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August 11, 2021 Update - Transmission for Central Coast Offshore Wind Presentation by VJohn White and Jim Caldwell

Additional submitted attachment is included below.

Backbone Transmission for Central Coast Offshore Wind

July 22, 2021

CEC Inter-Agency SB 100 Workshop on Transmission, Docket No. 21-SIT-01

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*Updated August 11, 2021

Offshore Wind Push Gains Momentum in California

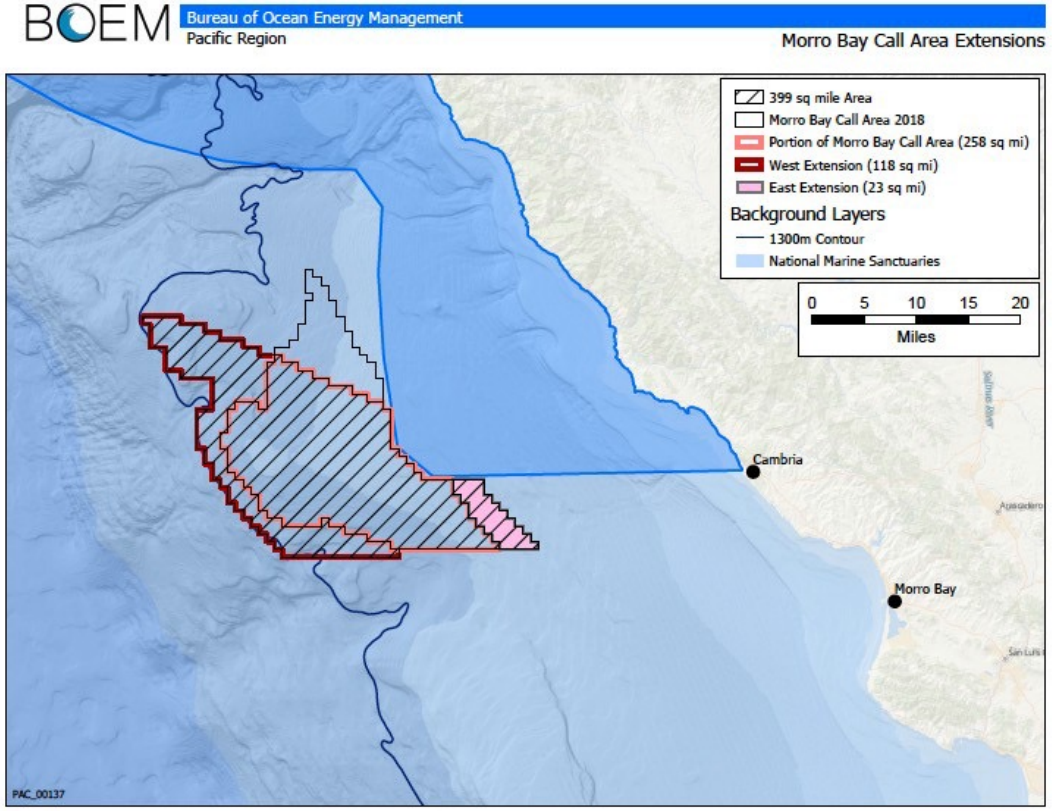
Lawmakers clear a proposal intended to jumpstart floating wind farms off the coast, saying the technology could prop the state's buckling power grid and create more than 10,000 new jobs.

Biden Administration Announces Offshore Wind Lease Sales

1. Announced upcoming lease area for up to 3 GW of Floating Offshore Wind Energy Northwest of Morro Bay, CA

2. Ongoing decommissioning of the Diablo Canyon Power Plant, projected for 2025

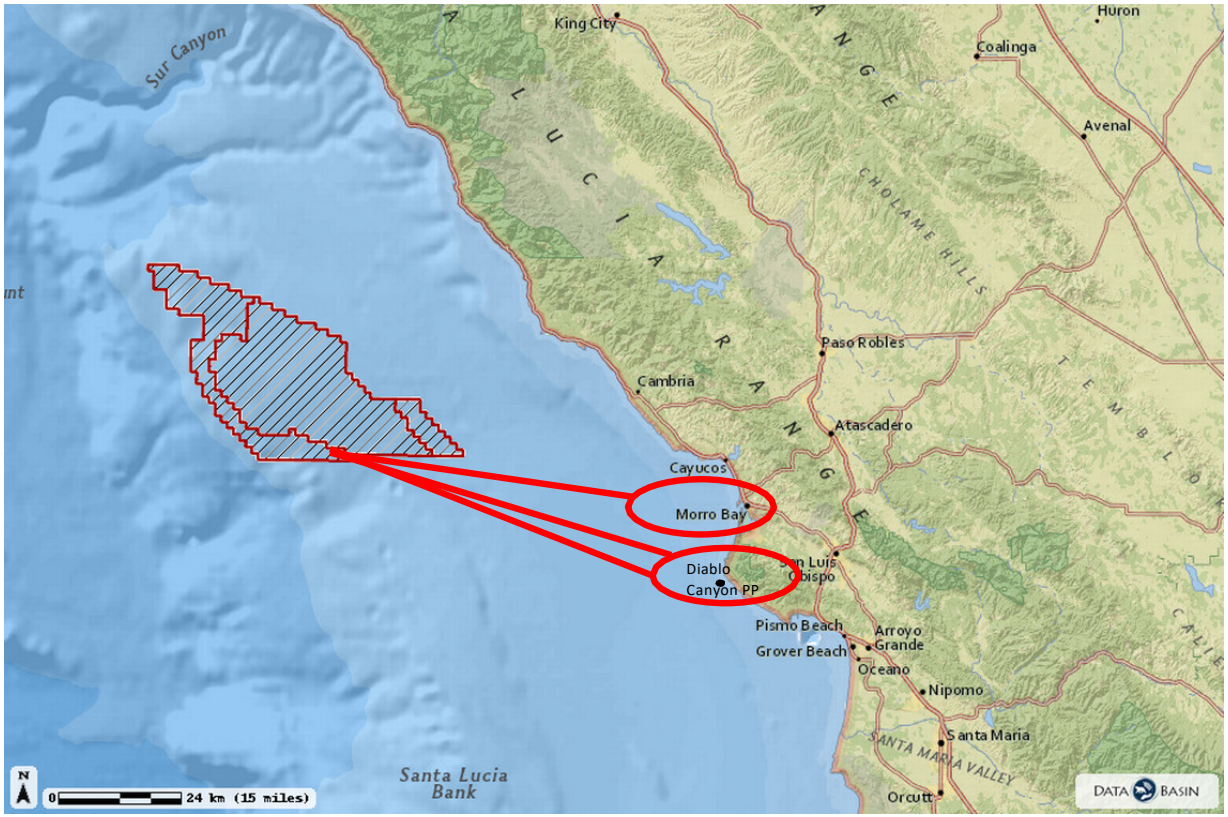
3. Large existing interest in repurposing existing assets, revitalizing area and ensuring economic growth in the Central Coast



Tehachapi Wind Resource Area

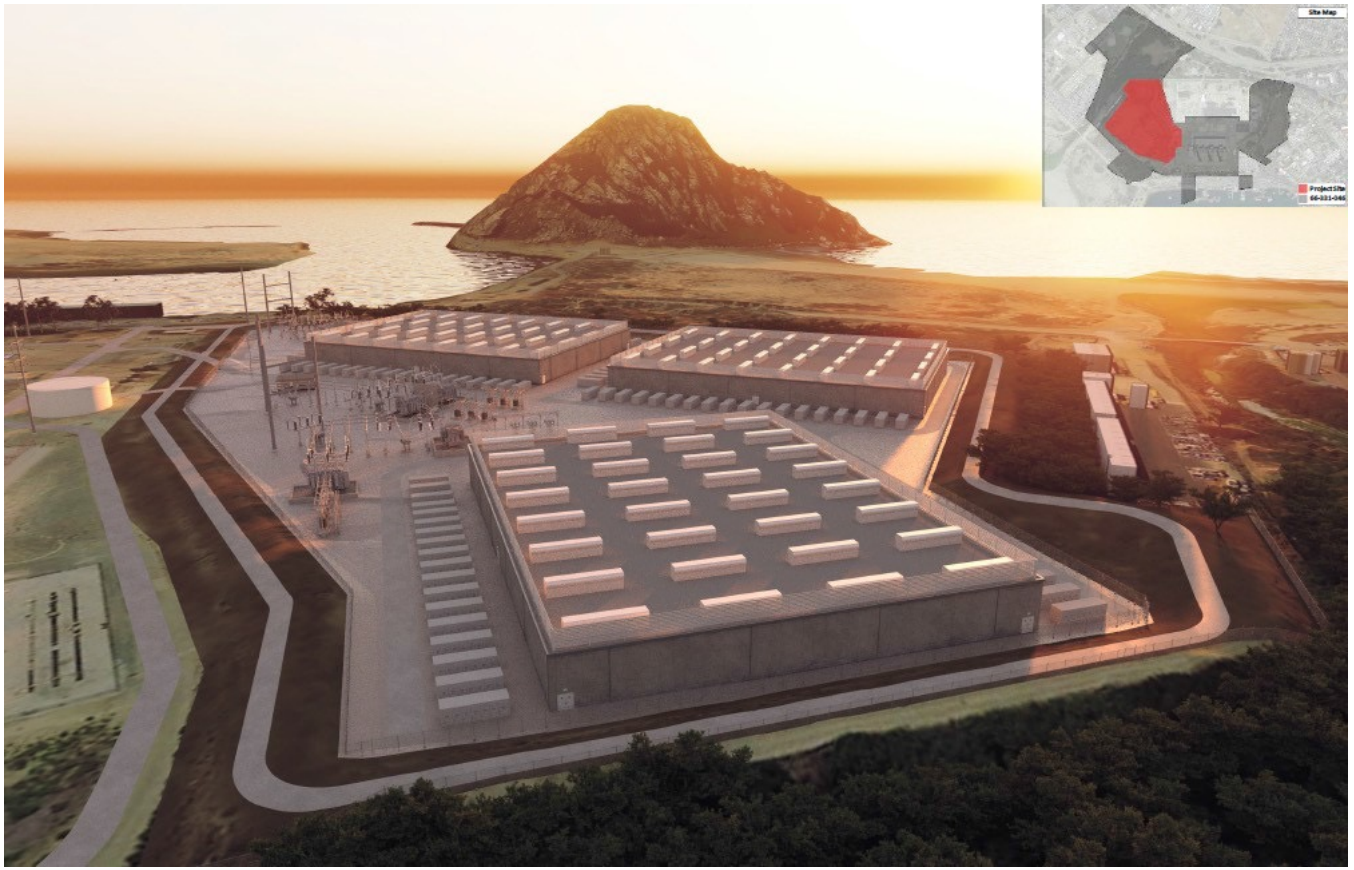
- In the early 2000's, as California began to implement the RPS, there was recognition that the Tehachapi Wind Resource Area held special promise for large-scale, cost-effective wind projects.
- But there was a lack of transmission access to the Southern California Edison system; and building transmission for Tehachapi would be a "generator interconnection" instead of a "network upgrade," which meant the cost of the new transmission line would be borne by the generators.
- In 2004, the CPUC and Dian Grueneich convened the Tehachapi Collaborative Study Group (D.04-06-010) under the context of AB 970, ensuring sufficient transmission to meet statutory RPS requirements.
- A new idea emerged, called a "renewable trunkline"; the line would be built by Southern California Edison in order to comply with state policy, i.e., the RPS; generators would pay back SCE and its customers as they used the line to send wind power to the SCE grid.
- This innovation in transmission finance was the first of its kind and was approved by FERC; it paved the way for billions in new investment and delivery of high-quality wind power to the California grid by allowing for approval of transmission for renewables in advance of interconnection requests.
- CEERT believes the same principles can apply to building a backbone transmission line to connect Central Coast offshore wind resource to the California grid at the Diablo Canyon and Morro Bay power plant sites.

Interconnect possibilities – existing basic options



- The interconnect discussions for the Central Coast offshore wind area have been concentrated on:
  - Morro Bay, existing transmission for the old 650 MW power plant
  - Diablo Canyon, using existing transmission of DCPP 2 GW
- An emerging approach is that each project could connect directly to each Point of Interconnection and incorporate an export cable in each project's economics

Morro Bay Storage



- Vistra Energy Morro Bay Energy Storage project
- 600 MW Lithium-Ion Batteries
- Construction start 2022
- COD: 2024
- Timed for when the 1st unit of Diablo goes offline

The possibility of developing a synergetic Offshore Wind Transmission project to the Morro Bay Wind Resource Area

Concept:

- **3 GW HV line from Offshore Wind Areas to:**
  - Diablo Canyon Point of Interconnection
  - Possibly also Morro Bay, where there would be storage capabilities adding ability for better grid management
- **Wind projects connect offshore to HV line**

Near Term Launch of Offshore Wind

Rationale:

- Given that Morro Bay will already be building an energy storage facility and that it will have interconnection limitations, Diablo Canyon becomes the main natural choice for the region, given its existing high interconnection capacity (approx. 2 GW)
- The Diablo Canyon Economic proposition is a much more salient issue at this point and the repurposing topic attracts many allies and could open up multiple avenues of funding
- Building a single HV transmission line to connect the different leases can bring large economic savings, reduce dramatically the risk for the projects and improve their ultimate Power Purchase Agreement price
- It could also accelerate development by integrating the line within transmission plans and remove barriers for developers to concentrate on the wind projects themselves
- It is also compatible with other needed transmission expansions, to enable solar plus storage projects in the Central Valley, and increase North South transfer capacity

Integrated Transmission build out has been a major source of cost reductions in Europe

- Examples in Europe show great success in TSO led transmission reducing overall costs
- The Netherlands case is one of the main examples with Tennet leading the development
- This has been a major source of PPA price reduction for OW

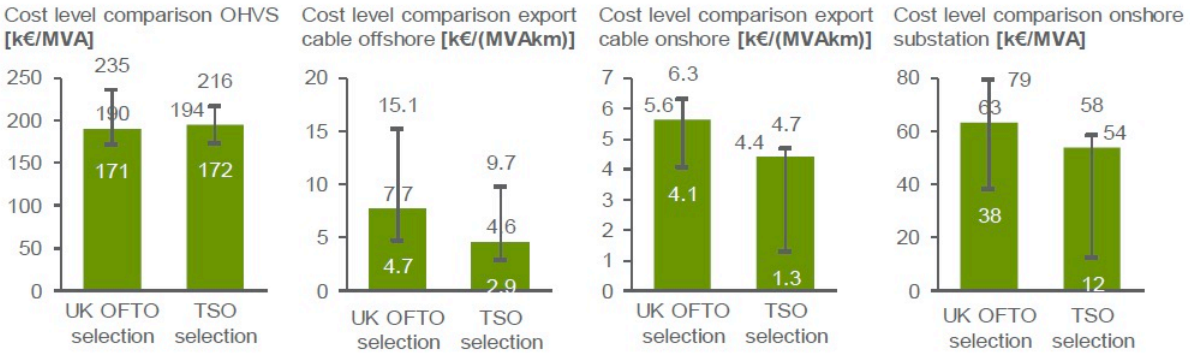
Navigant Netherlands report (Connecting Offshore wind farms), 2019

Overall conclusion and recommendation

This first of a kind comparison has shown that a TSO build approach to AC offshore transmission asset development can be realised at lower cost levels than the developer build approach. Moreover, the longer-term benefits compared to a developer build approach, as summarised in figure 2, are likely to be significant in a context where large-scale and far offshore wind clusters will require innovative system integration solutions to keep cost levels down while maintaining security of supply.

It is recommended to monitor offshore grid cost level development through future updates of this analysis, including realised cost levels from relevant grid connections.

Figure 4. Cost level comparison results (CAPEX only)



Source: Navigant analysis

The New Jersey Case

- In April 2021, the New Jersey BPU launched a solicitation for qualified developers to submit transmission solutions to deliver offshore wind into the grid
- The goal is to prepare in advance for the most effective integration of the offshore wind policy goals of 7.5 GW by 2035
- After the solicitation window closes on August 13, 2021, NJBPU and PJM will evaluate all submissions to determine which, if any, combination of project proposals can meet the State's offshore wind policy goals

Resources:

https://www.nj.gov/bpu/newsroom/2021/approved/20210415.html

https://www.nj.gov/bpu/pdf/boardorders/2020/20201118/8D%20-%20ORDER%20Offshore%20Wind%20Transmission.pdf

https://www.nj.gov/bpu/pdf/publicnotice/2.26%20OSW%20Presentation%20Final.pdf

https://www.nj.gov/bpu/pdf/publicnotice/Transmission%20Study%20Report%2029Dec2020%202nd%20FINAL.pdf

The opportunity

1. Develop the Central Coast Offshore Wind Hub in the most efficient and fast track way possible, saving time and money for California ratepayers
2. Encourage the focused development of an offshore transmission project to the Central Coast offshore wind lease area which could accelerate the launch of offshore wind projects and largely de-risk development of the wind leases.
3. California should explore alternative financing mechanisms for planned offshore transmission and allocation of costs between customers and generators, including the possibility of a public- private partnership with infrastructure investors, public ownership or jointly with utilities
4. Reutilize infrastructure @ Diablo Canyon, possibly for additional proposals for repurpose solutions and driving economic development quickly, post decommissioning: Time is running out for repurposing opportunities to be proposed, funded and captured
5. The Humboldt Offshore Wind Area is also constrained by the lack of transmission, and planning to meet the transmission needs of this region should be included in the public agencies' planning process

California's energy agencies should explore opportunities for a Public-Private solution, allowing the state to fund transmission expenses before costs reach ratepayers.

- The Federal Energy Regulatory Commission (FERC) grants a Rate of Return of about 11% on investment in new transmission facilities.
  - Tax-free, State-backed revenue bonds at 5% could be less than half the cost of private investment in new transmission.
- This is similar to a consumer refinancing credit card debt through a home equity loan to lower monthly payments.
- A private/public partnership between experienced private infrastructure developers, the State of California, CAISO, investors, and public owned utilities would be the model for an innovated, cost-effective, and timely approach to laying the foundation for the launch of California offshore wind industry.