October 3, 2024

Katherine Segal
Grid Deployment Office
U.S. Department of Energy
Attn: RFI for Offshore Wind Transmission

Via Email: OSWTransmission@hq.doe.gov

Re: Request for Information Regarding Interregional and Offshore Wind Transmission

Submission by: California Energy Commission, Lorelei Walker, Lorelei.Walker@energy.ca.gov

Dear Ms. Segal,

This letter is submitted on behalf of the undersigned California state entities in response to the August 19, 2024, *Request for Information Regarding Interregional and Offshore Wind Transmission* (89 Fed. Reg. 67075). For more than a decade, several state entities have been engaged in a range of initiatives to better understand the opportunities and actions for deploying floating offshore wind responsibly off the coast of California. As a result of these early efforts, the state launched the Intergovernmental Renewable Energy Task Force with the Bureau of Ocean Energy Management (BOEM) in 2016. Offshore wind energy efforts were accelerated in May 2021 when Governor Gavin Newsom signed an agreement on behalf of the state with the Department of the Interior (DOI) and the Department of Defense (DOD) to open the California Coast for potential offshore wind energy development. State entities appreciate the Grid Deployment Office's (GDO) efforts to understand the complex transmission siting constraints both offshore and onshore prior to making West Coast offshore wind transmission recommendations and have actively participated in GDO's multi-tiered approach to address challenges and barriers to transmission development to access West Coast offshore wind resources.

California's transformative energy policy, Senate Bill (SB) 100, The 100 Percent Clean Energy Act of 2018 (De León, Chapter 312, Statutes of 2018), increased the state's Renewable Portfolio Standard (RPS) goal to 60 percent by 2030 and established a state policy that RPS-eligible resources and zero-carbon resources supply 100 percent of California's electricity retail sales and electricity procured to serve state agencies by 2045.[1]

[1] California has a suite of climate and energy policies: AB 32 (Nunez, Chapter 488, Statutes of 2006), SB 350 (De León, Chapter 547, Statutes of 2015), SB 32 (Pavley, Chapter 249, Statutes of 2016), and SB 1020 (Laird, Chapter 361, Statutes of 2022).

California has some of the best offshore wind resources in the world and floating offshore wind has emerged as a promising source of affordable renewable energy generation for the state that can diversify the state's energy portfolio. In addition, offshore wind can advance both state and national climate and clean energy goals while providing statewide economic benefits. California, and the Pacific Coast of the United States, has the potential to be the center of a durable domestic supply chain for floating offshore wind, creating well-paying, family-supporting jobs and providing benefits to tribes and all Californians, including underserved, disadvantaged, and overburdened communities.

The state is involved in a number of planning efforts to advance transmission for offshore wind, including the Pacific Northwest National Laboratory's *West Coast Offshore Wind Transmission Study,* the DOD and California Energy Commission (CEC)-funded Schatz Energy Research Center's *Northern California and Southern Oregon Offshore Wind Transmission Study*, and planning for transmission alternatives. Both the availability of existing transmission and the need to develop more transmission capacity affect the deliverability and deployment of offshore wind energy. California recognizes the importance of proactive transmission planning to accommodate the development of offshore wind and facilitate transmission upgrades at a regional scale.

In accordance with Assembly Bill (AB) 525 (Chiu, Chapter 231, Statutes of 2021), state entities developed the *Assembly Bill 525 Offshore Wind Energy Strategic Plan* (Strategic Plan) that charts a path forward for floating offshore wind energy development in federal waters off the California coast. AB 525 identified the need to initiate long-term transmission and infrastructure planning to facilitate delivery of offshore wind energy to Californians. The Strategic Plan makes recommendations regarding potential environmental impacts and use conflicts of offshore wind, such as avoidance, minimization, monitoring, mitigation, and adaptive management, consistent with California's long-term renewable energy, greenhouse gas emission reduction, and biodiversity goals. The Strategic Plan and its recommendations provide direction and guidance for the development of offshore wind and associated infrastructure in a responsible and timely manner.

This letter comes from the undersigned state agencies and entity with responsibilities relevant to the development of offshore wind and was prepared with awareness and support for the California Department of Fish and Wildlife (CDFW) response letter submitted separately. This letter, jointly prepared by the undersigned, provides information in response to DOE's questions to consider when preparing the West Coast Action Plan to reduce impacts to California resources while facilitating transmission infrastructure needed to deploy offshore wind.

Comments

1. What considerations need to be accounted for when siting transmission for offshore wind energy generation in offshore locations on the West Coast?

a. For the considerations identified, what information is currently available?

b. For the considerations identified, do any lack existing data sources to rely on? If no data sources are available, are there existing methods to collect, survey, or otherwise measure the characteristics?

The Strategic Plan addresses these topics in Volume II, Chapters 4, 5, and 10. When siting offshore transmission infrastructure along the West Coast, there are many considerations that come into play to reduce potential conflicts with marine species and habitats, cultural resources, and existing ocean uses, including commercial and recreational fishing, commercial shipping, and military operations. It is also important to consider protecting cultural and biological resources and existing ocean uses with a goal of prioritizing least-conflict areas.

As part of California's Strategic Plan, entities identified suitable sea space, high-level potential impacts, and strategies to address those impacts based on the existing scientific body of information. Because offshore wind has not yet been deployed on the West Coast, detailed biological data and analysis of interactions with offshore wind technology was not sufficiently detailed to allow for in-depth evaluation of the extent of potential impacts. The same limitations exist for information on evaluating conflicts for specific ocean uses, such as commercial fishing and tribal cultural resources and uses. Continued efforts will be needed to better understand and identify potential conflicts, effects, and impacts so that they can be minimized and mitigated.

Marine Biological Resources: Waters off the California Coast support a rich ecosystem with many species of marine life present. Important biological areas should be taken into consideration when siting infrastructure offshore including Marine Protected Areas, Essential Fish Habitats, and sensitive benthic habitats. Nearshore impacts to coastal habitat may occur through landing the export cables onshore and bringing them to the grid. State regulatory agencies expect that cables will be buried. The preferred method of bringing these cables to the shore is through horizontal directional drilling, which brings the cables to shore below the seafloor and helps minimize impacts to nearshore environments.

Prior review by the California Coastal Commission (CCC) required that surveys and site assessment activities for offshore wind development avoid placing any anchors or allowing mooring line sweep on hard bottom habitat or sensitive habitats such as hydrothermal vents or deep-sea corals and sponges. The CCC requires other offshore cable projects avoid sensitive benthic habitats. However, if cables must be exposed on hard-bottom habitat, compensatory mitigation payments are required. Ongoing National Marine Fisheries Service scientific surveys and long-term monitoring efforts should not be disrupted or displaced. The presence and migratory pathways of protected species (federal or state threatened and endangered species) should be considered and protected.

Tribal and Cultural Resources: California Native American tribes have consistently expressed deep concerns about the impacts of offshore wind and associated infrastructure on tribal cultural resources. Areas and species relied upon by tribes for subsistence, cultural, and economic purposes all hold cultural significance. Project siting

can be informed by data from the California Historical Resources Information System (CHRIS) relating to historical resources (buildings, structures, objects, historic and archaeological sites, landscapes, districts). Information can be gathered to evaluate locations for potential effects on resources important to Native American and Indigenous peoples and resources that contribute to knowledge of the history of each area. This includes records of historic and prehistoric sites both onshore and offshore, and information on Sacred Lands acquired from the Native American Heritage Commission (NAHC). Many tribes consider coastal waters part of their unceded ancestral territory. Early, often, and meaningful consultation with Native American tribes is critical.

Fisheries: Pre-construction activities, construction, and ongoing operation of offshore wind infrastructure all have the potential to impact commercial, recreational, subsistence, and cultural fisheries in California, with consequences to marine ecosystems, local economies, livelihoods, and access. These impacts may include loss or reduction of current or future fishing grounds, impacts to marine life and habitats, economic losses, navigational hazards, damage or loss of fishing gear, increased vessel traffic, displacement from or use conflicts at ports and harbors, increased risk to fishermen's health and safety, and disruption to ongoing scientific surveys critical for fisheries management.

To identify least-conflict areas offshore the latest commercial, recreational, subsistence, and cultural fishing data should be used to conduct analyses assessing spatial and temporal trends in fishing effort and value metrics in the offshore and nearshore environments, in consultation with California Native American tribes and fishing representatives, including those on the California Offshore Wind Fisheries Working Group. In addition, least-conflict installation approaches such as transmission cable burial under the seafloor are expected to be required (where feasible) and would have fewer fisheries conflicts than transmission cables lying on the seafloor surface. Consultation with the fishing community, tribes, and state regulatory agencies are especially important when siting offshore transmission.

Existing Infrastructure: Offshore geographic areas with existing infrastructure may be unsuitable for siting transmission infrastructure. Existing infrastructure includes fiberoptic cables, power cables, outfalls, and pipelines. The California State Lands Commission (CSLC) maintains a public GIS site and several databases to track authorized uses and infrastructure currently under CSLC leases. Please note that public GIS data may only denote infrastructure as a single geographic point. Entities requiring detailed information about locations, dimensions, and other aspects of existing infrastructure should inquire through CSLC's Online System for Customer Applications and Records (OSCAR). Consultation on existing infrastructure will be important when siting offshore transmission.

Navigational Hazards and Vessel Safety: Offshore wind infrastructure development and ongoing operations have the potential to increase navigational hazards and vessel collisions for ocean users including commercial, recreational, subsistence, and cultural fishing, commercial shipping vessels, and military activities. Fishing and commercial shipping industry representatives have shared concerns about vessel safety caused by

collision with significant infrastructure in the water and increased boat traffic caused by offshore wind activities and associated vessel compaction. The US Coast Guard proposed shipping lanes from the *Pacific Coast Port Access Route Study* (PAC-PARS) and recommends the establishment of voluntary shipping fairways for vessel traffic to promote the safe, unobstructed navigation of vessels. Consultation on navigational hazards and safety will be important when siting offshore transmission.

Military Operations Necessary for National Defense: Early coordination with the DOD OSD Siting Clearinghouse can avoid or minimize encroachment on military testing, training, and operation areas. In addition to coordination, the Governor's Office of Land Use and Climate Innovation recently released the California Military Energy Opportunity Compatibility Assessment Mapping Project (CaMEO CAMP) that can inform military mission compatibility with offshore transmission siting.

Geologic Conditions: Siting of offshore and onshore transmission infrastructure should consider geologic conditions (e.g., slope, substrate lithology, seismic risk, and other geologic hazards such as tsunamis and mass movements) as these conditions may pose risks to the integrity of the transmission system. A variety of geological information for state waters has been compiled by the U.S. Geological Survey (USGS) with support from state partners. Additional existing resources include the U.S. National Seismic Hazard Model and Southern California Earthquake Data Center.

Sand Borrow and Sediment Disposal Sites: Transmission infrastructure should avoid resource areas or "sand borrow sites" (designated for sand to be moved from offshore to nearshore) and should also avoid identified sediment disposal sites. To our knowledge, there is not publicly available data that identifies these areas. Depending upon the location of disposal area, the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Boards, CDFW, or CSLC may have oversight authority. Existing information sources include the Southern California Dredged Materials Management Team (SCDMMT) and the Dredged Materials Management Office (DMMO).

Permitting and Environmental Review: The CSLC must issue leases for development in state waters and conduct a California Environmental Quality Act (CEQA) review prior to issuance of offshore leases. The CDFW would have permitting authority over development in state waters. The CCC would need to issue a coastal development permit for any component of the project within the coastal zone. The CCC would also need to issue a coastal consistency certification under the Coastal Zone Management Act (CZMA) before a transmission project is approved to comply with federal and state law.

Federal and state permitting and environmental review complexity should be a consideration for offshore transmission infrastructure development. California's Strategic Plan recommends developing and implementing coordinated permitting for offshore wind and related projects based on the previously successful Desert Renewable Energy Action Team (REAT) and Renewable Energy Policy Group (REPG) model. An Ocean REAT structure

could potentially be used for offshore wind-related transmission projects as appropriate for coordinated permitting.

Information Databases: California entities, in partnership with BOEM, have assembled publicly available geospatial information on ocean wind resources, ecological and natural resources, commercial and recreational ocean uses, community values, bathymetry and geology, and existing offshore infrastructure on the California Offshore Wind Energy Gateway. This data and information were used to produce a robust set of spatial models, designed to synthesize information to help interested parties and decision-makers assess the suitability of offshore wind energy development in federal waters off the coast of California. The California Offshore Wind Energy Modeling Platform provides an interface where the public and decision-makers can interact with, examine, and explore these models and their data sources.

2. What considerations need to be accounted for when siting transmission for offshore wind energy generation in onshore locations on the West Coast?

a. For the considerations identified, what information is currently available?

b. For the considerations identified, do any lack existing data sources to rely on? If no data sources are available, are there existing methods to collect, survey, or otherwise measure the characteristics?

The Strategic Plan addresses these topics in Volume II, Chapters 4, 6, and 9. Onshore transmission infrastructure could include new vaults for subsea export cable landings, substations, transmission lines, and generation tie (gen-tie) lines upland from the mean high tide line. When siting onshore transmission infrastructure along the West Coast, there are many considerations that come into play to reduce potential conflicts. Many of the same considerations offered above for offshore locations should be applied to onshore locations, such as biological resources, cultural resources, tribal cultural resources, geologic conditions, existing infrastructure, military operations necessary for national defense, and permitting and environmental review. In addition, environmental and land use constraints and ownership, proximity to tribal lands and underserved communities, wildfire risk, and other hazards should be considered.

Terrestrial Biological Resources: California National Conservation Lands, sensitive or protected lands such as parks, preserves, refuges, wilderness areas, designated critical habitat (e.g., Northern spotted owl), and important bird areas as well as the presence and migratory pathways of protected species (federal or state threatened and endangered species) should be considered and protected. In addition, the presence of protected native plants listed in the California Natural Diversity Database (CNDDB) and presence of nearby drainages should be considered when siting onshore transmission. Additional terrestrial biological resource considerations and potential data sources may be available from CDFW.

Environmental and Land Use Implications: Per the *Transmission Corridor Evaluation* and the *Substation Planning Evaluation*, the process of developing a new transmission project

requires detailed design and rights-of-way studies, including consideration of route alternatives, and identifying site specific environmental and engineering concerns. In addition to terrestrial biological resources, there are environmental and land use implications.

Land ownership and permitting jurisdiction should be identified and considered including federal, state (e.g., state parks and terrestrial areas managed by the CSLC including inland waterways and school land parcels), tribal, and private lands. In addition, incorporated cities, density of private parcels, aesthetics (e.g., proximity to tribal land, wilderness, wild and scenic rivers, or scenic highways), agricultural land (e.g., prime and unique farmland or Williamson Act land), Brownfields and contaminated lands, and airspace constraints (e.g., airports, military, and special-use airspace) should be considered.

Underserved Communities: In the Strategic Plan, the term *underserved communities* refer to populations that are predominantly composed of low-income residents, people of color, and indigenous communities, that have faced the brunt of environmental burdens for decades, also sometimes referred to as environmental justice communities. SB 535 (De León, Chapter 830, Statutes of 2012) CalEnviroScreen's disadvantaged (i.e., underserved) communities data identifies census tracts and tribal areas in California that are considered disadvantaged communities. Offshore wind development and operation should avoid, minimize, or mitigate impacts to underserved communities, including those in and around ports, and support actions to protect already overburdened communities, such as air and water pollution burdens and considerations for mitigations.

Transmission Corridor Identification: Landscape level planning for transmission can evaluate potential corridor options and associated environmental and land use conflicts not historically addressed in existing transmission planning processes. Conducting detailed routing studies, environmental permitting analyses, and tribal and community engagement can provide valuable input to the transmission planning processes and regulatory decisions. To support the California Independent System Operator's (ISO) assessment of transmission options, the CEC performed a high-level *Transmission Corridor Evaluation* to provide preliminary information and rankings of land-use and environmental constraints associated with alternative corridors for transmission infrastructure to access offshore wind resources from the Humboldt area.

The California ISO's 2023-2024 Transmission Planning Process (TPP) identified transmission projects (two 500kV lines and a new substation) needed to support offshore wind development in BOEM's Humboldt Wind Energy Area: the Humboldt #1-Collinsville Project and the Humboldt #2-Fern Road Project. Both approved Humboldt transmission projects will require new or expanded high voltage transmission corridors which should be accounted for when siting additional onshore transmission for offshore wind.

Permitting and Environmental Review: For new or expansion of existing substations and transmission lines that will be owned by a public utility and sited on land (i.e., above the mean high tide line), the California Public Utilities Commission (CPUC) will be the lead agency with permitting authority and responsibility for conducting environmental review

under CEQA. It is anticipated that a regional interagency task force will be developed to coordinate permitting and environmental review of onshore transmission for offshore wind, starting with the pre-filing phase of onshore transmission development. This onshore regional interagency task force is anticipated to be a subcommittee of, or interface directly with, the offshore wind coordinating permitting structure(s) based on recommendations in the Strategic Plan.

Environmental review performed pursuant to CEQA by the CPUC, in close coordination with other state and federal agencies, as well as any NEPA review required by federal agencies, would ensure that most of the above considerations are analyzed. However, initiation of a coordinated effort amongst agencies to proactively develop a compensatory mitigation program for potential impacts on biological resources is recommended. Additional coordination with the U.S. Nuclear Regulatory Commission (NRC) may also be required to ensure that onshore transmission would not adversely affect past and future radiological soil remediation efforts at potential interconnection sites (e.g., at the Diablo Canyon Power Plant or the decommissioned Humboldt Bay Nuclear Power Plant).

3. What environmental justice and energy justice issues should inform how transmission is sited and implemented on the West Coast for offshore wind?

The Strategic Plan addresses these topics in Volume II, Chapter 4. The fundamental purpose of offshore wind energy generation is to avoid and eliminate California's reliance on fossil fuels for electricity generation. Currently, California's thermal energy plants that rely on fossil fuels are disproportionally located in underserved communities. Because one primary role of these plants is to balance California's abundant solar energy supply, harnessing offshore wind can provide a necessary resource to replace the services currently provided by these plants. As a result, offshore wind can help provide zero-carbon energy supply equally, affordably, and sustainably to all Californians. Nevertheless, offshore wind development can cause impacts to communities, including communities that have been disproportionately burdened in the past. Throughout the siting and development process, attention must be paid to mitigate adverse impacts to local communities. Environmental justice and equity must be thoughtfully addressed early in the transmission siting process. Achieving energy equity requires the participation of individuals from underserved communities. An intentional approach can also avoid, mitigate, and lessen historical injustice in these processes.

Inclusive transmission planning and siting processes should be informed by diverse public participation, including from environmental justice and energy justice perspectives, which can be reinforced by creating advisory boards comprised of trusted community leaders. California is committed to a thoughtful approach on equity to help bring about a future where the benefits of cleaner, more efficient energy are enjoyed by all Californians, including those in underserved, tribal, and rural communities.

To make equity a reality in infrastructure projects, California created the Equity Foundation Pillars. The CPUC has created the Environmental and Social Justice (ESJ) Action Plan to serve as both a commitment to furthering ESJ principles, as well as an operating framework

with which to integrate ESJ considerations throughout the agency's work. The CEC's Justice Access Equity Diversity Inclusion (JAEDI) framework outlines the commitment to embedding energy equity and environmental justice in California's energy future. The CEC's Tribal Consultation Policy and the adopted Resolution Committing to Support Tribal Energy Sovereignty support California Native American tribes' participation in energy projects. The CSLC's Environmental Justice Policy and Tribal Consultation Policy and similar CCC environmental justice and Tribal Consultation policies are intended to ensure comments from these historically marginalized communities are more readily considered in decision-making. Tribal consultation required by AB 52 (Gatto, Chapter 532, Statutes 2014) throughout the CEQA review process for onshore transmission facilities will also be used to engage and elicit input from tribes.

As noted in the *2021 SB 100 Joint Agency Report,* CEC, CPUC, and California Air Resources Board (CARB) prioritize equitable outcomes by considering what energy policies could support underserved communities in overcoming barriers to clean energy. This includes:

- Keeping electricity affordable, with an emphasis on vulnerable populations and households that spend a disproportionately high share of their household income on energy.
- Reducing air pollution from local power plants, particularly in communities that experience a disproportionate amount of air pollution.
- Strengthening communities' ability to function during power outages and enjoy reliable energy in a changing climate.

For decades, marginalized communities have experienced disproportionate impacts from the environmental burdens of power plants, refineries and other industrial facilities concentrated in their communities, exposing residents to high levels of air and water pollution. While experiencing many of the burdens of energy, these communities have also not benefited from clean energy investment that is not designed to maximize common benefits to be shared among all customers. Offshore wind presents a unique opportunity to help ensure benefits are provided to everyone equitably benefiting those who have suffered the most from systemic injustices. A key priority for community groups is that as California moves towards clean energy, it also plans for the decommissioning of aging oil and gas facilities.

Many California Native American tribes have shared concerns about climate change and expressed the importance of developing renewable electrical generation to move away from fossil fuels as one of many solutions to address the climate crisis. Many tribes have further expressed that to successfully transition the grid to renewable energy equitably, new power generation and associated infrastructure must be built in an appropriate manner that provides local community benefits, reliable electricity, and supports California Native American tribes' energy priorities and community needs. Many tribes expressed in a variety of forums that they are working to combat climate change but are limited by their access to reliable clean power. Tribes are also interested in access to jobs and ownership or profit sharing within the clean energy economy, including energy

transmission. California Native American tribes in the North Coast region have expressed concerns that their communities are currently not connected to the electric system and rely on personal gasoline or diesel generators for their electricity needs.

The existing energy inequities are rooted in a history of extractive energy development impacting California Native American tribes. While rural communities are often significantly impacted by climate impacts such as wildfires, they are also often experiencing the least reliability and less access to energy-based climate solutions. As a result of inadequate transmission infrastructure, California Native American tribes in the North Coast, must resort to innovative solutions such as independently designed, owned and operated resiliency infrastructure. This infrastructure includes the Blue Lake Rancheria microgrid that routinely operates in an islanding state since coming online in 2017. More recently, the Tribal Energy Resilience and Sovereignty (TERAS) project funded by DOE will support four North Coast tribes to own and operate a nested microgrid system which will transform their outage-prone area.

Analysis of equity needs and benefits for tribes and divested, underserved communities should inform how transmission is sited and implemented on the West Coast for offshore wind. This analysis includes project designs to deliver pollution reduction and climate benefits and enable regional, state, tribal, local community energy and other benefits. Offshore wind has the potential to bring additional clean energy benefits to local and regional areas, and transmission infrastructure siting and implementation can be a critical element in realizing these benefits as part of environmental justice and energy justice considerations.

4. What specific topics about offshore wind transmission siting, technology, and benefits are not well understood by yourself or your organization?

The Strategic Plan addresses these topics in Volume II, Chapters 5 and 8. Federal funding and support would facilitate the numerous research needs and clarity related to the transmission siting, technology, and benefit topics listed below.

Marine Biological Resources Data Needs: More information and data collection on marine biological resources that could be affected by offshore wind transmission development – both onshore and undersea – are needed. While there is some understanding of potential impacts on species, there is a need for data that is at project-level scale, or detailed mapping at a greater resolution. Marine species data and additional data collection topics needed include:

- Species density, distribution, and migration routes and timing
- Biological information on feeding, habitat, and breeding
- Monitoring of baseline and post-project conditions
- Species interaction with offshore wind transmission infrastructure (environmental monitoring) including the extent of avoidance and attraction, secondary entanglement, and electromagnetic fields.
- Climate change effects on species activity patterns

- Seismic activity and its effect on offshore and onshore wind transmission technologies
- Tsunami effects on offshore wind infrastructure
- Sea level rise and its effect on existing onshore generation, transmission systems, and future designs
- Effects of offshore wind development on local weather patterns (wind, rain, fog), ocean currents, and upwelling
- Spatial data on recreational fishing areas and activities and fisheries
- Cultural resources information, with input from California Native American tribes and local and tribal communities

Addressing these data gaps and research needs can provide baseline information to inform transmission project construction and operations plans, including strategies to minimize and mitigate impacts to marine resources and existing ocean users.

Transmission Technology Needs: Some of the transmission technologies needed to bring offshore wind energy to shore and interconnect with the larger bulk transmission system are still emerging. Areas requiring additional research and development include:

- Dynamic cables, floating substations, direct current circuit breakers, and other technologies needed to meet California's long term offshore wind planning goals.
- Innovative design approaches such as networked or backbone systems needed to efficiently interconnect offshore wind projects.
- Phased transmission planning approaches that allow examination of infrastructure for short- and long-term needs, to reduce costs and environmental impacts.
- The need for and design of these systems, along with regulatory guidance for ownership of network ready transmission projects, may be helpful to facilitate interconnection.
- Potential supply chain constraints and solutions
- Standards for offshore wind energy generation (i.e. power density), safety, technology, and layout
- Transmission cost clarity: In the California ISO's *20-Year Transmission Outlook Update (2024)*, California's anticipated load growth to 2045 and the expectation of major offshore wind generation are driving the higher estimated cost for future transmission needs from approximately $30.5 billion over a 20-year timeframe identified in the first *20-Year Transmission Outlook* (2020) to the estimated $45.8 billion to $63.2 billion over the next two decades, with offshore wind development the primary driver of these higher projected costs. The range for future project cost estimates over this timeframe varies significantly due to detailed design requirements and uncertainty in permitting timelines, routing decisions, and equipment and labor costs. Also, the high-level analysis to determine feasible transmission alternatives included a bulk system power flow assessment for a range of load and resource scenarios. These costs do not include transmission that has

already been approved by the California ISO and is under development, but not yet in service.

Addressing these data gaps and research needs will bring needed clarity for transmission technologies.

Offshore Transmission Analysis Recommendations:

- Analysis for localized interconnections, upgrades for energy resiliency and reliability, future proofing for climate impacts, and carbon reductions
- State, interstate, and regional undersea grids cost benefit analyses
- HVDC cabling between wind areas with offshore grid analysis updated on regular basis to track technological advancements
- Interstate grids based on offshore wind generation locations with reference to load centers or other factors (e.g., decommissioning of vulnerable existing coastal power plants)
- Research and development of offshore transmission designs and technologies including ecosystem adaptive management designs and related technologies

Onshore Transmission Analysis Recommendations:

- Analysis for localized interconnections, upgrades for energy resiliency and reliability, carbon reductions in distribution grids, and climate impacts (e.g., sea level rise and impacts to coastal generation and grid infrastructure)
- State, interstate, and regional grid cost benefit analyses that contemplate climate impacts (e.g., drought and heat domes in the west and impacts / variability of hydroelectric generation)
- Interstate grids based on offshore wind generation locations with reference to load centers or other factors (e.g., decommissioning of vulnerable existing coastal power plants)
- Research and development of offshore transmission designs and technologies including ecosystem adaptive management designs and related technologies
- Building off the *National Transmission Needs Study*, partner closely with California on analyses and funding to improve reliability and resilience, alleviate congestion, deliver cost-effective generation to meet demand, and meet future generation and demand with appropriate within-region and interregional capacity.

Science Entities: Federal funding and support for science entities such as the Pacific Offshore Wind Consortium (POWC) can help facilitate the multitude of research needs, data gaps, and analyses listed above related to offshore wind transmission. The POWC will enable universities, host communities, and tribal nations to share resources, co-develop best practices, and design comprehensive research programs that reflect the dynamic nature of the ocean environment and the diversity of community perspectives. The POWC will advance three pillars: research and innovation, university-level workforce education and professional development, and community and tribal engagement and knowledge exchange.

d. What specific data or information can be provided by ocean co-users for the purpose of filling knowledge gaps? How should information from ocean co-users be disseminated or shared?

One tool to consider using is virtual story maps, which are created collaboratively in a community-based approach to help fill data gaps and provide publicly available baseline data to state, public, scientific, and business interests in an electronic GIS format. For example, during the AB 525 strategic plan process, Central Coast fishermen provided information on their recent and historic fishing experience, which was then digitized by spatial analysts, and used to map species specific commercial fishing grounds to create the Central Coast Fishing Heritage Story Map. Similarly, North Coast fishermen's associations collaborated to provide data on community fishing grounds by species or species complex, gear type, depth, seafloor substrate, and season that was used to create the North Coast Fisheries Mapping Project. Both recent story maps were used during California's sea space identification for offshore wind planning.

5. What forms of assistance (technical assistance or otherwise) would support efficient and equitable siting and development of offshore wind transmission infrastructure?

The *Northern California and Southern Oregon Transmission Study* (NCSO Study), funded by DOD, was essential for advancing offshore wind transmission planning and development. The study evaluated multiple transmission alternatives with various technologies and configurations, subsea cable routing, meshed and backbone offshore networks, and existing infrastructure and rights-of-way. The study's resource assessment and transmission alternatives provided key data and input assumptions that informed the Strategic Plan, the CPUC's Integrated Resource Planning process, the California ISO's Transmission Planning Process and *20-Year Transmission Outlook* process, and the DOE's *West Coast Offshore Wind Transmission Study*. The NCSO Study also contributed to the California ISO's identification and approval of the first near term transmission project to access offshore wind resources off the West Coast.

California recognizes the substantial efforts included in the forthcoming *West Coast Offshore Wind Transmission Study*, which is evaluating ways to achieve offshore wind energy goals that support grid reliability and resilience as well as ocean co-use. Further, we look forward to recommendations for interregional and offshore wind transmission from the *West Coast Action Plan for Offshore Wind Transmission Development,* intended to support planning entities and siting authorities in decision-making processes. However, additional federal funding for continued research and transmission planning development will help advance efficient and equitable siting and development of transmission infrastructure necessary to meet state and national offshore wind goals.

Offshore wind transmission offers an opportunity for a more equitable process for tribes and community groups in energy development than has historically occurred. California Native American tribes expressed a desire for procedural equity, especially related to transmission. To enable procedural equity, California Native American tribes need to have

engagement spaces, consultation spaces, and the financial ability to participate for equitable outcomes. This means having an influential role in the co-development of engagement spaces shared with other communities as well as access to government-to-government consultation with transmission agencies. For tribes to be able to effectively engage with the development of offshore wind transmission infrastructure, federal funding for personnel and expertise capacity is needed similar to the technical assistance offered within DOE's recently launched Inclusive Transmission Planning. In addition to technical assistance, California Native American tribes have advocated for access to independent expert resources as well as financial support to enable capacity building and participation.

Community groups and advocates have proposed a number of strategies to address impacts, including increasing engagement with potentially impacted communities and funding to increase their capacity to engage. According to advocates, best practices for engagement include creating an advisory board of community leaders, partnering with trusted community groups, advertising meetings weeks in advance, holding meetings in trusted locations at times when working families can attend, providing children's activities and food, and creating accessibly written materials that are also translated.

6. Do you have any additional information or thoughts you want to provide about transmission infrastructure related to offshore wind energy?

Developing transmission to deliver offshore wind to California requires proactive and long-term planning, as well as holistic consideration of the offshore wind development process. California's energy agencies, the CEC and CPUC, and the California ISO have a Memorandum of Understanding (MOU) to tighten linkages between resource planning, transmission planning, procurement, and interconnection. The CEC provides a demand forecast, the CPUC develops resource planning portfolios, and the California ISO uses these inputs as the basis for its annual Transmission Planning Process and for transmission approvals. The MOU also seeks to incorporate load-serving entity procurement decisions and interconnection needs into this process. Offshore wind has a number of unique considerations that may warrant a separate, dedicated pathway toward interconnection. The California ISO is considering potential tariff changes, which would require approval from the Federal Energy Regulatory Commission, in Track 3 of its Interconnection Process Enhancements initiative.

For the planning, siting, and development of offshore wind transmission infrastructure to be successful, the state and federal government must continue to work with the public and the scientific community to undertake robust scientific research to fill data gaps and better understand the potential impacts of offshore wind development on coastal, marine, and tribal cultural resources and environments, as well as on communities. In addition, critical information and clarity are needed surrounding supply chain constraints and availability of key technologies, at scale, in transmission systems.

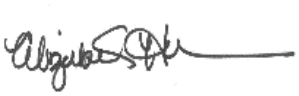
Substantial financial and human capital and ongoing consultations and engagement with Native American tribes, state, federal, and local agencies, communities, labor unions, and interested parties will also be required. Technical assistance for environmental and energy

justice communities promotes engagement with and enables an inclusive transmission planning process. This engagement along with robust baseline and monitoring data, will be critical in siting, designing, constructing, and operating projects that avoid, minimize, and mitigate impacts.

Closing

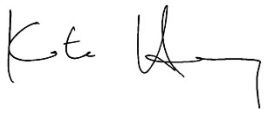
We thank DOE for the opportunity to provide a response to the RFI. The state is committed to working with our federal partners to ensure the successful development of offshore wind off the West Coast, which will be an important component of meeting California's clean energy and climate goals.

Sincerely,



Elizabeth Huber
Director for Siting, Transmission, and Environmental Protection
California Energy Commission

Nicole Dobroski
Chief, Division of Environmental Science, Planning, and Management
California State Lands Commission



Dr. Kate Hucklebridge
Executive Director
California Coastal Commission

Leuwam Tesfai
Deputy Executive Director for Energy and Climate Policy
California Public Utilities Commission

Jeff Billinton
Director of Transmission Infrastructure Planning
California Independent System Operator