highlight the capacity value of<br/>offshore wind</li> <li>Most studies focus on a single region or<br/>state</li> <li>No consensus about optimal grid<br/>infrastructure for offshore portion of<br/>the network among different studies</li> <li>West Coast Offshore Wind Transmission<br/>Literature Review and Gaps Analysis</li> </ul> |



The Convening Series sits within a broader workflow for offshore wind transmission planning at DOE.





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# **DOE Role in Offshore Wind Transmission**

DOE supports planning, analysis, research and development for national energy infrastructure and policy. DOE also has extensive focus in domestic workforce and supply chain development. However, the Agency does not own transmission assets and does not have a regulatory role in offshore transmission siting or deployment.

As part of this work, DOE is:

- Hosting convening workshops to solicit information about offshore wind transmission
- Funding transmission analyses and research to support advancement of offshore wind transmission
- Supporting technical assistance programs to provide educational information, capacity, and technical analysis







#### BOEM Bureau of Ocean Energy Management

# **BOEM's Role in Offshore Wind Transmission**

### West Coast Offshore Wind Transmission Convening

Jennifer Miller | January 17, 2024

#### **BOEM's Role - Regulatory Framework**

Under the Outer Continental Shelf Lands Act (OCSLA) §1337(p)(1)(C), the Secretary may grant a lease, easement, or right-of-way (ROW) on the OCS for activities that produce or support production, transportation, or transmission of energy sources other than oil and gas.



#### Transmission as part of an offshore wind lease

<u>585.200(b)</u> - a lease confers the right to one or more project easements without further competition for transmission

#### Transmission under a Right-of-Way (ROW) Grant

<u>585.300</u> - an ROW grant authorizes installation of the cables, pipelines, and associated facilities on the OCS that involve the transportation or transmission of electricity or other energy product from renewable energy projects.





### Transmission as Part of a Lease

- 1. A lessee works with regional & state entities and utilities to determine appropriate landfall and Points of Interconnection
  - BOEM does not have jurisdiction over landfall sites, nor state waters
  - Grid connection study with ISO/RTO
- 2. An easement to shore is granted at COP approval
  o The details of the easement(s) are provided as
  - part of the COP
- 3. Easement may be presented in COP as options under a Project Design Envelope
  - Allows for more than one option to be considered







#### **Lease Associated Transmission Planning**



- **Communication Plans and Progress Reports:** Include feedback from engagement with Tribes and parties regarding transmission planning, prior to proposing transmission routes
- Construction and Operations Plan (COP): must include project information, survey results, CVA nomination, OSRP, SMS, information needed to conduct NEPA and other relevant laws.
- Construction and Operations Plan (COP) review: may be conditioned on the use of cable corridors, regional

transmission systems, meshed systems, and other mechanisms where appropriate



#### **Key Steps in ROW Process – No Lease Association**



1. OCSLA requires a competitive process unless BOEM determines there is no competitive interest (585.307)

- Request for Competitive Interest (RFCI)
- Spatial conflicts & criteria for ROW
- Solicits information on area/potential conflicts
- ROW Issuance
  - Discretion in whether to issue any ROW/Right of Use Easement
  - Survey work for development of a General Activities Plan
- Submission of General Activities Plan
  - Within one year of ROW issuance
  - Triggers NEPA review
### **Considerations and References Used to Evaluate Siting**

### OCSLA 1337(p)(4) Requirements

- Prevention of waste
- Conservation of the natural resource of the OCS
- Protection of the environment

### • Minimization of conflict with other ocean uses and sensitive areas

- Fisheries
- Sand & Gravel Resources
- Other Cables
- Benthic Conditions
- NEPA & Associated Consultations
- BOEM Guidance
- Marine Cadastre & Ocean Data Portals

- Navigation
  - o DoD
  - Sensitive Habitat
  - Cultural Resources



### **BOEM Funded Studies to Inform Transmission in the Pacific Region**

- Completed (2020) Offshore Wind Generation and Load Compatibility Assessment with Emphasis on Electricity Grid Constraints, Mitigation Measures and Associated Costs: Humboldt State University, Schatz Energy Research Center assessed the feasibility, scale, and transmission options of offshore wind power generation along California's north coast.
- Completed (2020) Exploring the Grid Value Potential of Offshore Wind Energy in Oregon: Pacific Northwest National Laboratory broadly characterized the value that Oregon offshore wind energy may convey to the electric grid.
- Completed (2021) Evaluating the Grid Impact of Oregon Offshore Wind: NREL comprehensively assessed the potential value of offshore wind energy to the Oregon power system, specifically as a possible non-wires alternative for the electric grid.
- Ongoing West Coast Power Flows: Pacific Northwest National Laboratory (PNNL) identify the constraints and opportunities for Oregon and California offshore wind power to flow to the San Francisco area. Three transmission scenarios will be compared.







Jennifer Miller | January 17, 2024

### **Liz Weber**



### Project Manager, National Renewable Energy Laboratory





### Tribal Nation Offshore Wind Transmission Technical Assistance Program

Liz Weber : Program Manager, NREL

# Program Overview

The U.S. Department of Energy's (DOE) Tribal Nation Offshore Wind Transmission Technical Assistance Program supports federally recognized American Indian and Alaska Native Tribes and Villages in activities related to the planning and development of U.S. offshore wind transmission projects.

Through the program, DOE will offer educational resources, training, and on-call assistance from technical experts and researchers at the National Renewable Energy Laboratory (NREL). Funds for Tribal member and staff participation in key offshore wind transmission forums are also available through the program.





Educational events, webinars, inperson and virtual presentations for Tribal members and staff will cover topics such as transmission designs, available technologies and supply chain, siting and permitting, interconnection process, and related cultural and environmental impacts.





The planning and permitting for offshore wind transmission can be a complex, multi-year process. Expert Match enables Tribal members and staff to consult with national laboratory experts to leverage expertise and resources to better understand and respond to offshore wind transmission proposals. Following an initial consultation, Tribes receive customized information in the form of data, modeling and analysis support, policy and regulatory review, and more.





It is *critical* that Tribal perspectives are **represented** and **understood** in offshore wind planning efforts, but inadequate financial resources can be a barrier to Tribal participation.

Through Participation Support, Tribal members and staff can request funding to participate in offshore wind transmission-related discussions and events.

Eligible events may include those hosted by federal or state agencies and/or national laboratories. Events must have an offshore wind transmission component.



# Thank You

For questions, contact <u>GDOTribalOSW@nrel.gov</u> or visit <u>https://bit.ly/GDOTribalOSW</u> Liz Weber, <u>Liz.Weber@NREL.gov</u>

### **Katie Segal**



Policy Advisor, Grid Deployment Office, U.S. Department of Energy



### West Coast Offshore Wind Transmission Convening Series Overview

Katie Segal: January 17, 2024





## West Coast Region Tasks

#### **Prior Tasks**

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- Literature Review
- Scoping Call

### **Ongoing Tasks**

- Transmission Study
- Convening Workshops

#### **Next Steps**

Recommendations Development





### West Coast OSW Transmission Planning Workflow







## **Convening Series Overview**

**Goal**: Develop transmission recommendations **Approach**: Hold workshops to hear from wide range of governments, subject matter experts, industry, etc. **Timeframe**: Throughout 2024, ending early 2025



## **Convening Series**

|           |   | What It Is  | What It Isn't  |
|-----------|---|---|--|
| Objective | ŧ | Opportunity to think about and discuss future transmission system for OSW                 | Not prescribing actions, building consensus, or creating mandates  |
| Methods   |   | Collect input through conversations and<br>Convening Workshops                            | Not a formal solicitation or government-to-government consultation |
| Output    |   | Recommendations published in OSW<br>Transmission Action Plan<br>(New West Coast Addendum) | Not a regulatory action; not a siting decision                     |



## **Convening Tracks**

The convening series has four distinct tracks that focus the conversation on relevant topics:





### How will input be used?

Convening series and any input gathered will inform eventual Action Plan recommendations made by DOE and BOEM





### **Public Track**



#### Side Sessions at Conferences

- Exact conferences TBD
- Not limited to registrants

#### **Virtual Sessions**

- Kick-off meeting today
- Pre-publication workshop early 2025
- Others TBD

#### **Other Feedback Options**

#### Talk with us at conferences

- POET NW OSW January 2024
- IPF April 2024
- Pacific OSW Summit May 2024
- Others TBD

Visit our website www.energy.gov/gdo/west-coast-offshore-windtransmission-planning



### **Tribal Nation Track**



#### Goals:

- Understand needs, concerns, and benefits related to OSW transmission
  - Recommend actions to support equitable distribution of transmission development benefits to Tribal Nations



#### **In-Person Listening Session**

- Ahead of DOE Tribal Clean Energy Summit
- February 26, 3:00-5:00 PM at Pechanga Resort Casino, Temecula, CA

#### Workshop at DOE Tribal Clean Energy Summit

- February 27
- Part of Summit agenda
- Share input on transmission topics

#### **Virtual Listening Session**

- March 7, 9:00-11:00 AM PT
- Hosted via WebEx + Phone

### Additional workshops to be added based on feedback received.

#### **Pre-Results Workshop for Tribes**

• TBD, late 2024

#### Talk with us at conferences

- Tribal Offshore Wind Summit in Eureka, California
- ATNI
- RES 2024



### **Regional Coordination Track**



AUGUS

PRIL

- Create forum for state-to-state/state-toregional transmission organization (RTO) collaboration
- Provide states and regional planners with technical information to support decisions

#### Dates TBA

- Coordinating with National Association of State Energy Officials (NASEO)
- 2-3 workshops for state government agencies, ISO/RTOs, utilities – to be scheduled
  - March/April
  - May/June
- Pre-results workshop

#### Topics include economics & policy, siting & planning



TUESDAY

### **Technical Track**



#### Began in May 2023 through **WOW-TS Advisory Committee** meetings

General Advisory Committee (AC) meetings occur quarterly throughout 2023 – 2024. The AC comprises four subgroups that meet ad-hoc, and occur more frequently as study input/review is needed:

- Planning subgroup, met 5 times in 2023
- Environment & Siting subgroup, met 3 times in 2023
- Technology subgroup, met twice in 2023
- Community Values subgroup, first meeting upcoming
- System Operators subgroup, met six times in 2023

#### Advisory Committee members include:

- State energy, planning, PUCs, and environmental offices
- Developers and component manufacturers
- System operators
- Tribal Nations
- Ocean co-users



# **Thank You**

#### www.energy.gov/gdo/offshore-windtransmission-federal-planning-support

OSWTransmission@hq.doe.gov

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### **Questions?**

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### **Travis Douville**



Wind Systems Integration Portfolio Manager, Pacific Northwest National Laboratory





# West Coast Offshore Wind Transmission Study

# Project Overview & Status

January 2024



PNNL is operated by Battelle for the U.S. Department of Energy



- **How much** west coast offshore wind should be developed through 2035 and 2050? **What** are the west coast-wide offshore wind installed capacity contributions for meeting state and federal clean energy goals through 2050, within the context of plausible emergence of land-based wind energy, solar energy, and energy storage and other types of energy generation, and the evolution of demand through building and vehicle electrification and climate change?
- Where should the generation and transmission be developed? What deployment pathways emerge from nodal representations of offshore transmission and generation every five years from 2035 to 2050?
- **How** does the Western Interconnection (WI) function in 2035 and 2050 with offshore wind contributions? **What** is the nodal composition of WI generation and transmission resources which meet existing adequacy, contingency, steady-state and transient stability requirements?
- How do these 2035 and 2050 WI perform under resilience events such as wildfires, earthquakes, and droughts?
- What are the technoeconomic and socioeconomic benefit-costs tradeoffs of varying (i) points of interconnection and cable routing strategies and (ii) degrees of coordinated transmission (i.e., radial vs. "within region" vs. "between regions"?





Current work <sup>64</sup>



#### **General** (225 + members)

**Planning** (state DOEs, PUCs, DEPs, land use, etc.)

Environment & Siting (Federal agencies and other experts)

**Technology** (manufacturers & developers)

**System Operators** (BPA/CAISO/PAC, NorthernGrid, WestConnect, NWPCC)

**Community Value** and Ocean Co-users (to be assembled post nodal model builds) Inform major study assumptions and raise awareness of findings as study progresses. Quarterly meetings.

Vet assumptions with established regulatory processes and existing efforts. Ad-hoc meetings.

Verify data inputs and prioritize any emerging siting impacts. Ad-hoc meetings.

Guide application of technology cost & performance inputs. Ad-hoc meetings.

Incorporate existing plans to the extent possible. Advise contingency analysis. Quarterly meetings.

Inform the set of values for consideration within the socio-ecological analysis. Ad-hoc meetings.

Self-selected

Nominated

### **EXAMPLE TASK 2—Zonal Capacity Expansion**

#### **Two-stage approach:**

Pacific

Northwest

- <u>Fast-track (V1):</u> production of capacity expansion scenarios using the current state of capacity expansion tools (algorithms and input data), aiming at providing results to the zonal-to-nodal and nodal workflows in the first few months of the project
- Improved Representation (V2): in this stage, improvements to the capacity expansion models and input data will be implemented, aiming at incorporating lessons learned from previous offshore wind integration studies, as well as from the fast-track stage
  - Example: Updates to wind resource characterization as a result of validations enabled by DOE LiDAR buoy measurement campaigns.













<u>Weather-synchronized</u> simulations of load, wind, solar for historical and future conditions

- Wind and solar resources from Thermodynamic Global Warming simulations dataset (Jones et al., 2023).
- Loads start with Evolved Energy Research (low IRA impact scenario) load projections for 2035 & 2050 reflecting load growth and electrification – each has 7 weather year scenarios,
- These scenarios are expanded with a neural network model trained on these 7 weather years to produce load for historical and future weather years.

#### **Bottom-up Demand Projections**



#### Machine Learning Algorithm



#### **Resource Adequacy Sweeps**



Coincident demand and variable supply profiles →(43 historical years, 70 future years) 21 years of hydropower variability (2001-2022) Stochastic forced outage variability

Jones, A.D., Rastogi, D., Vahmani, P. et al. Continental United States climate projections based on thermodynamic modification of historical weather. Sci Data 10, 664 (2023). <u>https://doi.org/10.1038/s41597-023-02485-5</u>.

# **Topology Sets Inform Technoeconomics**



Pacific

Northwest



### Task 8.2—Community-based and environmental benefit-cost analysis

- Iterative engagement with AC subcommittee to identify potential community benefits and costs and incorporate their input throughout the analysis.
- Natural capital modeling to quantify socioeconomic values of marine ecosystems to coastal communities and change in these values with transmission development.
- Trade-off analysis to compare benefits and costs of different transmission and interconnection alternatives to marine ecosystems and coastal community values.





# Thank you

wowts@pnnl.gov



### **Questions?**

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### **Alissa Baker**



Senior Technical Advisor for Offshore Transmission, Grid Deployment Office, U.S. Department of Energy



### **Lesson Learned from the Atlantic**

Navigating the Waves of Offshore Wind Transmission

Alissa Baker: January 17, 2024





# **Atlantic Engagement & Prior Work**





# **Scoping & Convening**

### Scoping Calls (2021)

- DOE and BOEM hosted 21 listening sessions
- More than 100 different entities consulted (including federal agencies; Tribal Nations; state agencies; grid operators; cable and transmission providers; fisheries organizations; NGOs; developers; regional ocean coordinators; unions; and utilities.)

### **Convening Workshops (2022-2023)**

- DOE and BOEM hosted 9 workshops and a Tribal Nation Dialogue
- Over 40 hours of expert presentations and facilitated roundtable discussions
- More than 875 individuals participated, representing 443 entities





2-year study (November 2021 – October 2023) Alignment with federal and state offshore wind goals Near-term (2030) and Long-term (2050)

#### Goals:

- Identify high-value coordinated transmission solutions
  through multi-scenario modeling &analysis
- Avoid known areas of co-use conflicts, exclusions
- Minimize overall cable distances

#### Maps:

- Interregional networked topology
- 5-year increments (2035-2050)

NREL website: <u>www.nrel.gov/wind/atlantic-offshore-wind-</u> <u>transmission-study.html</u>





Studied scenarios and pathways of offshore wind (OSW) and transmission deployment through 2050 with 85 GW in the Atlantic, respecting ocean co-uses

The team studied four topologies (and sensitivities): **Radial:** Planned connections from offshore substations to onshore grid.





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Study

- An analysis of the operation, economics, and reliability implications of different types of offshore wind transmission networks
- A long-term planning analysis of the grid in 2050 in a low carbon scenario
- A focus area from Maine to South Carolina
- Cable routing analysis

• An interconnection study level of detail for offshore wind injections

not.

- An analysis of impacts of electrification (approximately doubling electricity demand) on the transmission system at all voltage study is levels (transmission elements below 230 kV are simplified in this study)
  - A detailed siting or permitting analysis
  - A prescription or suggestion for Points of Interconnection or exact interlinks





# **Key Findings:** Offshore wind development provides a *unique opportunity* to add transmission capacity offshore that provides value to the grid.

- Offshore wind will be a **key part** of a low carbon future for Atlantic states.
- Offshore wind development provides a unique opportunity to **expand transmission capacity** offshore with feasible cable routes that consider ocean co-users and environmental constraints.
- Production cost savings and resource adequacy benefits of proactive, coordinated interregional offshore transmission planning **outweigh costs**.
- Interconnecting offshore transmission lines contributes to grid reliability by enabling resource adequacy and helping manage the loss of onshore grid components (contingencies).
- Sequencing transmission infrastructure **reduces development risk** while positioning the states to receive benefits.

# **Action Plan**

U.S. DEPARTMENT OF



- 41 recommendations
- Spanning 2023-2050
- 5 Key Categories
- Co-drafted by DOE & BOEM
- Input provided by FERC, NOAA
- Read the plan at energy.gov:



# **Partnerships and Collaborative Efforts**

#### **1.1.1. OFFSHORE WIND TRANSMISSION STATE COLLABORATIVE**

States are driving offshore wind development through clean energy policies and are instrumental to achieving the national goal of 30 GW of offshore wind deployment by 2030. States are also diverse and bring their own unique experiences, perspectives, goals, policies, and transmission planning processes that are important to align.

#### **1.1.2. REGIONAL TRANSMISSION PLANNING COLLABORATIVE**

It will take more than coordinated policy and planning decisions from the states to ensure holistic plans are created and executed. The regional transmission entities are responsible for the actual planning, coordination, and operation of the grid, and as such, will have a key role in this transition.

#### **1.1.3. TRIBAL NATION ENGAGEMENT**

BOEM's Draft Guidelines and Instructions for Native American Tribes Communications Plan Development provides guidance to comply with the requirements and intent of the lease stipulation for a Native American Tribal Communications Plan and seeks to "ensure early and active information sharing, focus discussion on potential issues, and collaboratively identify solutions . . . to promote the sustainable development of offshore wind energy projects."



Partnerships & Collaborations



### Lessons Learned from the Atlantic Environmental Stewardship

#### 3.3.2. ENVIRONMENTAL RESEARCH AND DEVELOPMENT FOR OFFSHORE WIND TRANSMISSION

Federal agencies and other institutions have invested in research on the environmental effects of offshore wind and transmission infrastructure. The current state of research is described by DOE-funded U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) project. Several research topics were identified during the Convening Workshops and through SEER, which are described in the Action Plan. We recommend continuing this research to address emerging issues and research gaps.







U.S. OFFSHORE WIND SYNTHESIS OF ENVIRONMENTAL EFFECTS RESEARCH



### Lessons Learned from the Atlantic Value of Interregional Transmission

#### 2.2.1. INTERREGIONAL OFFSHORE TOPOLOGY PLANNING

When done well, holistic transmission planning that spans ISO/RTO and state boundaries can add tremendous value to local system reliability and reduce ratepayer costs. However, it requires transmission planners to look beyond their own jurisdiction and into neighboring regions where they may have limited data or a basic understanding of the system.

Although radial generator lead lines and radial shared lines will be essential for the deployment of offshore wind along the Atlantic, the AOSWTS has found that all networked topologies have **benefits significantly outweighing their costs**, often by a ratio of 2 to 1 or more.



OSWTransmission@hg.doe.gov



### Lessons Learned from the Atlantic Value of Interregional Transmission

#### 2.2.2. REGULATED INTERREGIONAL JOINT PLANNING PROCESSES

FERC Order No. 1000 sets forth the current generic Federal requirements for considering potential interregional transmission. However, it requires only coordination between regions. Fully integrated interregional planning is allowed but not required and, to date, has not been successfully implemented for any large-scale infrastructure.

There is a definite need to enhance the current joint interregional transmission coordination process, to take a broader view of interregional project needs and benefits, and to provide pathways pursuant to which projects can be planned and paid for. We advocate for firmer regulation and support FERC's consideration of the issue.





### Lessons Learned from the Atlantic Addressing Reliability Standards

# 2.3.1. NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION (NERC) RELIABILITY STANDARDS AROUND OFFSHORE TRANSMISSION

Application of NERC transmission planning standards to offshore wind generation and transmission could benefit from further clarification and potential modification. Applicable requirements and the standards governing them may need updates to ensure applicability to ocean transmission infrastructure and offshore wind generation tie-lines. Technical clarity is needed in the following three topic areas:

- 1. Credible multiple contingencies of subsea cables within a common corridor
- 2. Credible multiple contingencies of HVDC bipole topologies with dedicated metallic return
- 3. Generator definitions for large distributed energy generation plants composed of many individual generators within planning contingency standards.





### Lessons Learned from the Atlantic Supporting Local Communities



#### **5.2.5. COMMUNITY BENEFIT AGREEMENTS**

Community benefit agreements (CBA) are one way to help bring local communities into sustained focus and ensure that communities impacted by infrastructure are net beneficiaries, which may positively impact the ability to site and permit transmission infrastructure within the community. CBAs between project developers and impacted communities—such as Tribal Nations, non-Tribal indigenous groups or coalitions, fishing, and other community groups or coalitions—can play a positive role in helping ensure that developers are affirmatively reaching out to communities and committing to provide benefits suited to each community's unique needs.



# Lessons Learned from the Atlantic Improving Processes

#### **5.2.1. IMPROVED ENVIRONMENTAL REVIEW AND PERMITTING FRAMEWORKS**

The development of offshore wind infrastructure is regulated, permitted, and shaped by many different entities, including Federal agencies, Tribal Nations, state and local authorities, and grid operators. To efficiently and effectively allow transmission infrastructure to develop, all parties must coordinate and align their processes and expectations. This includes project review, NEPA analysis and associated consultations, grid connection studies, and state and local requirements. We recommend establishing clarity among Federal, Tribal Nation, state, and local jurisdictions on roles and responsibilities from the outset of the regulatory process.





### **Action Plan**

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• Read the plan at energy.gov:



# **Thank You**

#### www.energy.gov/gdo/offshore-windtransmission-federal-planning-support

OSWTransmission@hq.doe.gov

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### **Questions?**

Please submit all presentation questions through the chat box.







### **David M. Turk** Deputy Secretary,

U.S. Department of Energy



### Laura Daniel-Davis

Acting Deputy Secretary, U.S. Department of the Interior



# **Other GDO News**

Grid Resilience Technical Assistance Consortium Funding Opportunity

- Open to non-profits, universities, and industry
- Closes on February 15th
- <u>www.energy.gov/gdo/articles/grid-deployment-office-announces-grid-resilience-technical-assistance-consortium</u>



# **Thank You**







