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Description:	Primary Presentation Slides for the March 29, 2024 AB 525 Draft Strategic Plan for Offshore Wind Development Workshop 2 of 2
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AB 525 Workshop 2 of 2: Draft Strategic Plan for Offshore Wind off the Coast of California in Federal Waters

March 29, 2024

AM Workshop Schedule

1. Welcome and Introductions
2. Overview of AB 525 Draft Strategic Plan
3. Sea Space for Offshore Wind
4. Offshore Wind Permitting
5. Comment Period
6. Lunch

PM Workshop Schedule

1. Welcome Back
2. Transmission
3. Comment Period

Welcome and Introductions

Agency Leadership Acknowledgements

- **Office of Governor Gavin Newsom:**
  - Christine Hironaka: Deputy Cabinet Secretary to Governor Newsom
  - Jana Ganion: Senior Offshore Wind Advisor to Governor Newsom
- **California Energy Commission:**
  - Chair David Hochschild
  - Vice Chair Siva Gunda
- **California State Lands Commission:** Jennifer Lucchesi, Executive Officer
- **California Coastal Commission**: Dr. Kate Hucklebridge, Executive Director
- **California Department of Fish and Wildlife:**
  - Chuck Bonham, Director
  - Becky Ota, Habitat Conservation Program Manager
- **California Natural Resources Agency:**
  - Le-Quyen Nguyen, Deputy Secretary for Energy
  - Noaki Schwartz, Deputy Secretary for Equity and Environmental Justice
  - Geneva E.B. Thompson, Deputy Secretary for Tribal Affairs
- **Ocean Protection Council:** Jennifer Eckerle, Executive Director and Deputy Secretary for Oceans and Coastal Policy for Natural Resources

Agency Leadership Acknowledgements

- **California Public Utilities Commission:**
  - Commissioner John Reynolds
  - Commissioner Matthew Baker
  - Commission Darcie Houck
- **California Independent System Operator:**
  - Elliot Mainzer, President and CEO
  - Neil Millar, Vice President, Infrastructure and Operations Planning
- **State Water Resources Control Board:**
  - Eric Oppenheimer, Executive Director
  - Phillip Crader, Assistant Deputy Director
- **Governor's Office of Planning and Research:** Samuel Assefa, Director
- **Governor's Office of Business and Economic Development:** Dee Dee Myers, Senior Advisor and Director
- **California Workforce Development Board:** Kaina Pereira, Executive Director
- **California Labor & Workforce Development Agency:** Stewart Knox, Secretary

Draft AB 525 Strategic Plan Overview

Elizabeth Huber

Draft AB 525 Strategic Plan Overview

Elizabeth Huber, Director, Siting, Transmission and Environmental Protection Division
March 29, 2024

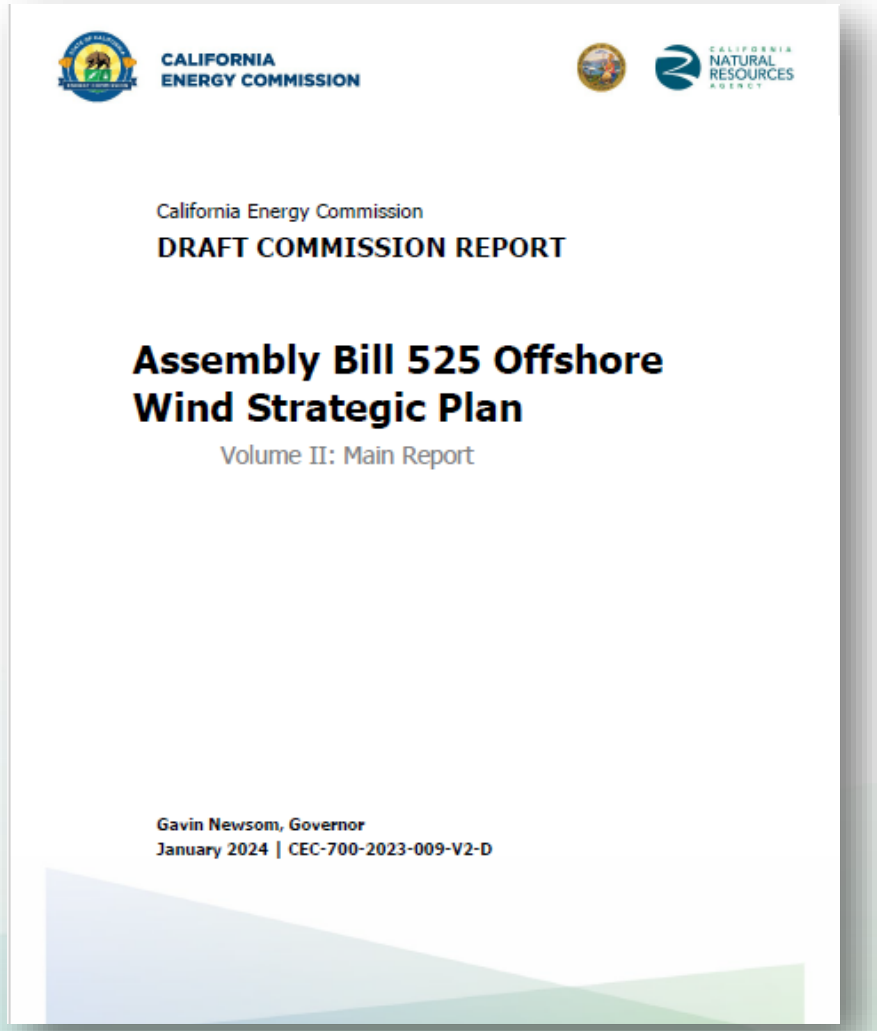
AB 525 Legislative Findings

- Provides economic and environmental benefits
- Advances climate goals and diversifying the energy portfolio
- Improves grid reliability
- Serves electricity needs and improve air quality in underserved communities.
- Stimulates state and local economic and workforce development

AB 525 Statutory Requirements

- Identify **suitable sea space** to accommodate the 2045 offshore wind planning goal.
- Develop plan for **port infrastructure** and identify **workforce development** needs.
- Assess and plan for **transmission** infrastructure needs to meet offshore wind goals.
- Establish a coordinated and efficient **permitting process.**
- **Identify potential impacts and strategies** to address them.

AB 525 Required Deliverables



[Link: AB 525 Reports: Offshore Renewable Energy(ca.gov)]

AB 525 Coordinating Agencies

CALIFORNIA NATURAL RESOURCES AGENCY

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

PUBLIC UTILITIES COMMISSION EUREKA STATE OF CALIFORNIA

CALIFORNIA GOVERNOR'S OFFICE OF BUSINESS AND ECONOMIC DEVELOPMENT

CALIFORNIA COASTAL COMMISSION

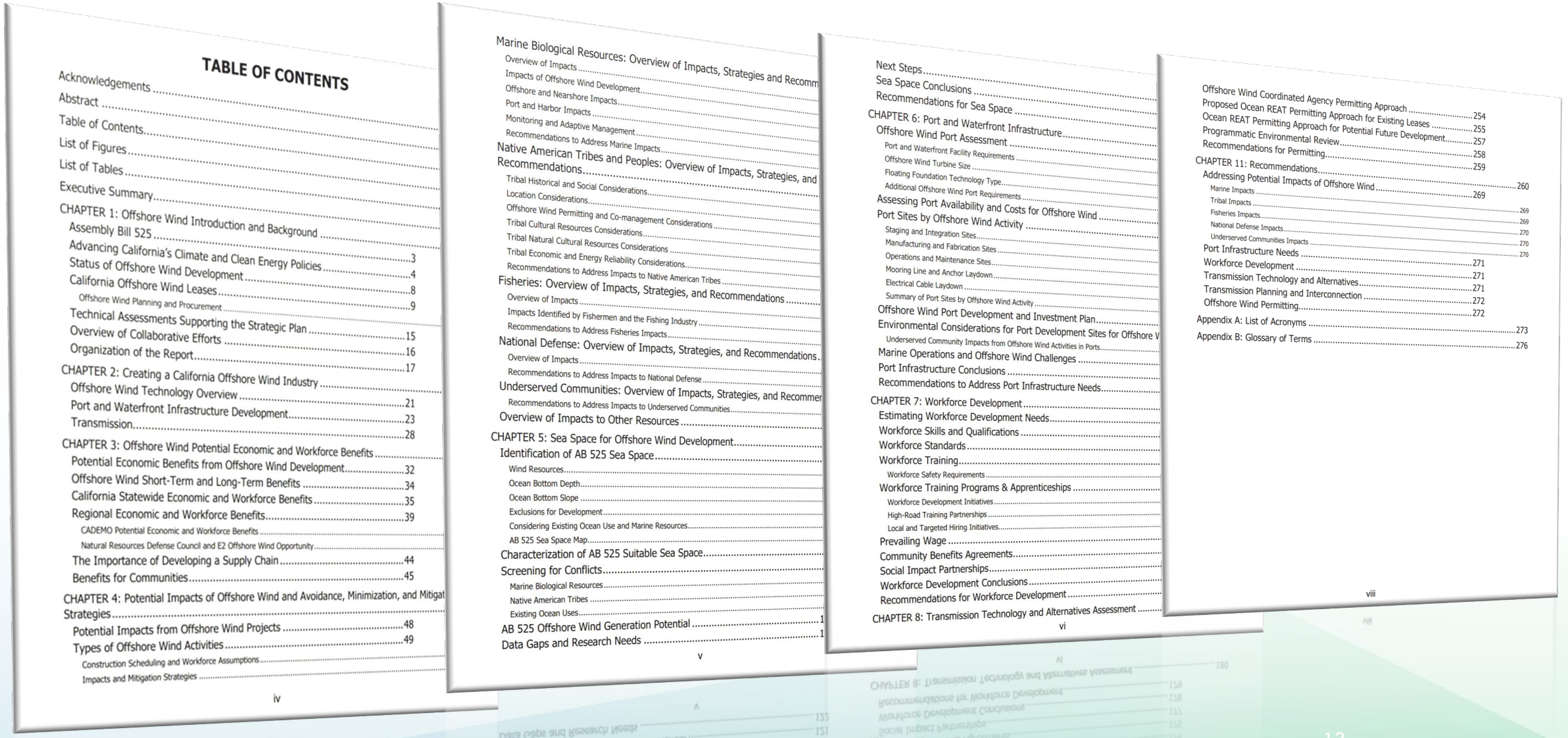
CALIFORNIA OCEAN PROTECTION COUNCIL

CALIFORNIA STATE LANDS COMMISSION STATE OF CALIFORNIA

LABOR & WORKFORCE DEVELOPMENT AGENCY

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH STATE OF CALIFORNIA

Draft AB 525 Strategic Plan Structure



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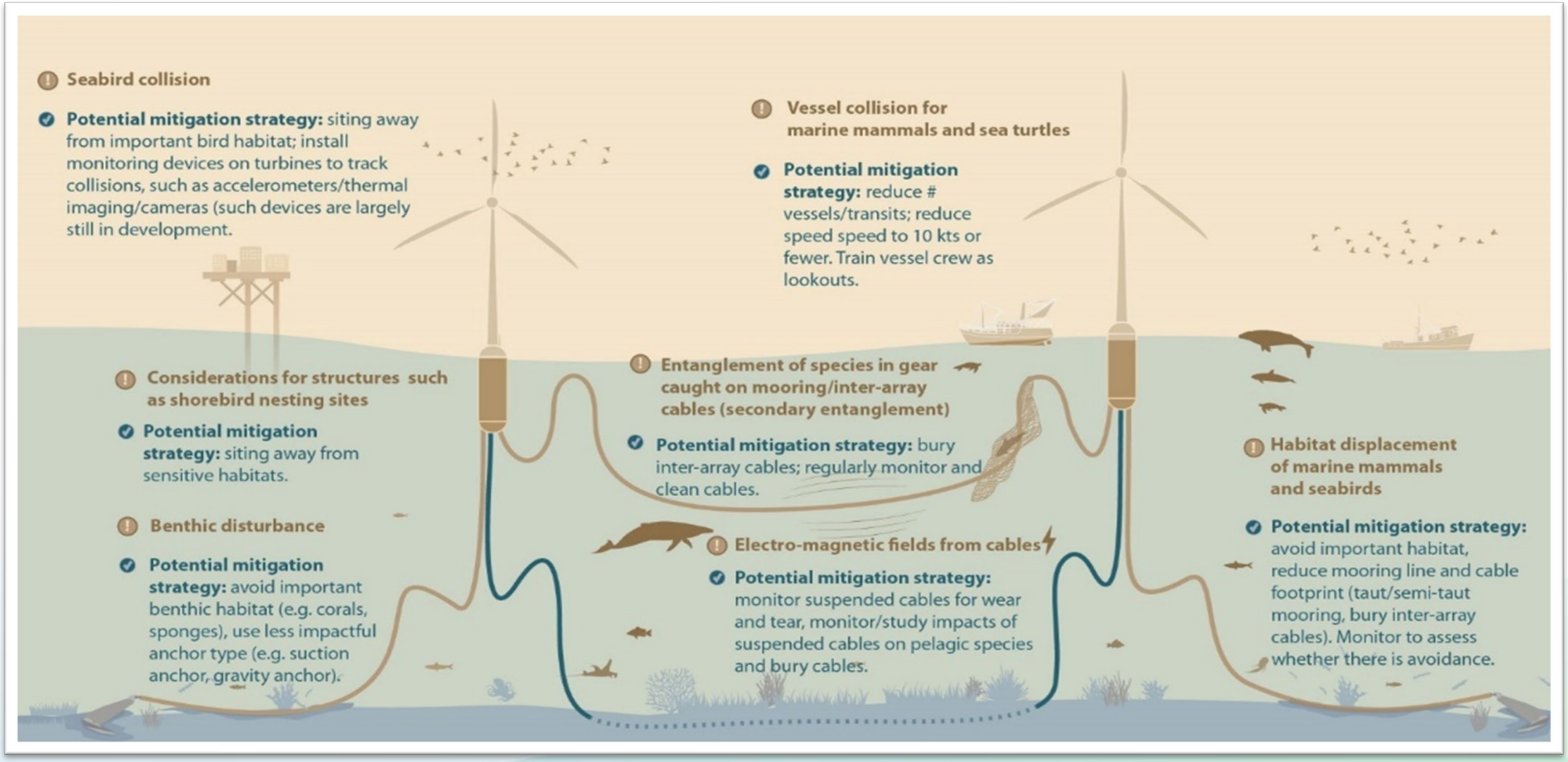
Chapter 3: Offshore Wind Potential Economic and Workforce Benefits

Key Benefits:

- Direct, indirect, and induced economic benefits.
- Developing local skilled and trained workforce & long-term job creation.
- Ports and waterfront facilities. are important drivers of economic benefits primarily in supply chain.
- Community Benefits Agreements (CBAs) are important tools.

Chapter 4: Potential Impacts of Offshore Wind and Avoidance, Minimization, and Mitigation Strategies

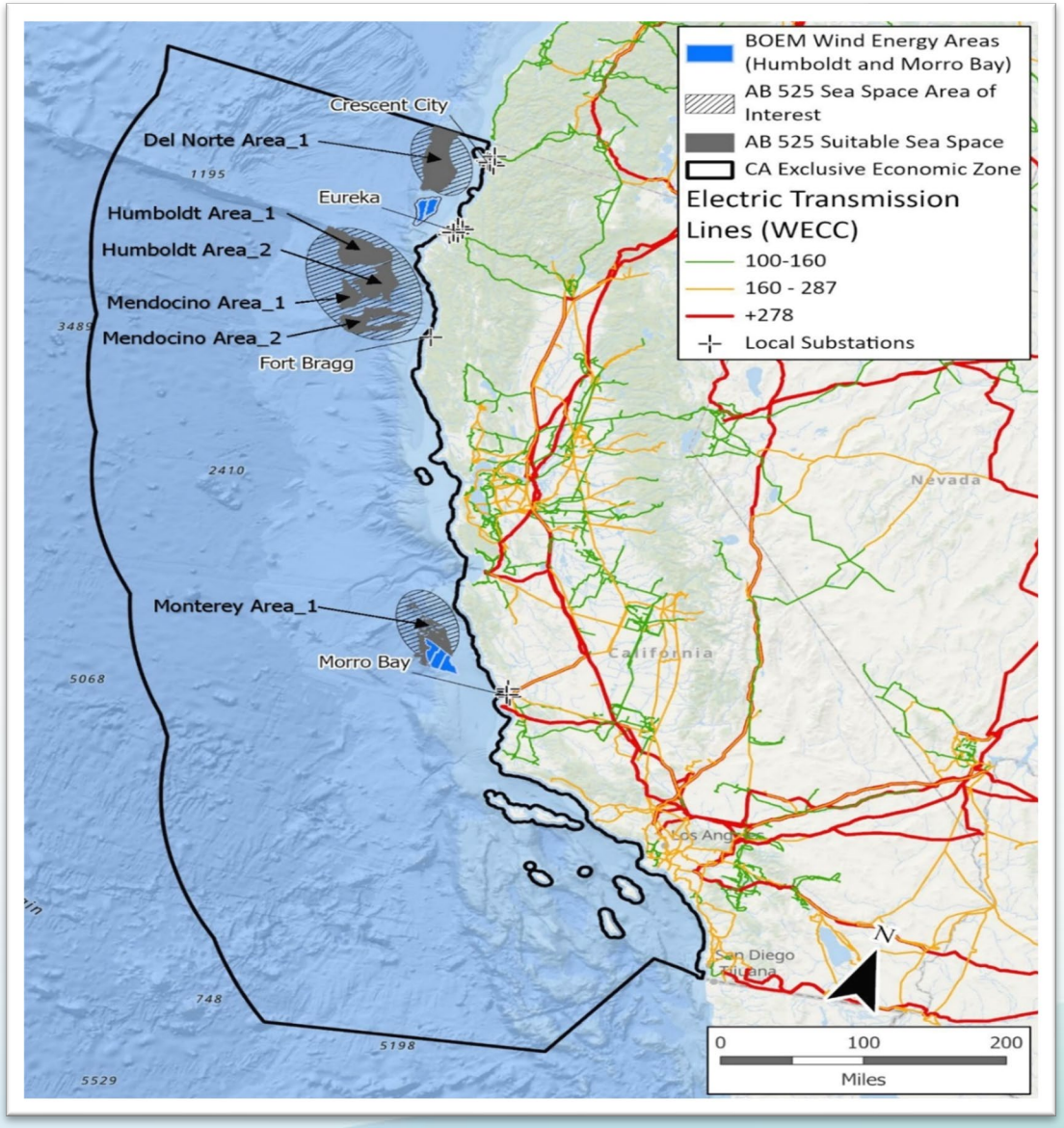


Potential Impacts of Offshore Wind and Avoidance, Minimization, and Mitigation Strategies

- California Native American and Indigenous Peoples (including tribal cultural resources)
- Underserved Communities
- Coastal Resources (marine and biological)
- Fisheries
- National defense

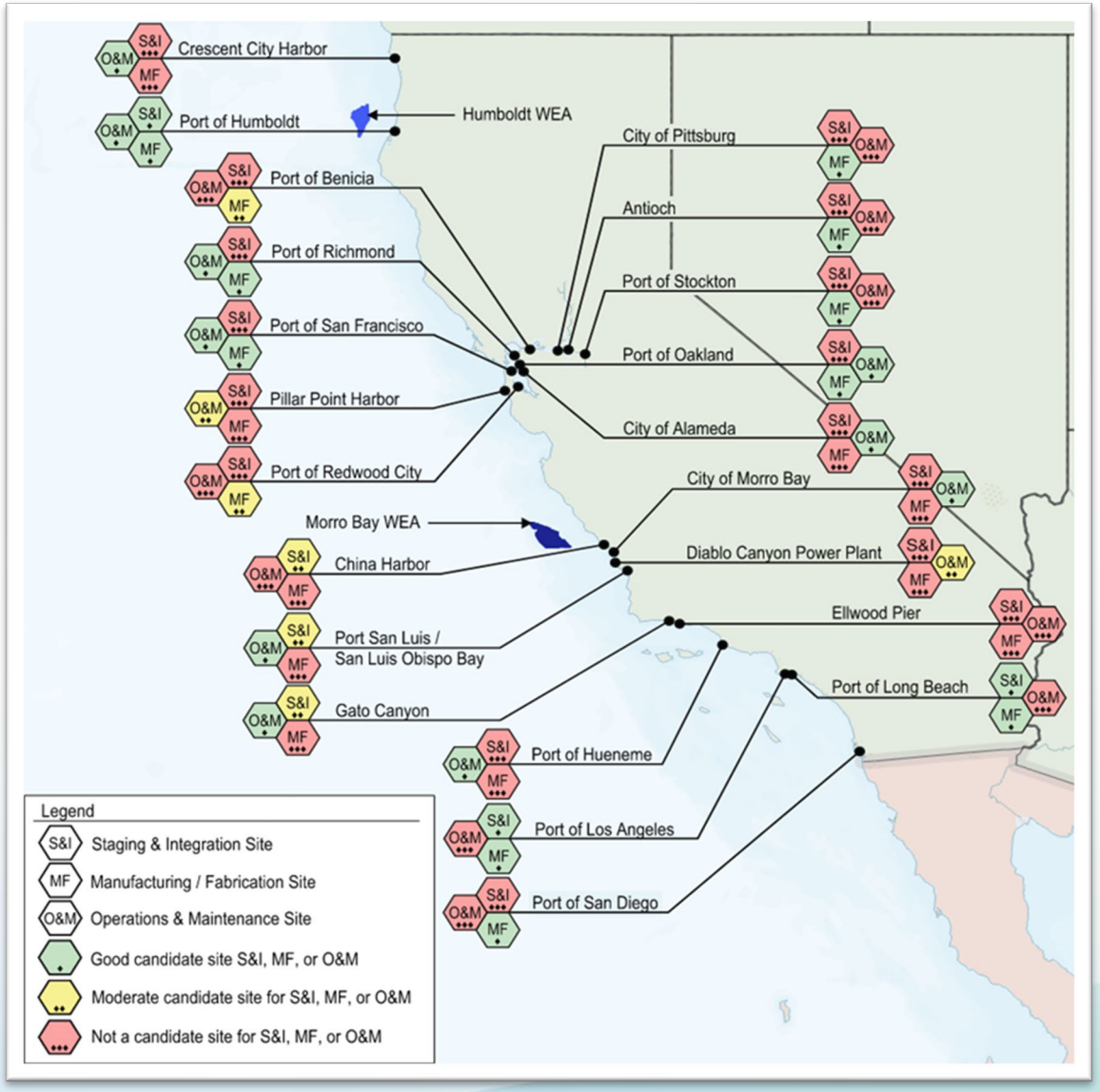
Link: March 20, 2024 Workshop Information

Chapter 5: Sea Space for Offshore Wind Development



- Sufficient sea space needed to accommodate 25 GW planning goal.
- Up to 50% of that sea space may be unsuitable due to conflicts.
- Development should occur at least 20 miles offshore to avoid conflicts.
- Ocean use species and ecosystem conflicts will require additional evaluation to determine suitability.

Chapter 6: Port and Waterfront Infrastructure



- Assessing port needs and costs
- Port sites by offshore wind activity:
  - *Staging and Integration*
  - *Manufacturing and Fabrication*
  - *Operations and Maintenance*
- Environmental consideration for port development sites
- Marine operations and offshore wind challenges

Port and Waterfront Infrastructure

- Existing port infrastructure is unable to support offshore wind industry.
- A coordinated multi-port strategy is needed: 16 large and 10 small port sites.
- Estimated investment of $11 - 12B is needed to meet the 2045 goal.

Recommendations:

- Develop port readiness framework coordinated with larger West Coast port network.
- Collaborate with ports and harbors, tribal governments, local communities, port users, and others in developing port framework.
- Engage with industry leaders, developers, and supply chain entities to explore options to support local supply chain development.

Chapter 7: Workforce Development

- Workforce needs and standards
- Workforce Training Programs and Apprenticeships
- Varying types of jobs are expected to support offshore wind development

Workforce Development

- Most needed near-term skills are in trades, technician, and construction sectors.
- In the long-term more jobs are in the supply chain and manufacturing sector.
- A workforce with right skillset requires specialized training for different types of workers.

Recommendations:

- Identify workforce needs, establish equitable hiring standards, fund training and education, and recruit entry-level and experienced workers.
- Coordinate to create career opportunities, workforce training, and economic development benefits.
- Support project labor agreements that provide local communities and tribes with meaningful economic benefits.

Chapter 8: Transmission Technology and Alternative Assessment

- Transmission technologies are still emerging including dynamic and higher capacity cables and floating substations.
- Large investments will be required to deliver electricity to local communities and the larger grid.
- Potential transmission pathways for the North Coast will require additional detailed corridor planning.

Chapter 9: Transmission Planning and Interconnection

- Proactive planning and innovative interconnection approaches.
- Landscape level planning for transmission corridors can help future permitting.
- Assessing transmission needs for host communities and other rural communities.

Chapter 10: Offshore Wind Permitting

BOEM
Bureau of Ocean Energy Management

- The permitting process for any large infrastructure such as offshore wind is complex and involves numerous state, federal, and local agencies.
- A coordinated multi-agency permitting approach was developed to streamline the permitting for large renewable projects in the California desert.
- The permitting approach created the Renewable Energy Action Team (REAT) and Renewable Energy Policy Group (REPG) to ensure coordination.

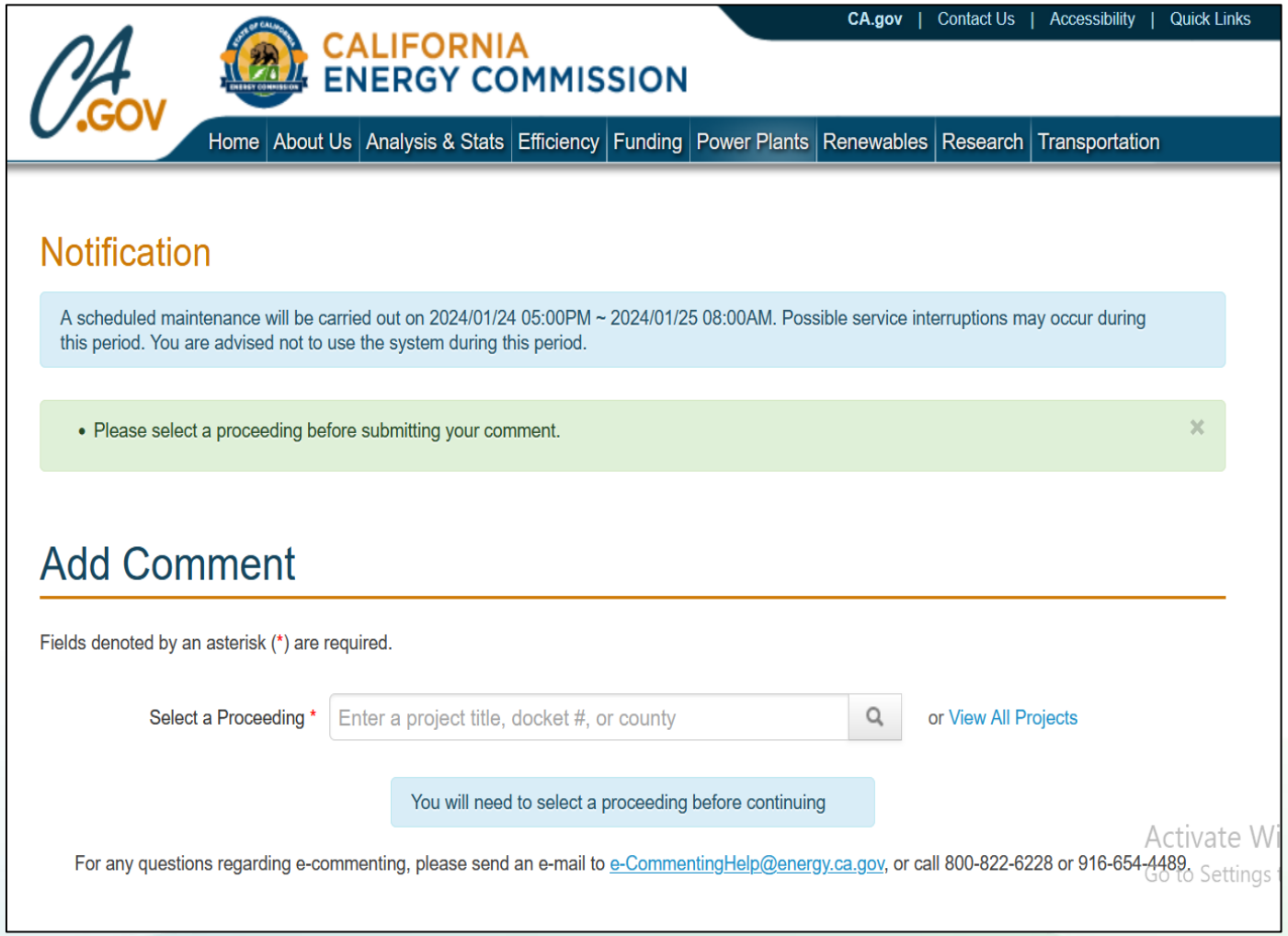
Public Participation and Links

[AB 525 Reports: Offshore Renewable Energy (ca.gov)]

- Reports and studies
- Workshop events info

File Comments to Docket #17-MISC-01:
[California Energy Commission : e-comment : Select a Proceeding]

Comments Due April 22, 2024, for Strategic Plan and workshops



Chapter 5: Sea Space for Offshore Wind Development

Danielle Mullany

Assembly Bill 525 Draft Offshore Wind Strategic Plan Chapter 5: Sea Space for Offshore Wind

Danielle Mullany, Electric Generation Specialist
Siting, Transmission, and Environmental Protection Division
March 29, 2024

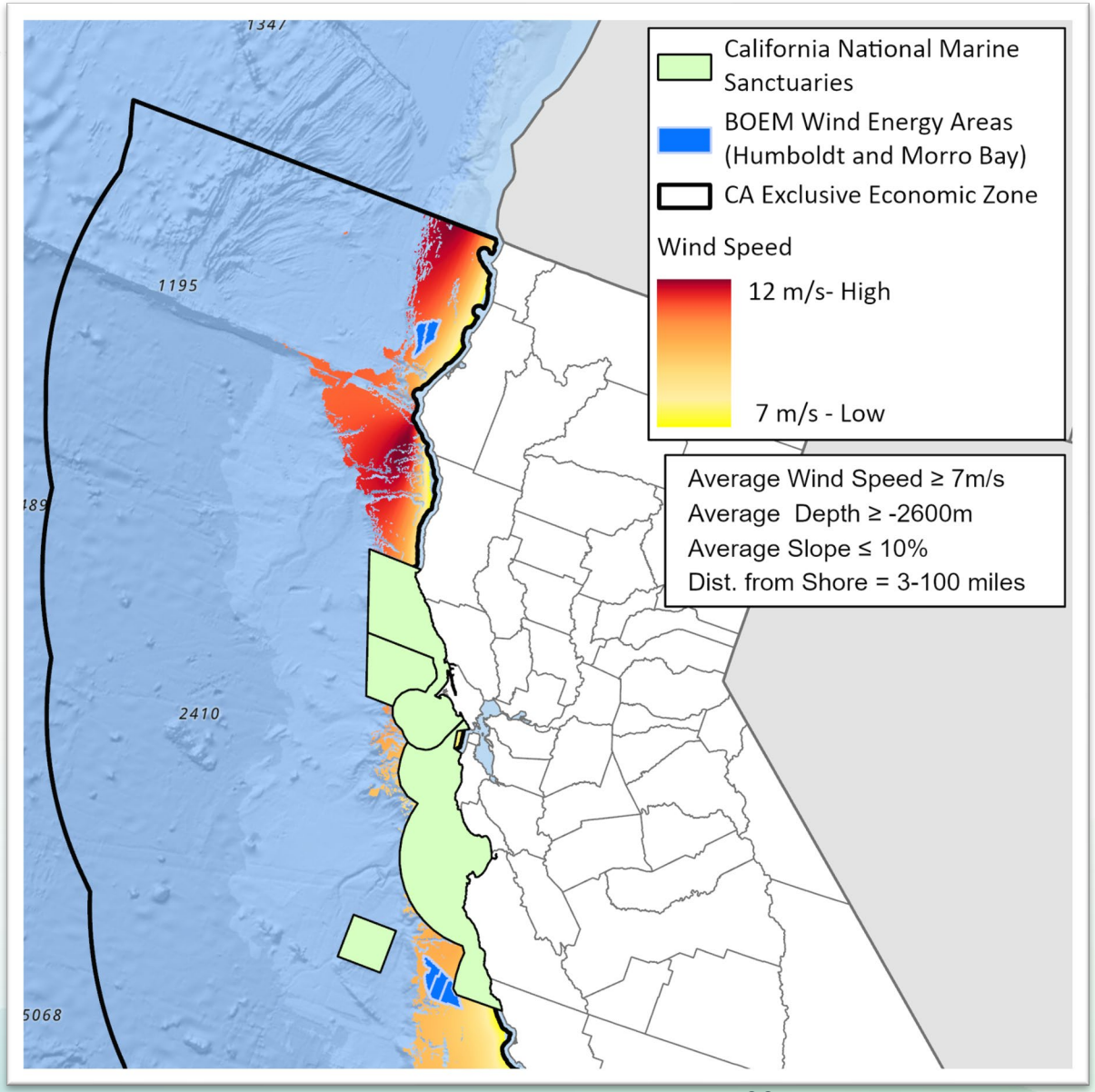
Sea Space Identification

AB 525 Sea Space Identification

- Identify suitable sea space in federal waters to accommodate the offshore wind planning goals:
  - 2 to 5 GW by 2030 and 25 GW by 2045

Impact Assessment

- Consider potential impacts to:
  - Native American and Indigenous peoples
  - Coastal resources
  - Fisheries
  - National defense
- …and identify strategies to address those impacts



Identification of Suitable Sea Space: Process

Identify Wind Potential

- Offshore wind characteristics
- Ocean characteristics that can affect offshore wind technology
- Protected Areas-exclusions for development

Screen with Available Data

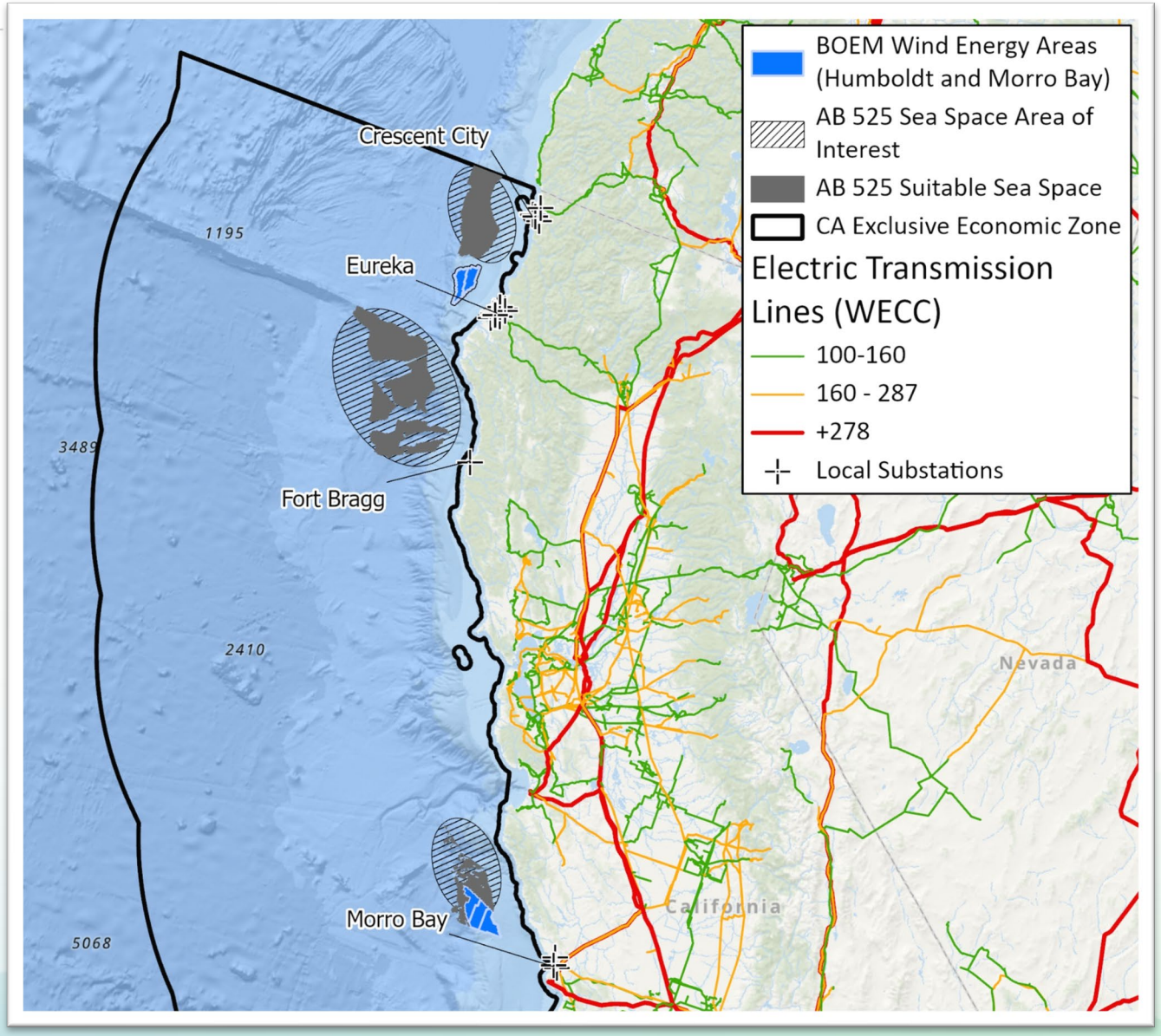
- Ocean uses
- Existing infrastructure
- Benthic (ocean bottom) habitats
- Marine mammals
- Marine birds
- Marine turtles

Summarize Results

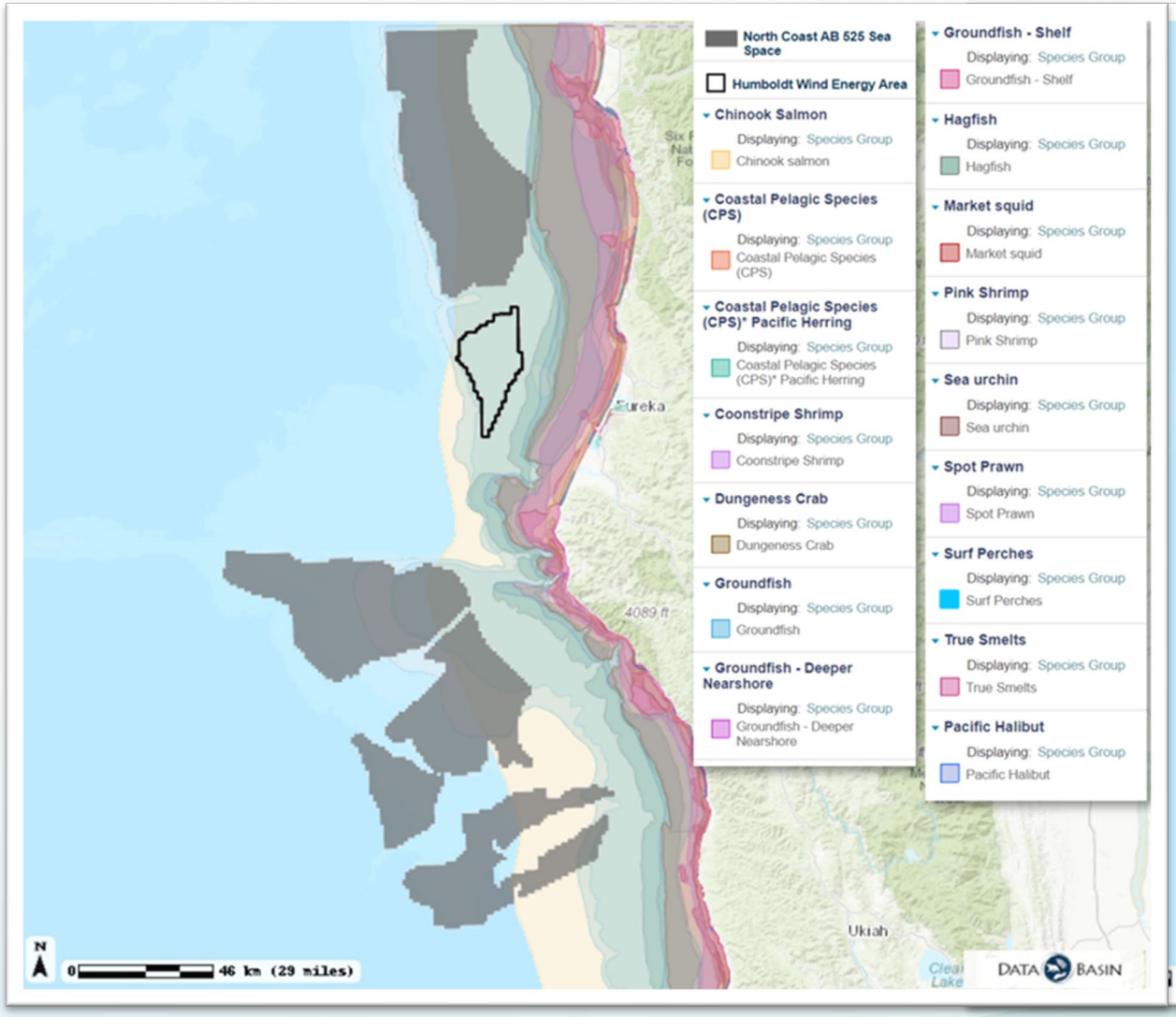
- Describe, characterize, and summarize results in Strategic Plan

Identification of Suitable Sea Space: Results

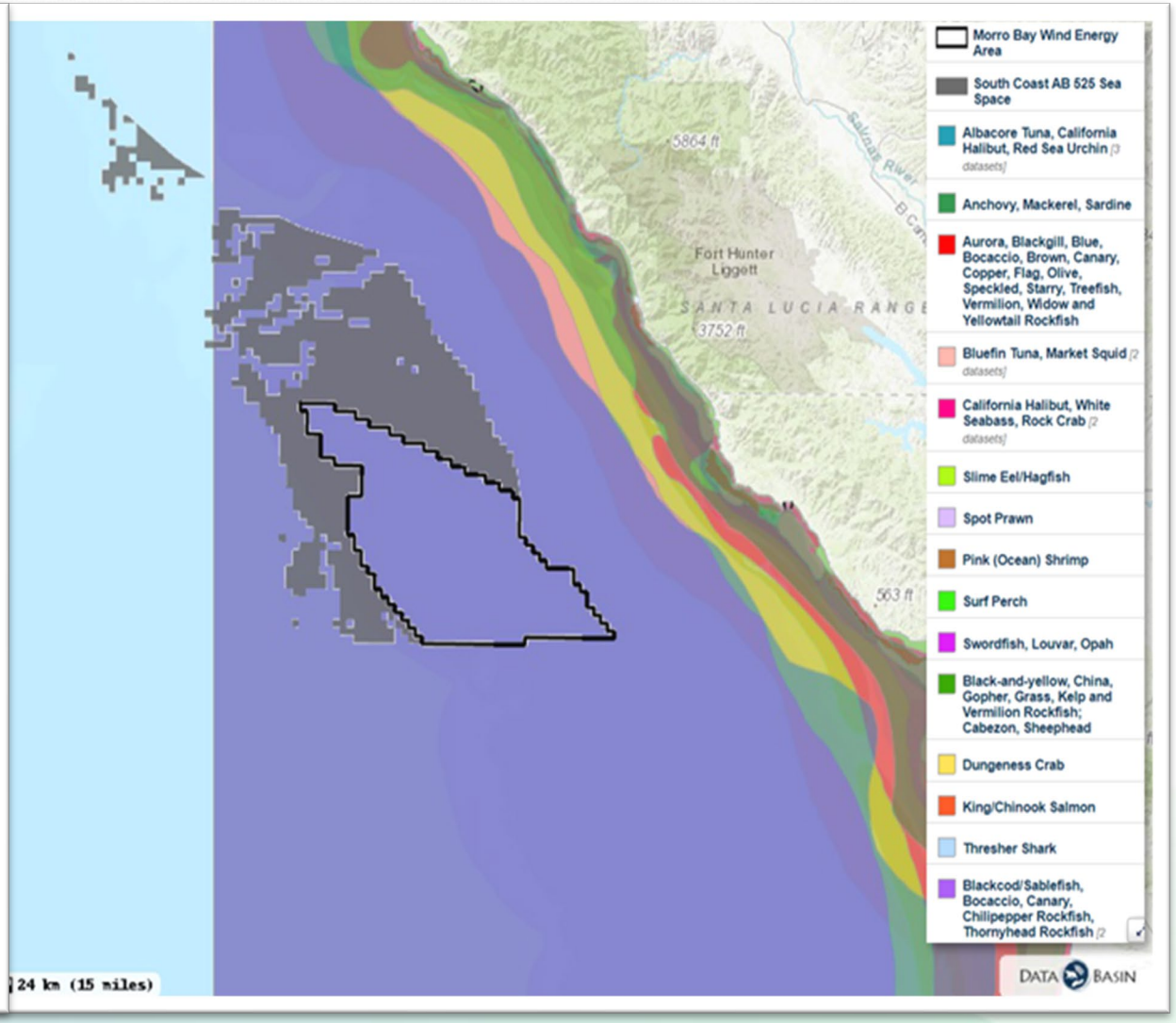
- Six areas identified for further research (gray areas on map)
- Wind Speed 8m/s or better
- Water Depth – approximately 800m to 2600m
- Ocean Bottom Slope less than 10%
- Distance from Shore – approximately 20-70 miles



Commercial Fisheries

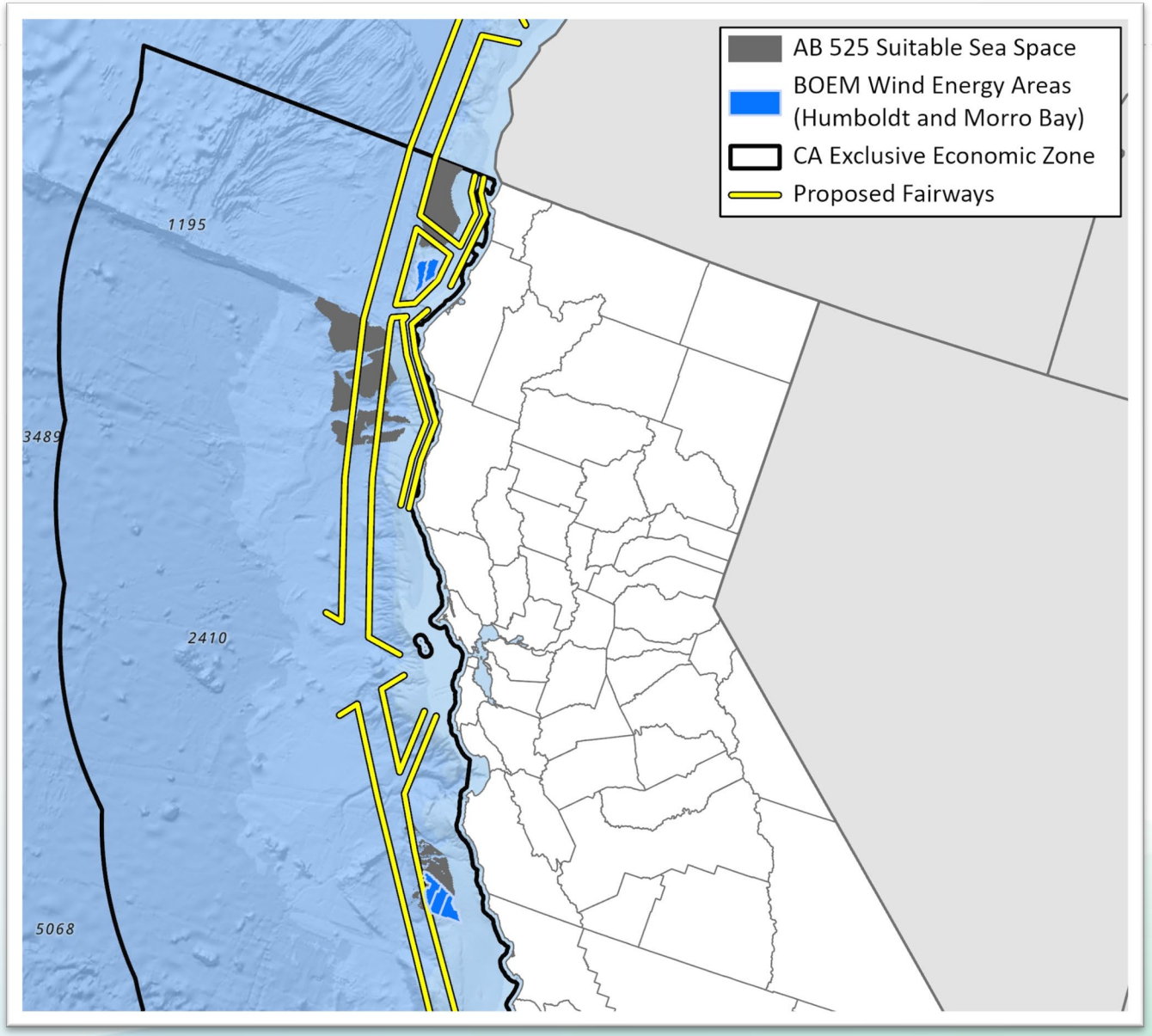


North Coast

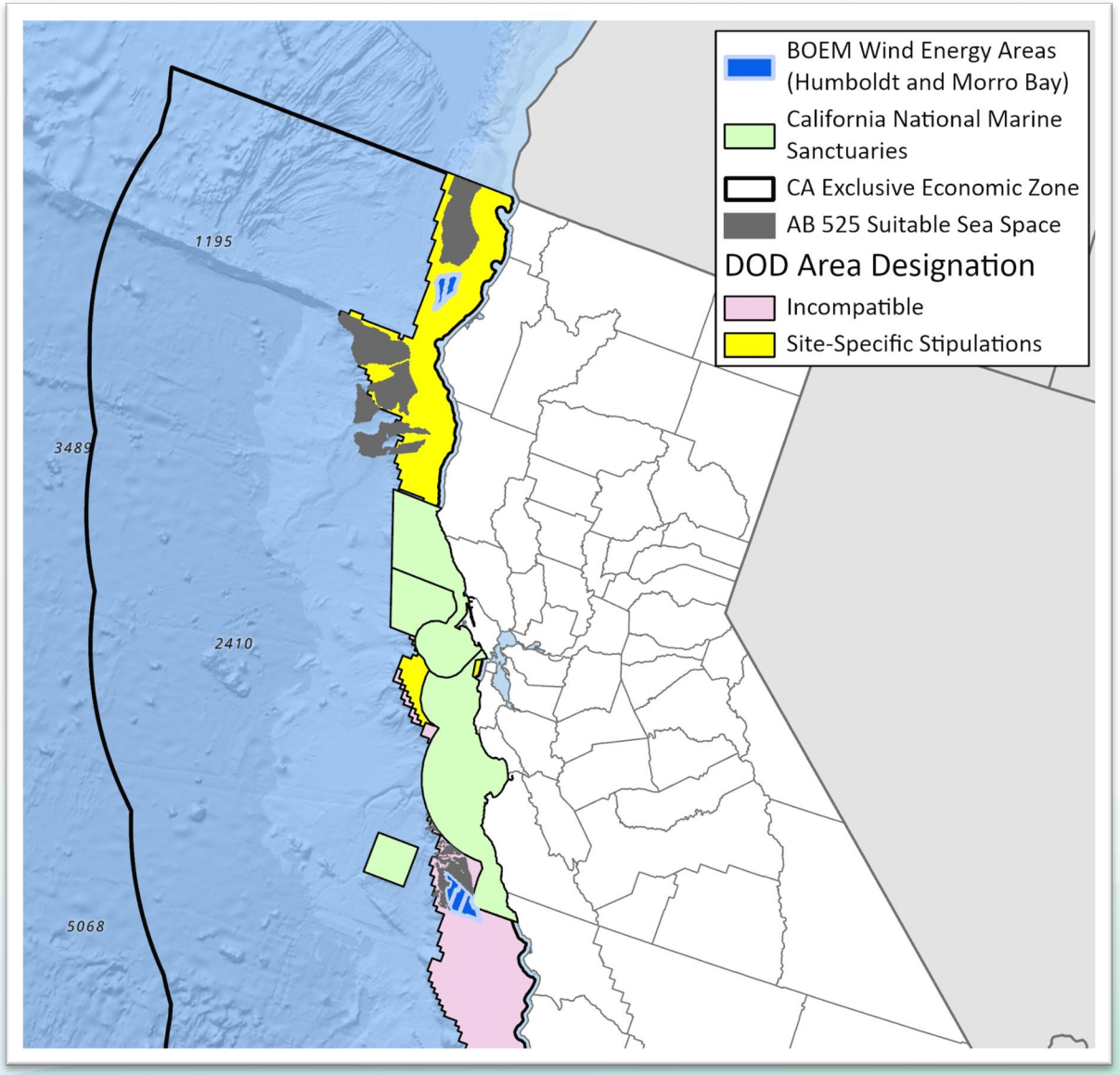


South Central Coast

Commercial Shipping

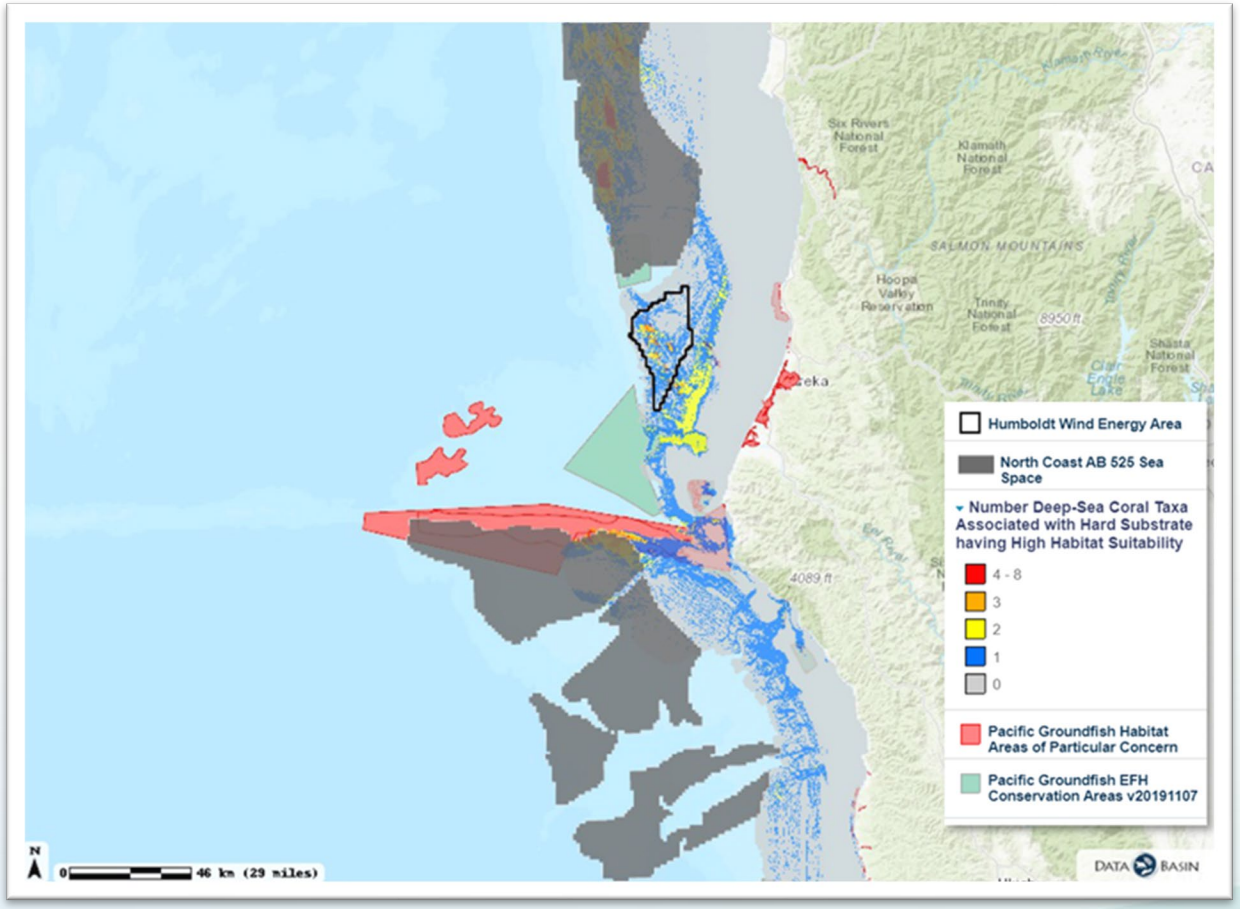


US Department of Defense Military Area Designation

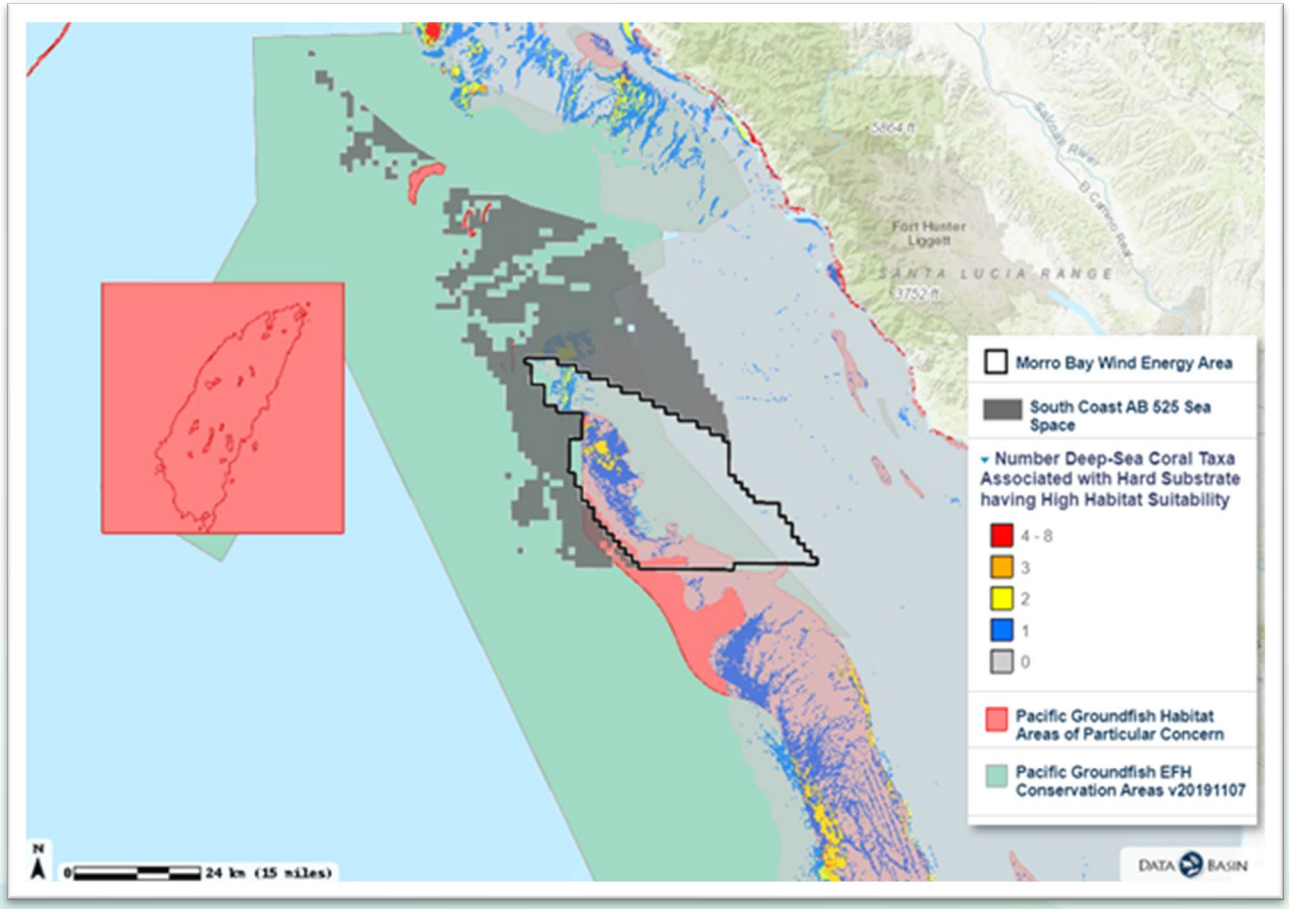


Benthic Habitat and Protected Areas

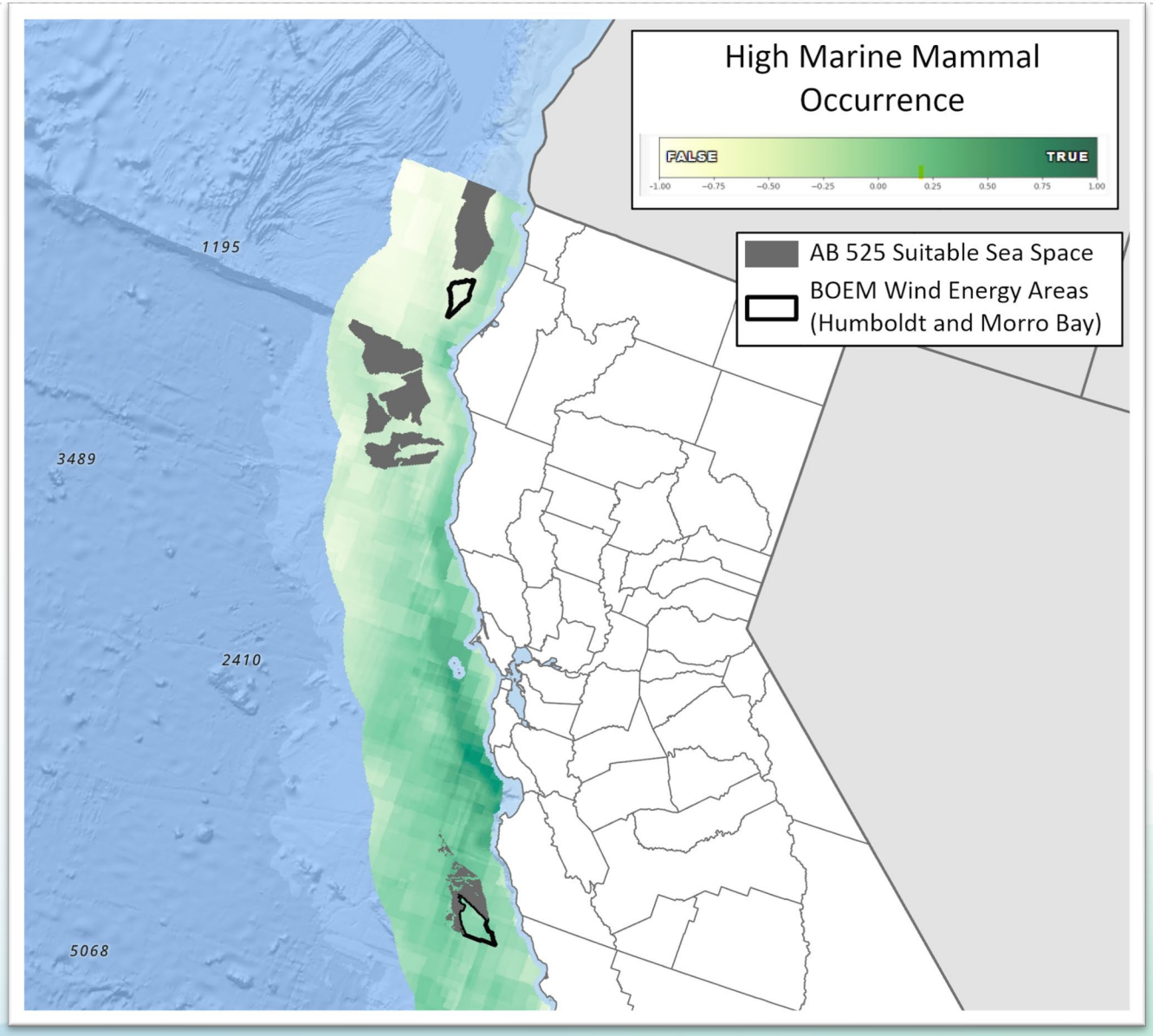
North Coast



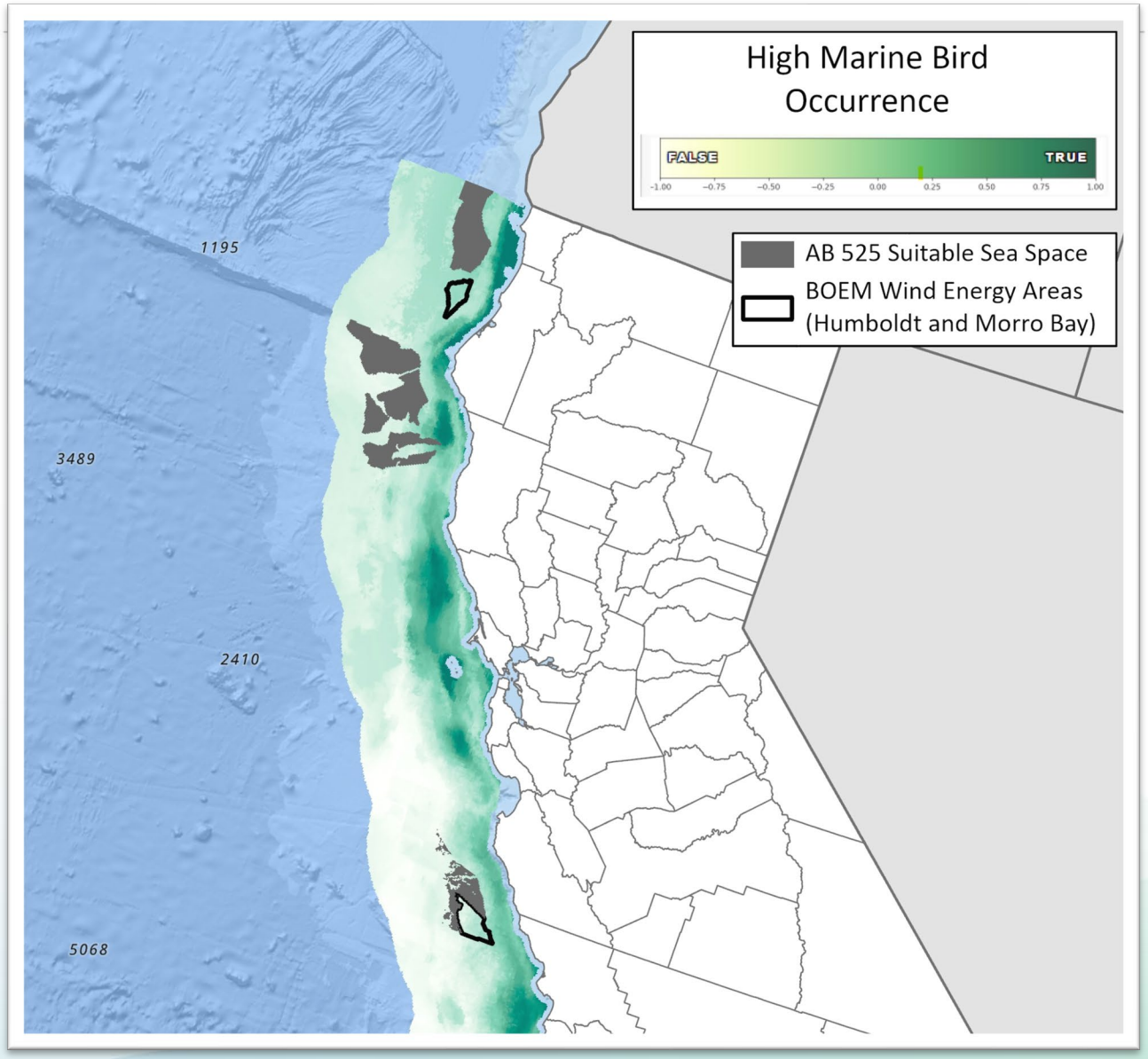
South Central Coast



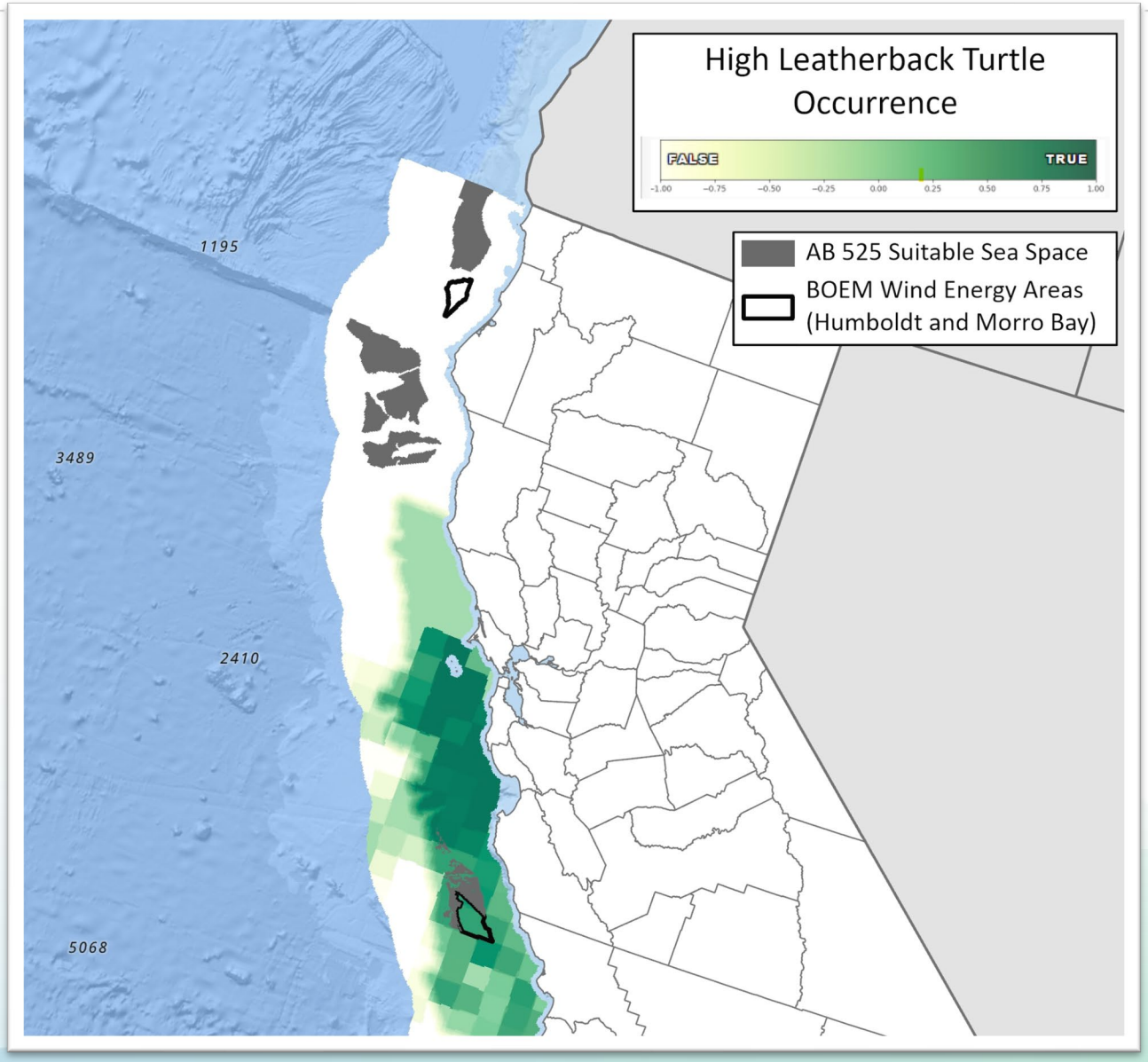
Marine Mammals



Marine Birds



Leatherback Turtle



Sea Space Generation Potential

Location	Installation Capacity: Low Estimate (GW)	Installation Capacity: High Estimate (GW)	Area (Square Miles)	Avg. Ocean Depth (Meters)	Avg. Distance to Shore (Miles)
Humboldt Leases	1.6	2.7	207	500-1,100	21-35
Morro Bay Leases	2.9	4.9	376	900-1,300	26-45
AB 525 Sea Space	31.3	52.1	4,020		
CA Total	35.8	59.7	4,603		

AB 525 Sea Space Conclusions

- There is sufficient sea space area to meet the 2045 offshore wind goal of at least 25 GW
- Large-scale conflicts that could reduce size of sea space include: benthic habitats, shipping lanes, and DOD military activity
- Offshore wind development in waters up to 1,300 meters in depth is more feasible in the near term
- Sea space located approximately 20 miles from shore avoids the greatest degree of conflicts for marine biological resources and existing ocean uses
- North Coast sea space is more desirable from a wind resource perspective
- Higher concentrations of marine species occur south of the greater Bay Area coast so marine resource conflicts would be lower in sea space off the North Coast
- Sea space areas off Humboldt and Mendocino counties are in conflict with the PAC-PARS proposed shipping fairways and the South-Central Coast sea space is likely to conflict with DOD military operations

AB 525 Sea Space Recommendations

- Continue suitable sea space identification, research, analysis and refinement, in coordination with BOEM, underserved and tribal communities, and stakeholders to inform the feasibility of offshore wind development that minimizes impacts to California's coast and ocean resources.

Bureau of Ocean Energy Management

Abigail Ryder and Matthew Blazek

BOEM Bureau of Ocean Energy Management

California Offshore Wind PEIS

AB 525 Workshop

March 29, 2024

Abigail Ryder | Program Analyst

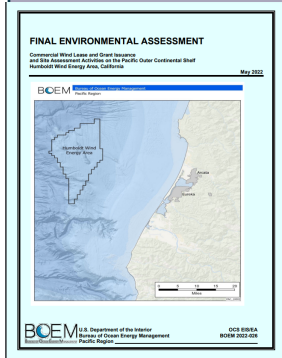
National Environmental Policy Act (NEPA) Background

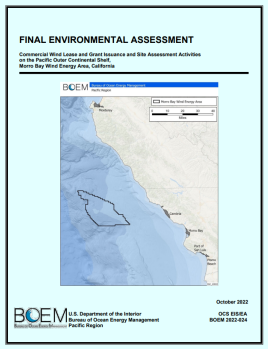
- **NEPA** is a procedural law intended to ensure that Federal agencies consider the environmental impacts of their actions in the decision-making process.
- **Environmental Impact Statements** (EISs) are prepared to provide a full and fair discussion of significant environmental impacts of an action for decision makers and the public.
- An EIS considers **Reasonable Alternatives** to Federal actions that would avoid or minimize adverse impacts or enhance the quality of the human environment.
- A **Record of Decision (ROD)** is prepared after an agency issues a final EIS. The **ROD** states the agency's environmental decision.

California Offshore Wind Development and NEPA

Planning & Analysis | **Leasing** | **Site Assessment** | **Construction & Operations**

1. Environmental Assessments (EAs)
Humboldt & Morro Bay Leasing Activities: Finalized 2022



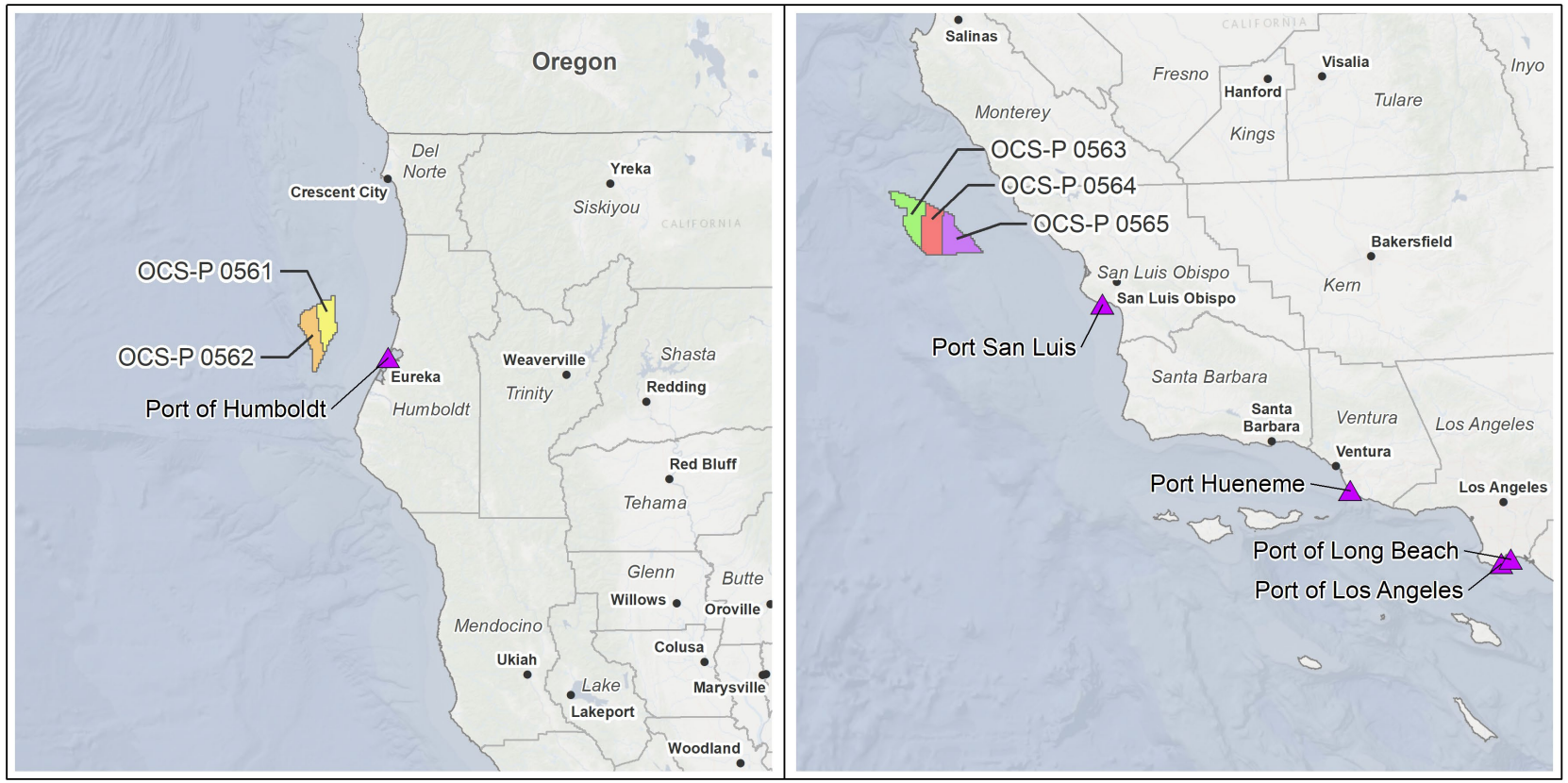


2. Programmatic EIS
Existing Humboldt & Morro Bay Leases
Expected to Finish Late 2025

3. EISs for Individual COPs once COPs are received

Proposed Action for the California OSW Programmatic EIS

- Identify, analyze, and adopt potential **mitigation measures** for the 5 leased areas that may be incorporated into future **Construction and Operations Plans (COPs)** or imposed as conditions of approval of COPs.



Programmatic EIS:

- Includes high level analysis of potential impacts, not project-specific
- Considers mitigation measures that could be applied across all five leases (programmatic mitigation measures)
- Includes cumulative impact analysis

Initial Alternatives for California OSW Programmatic EIS

Alternative A

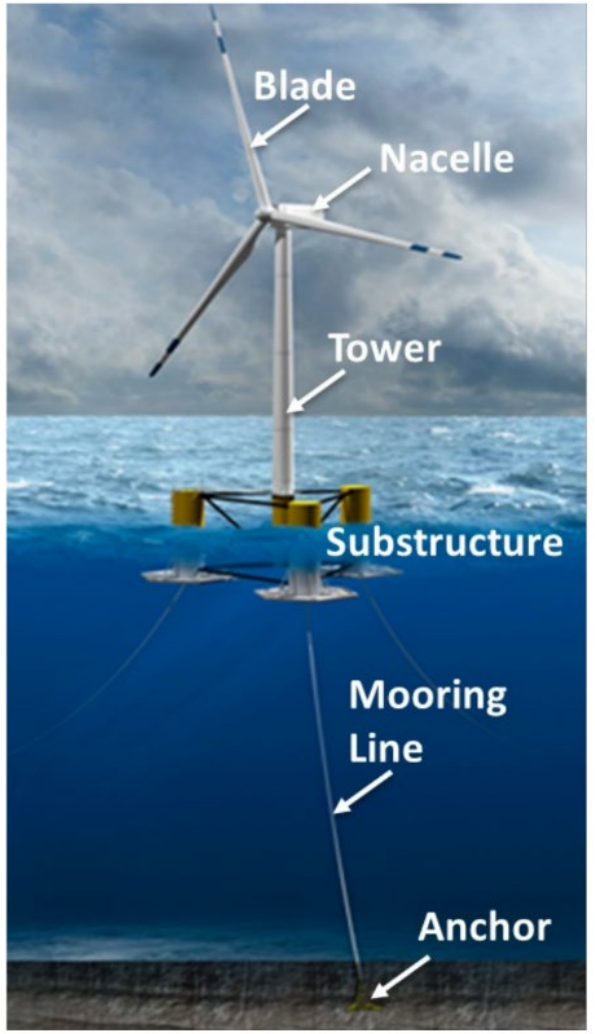
- No Action: no offshore wind development in the California Lease Areas

Alternative B

- Offshore wind development in the Lease Areas – *without* mitigation

Alternative C – Proposed Action

- Offshore wind development in the Lease Areas – *with* programmatic mitigation measures



Expected Outcomes of Record of Decision (ROD) for California Programmatic EIS

Identify programmatic mitigation measures which:

- May be incorporated directly in COPs by lessees; or
- May be required by BOEM as conditions of approval for COPs

Ability for projects proposed within lease areas to use a tiered environmental review process that builds on the outcomes of the PEIS in later project-specific analyses.

The Record of Decision (ROD) for the California Programmatic EIS will NOT approve any activities.

www.boem.gov/caoffshorewindpeis

California Offshore Wind Programmatic EIS Review Process

EISs have a 2-year timeline by law

Public Scoping Winter 2024

- Published Notice of Intent in *Federal Register* Dec 20, 2023
- 60 day public comment period closed Feb 20, 2024
- 187 comments received
- 2 virtual public meetings Feb 6 & 8
- Gathered input on issues and alternatives

Draft PEIS Autumn 2024

- Prepare with cooperating agencies/entities
- Publish Notice of Availability in *Federal Register*
- Public comment period
- Hold public meetings

Final PEIS Summer 2025

- Address public comments with cooperating agencies
- Publish Notice of Availability in *Federal Register*

Record of Decision Late 2025

- Minimum 30-day waiting period after Final PEIS

The Record of Decision (ROD) for the California Offshore Wind PEIS will NOT approve any activities.

BOEM will conduct project-specific EISs on COPs once they are received.

www.boem.gov/caoffshorewindpeis

BOEM Bureau of Ocean Energy Management

BOEM Renewable Energy Process

AB 525 Workshop

March 29, 2024

Matthew Blazek | Renewable Energy Specialist

BOEM's Staged Offshore Wind Energy Authorization Process

Planning & Analysis	Leasing	Site Assessment	Construction & Operations
~ 2 YEARS	~ 1-2 YEARS	UP TO 5 YEARS	~ 3 YEARS (+25)
• Intergovernmental Task Force • Request for Information or Call for Information and Nominations • Area Identification • Environmental Reviews	• Publish Leasing Notices • Conduct Auction or Negotiate Lease Terms • Issue Lease(s)	• Site Characterization • Site Assessment Plan	• Construction & Operations Plan • Facility Design Report and Fabrication & Installation Report • Decommissioning • Environmental and Technical Reviews

BOEM coordinates and consults with affected Tribal, State, and local governments and other Federal agencies

Multiple opportunities for public input

BOEM California Intergovernmental Renewable Energy Task Force

Purpose

- Provide coordination with Tribal, Federal, State, & local governments
- Discuss stakeholder issues and concerns
- Exchange information about offshore and coastal resources, uses, and priorities
- Provide input to BOEM renewable energy leasing decisions
- Does not replace consultation under existing Federal laws and regulations

History

- Established in 2016 per request from former Governor Brown
- Five meetings held from 2016 through 2022

Federal Advisory Committee Act (FACA)

- Task Force is not chartered under FACA
- Membership is restricted to Federal, State, local, & federally recognized Tribal governmental bodies

Proposed BOEM 2024 Offshore Wind Lease Activities

Current Offshore Wind Lessees

- Continued submission and review of communication plans, survey plans
- Some lessee survey activities expected to take place in 2024

Future California Leasing Areas

- Conduct outreach with Tribal governments, stakeholders, and local, State, and Federal agencies
- Continuing to collaborate with the State of California on AB 525 Strategic Plan and identify additional areas for potential leasing
- Collect data and information in partnership with NOAA's National Centers for Coastal Ocean Science (NCCOS) to inform any future decision-making

BOEM

Bureau of Ocean Energy Management

BOEM.gov

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Chapter 10: Offshore Wind Permitting

Eli Harland

Assembly Bill 525 Draft Offshore Wind Strategic Plan Chapter 10: Offshore Wind Permitting

Eli Harland, Offshore Wind Federal Programs & Outreach Liaison
Siting, Transmission, and Environmental Protection Division
March 29, 2024

Requirements for Permitting from AB 525

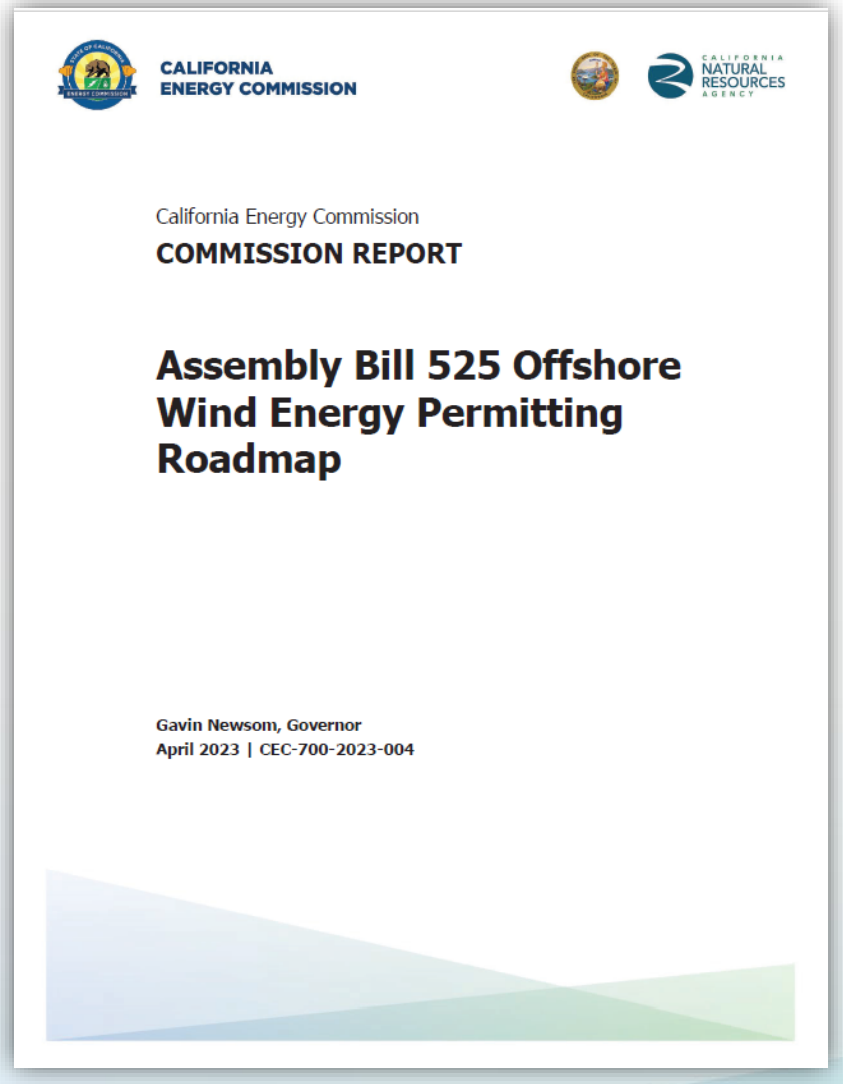
A chapter in strategic plan on permitting that includes the findings of the Permitting Roadmap

Permitting Roadmap required to:

- Goal for permitting time frame
- Describe local, state, federal roles
- Alignment with federal agencies and coordination of NEPA and CEQA

Relevant local, state, and federal agencies, including, the California Coastal Commission, the Department of Fish and Wildlife, and the State Lands Commission, interested California Native American tribes, and affected stakeholders

AB 525 Offshore Wind Energy Permitting Roadmap



Background

- 2016 federal & state MOU
- Ongoing state agency coordination
- Conceptual permitting roadmap
- Permitting Roadmap
- Public Workshop

Approaches

- Discussion of local, state, and federal permitting
- Several approaches considered
- Coordinated permitting approaches
- Environmental review approaches
- Supporting resources for agencies

Coordinated Permitting Approach

NEPA
NATIONAL ENVIRONMENTAL POLICY ACT

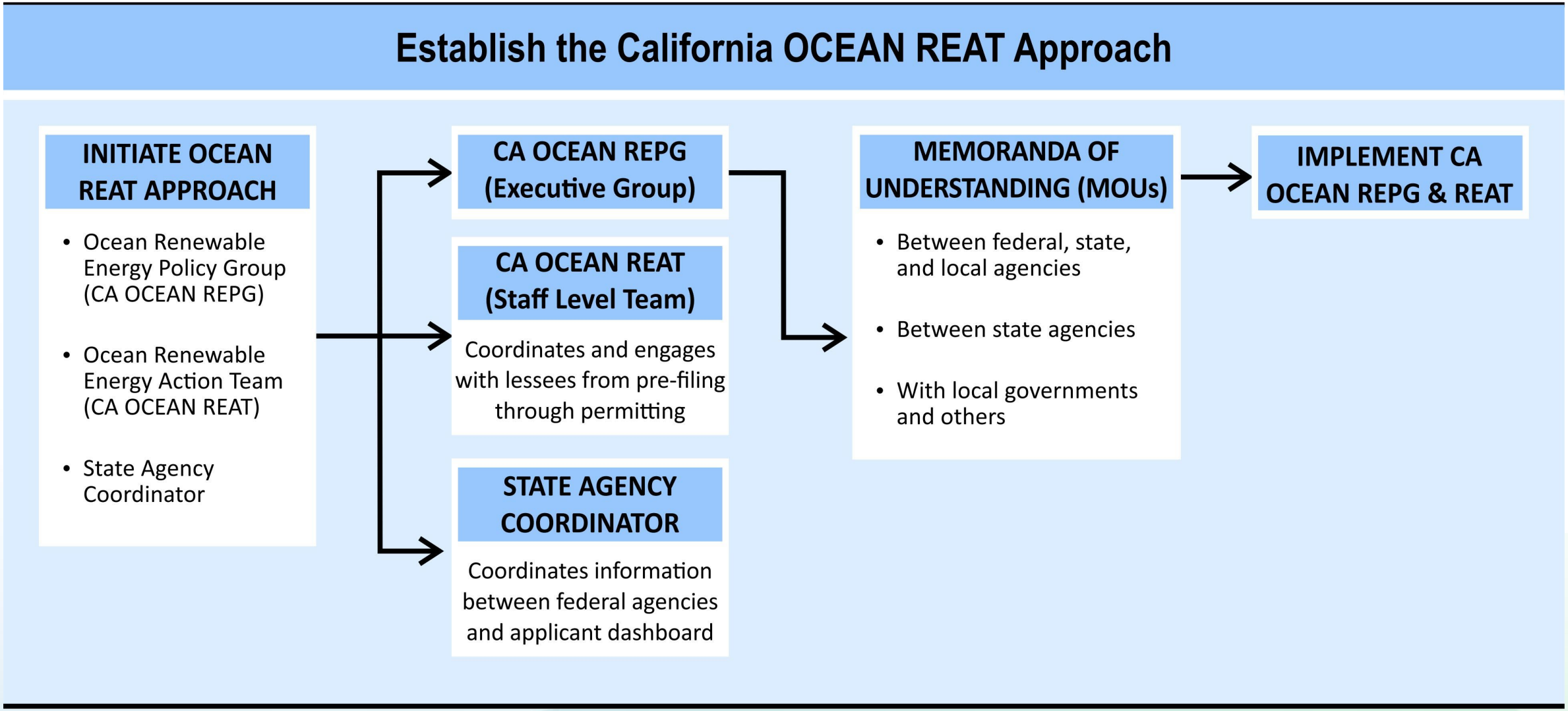
BOEM
Bureau of Ocean Energy Management

CZMA
Coastal Zone Management Act

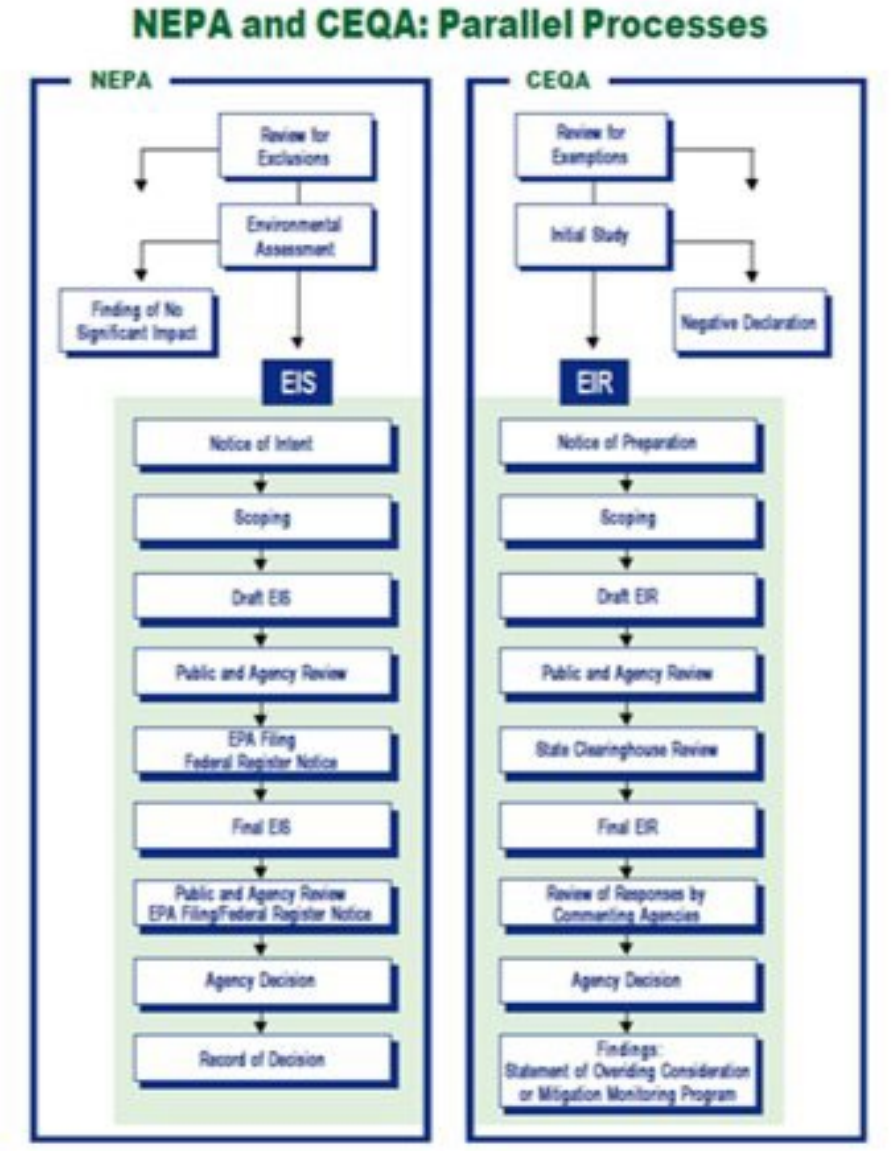
Comprised of agencies with a role in the planning, environmental review and permitting aspects of offshore wind off the coast of California.

- **Ocean Renewable Energy Policy Group (REPG)**
- **Ocean Renewable Energy Action Team (REAT)**
- **Establishing timelines and review process**

Example of Coordinated Approach



Environmental Review Approaches



Joint CEQA and NEPA Documents

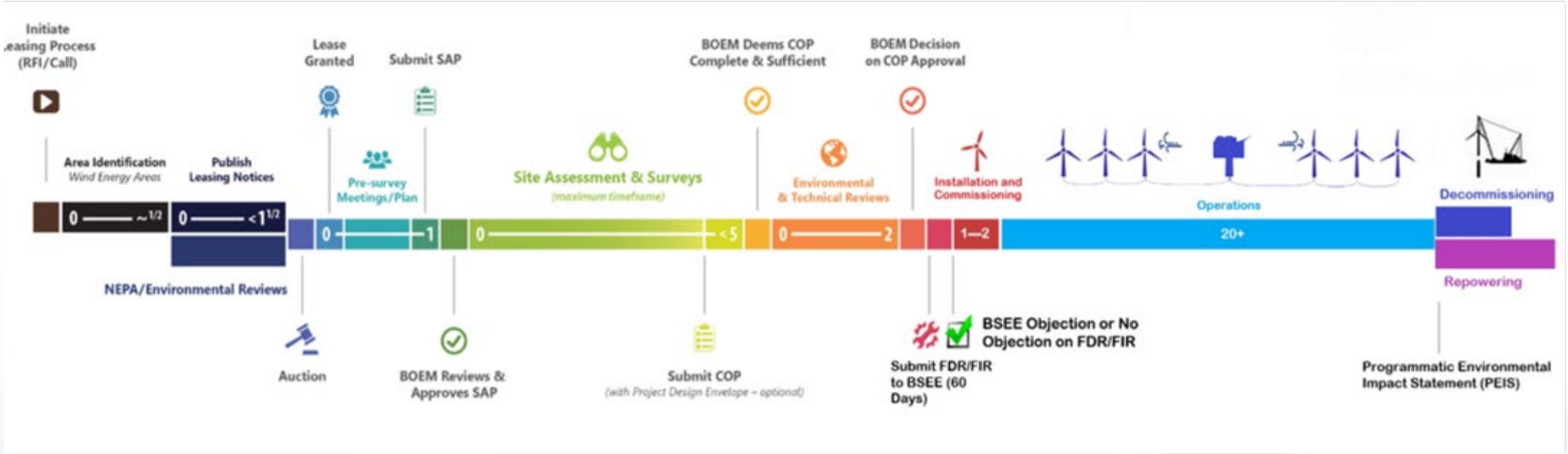
- Efficiency
- Consistency
- Simplicity and public accessibility
- Can be challenging to align

Programmatic Environmental Documents

- Sets the stage for specific projects
- Program-wide strategies
- Can define range of construction activities (uncertainty and complex impact analysis)

BOEM's Offshore Wind Authorization Process and Lifecycle Milestones

Future potential leasing — **The first 5 PACW-1 leases can be thought of in this approximate timeframe**



Source: Bureau of Ocean Energy Management

Offshore Wind Permitting Findings and Recommendations

- The permitting process for any large infrastructure such as offshore wind is complex and involves numerous state, federal, and local agencies.
- A coordinated multi-agency permitting approach was developed to streamline the permitting for large renewable projects in the California desert.
  - *The Renewable Energy Action Team (REAT) and Renewable Energy Policy Group (REPG) ensured coordination.*

Recommendations:

- Consider developing a coordinated, comprehensive, and efficient permitting process modeled on the successful REAT approach called the Ocean REAT.
- Engage early and consistently with BOEM on its offshore wind Programmatic Environmental Impact Statement (PEIS) to ensure the states priorities are reflected.

California State Lands Commission

Jennifer Lucchesi

Chapter 10: Offshore Wind Permitting

CALIFORNIA STATE LANDS COMMISSION

March 29, 2024

California State
Lands Commission

Intro to State Lands Commission

- The State Lands Commission is primarily a land and resource management agency (very narrow regulatory roles)
- Governed by a 3-member Commission including the Lieutenant Governor, the State Controller, and the Governor Appointed Director of Finance
- All decisions are made at public Commission meetings that are held approximately every 2 months

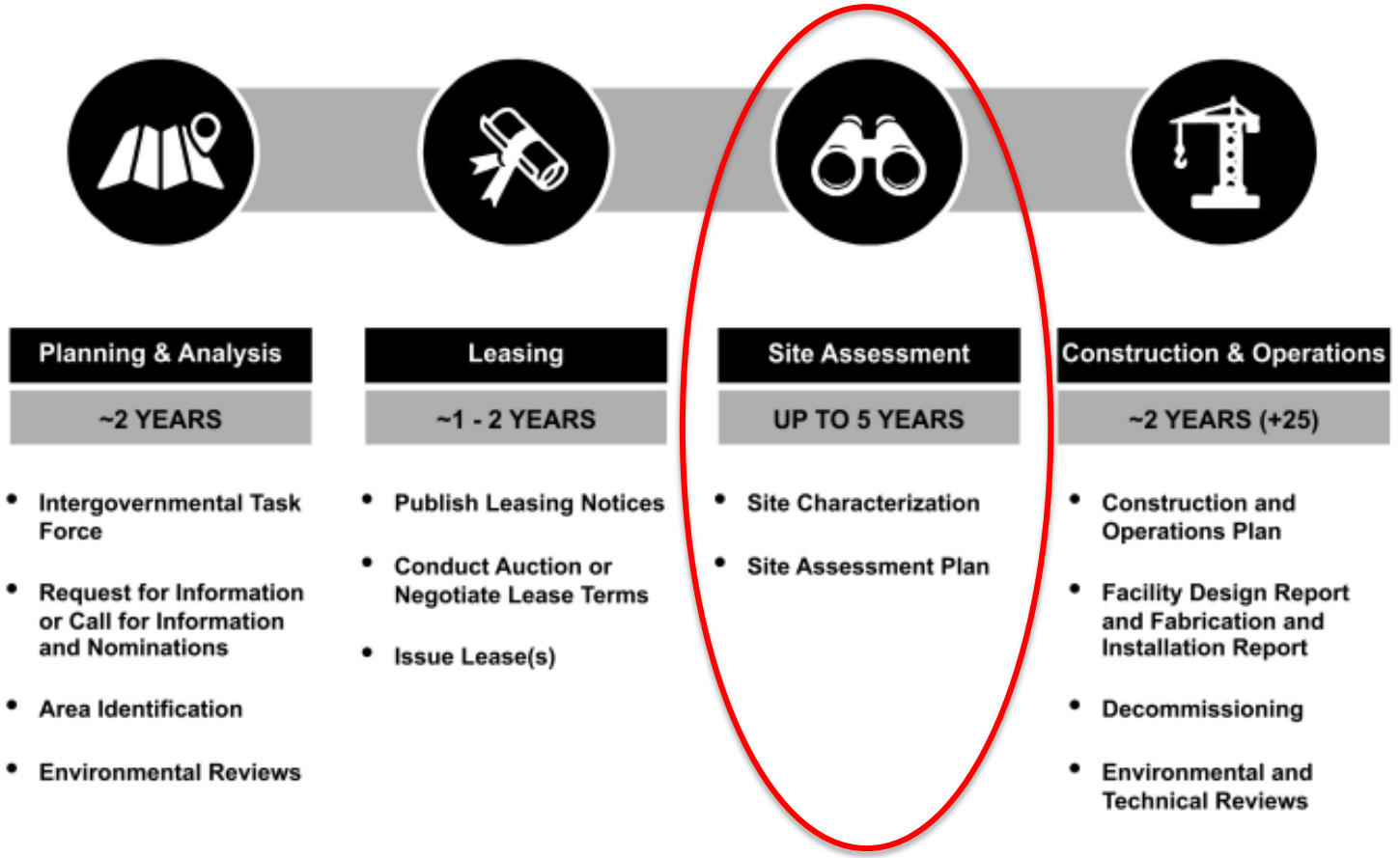


Land Management

- Jurisdiction – Public Trust Lands
  - Mean high tide line to 3 miles offshore
  - Beds of navigable waterways
- Public Trust consistent development and uses
- Best interests of the State

CSLC Role in Offshore Wind Projects

- Offshore geophysical survey permits and geological sampling permits



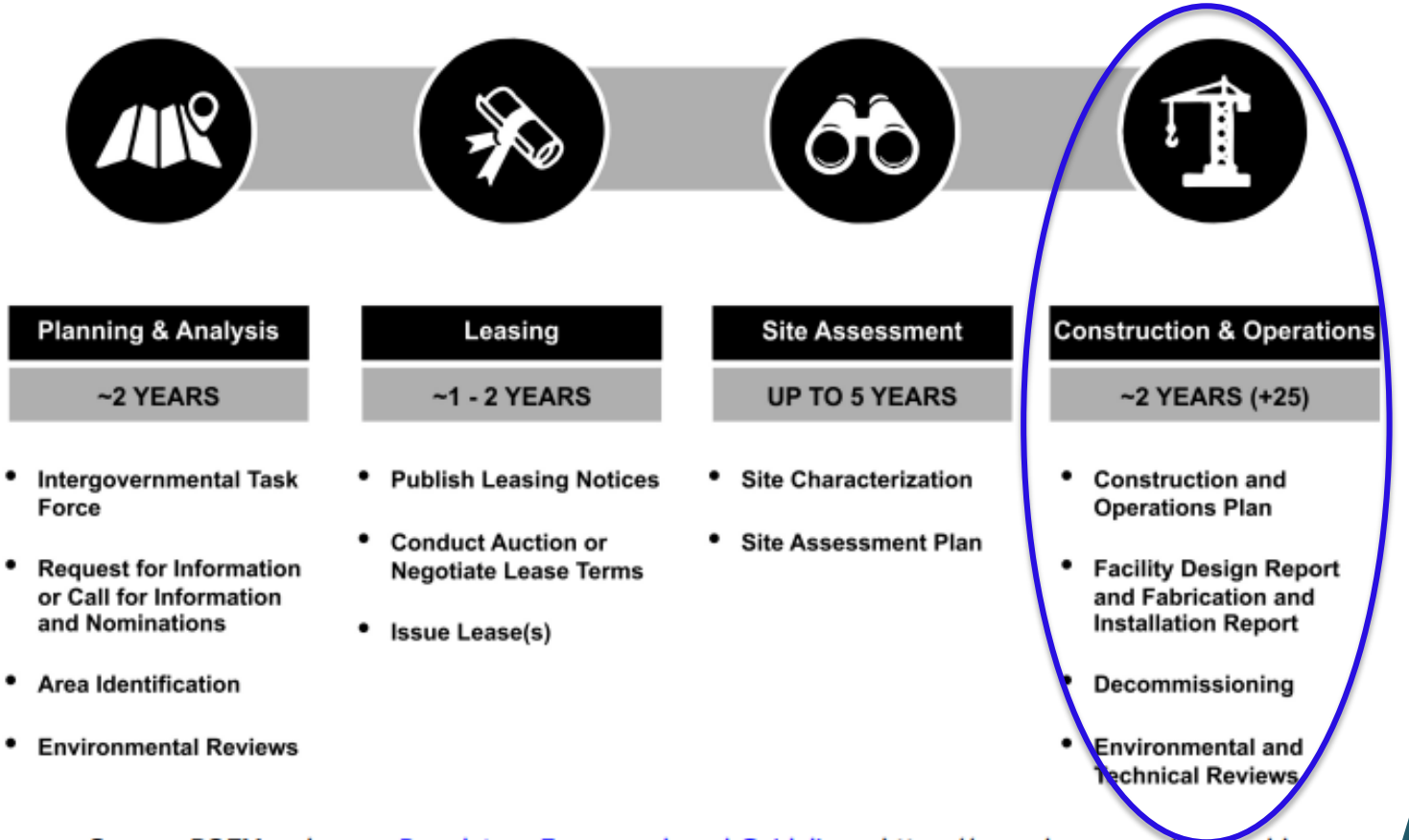
Source: BOEM webpage, Regulatory Framework and Guidelines, https://www.boem.gov/renewable-energy/regulatory-framework-and-guidelines

Offshore Survey and Sampling Permits

- Non-exclusive permits to qualified operators
- Geophysical surveys using low energy survey equipment covered by permit program
- Geological sampling subject to site and activity specific review
- Permit terms and conditions to:
  - Limit impacts to wildlife, marine environment
  - Reduce conflicts with ocean users

CSLC Roles for Offshore Wind Projects

- California Environmental Quality Act (CEQA) lead agency
- Leasing of state lands for offshore wind components (e.g., export cables)



Source: BOEM webpage, Regulatory Framework and Guidelines, https://www.boem.gov/renewable-energy/regulatory-framework-and-guidelines

Leasing of State Lands

- Lease application for offshore wind component parts (e.g., export cables) to be placed in/on state lands
- Evaluation
  - Environmental impacts (CEQA)
  - Consistent with the Public Trust Doctrine
  - Best interests of the state
- Lease terms, conditions, surety, rent

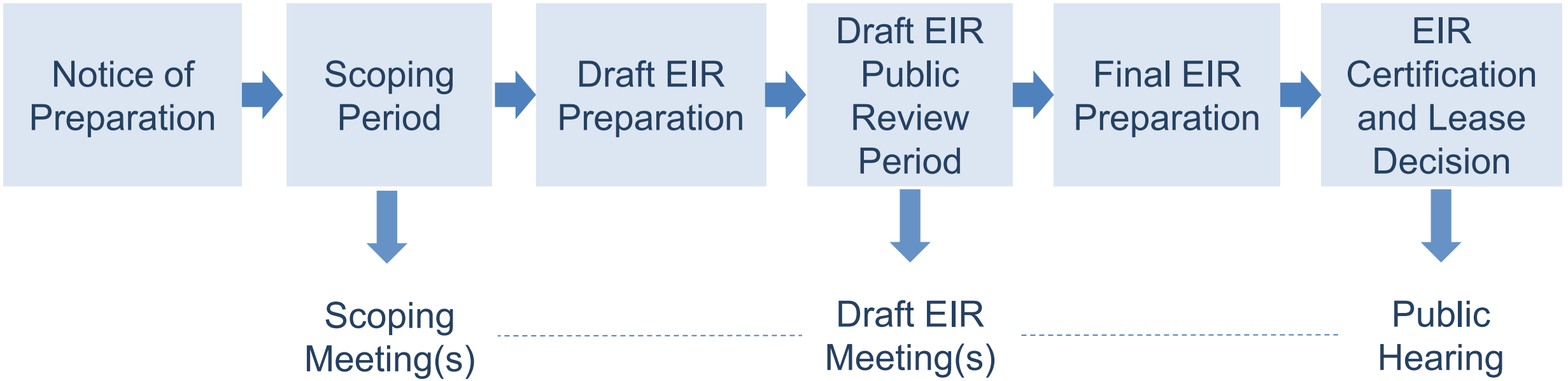
CEQA Lead Agency

- SB 286 (McGuire, 2023)
  - CSLC CEQA lead agency for all offshore wind projects
- Inform decisionmakers and public about potential environmental impacts of proposed projects
- Mitigation measures to prevent or reduce identified environmental impacts
- Consideration of project alternatives
- Examine “whole of the project”

Coordinated Environmental Review

- Preparation of joint CEQA and NEPA document with state and federal agencies
  - Efficiencies from preparation of a single document to support multiple agencies' decisions
  - Consistency in analysis, impact conclusions, and mitigation measures
  - Simplicity and public accessibility – one process, one document, less confusing and time consuming
- Program and project-specific analysis

Environmental Impact Report (EIR) Process



Tribal Consultation

- AB 52 (Gatto, 2014)
  - Tribal consultation during the CEQA process
- CSLC Tribal Consultation Policy
  - Mutual education
  - Mutual respect
  - Outreach and communication
  - Timely notice and information sharing

Additional Considerations

- Environmental Justice
- Climate change
- Ocean users
  - Commercial fishing
  - Navigation

www.slc.ca.gov

THANK YOU

Jennifer Lucchesi
Executive Officer
jennifer.lucchesi@slc.ca.gov

California State
Lands Commission

California Coastal Commission

Holly Wyer

California Coastal Commission: Offshore Wind Permitting

AB 525 Draft Strategic Plan Workshop

March 29, 2024

Coastal Commission's Role in Offshore Wind

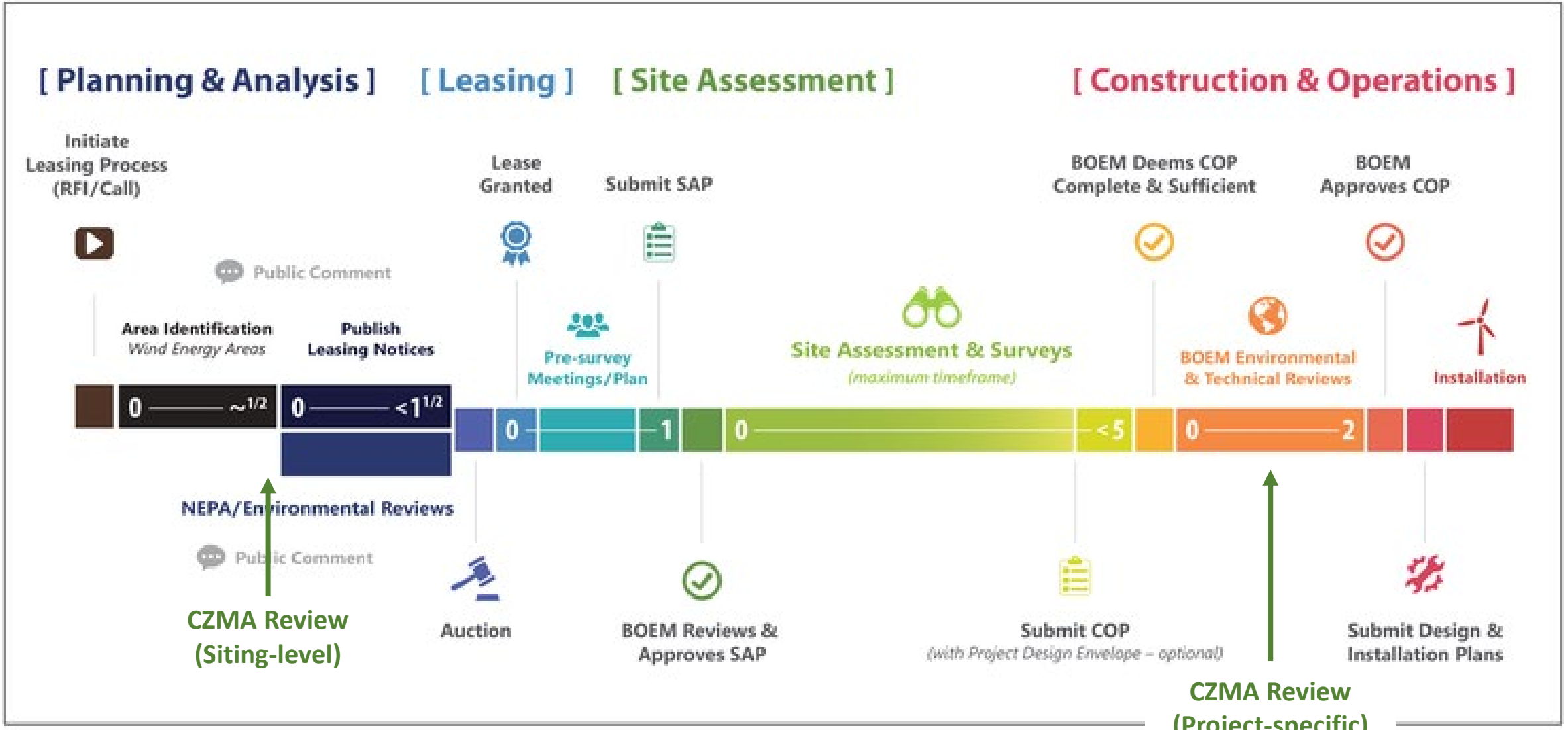
- Authority comes from two laws:
- Coastal Zone Management Act
  - Federal Law
  - Requires consistency with state coastal management policies
- California Coastal Act
  - State Law
  - Regulates development

Photo Credit: Paula Park

Coastal Zone Management Act

- Coastal Zone Management Act
  - Creates partnership between state and federal government; and
  - Provides states with decision-making authority over federal actions that impact state coastal resources.
- Coastal Commission is the only state agency with an official action at the leasing phase
- Further review and actions at the construction and operations phase

BOEM Leasing Process & CZMA Review



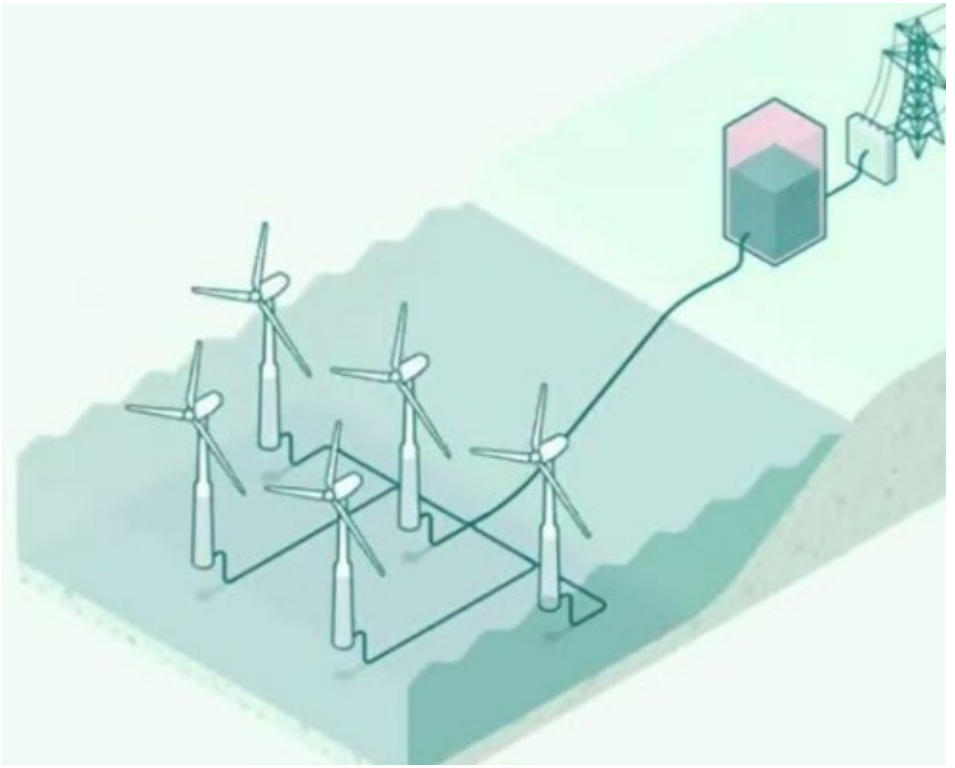
Coastal Act

- Requires Coastal Development Permits for development within the Coastal Zone
  - Landward boundary defined in the Coastal Act, seaward boundary within 3 nautical miles
- Assess impacts to coastal resources and consistency with Coastal Act policies
- SB 286: Consolidated Permit

Photo Credit: Mary Rose

Offshore Wind Context

- Coastal Zone Management Act Review:
  - Lease area development
  - Export cables in federal waters
- Coastal Act Review:
  - Export Cables in state waters
  - Cable landings to shore
  - Shore-side infrastructure
- Concurrent review for projects crossing federal and state waters



Not to scale
Image credit: allsustainablesolutions.com

Thank you

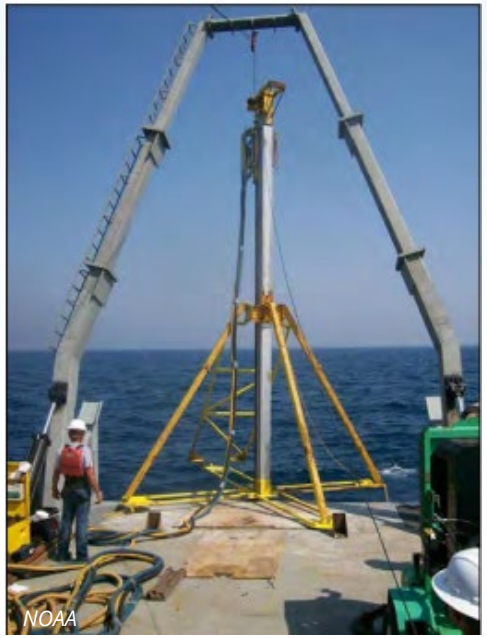
- Contact: Holly.Wyer@coastal.ca.gov

California Department of Fish and Wildlife

Cyndi Dawson

Role in Permitting for Offshore Wind


Lithuania's Ministry of Energy


NOAA

March 29, 2024

California Energy Commission
Workshop on the Draft AB 525 Strategic Plan for Offshore Wind off the Coast of California in Federal Waters

Cyndi Dawson
Senior Environmental Scientist
Marine Region Habitat Conservation Program

CDFW Roles and Responsibilities

- Trustee agency with jurisdiction over conservation, protection, and management of **wildlife, native plants, and the habitat** necessary to maintain biologically sustainable populations.
- Regulatory authority under the CA Endangered Species Act (CESA).
- Management of Marine Protected Area Network and state-managed fisheries

Scientific Collecting Permit (SCP)

When is an SCP required?

- When scientific research will result in “take” of wildlife
- When any scientific equipment are installed inside a Marine Managed Areas (e.g. MPA, Special Closure)

Photo by Brittany Jones, University of Alaska, Fairbanks)

Incidental Take Permit (ITP) & Consistency Determination

When is an ITP recommended?

- Take of a California threatened or endangered species.
- Any phase of offshore wind development, most likely during construction, especially in bays and estuaries for port projects

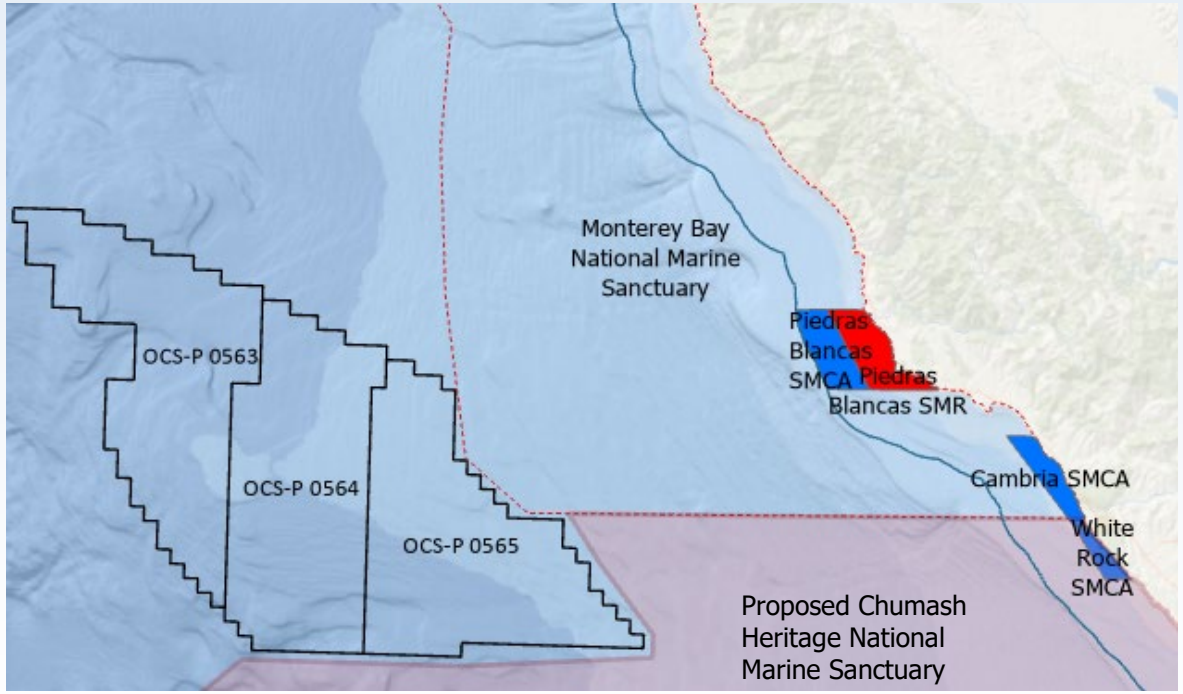
CDFW can authorize take and issue an ITP if:

- The take is incident to an otherwise lawful activity,
- The impacts of the authorized take are minimized and fully mitigated,
- The applicant has ensured adequate funding for the minimization and mitigation measures to be adopted,
- The take will not jeopardize the continued existence of the species.

Other points of engagement

When else would CDFW be involved in permitting?

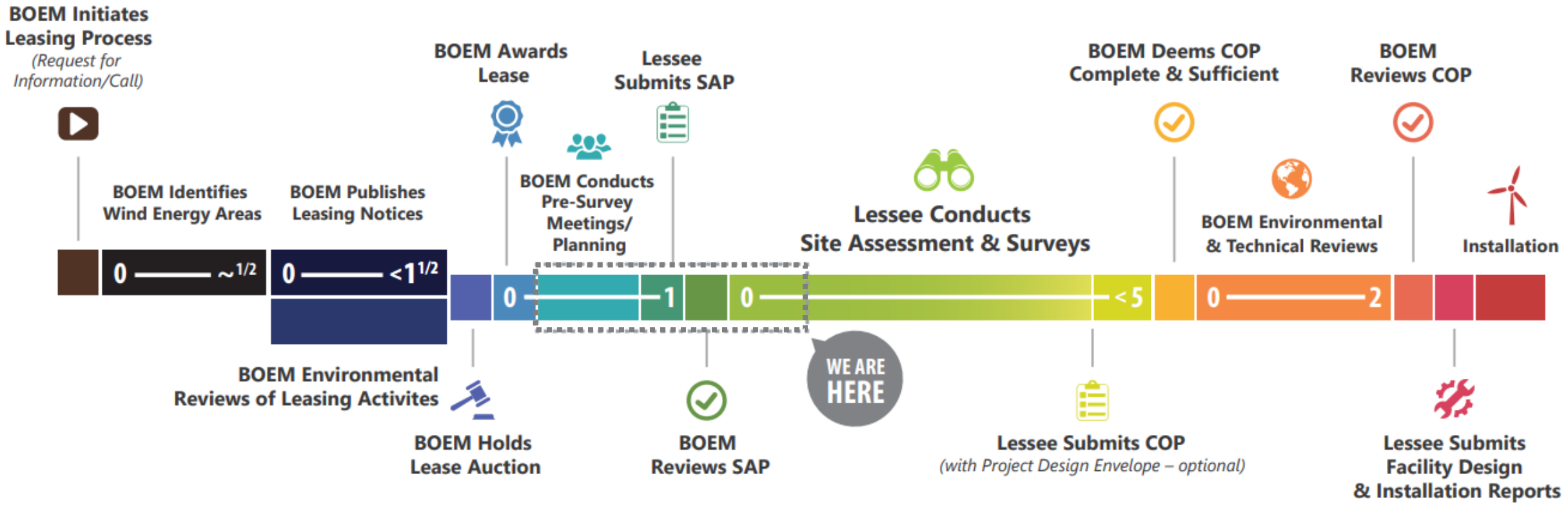
- Direct or indirect impacts on MPA Network
- Substantially impact any river, stream, or lake (i.e. LSA)
- Protected habitat impacts (e.g. eelgrass, EFH)



- Inter-agency consultation

Bureau of Ocean Energy Management Timeline

Planning & Analysis | **Leasing** | **Site Assessment** | **Construction & Operations**



Phases of OSW Development and CDFW Role

Site Characterization Surveys

- High Resolution Geophysical
- Historical and archaeological
- **Habitat and wildlife**

Site Assessment

- Metocean buoys
- Installation/removal

*** BOEM Approved Site Assessment Plan (SAP) is required

Construction & Operation

- **Port facilities**
- Turbines and substation
- **Transmission lines**
- Inter-array cables and moorings
- **Operation and maintenance**

*** BOEM Approved Construction and Operation Plan (COP) required

- **Likely permit issuance**
- Consultation and coordination with permitting agencies

Thank You

CONTACT

offshorerenewableenergy@wildlife.ca.gov

Cyndi Dawson

State Water Resources Control Board

Phillip Crader

The California Water Boards

Offshore Wind Project Water Quality Permitting

Phil Crader
State Water Board, Division of Water Quality

March 29, 2024

Who We Are and What We Do

- Water Boards
  - State Water Resources Control Board
    - Statewide or cross-regional issues, including policies, permits, and plans
  - Nine Regional Water Quality Control Boards
    - Region-specific permits and plans

- The Water Boards have regulatory responsibility for protecting the water quality of
  - 1.6 million acres of lakes,
  - 1.3 million acres of bays and estuaries,
  - 211,000 miles of rivers and streams, and
  - **1,100 miles of exquisite California coastline.**

- If your (proposed) activities or discharges from your property or business could affect California's surface, coastal, or ground waters, in most cases you will need to apply for a permit from the Water Boards.

Water Boards Permitting

- Regulatory requirements vary by activity type and water body
  - Waters of the United States (Federal Clean Water Act - 1972)
    - National Pollutant Discharge Elimination Permits (NPDES) – Discharges to surface waters
    - Clean Water Act Section 401 Certifications – In-water work such as dredge or fill activity in Waters of the U.S.
  - Waters of the State (Porter-Cologne Water Quality Control Act – 1969)
    - State Waste Discharge Requirements (WDRs)
      - In-water work such as dredge or fill activity in non-federal Waters of the State
      - Discharges to surface waters, ground water, or land

Water Boards Permitting

- Permit Types
  - Individual permits
    - Issued for a single project
    - Dischargers file an application
    - Dischargers expected to provide environmental document (CEQA/NEPA)
    - Board issues an individual permit for each application that is filed
    - Higher cost, longer timeframe, specific to a discharge
  - General permits
    - Issued for a class of projects with common characteristics
    - Environmental documentation is prepared by the Water Board before the general permit is adopted
    - After adoption, dischargers file a Notice of Intent to enroll in the permit
    - Lower cost, shorter timeframe, applies to a general category of work

Water Boards Permitting

- Water Boards have prioritized the expedited application review and permit issuance for clean energy project. We need your help. Please reach out early and often.
- When permitting a project, the Boards will consider potential discharges associated with the planning, construction, operation, and maintenance of the project.
- **Activities that can affect water include, but are not limited to:**
  - discharge of process wastewater not discharging to a sewer (factories, cooling water, etc.)
  - waste containments (landfills, waste ponds, etc.)
  - construction sites
  - boatyards
  - discharges of pumped groundwater and cleanup (underground tank cleanup, dewatering, spills)
  - material handling areas draining to storm drains
  - filling of wetlands
  - dredging, filling and disposal of dredge wastes
  - commercial activities not discharging to a sewer (e.g., factory wastewater, storm drain)
  - waste to land

Offshore Wind Projects

Offshore Wind Project activities that might require permits:

- Pre-construction surveys – limited term
  - Sounding
  - Benthic sampling
- Construction work – limited term
  - In-water work
  - Waste Discharge Permits
  - Construction Stormwater General Permit
- Operation and Maintenance – life of project
  - Structure cleaning, repairs, and other in-water activity
  - Repairs to transmission lines or other infrastructure
    - In water or on land
  - Industrial Stormwater General Permit

Resources

Citizen's Guide to Working with the California Water Boards:
waterboards.ca.gov/publications_forms/publications/general/docs/citizenguide.pdf

National Pollutant Discharge Elimination System Permitting Frequently Asked Questions:
https://www.waterboards.ca.gov/water_issues/programs/npdes/

State Waste Discharge Permit General Information:
https://www.waterboards.ca.gov/water_issues/programs/waste_discharge_requirements/

Dredge or Fill Permitting Frequently Asked Questions:
https://www.waterboards.ca.gov/water_issues/programs/cwa401/#faqs

California Ocean Plan:
https://www.waterboards.ca.gov/water_issues/programs/ocean/docs/oceanplan2019.pdf

Phil Crader, Assistant Deputy Director
State Water Board, Division of Water Quality
phillip.crader@waterboards.ca.gov
(916) 341-5455

Thank You!

CALIFORNIA Water Boards | State Water Resources Control Board

Comment Period

Public Comments

Instruction
- 3 minutes or less per person
- 1 representative per organization

Zoom App/Online
- Click “raise hand”

Telephone
- Press *9 to raise hand
- Press *6 to (un)mute

When called upon
- Will open your line
- Unmute, spell name, state affiliation, if any

3-MINUTE TIMER

For Phone Participation: Dial (669) 900-6833 or (888) 475-4499 Enter Webinar ID: 862 0687 3587

LUNCH BREAK
1:xx to 2:xx

Welcome Back

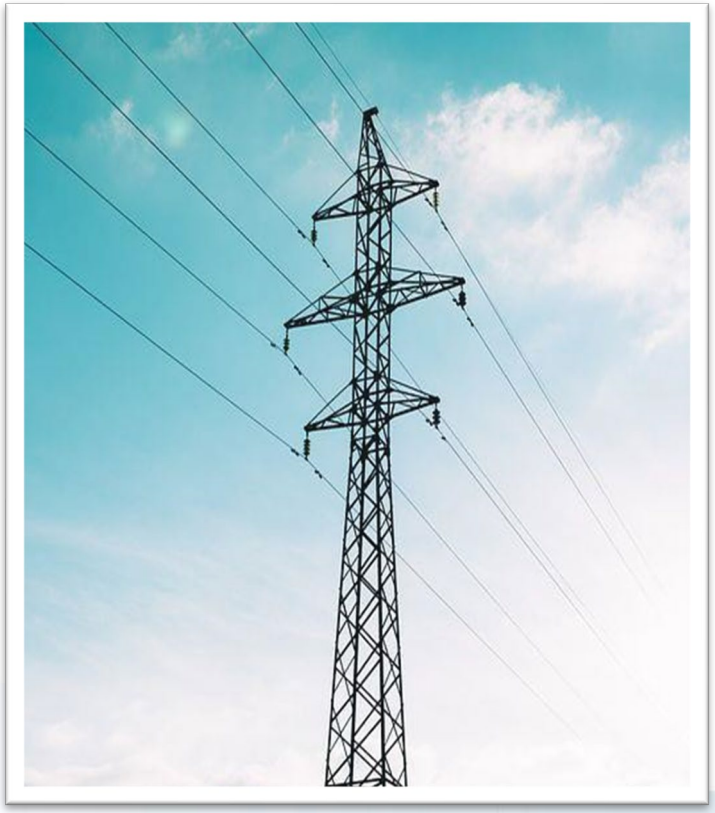
Chapters 8 & 9: Transmission Technologies and Planning

Lorelei Walker

Assembly Bill 525 Draft Offshore Wind Strategic Plan Chapters 8 & 9: Transmission Technologies, Interconnection, and Planning

Lorelei Walker, Offshore Wind Energy Analyst
March 29, 2024

AB 525 Offshore Wind Transmission



AB 525 requires the CEC to:

- Consult with the California Public Utilities Commission (CPUC) and the California Independent System Operator (ISO)
- Assess transmission investments and upgrades necessary to support California's 2030 and 2045 offshore wind planning goals
- Assess the existing transmission infrastructure and capacity
- Assess relevant costs for network upgrades and subsea transmission to support offshore wind energy development

AB 525 Transmission Analytical Inputs

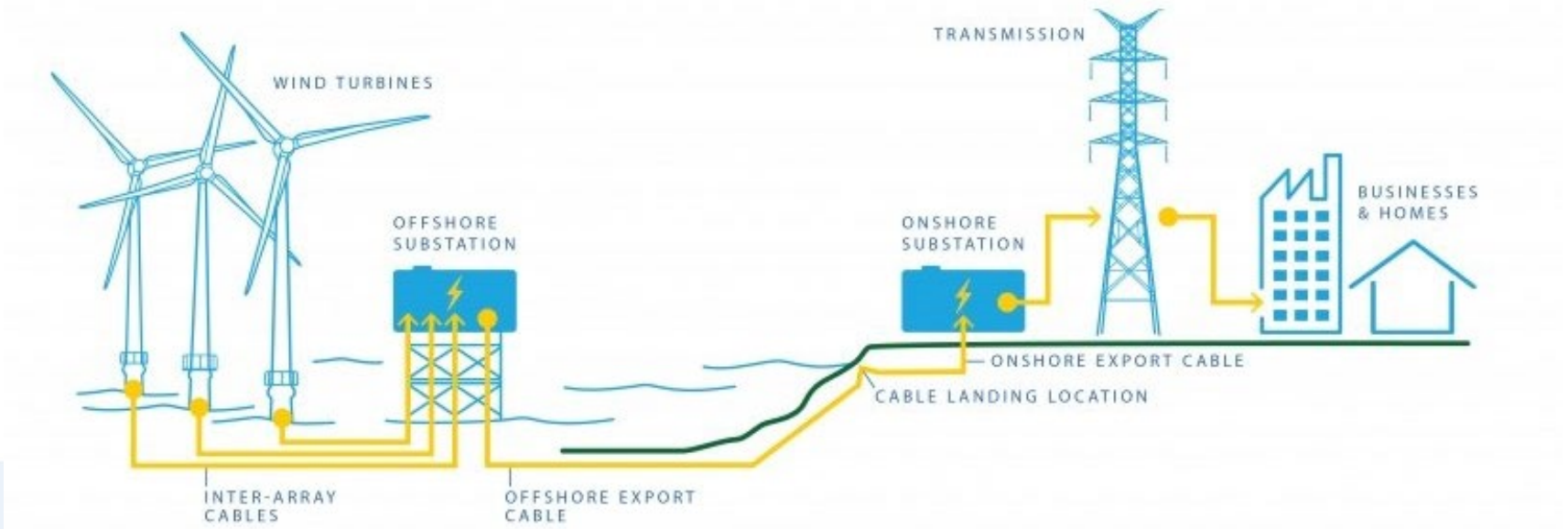
- CPUC Integrated Resource Plan (IRP)
- California ISO Transmission Planning Process (TPP)
- 2020 - 2022 offshore wind studies by Schatz Energy Research Center, Cal Poly Humboldt
- Schatz Energy Research Center report: *Northern California and Southern Oregon Offshore Wind Transmission Study*
- Guidehouse Inc. report: *Offshore Wind Transmission Technologies Assessment: Overview of Existing and Emerging Transmission Technologies*

Chapter 8: Transmission Technology and Alternative Assessment Overview

- Transmission technologies for interconnecting offshore wind projects
  - Current and emerging transmission technologies
  - Offshore wind interconnection concepts
  - Existing North Coast and Central Coast transmission systems
- Transmission technology and alternatives conclusions and recommendations

Transmission Infrastructure Needed

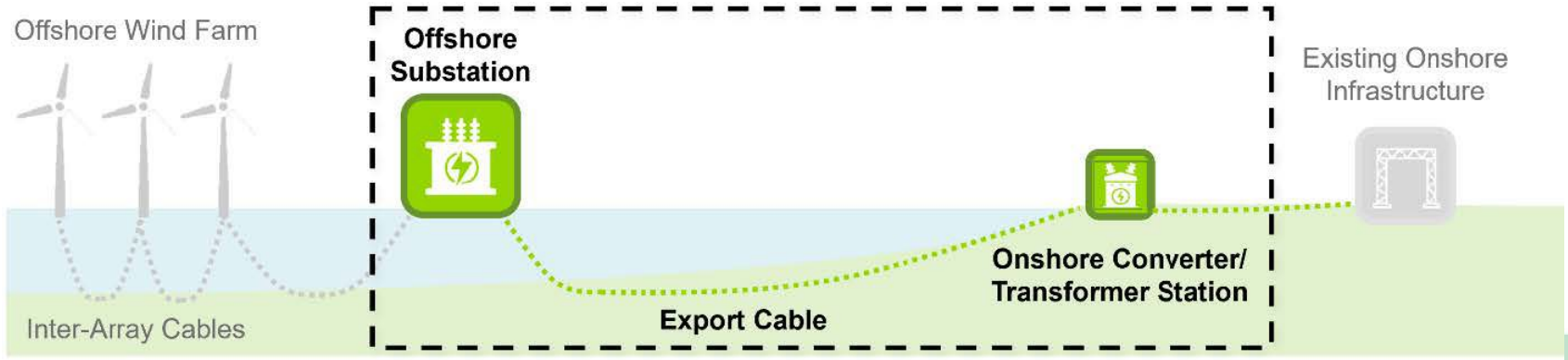
Transmission and interconnection infrastructure are needed to transport electricity generated from offshore wind projects and connect them to the larger transmission system.



Source: U.S. Department of Energy: Grid Deployment Office

Transmission Technologies Assessed

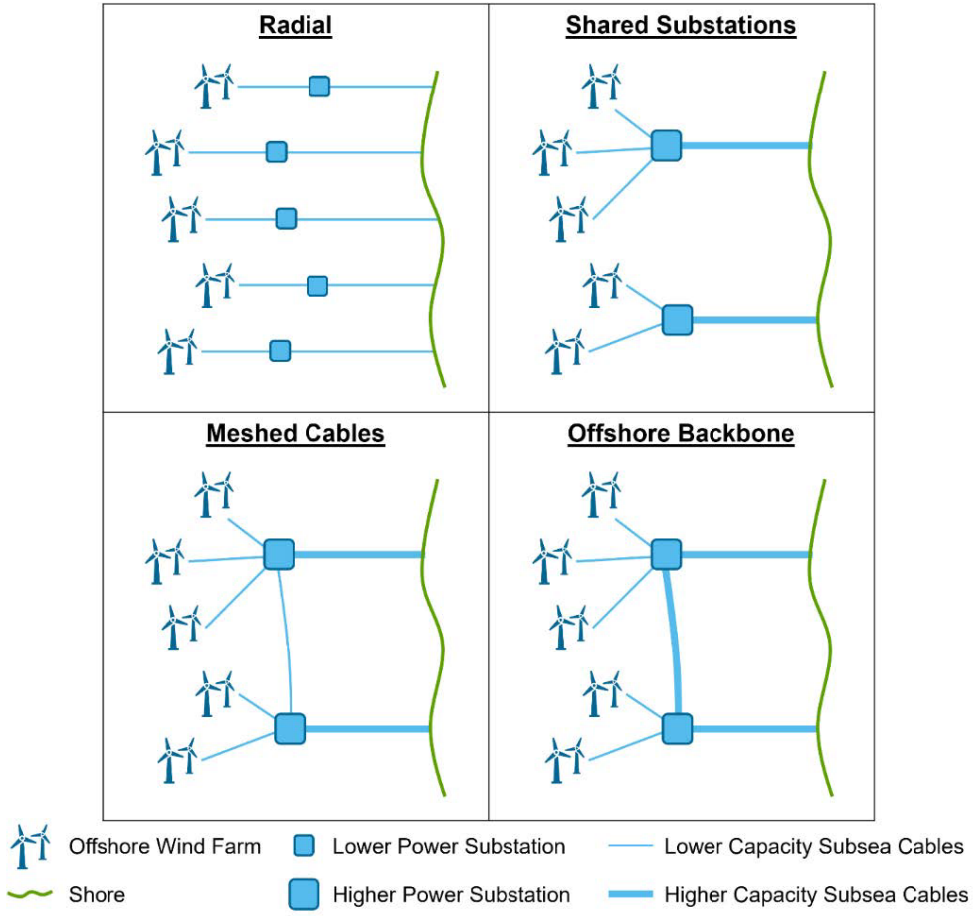
- Assessed the status and costs of offshore wind-related transmission technologies including:
  - High-voltage alternating current (HVAC) and high-voltage direct current (HVDC) export cables
  - Floating offshore substation platforms
  - Onshore converter/transformer stations
  - Other related electrical components



Source: Guidehouse Inc., *Technologies Assessment*

Offshore Interconnection Assessed

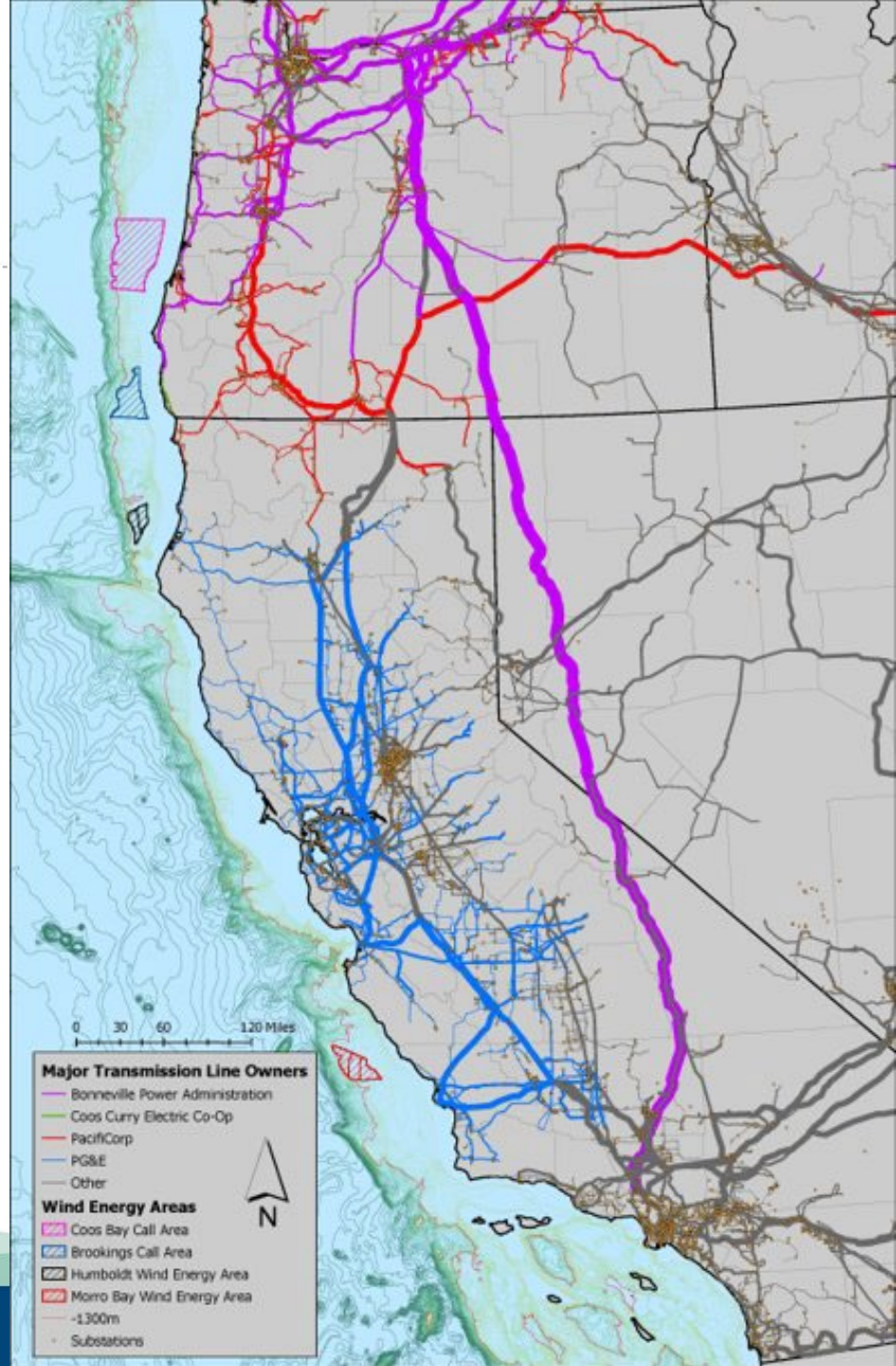
- Assessed offshore wind-related meshed grid and interconnection layout concepts
  - Most projects to date are connected to shore radially using point-to-point cables
  - Concepts can increase reliability and redundancy such as:
    - shared substations
    - meshed grids
    - and offshore backbones



Source: Guidehouse Inc., *Technologies Assessment*

Existing Transmission Infrastructure

- The existing North Coast transmission system includes:
  - 60 and 115 kV facilities serving local loads
  - 115 kV lines running along an east to west corridor serving the coast
- The existing Central Coast transmission system includes:
  - 3 GW available with Diablo Canyon online
  - 5 GW available once Diablo Canyon retires



Chapter 8
Conclusions and Recommendations

- Transmission technologies are still emerging and not yet commercially available including dynamic and higher capacity cables and floating substations.
- Continued assessment of transmission interconnection concepts and phased approaches to transmission development are needed.
- Large investments in upgrades and new transmission infrastructure are needed to deliver electricity to local communities and the larger grid.
- Potential transmission pathways for the North Coast will require additional detailed corridor planning.

Recommendations:

- Continue assessing transmission alternatives for the North and Central Coast offshore wind development to meet the offshore wind planning goals.
- Consider phased approaches to transmission development that examine needs, costs, and benefits in both short-term and long-term.

Chapter 9 Transmission Planning and Interconnection Overview

- Transmission planning processes
- Corridor planning
- Interconnection issues

Transmission Planning Processes

- California must initiate proactive long-term transmission planning now
- California has a robust transmission planning process under the joint agency MOU
- Ongoing transmission planning, including targeted analysis of alternative transmission pathways, is necessary to inform infrastructure decisions for offshore wind
- The CEC, through the Schatz Study, has initiated regional planning with Southern Oregon and is also participating in the Department of Energy's *West Coast Offshore Wind Transmission Study*
- Additional regional planning will be necessary to ensure the benefits of offshore wind can be shared throughout the Western Interconnection

Transmission Corridor and Land Use Planning

- Transmission development is challenging with long linear facilities crossing many land use types and jurisdictions
- The CEC has engaged in successful landscape level transmission planning efforts through the RETI, DRECP, and other corridor planning
- This approach identifies a wide range of potential constraints and conflicts including environmental sensitivities, tribal and cultural resources, land uses and other considerations.
- Locating transmission infrastructure in preferred areas can reduce environmental impacts, permitting costs, and timelines.

Chapter 9
Conclusions and Recommendations

- Proactive planning will be needed to bring transmission projects online to meet California's offshore wind planning goals.
- Landscape level planning for transmission corridors can provide a smoother path for transmission projects from planning to permitting.
- Assessing transmission needs for host communities and other rural communities along transmission routes can help address reliability and equity issues.

Recommendations:

- Foster regional bulk transmission planning to support West Coast offshore wind development that can benefit the Western Interconnection.
- Identify and prioritize alternative points of interconnection that limit the number of landfall sites and minimize environmental impacts and long run costs.

Schatz Energy Research Center

Jim Zoellick and Arne Jacobson

Northern CA and Southern OR Offshore Wind Transmission Study

Workshop on Assembly Bill 525: Draft Strategic Plan for Offshore Wind Development

March 29, 2024

Jim Zoellick, Principal Engineer
Arne Jacobson, Ph.D., Director
Schatz Energy Research Center

Introductions

Project Sponsors and Core Steering Group Members

CALIFORNIA ENERGY COMMISSION

Agreement No. 700-22-002

OREGON DEPARTMENT OF ENERGY

Project Team

Team lead: Arne Jacobson; **Project manager**: Jim Zoellick; **Team members**: Charles Chamberlin, Eli Wallach, Ian Guerrero, Andrew Harris, Greyson Adams, Lorelei Walker*

+ Anton Fund Interns: Claire Ingvoldsen*, Donovan Wakeman*

*Student researchers

Partners

QUANTA TECHNOLOGY

NREL NATIONAL RENEWABLE ENERGY LABORATORY

MOTT MACDONALD

H. T. HARVEY & ASSOCIATES Ecological Consultants

CONAWAY GEOMATICS

Offshore Wind Generation Scenarios

The analysis considered three scales of offshore wind development…

Development Scenario	OSW Capacity S. Oregon	OSW Capacity N. California	Total OSW Capacity
Low	3.1 GW	4.1 GW	7.2 GW
Mid Range	3.1 GW	9.3 GW	12.4 GW
High	9.8 GW	16.0 GW	25.8 GW

Image source: Wikipedia Commons (https://upload.wikimedia.org/wikipedia/commons/7/76/Agucadoura_WindFloat_Prototype.jpg

Offshore Wind Generation Scenarios

The analysis considered three scales of offshore wind development…

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Mid Range	3.1 GW	9.3 GW	12.4 GW
High	9.8 GW	16.0 GW	25.8 GW

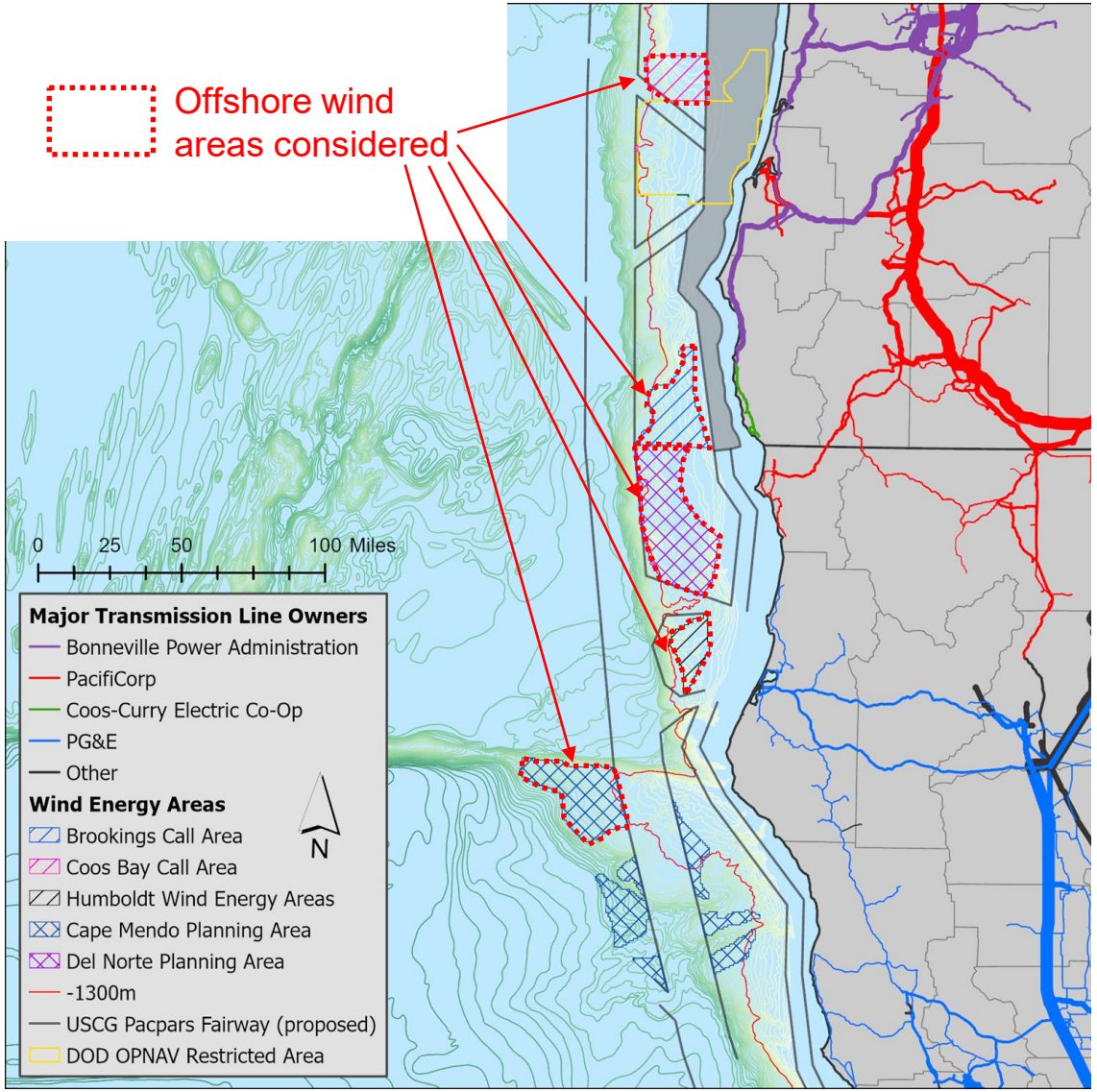
… and 10 transmission alternatives

Development Scenario	Total OSW Capacity	# of Transmission Alternatives
Low	7.2 GW	2
Mid Range	12.4 GW	6
High	25.8 GW	2

230 kV transmission line near Langlois, Oregon

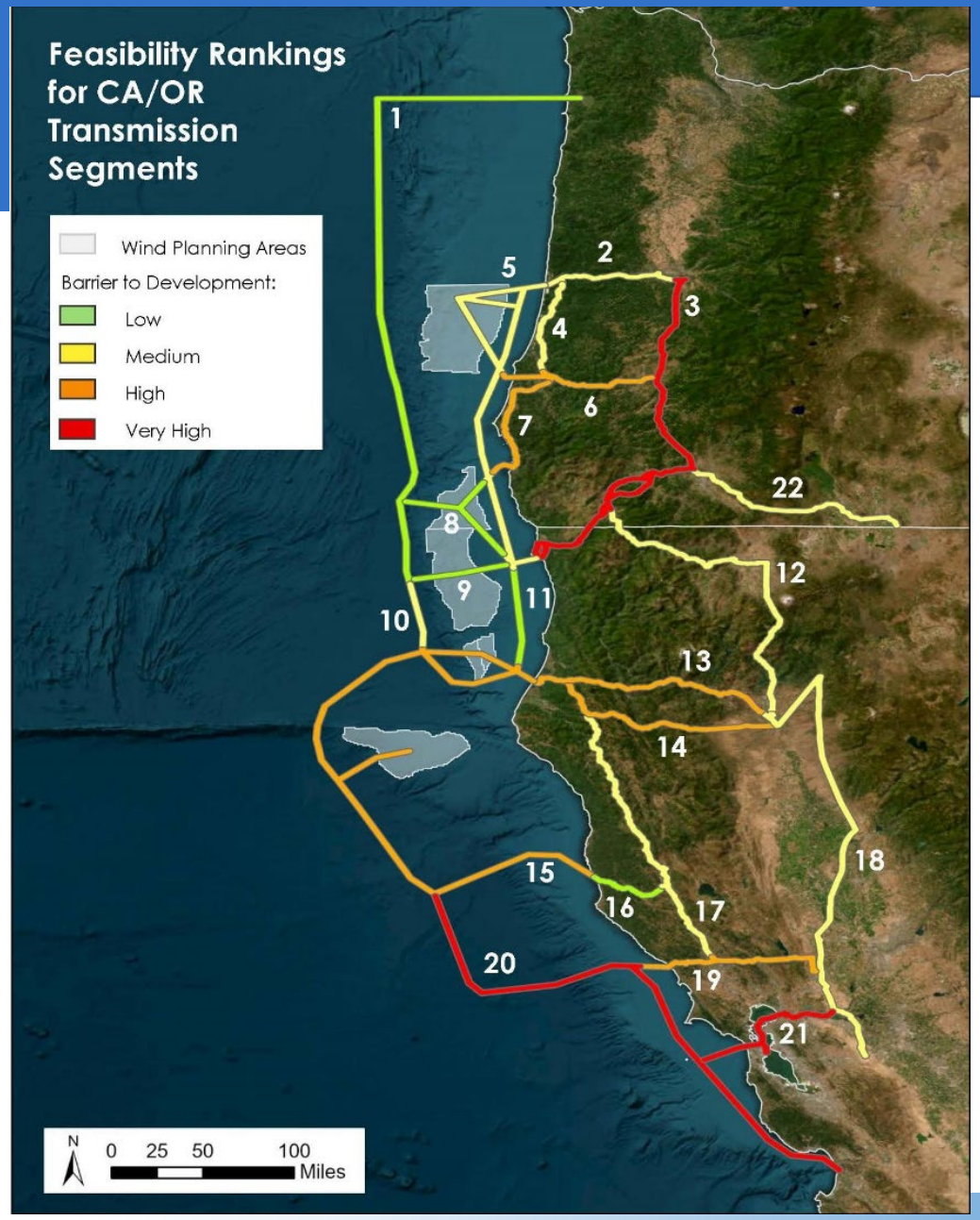
Offshore Wind Development Overview

- The OSW areas considered were based on BOEM designated areas and CEC sea space analyses
- We considered potential restrictions:
  - Draft Pacific Coast Port Access Route Study (PAC-PARS)
  - DOD OPNAV restrictions



Transmission Corridors
Preliminary Assessment

- Transmission routes considered are notional and generally follow existing rights of way. Eventual transmission routes may differ.
- A high level assessment was conducted to assess potential barriers to development.
- Barriers were ranked from low to very high.
- Barriers included sensitive habitats, land use & permitting challenges.



New Transmission Assumptions

A range of transmission technologies were considered, including:

- onshore and offshore technologies,
- high voltage AC and DC transmission technologies,
- dynamic undersea cables,
- floating substations and HVDC conversion stations,
- an offshore HVDC backbone and a mesh network that connect offshore wind farms, and
- phase-shifting transformers that can deliver power to local communities.

Note: Some of these technologies are not currently available, but rather are under development.

Credit: Senu Sirnivas/NREL

New Transmission Assumptions

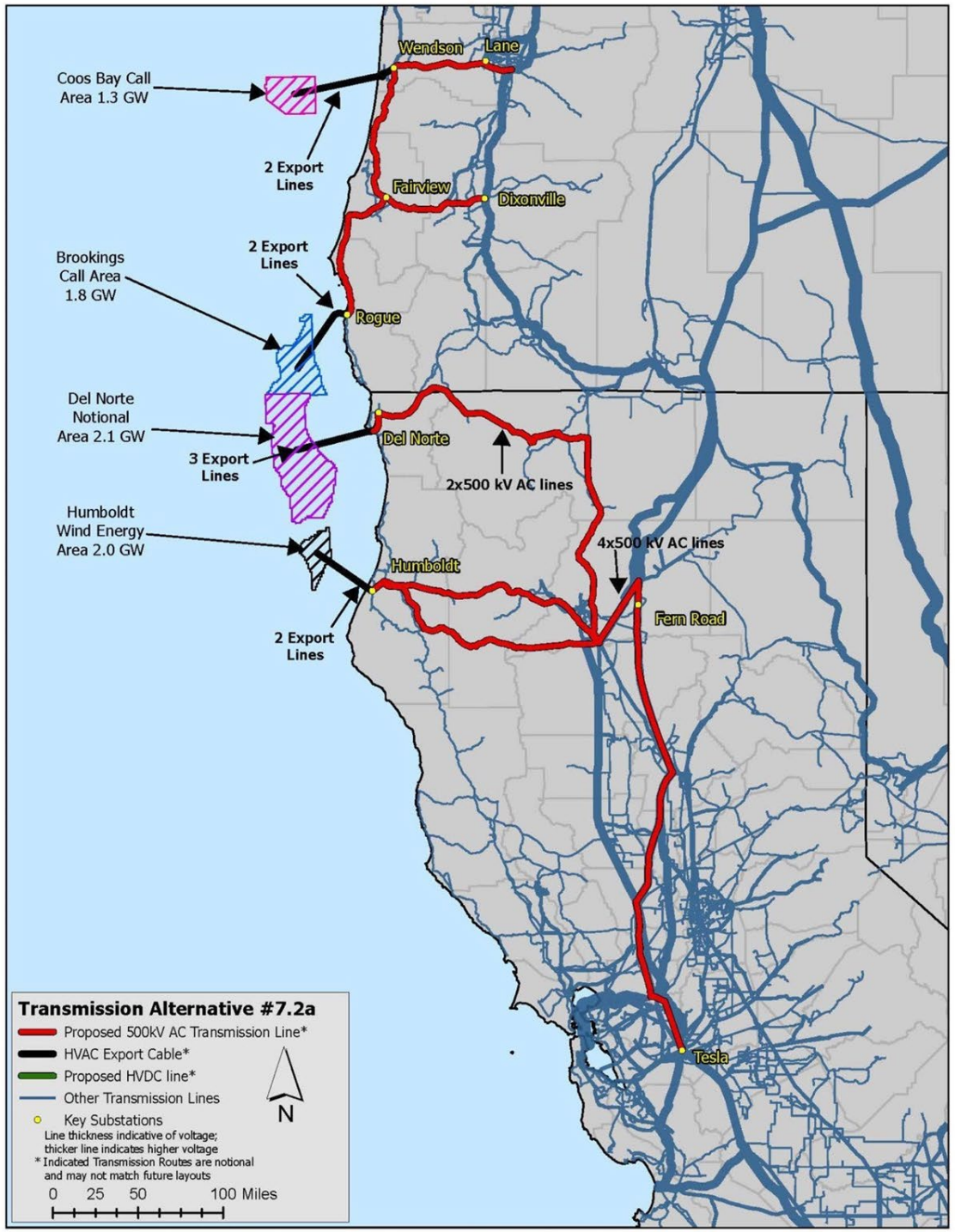
Methodology:

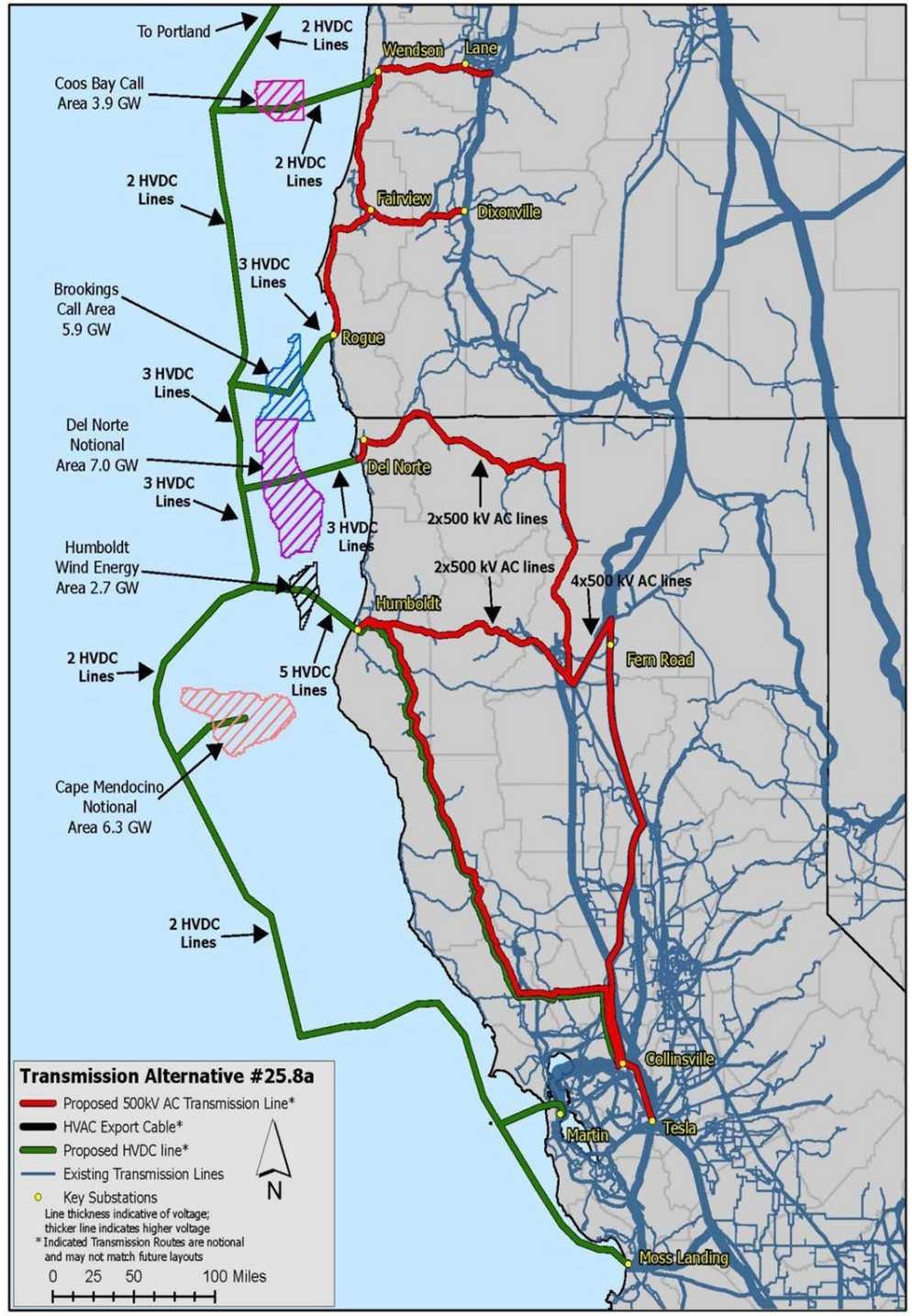
1. Determine OSW capacity.
2. Size transmission.
3. Run steady-state, summer peak power flow analysis with OSW and new transmission.
4. Determine need for network upgrades.
5. Determine cost of new transmission infrastructure and network upgrades.
6. Assess costs and benefits.

Goal: To explore, not optimize.

Technology	Capacity	Notes
HVAC overhead (500 kV)	3.2 GW	Mature in use technology currently available.
HVAC undersea (400 kV)	1.0 GW	Technology in development; requires dynamic cables and floating substations that do not currently exist. Assumed maximum distance of 60 miles due to higher cable power losses and
HVDC overhead (±500 kV)	3.0 GW	Technology exists today. Assumed voltage source converter (VSC) bi-pole technology.
HVDC undersea (±525 kV)	2.0 GW	Technology in development; requires dynamic cables and floating substations that do not currently exist. Assumed voltage source converter (VSC) bi-pole technology

These are maps for two of the alternatives studied (7.2a and 25.8a).





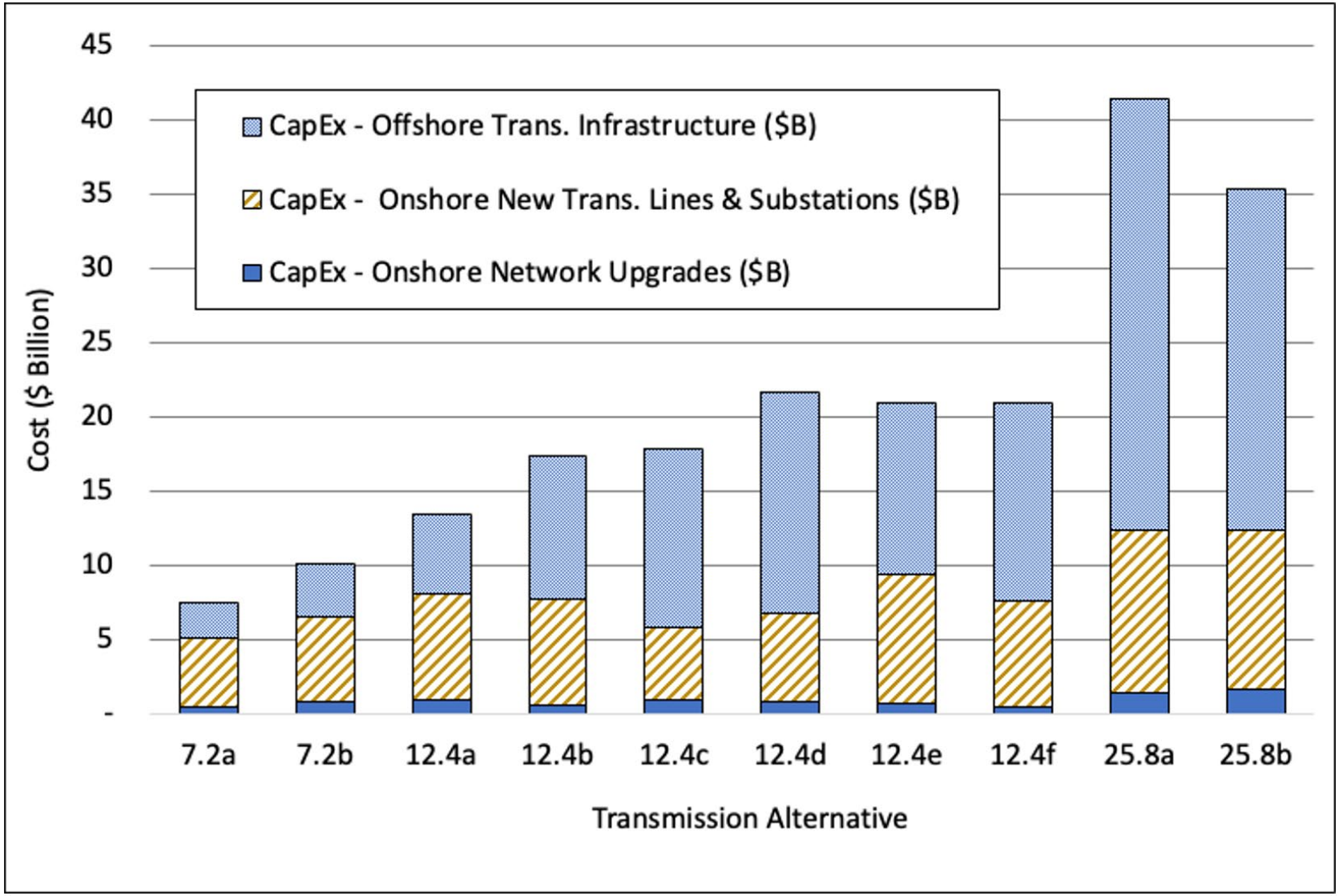
Transmission Alternatives

Transmission Alternative	7.2a	7.2b	12.4a	12.4b	12.4c	12.4d	12.4e	12.4f	25.8a	25.8b
Total Wind Farm Capacity (GW)	7.2	7.2	12.4	12.4	12.4	12.4	12.4	12.4	25.8	25.8
Offshore HVDC backbone connecting wind farms	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Offshore HVDC mesh network	No	No	No	No	No	No	Yes	Yes	Yes	Yes
# of HVAC undersea export cables	9	9	14	14	14	9	3	3	0	0
# of floating HVAC substations	9	9	14	14	14	9	3	3	0	0
# of HVDC undersea cables	0	2	2	5	3	5	8	10	27	22
# of floating HVDC conversion stations	0	0	0	0	5	8	7	8	15	15

- Wind farm capacities increase moving from left to right.
- Alternatives, moving from left to right, rely on increased amount of offshore HVDC infrastructure.
- Last four alternatives utilize HVDC mesh network.
- Alternatives that are farther to right are expected to be developed further in the future.

Transmission cost for each alternative

- Transmission costs increase as capacity increases.
- Network upgrades represent small portion.
- Offshore infrastructure represents larger portion for higher capacity buildouts.
- Costs to serve local host communities appears small (a few % of total).



LCOE and LCOT Results – 2032 OSW Plant

Schatz Energy Research Center

Levelized Cost of Energy & Transmission

- Conducted PCM runs.
- LCOE for wind plants ranged from $64-$66/MWh.
- LCOE+T ranged from $77-$85/MWh, exceeding the estimated 2032 net revenues from wholesale market participation.
- We also found substantial system-wide production cost savings and emission savings compared to the base case without OSW.

Alternative	OSW Plant Levelized Cost of Energy* (LCOE) [$/MWh]	Levelized Cost of Transmission [$/MWh]	LCOE + T [$/MWh]	System-wide Production Cost Savings [$M]	System-wide CO_2 Cost Savings [$M]
7.2a	$64.71	$11.81	$76.53	604	554
7.2b	$65.74	$16.20	$81.95	655	535
12.4a	$65.98	$12.39	$78.37	1,474	1,111
12.4b	$65.17	$15.78	$80.96	1,542	1,126
12.4c	$65.67	$16.35	$82.01	1,480	1,091
12.4d	$65.37	$19.74	$85.11	1,521	1,112
12.4e	$65.22	$19.06	$84.29	1,517	1,126
12.4f	$64.15	$18.78	$82.94	1,343	941
25.8a	$65.45	$17.94	$83.39	N/A	N/A
25.8b	$65.41	$15.34	$80.75	N/A	N/A

*Offshore wind plant LCOE excludes offshore substation and export cable costs which are included in LCOT.
Notes: All monetary values are in 2022 dollars and inflation was assumed to be 2.5%. Production cost runs were not conducted for Alternatives 25.8a and 25.8b.

Key Findings and Recommendations

- Transmission infrastructure costs will be substantial.
- Long distance subsea HVDC cable runs and floating conversion stations are expensive, but may still be preferred. Costs may decrease as HVDC technology matures.
- While a simple radial interconnection approach may be the cheapest near-term solution, at scale this will be problematic, and a more robust HVDC meshed network may be preferable.
- Proactive transmission planning will be important, with a focus on the long term to minimize costs and impacts. This will require a coordinated regional planning effort.

Credit: Senu Sirnivas/NREL

Key Findings and Recommendations

- OSW development will happen over several decades, so a phased transmission planning approach should be used.
- Many required technologies are still in development, so coordination with industry will be important. Supply chain issues should be considered and addressed.
- If an offshore HVDC mesh network is developed, ownership of the network becomes an important policy and regulatory question.
- Serving OSW host communities will be important, and this can be done for a small fraction of the overall cost.
- Environmental permitting for onshore and offshore transmission will be complicated and arduous, and it should be part of a proactive planning effort.

Credit: Senu Sirnivas/NREL

Contact Information


Photo credit: Maia Cheli

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www.schatzcenter.org/wind

Glossary of Terms

Term/ Acronym	Definition
AC	Alternating current
BOEM	Bureau of Ocean Energy Management
CEC	California Energy Commission
CapEx	Capital Expenditure
DC	Direct Current
DOD OPNAV	Department of Defense Office of the Chief of Naval Operations
GW	Gigawatt
HVAC	High voltage alternating current
HVDC	High voltage direct current
kV	kilovolt

Term/ Acronym	Definition
LCOE	Levelized Cost of Energy
LCOE+T	Levelized Cost of Energy plus Transmission
LCOT	Levelized Cost of Transmission
MWh	Megawatt-hour
NREL	National Renewable Energy Laboratory
OSW	Offshore Wind
PAC-PARS	Pacific Coast Port Access Route Study
PCM	Production Cost Model
USCG	United States Coast Guard
VSC	Voltage Source Converter

Photo credit: Maia Cheli

California Independent System Operator

Jeff Billinton

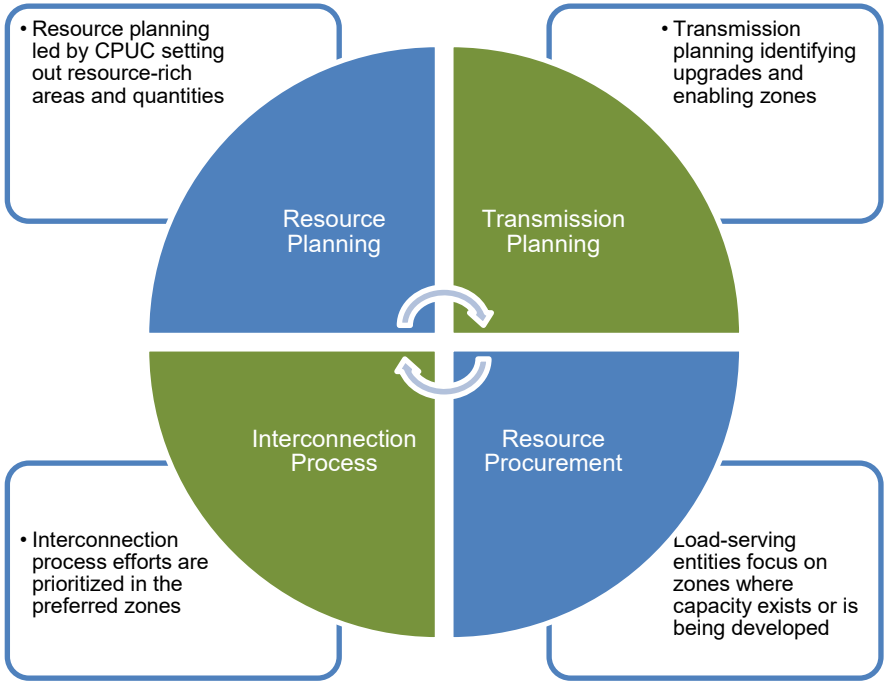
Transmission Planning Process and Offshore Wind

Jeff Billinton
Director, Transmission Infrastructure Planning

March 29, 2024

CEC AB 525: Draft Strategic Plan for Offshore Wind Development Workshop

Transmission Planning and Generation Interconnection are two of four fundamental and interwoven processes:



The CPUC/CEC/ISO Memorandum of Understanding signed in December 2022 sets the strategic direction for process improvements to:

- Tighten the linkage between planning, procurement direction, and the ISO interconnection process to the greatest extent possible.
- Create formal linkage between CEC SB 100/IEPR activities and the ISO and CPUC processes
- Reaffirm the existing state agency and single forecast set coordination
- Update references to current processes and set direction to updating process documentation

The ISO leads the transmission planning process for our footprint, coordinated with load forecasts from the CEC and resource planning from the CPUC

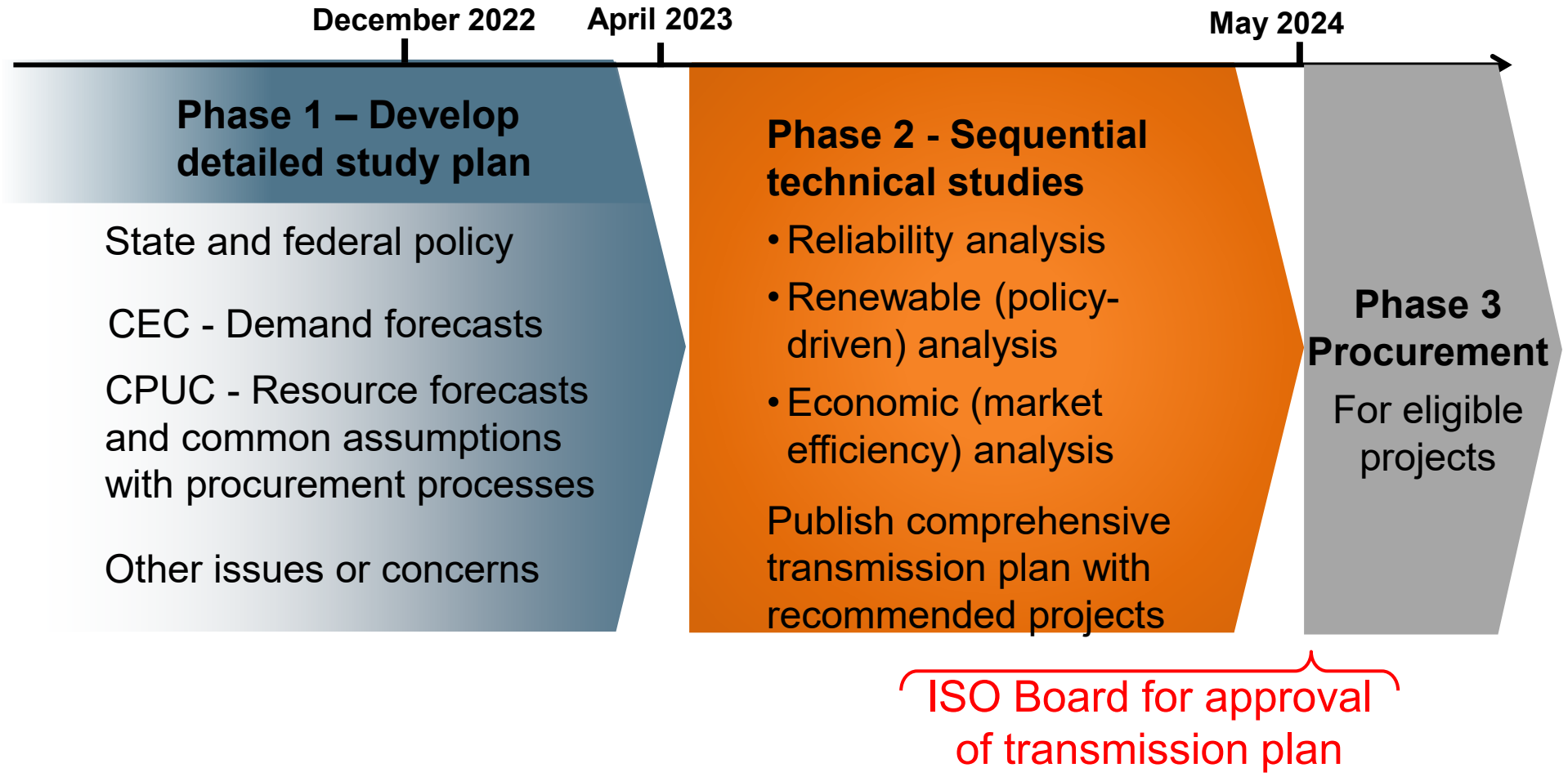
- Annual 10-Year transmission plan is the formal approval document for expansion planning in our footprint
  - Ramped from 10 year average of $650 million per year to $3 billion in 2021-2022 plan, and $7.3 billion in 2022-2023 plan
  - Responded to accelerating load growth and escalating renewable energy needs
  - Focuses on most efficient and effective long term solutions – including Grid Enhancing Technologies and non-wires solutions

- 20 Year Outlook assesses longer term needs
  - First prepared in 2022, being updated in 2024
  - Establishes a longer term direction and strategy
  - Provides context for nearer term decision
  - Informs going-forward resource planning decisions

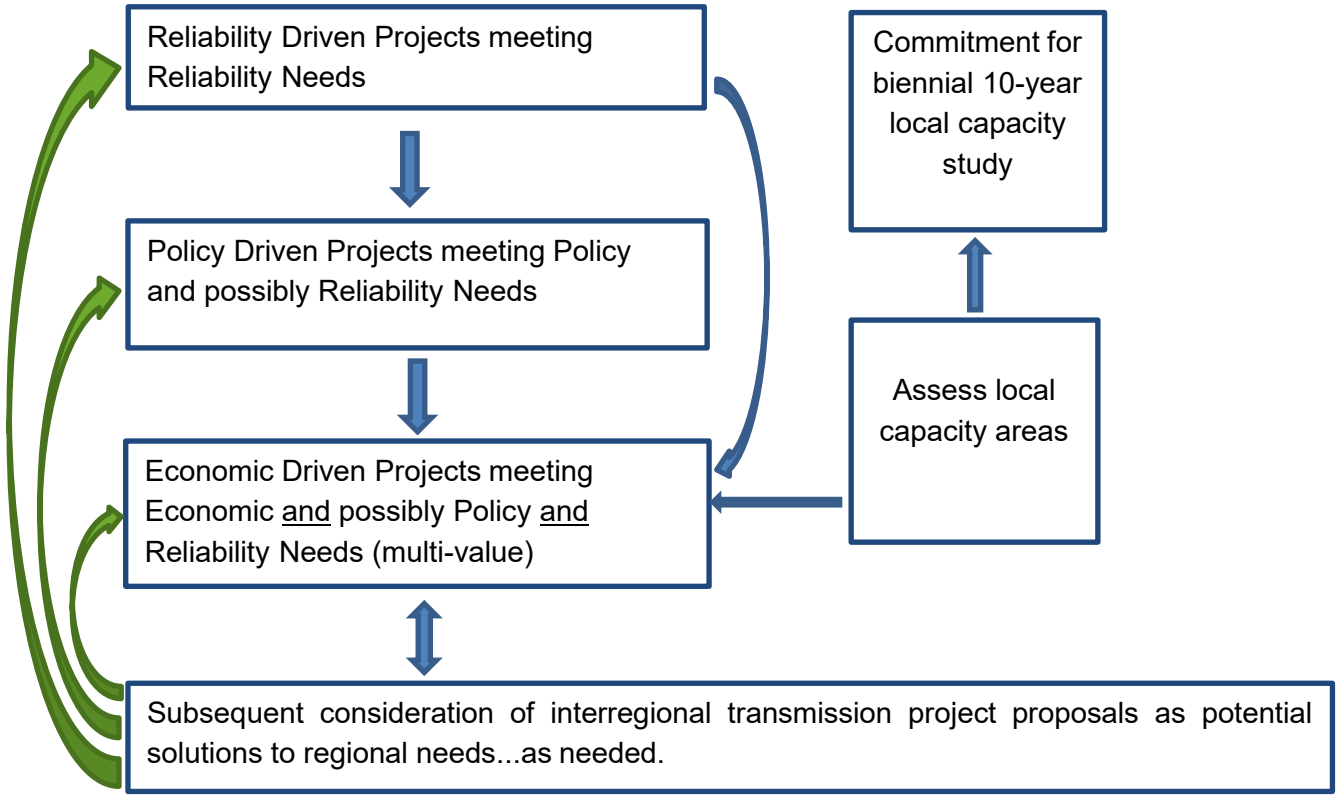
Beyond those approvals, the ISO has advanced other measures:

- In December 2023, the ISO conditionally approved participation in a joint effort with Idaho Power for the "SWIP North" transmission project
  - Providing access to over 1000 MW of Idaho resources to California
- Developed a subscriber participating transmission owner framework facilitating merchant transmission to bring renewable energy to the California border
  - Two major projects have applied to join the ISO using this framework – TransWest Express and Sunzia
  - Transmission development costs included in power purchase agreement with load-serving entity rather than Transmission Access Charge

The ISO's Transmission Planning Process is established in its tariff:



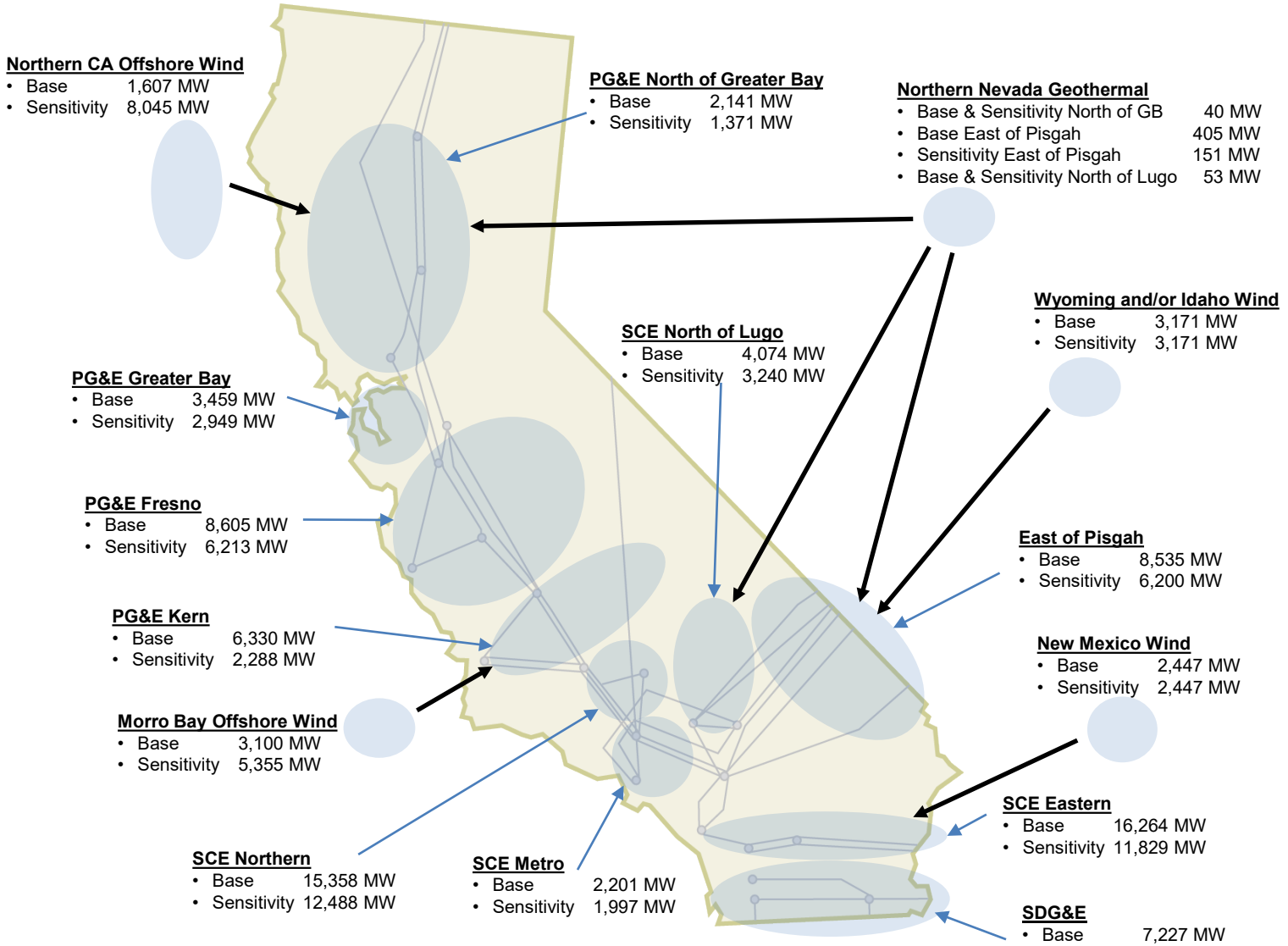
Studies are coordinated as a part of the transmission planning process



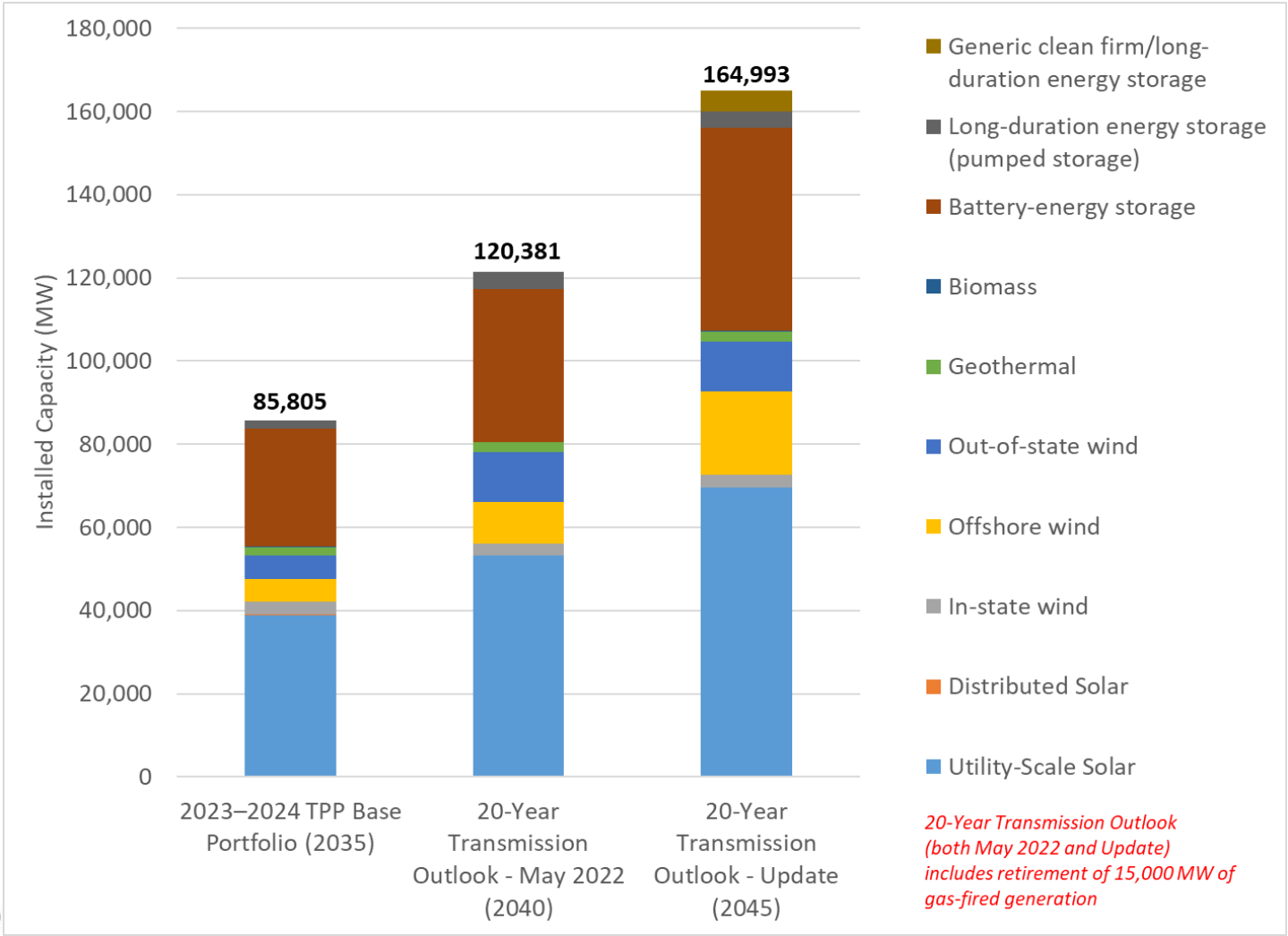
Those needs continued in the 2023-2024 Plan and the basis for updating the 20 Year Transmission Outlook

Resource Type (MW)	2023-2024 Transmission Planning Process		20-Year Transmission Outlook	
	Base Portfolio (2035)	OSW Sensitivity (2035)	May 2022 2040 SB100 Starting Point Scenario (MW)	Update New Resource Assumption in the 2045 Scenario (MW)
Natural Gas Fired Power Plants	-	-	(-15,000)	(-15,000)
Utility-Scale Solar	38,947	25,746	53,212	69,640
Distributed Solar	125	125	-	125
In-state wind	3,074	3,074	2,837	3,074
Offshore wind	5,497	13,400	10,000	20,000
Out-of-state wind	5,618	5,618	12,000	12,000
Geothermal	2,037	1,149	2,332	2,332
Biomass	134	134	-	134
Battery-energy storage	28,373	23,545	37,000	48,813
Long-duration energy storage (pumped storage)	2,000	1,000	4,000	4,000
Generic clean firm/long-duration energy storage	-	-	-	5,000

2023-2024 TPP Adopted Base and OSW Sensitivity Portfolios (2035)



Portfolios – 2023-2024 Transmission Planning Process and 20-Year Transmission Outlook



Offshore Wind Resources – comparison between the 2045 Transmission Outlook and recent annual TPP

	2022-2023 TPP		2023-2024 TPP		2024-2025 TPP		20-Year Transmission Outlook	
	Base Portfolio	Sensitivity Porfolio	Base Portfolio	Sensitivity Porfolio	Base (2034)	Base (2039)	May 2022	May 2024 Update
Morrow Bay Call Area	1588	3100	3100	5355	2924	2924	6000 [1]	5400
Humboldt Call Area	120	1607	1607	2600	931	1607	4000 [2]	2700
Del Nort Area	-	-	-	3445				7000
Cape Mendocino Area	-	-	-	2000				4900
Total OSW	**1708**	**4707**	**4707**	**13400**	**3855**	**4531**	**10000**	**20000**

1. Central Coast
2. North Coast

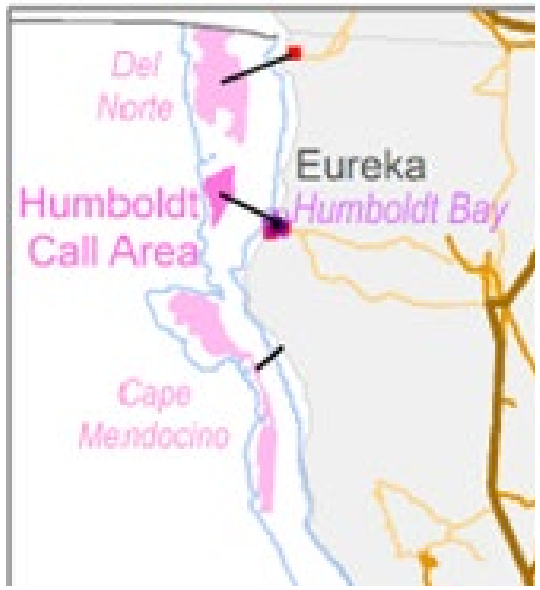
- The ISO recommends for approval transmission projects that are found needed to meet the needs of the base portfolio

Offshore Wind Transmission Planning Study Approach

- **Step 1**: Perform high level assessment in the 20-year outlook to identify system enhancements required for the OSW
  - 14,600 MW in the North Coast
  - 5,400 MW in the Central Coast
- **Step 2**: Perform detailed studies on the sensitivity portfolio in the 2023-2024 TPP to identify system enhancements required to integrate OSW:
  - 8,045 MW in the North Coast
  - 5,355 MW in the Central Coast
- **Step 3**: Perform detailed studies on the base portfolio to recommend projects to integrate OSW
  - 1,607 MW in the North Coast
  - 3,100 MW in the Central Coast

Offshore Wind Installed Capacity Assumptions

		2023-2024 TPP	
	20-Year Outlook	Sensitivity Portfolio	Base Portfolio
Del Norte	7,000	3,445	0
Humboldt Call Area	2,700	2,600	1,607
Cape Mendocino	4,900	2,000	0
Total	14,600	8,045	1,607

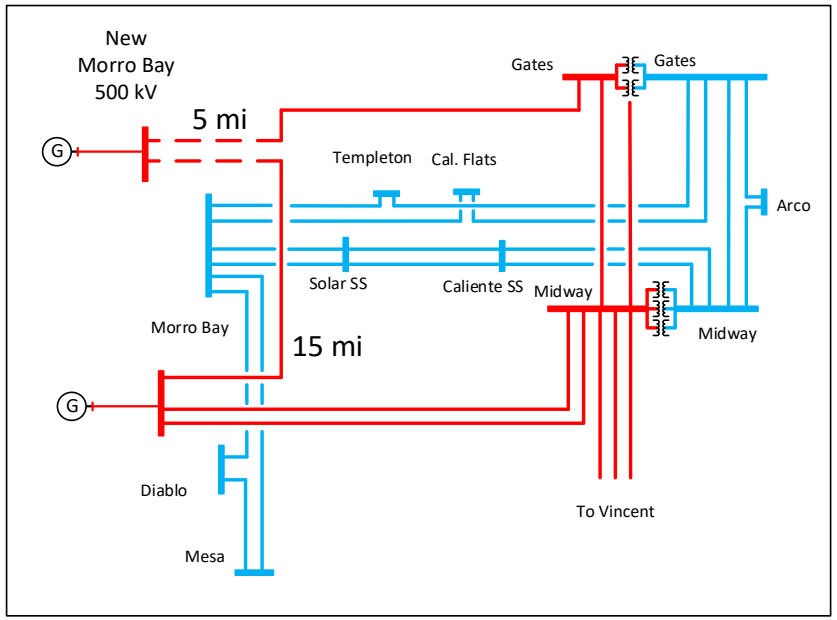


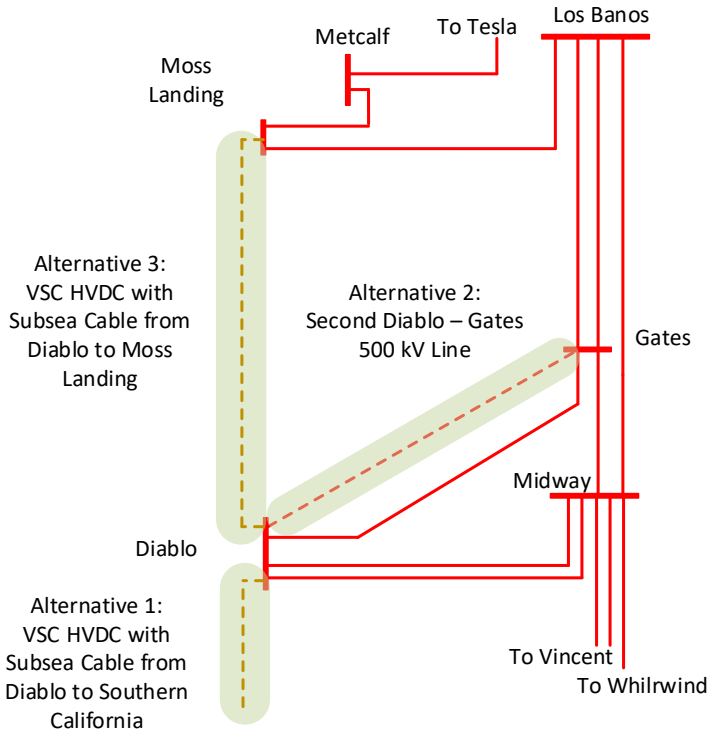
Source: [The Cost of Floating Offshore Wind Energy in California Between 2019 and 2032 (nrel.gov)](#)
(Page 39)

		2023-2024 TPP	
	20-Year Outlook	Sensitivity Portfolio	Base Portfolio
Morro Bay	5,400	5,355	3,100
Total	5,400	5,355	3,100

Central Coast Offshore Wind Interconnection

- It the 2021-2022 Transmission Plan it was identified that up to 5.3 GW of generation could be integrated into the 500 kV system in Morro Bay / Diablo area.
- Depending on the status of the DCPP and the total generation in the area, a new 500 kV substation and further system enhancements might be required in the area to integrate the OSW in Central Coast in 20-year outlook (5,400 MW), sensitivity portfolio (3,355 MW) and base portfolio (3,100 MW).

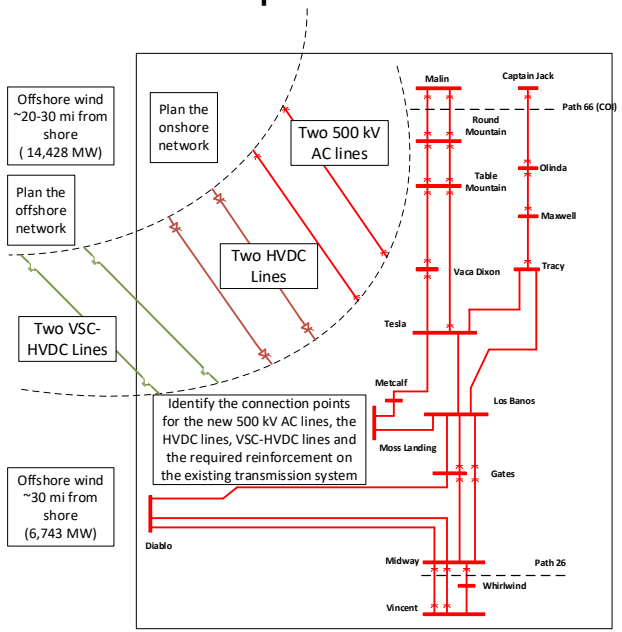




Transfer Path for North Coast OSW in the 20-Year Transmission Outlook

- In the offshore wind sensitivity study in the 2021-2022 Transmission Plan a hybrid solution was evaluated to integrate 14,428 MW of OSW in the North Coast
- Same solution is expected to provide sufficient capacity as the transfer path for the 14,600 MW North Coast OSW in the portfolio for the updated 20-Year Transmission Outlook

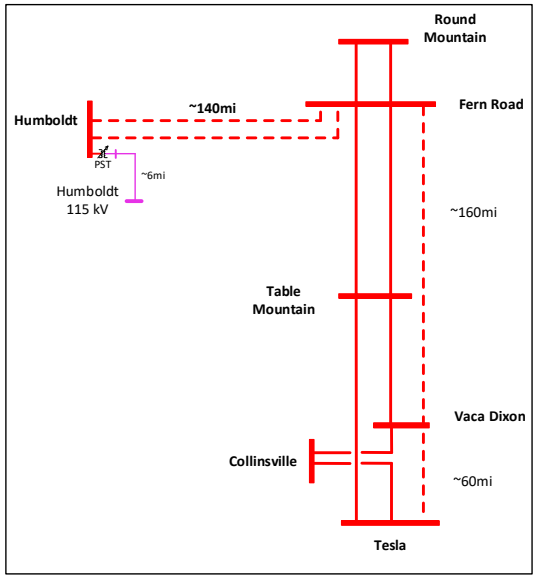
High level assessment of a hybrid transfer path	
500 kV AC line to Fern Road	2
Onshore overhead VSC-HVDC to Collinsville	2
Offshore sea cable VSC-HVDC to Bay Area	2



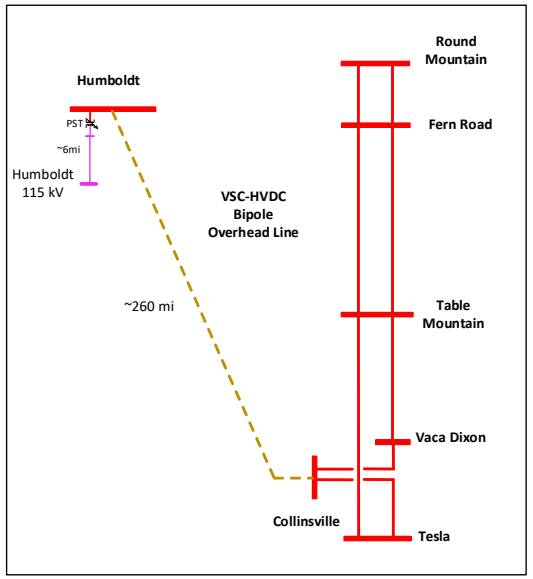
Reference: 2021-2022 Transmission Plan (page 255)
http://www.caiso.com/Documents/ISOBoardApproved-2021-2022TransmissionPlan.pdf

Requirement in 2023-2024 Transmission Plan: Propose a Project for Approval for 1,607 MW

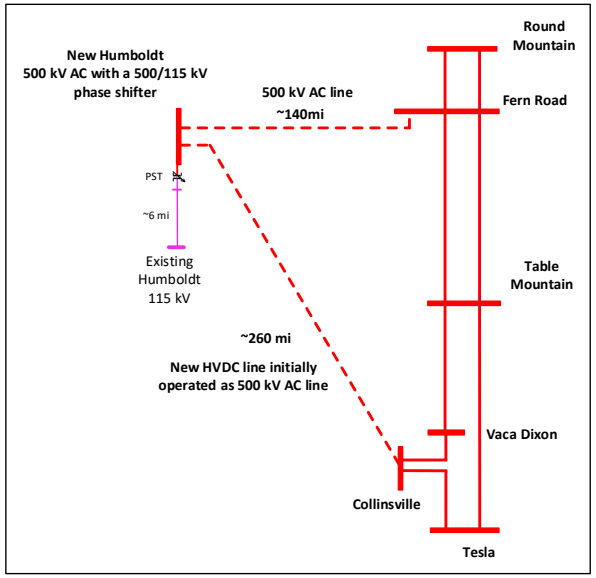
500 kV AC Alternative



HVDC Alternative



Hybrid Alternative



2023-2025 Transmission Planning Process Transmission Policy-Driven Projects

- In 2022-2023 TPP where there was a need in base portfolios, alternatives were approved that also met the needs in the sensitivity portfolio - which essentially became the 2023-2024 portfolio
- As a result, many of the needs for the 2023-2024 scenarios were addressed last year
- With offshore wind identified in the base portfolio from the Humboldt call area, transmission development for the North coast will be identified

2023-2024 Transmission Plan Milestones

- Draft Study Plan posted on February 23
- Stakeholder meeting on Draft Study Plan on February 28
  - Comments submitted by March 14
- Final Study Plan posted on August 16
- Preliminary reliability study results posted on August 15
- Stakeholder meeting on September 26 and 27
  - Comments submitted by October 11
- Request window closed October 15
- Preliminary policy and economic study results on November 16
  - Comments to be submitted by November 30
- Draft transmission plan to be posted on April 1, 2024
- Stakeholder meeting April 9, 2024
  - Comments to be submitted within two weeks after stakeholder meeting
- Revised draft for approval at May Board of Governor meeting

Comment Period

Public Comments

Instruction
- 3 minutes or less per person
- 1 representative per organization

Zoom App/Online
- Click “raise hand”

Telephone
- Press *9 to raise hand
- Press *6 to (un)mute

When called upon
- Will open your line
- Unmute, spell name, state affiliation, if any

3-MINUTE TIMER

For Phone Participation: Dial (669) 900-6833 or (888) 475-4499 Enter Webinar ID: 862 0687 3587

Public Participation and Links

[AB 525 Reports: Offshore Renewable Energy (ca.gov)]

- Reports and studies
- Workshop events info

File Comments to Docket #17-MISC-01:
[California Energy Commission : e-comment : Select a Proceeding]

Comments Due April 22, 2024, for Strategic Plan and workshops