

DOCKETED

Docket Number:	19-ERDD-01
Project Title:	Research Idea Exchange
TN #:	228972
Document Title:	AWEA-California Comments on Preliminary Research Roadmap
Description:	N/A
Filer:	System
Organization:	Danielle Osborn Mills/American Wind Energy
Submitter Role:	Public
Submission Date:	7/12/2019 4:42:26 PM
Docketed Date:	7/12/2019

Comment Received From: Danielle Osborn Mills
Submitted On: 7/12/2019
Docket Number: 19-ERDD-01

AWEA-California Comments on Preliminary Research Roadmap

Attached please find comments of the American Wind Energy Association of California on the Preliminary Draft Research Roadmap. If you have any questions, please don't hesitate to contact me.

Danielle Mills

Additional submitted attachment is included below.



July 12, 2018

California Energy Commission
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Filed Electronically

Subject: AWEA-California Comments on Preliminary Draft Research Roadmap (Docket No. 19-ERDD-01)

The American Wind Energy Association of California¹ (“AWEA-California”) provides the following comments on Preliminary Draft Research Roadmap. We strongly support the Energy Commissions efforts to facilitate innovation while ensuring affordability and reliability, and we believe that research to advance utility-scale wind energy development will hasten California’s transition to a low-carbon future. We appreciate this opportunity to offer comments on the proposed scope of research topics.

Summary

1. CEC research funding should be narrowed to focus on areas of greatest need and avoid duplication of research already underway. The initiatives should be scaled back to better optimize the value of the research.
2. AWEA-California suggests certain refinements to the inputs and assumptions around land-based and offshore wind resources, based on recent data.
3. AWEA-California supports CEC funding of research on manufacturing and port infrastructure.
4. Analysis of interconnection and transmission for wind energy – both land-based and offshore – is underway in other venues. While interconnection and transmission planning are critical to the renewable industry in general, expending limited EPIC funds in this area will likely be duplicative and unnecessary.

Discussion

1. **CEC research funding should be narrowed to focus on areas of greatest need in order to optimize the value of the research.**

AWEA-California appreciates the broad suite of technologies and issues covered in the Draft Research Roadmap. We suggest, however, that the Commission carefully evaluate the information gaps and technologies in need of research and attempt to avoid redundant research projects. Public Resources

¹ Members of AWEA California include global leaders in utility-scale wind energy development, ownership, and operations, and many members also develop and own other energy infrastructure such as transmission lines, utility-scale solar, and energy storage. We are committed to the need for—and widespread economic benefits derived from—a diverse and balanced portfolio in California to reliably and affordably meet state energy demands and environmental goals. AWEA California strives to direct the economic and environmental benefits of utility-scale wind energy to California.



Code Section 25711.5(a) sets the statutory framework for the EPIC program to “[a]ward funds for projects . . . strategically focused and sufficiently narrow . . .” While the list of technologies eligible for awards is broad, the research projects must be strategically focused (i.e., avoid duplication) and narrow. Where possible, it is important to consider the ultimate implications of findings on deployment of certain technologies and ensure that research efforts will lead to the optimal cost-effective deployment of clean energy to facilitate California’s progress toward its greenhouse gas reduction mandates.

Given the need for focused research, and discussed further below, AWEA-California makes the following research recommendations:

- Do not focus research funding on floating platform technologies and anchoring. This work is already underway in the private sector by individual companies.
- Research on in-state manufacturing capability compliments research on port infrastructure, and vice-versa. The CEC should build upon existing port-related research underway in various regions of the state.
- Upgrading the state’s transmission system is essential to unlocking the full potential of California’s wind energy resources. Transmission and interconnections are ripe for additional analysis; however several entities are conducting more granular studies of transmission needs and new research efforts should be considered in light of these efforts.
- The CEC should consider the cross-cutting benefits directing research funding toward the development and demonstration of deep-water storage solutions with a goal of improving integration of offshore wind energy.

On the final point, the water depth off the coast of California necessitates the use of floating foundation turbines and simultaneously offers storage opportunities that would not be viable in shallower waters. The pressure resulting from the water column is well suited for the development of environmentally benign, long-term storage that could lead to offshore wind becoming a baseload energy source. While basic technical components of such storage are readily available, we recommend research and demonstration of the overall system integrated with an offshore wind project. Due to significant potential benefits of this storage solution, and the intent to explore other storage solutions in the Preliminary Roadmap, we recommend CEC consideration of cross-cutting research funding to demonstrating the potential for offshore wind-storage solutions.

2. The CEC should continue to refine certain inputs and assumptions related to land-based and offshore wind based on recent information.

A. Land-based wind costs and resource potential

The Draft Research Roadmap assumes land-based wind costs to be 5.4 cents/kWh in FY 2018, with a target of 3.1 cents/kWh by 2030. This assumption seems high based on recent public information on PPA prices. Specifically, LevelTen’s Q1 PPA Price Index from May of 2019 summarizes recent PPA prices for wind and solar by ISO region.² The most competitive wind prices in Q1 in SPP and ERCOT were roughly \$38/MWh in CAISO.

² [LevelTen Q1 2019 PPA Price Index](#). May 2019.



The Roadmap also notes production as one of the top barriers of California's ability to ramp production and lower costs. In fact, California is currently home to 12 wind-component manufacturing facilities, which currently create parts for utility-scale wind projects in California and throughout the country. California can increase both its manufacturing output and attract new manufacturing facilities by demonstrating interest in utility-scale wind growth in and around California.

AWEA-California does not agree that manufacturing production is a key barrier for land-based wind development. The true limiting factor of land-based wind in California is resource quality and availability. The Draft Roadmap astutely notes local land use restrictions as challenges to further development of some of California's best wind resource areas. It is also important to acknowledge the potential for repowering some of California's older wind projects with new technology to improve the efficiency of the projects and minimize environmental impacts, and to consider the availability of high capacity-factor wind from other areas of the west where wind speeds are higher and the costs of generation could be significantly lower.

B. Offshore wind costs

The Draft Roadmap points to federal DOE congressional budgetary documents in evaluating project cost targets. In light of the global growth of offshore wind, technology advancements are occurring in real time around the world. AWEA-California suggests continued refinement of the cost assumptions for floating offshore wind technologies based on known cost reductions and recent generation and cost data from recently contracted east coast projects and European floating offshore wind projects.³

3. Utility-scale wind energy presents an enormous opportunity to grow the economy through job creation (manufacturing, construction, and operations) and reduced electricity generation costs.

Utility-scale offshore wind energy presents an enormous opportunity to grow the economy through port revitalization and job creation (manufacturing, construction, and operations), reduced electricity generation costs, and a generation profile that complements California's exceptional solar resource. Creation of a robust California market for offshore wind presents an enormous opportunity to establish a highly skilled local workforce to construct and maintain offshore wind facilities.

In order to attract offshore wind jobs and manufacturing to California, the state must send strong market signals indicating significant and sustained development potential in California, likely upwards of ten gigawatts (GW) over the next ten years. The robust response of 14 companies to the Bureau of Ocean Energy Management (BOEM) recent Call for Information and Nominations (Call) indicates significant commercial interest in developing the state's abundant offshore wind resource. However, this is merely the first step in attracting significant new investments, including a manufacturing and

³ The 20-year average cost of long-term contracts for Massachusetts' 800 MW Vineyard Wind Project in is \$84.23 per MWh in levelized nominal dollar terms. This is equivalent to a levelized net present value price in 2017 dollars of \$64.97 per MWh. <https://macleanenergy.files.wordpress.com/2018/08/doer-83c-filing-letter-dpu-18-76-18-77-18-78august-1-2018.pdf>



supply chain presence in California. Other important actions will ensure economic growth through offshore wind development; these include a successful BOEM lease auction in 2020, incorporation of offshore wind into long-term planning processes such as integrated resource planning, a state commitment to an offshore wind target, and public investments in baseline wildlife and habitat surveys.

AWEA-California supports additional research around California's ports to facilitate development of utility-scale offshore wind. An analysis of local port infrastructure is underway in the North State through Schatz Energy Research Center⁴, and should be considered as the basis for a broader statewide strategic plan for ports completed by the CEC or Ocean Protection Council. Recent publicly funded efforts in Massachusetts and New York to identify existing port and waterfront properties and assess their potential to serve various offshore wind supply chain needs provide excellent models.⁵ We also anticipate an effort at the federal level to assess the capacity of various ports to accommodate offshore wind logistics and development⁶, and believe that the Energy Commission's research could supplement this federal research with a California lens, focusing on ensuring that adequate infrastructure is developed in the state to benefit from the high economic value of floating offshore wind construction and installation activities. If the infrastructure is inadequate these high economic value activities will be done elsewhere, leaving the state with only the construction and maintenance jobs.

In addition, given California's clean energy and electrification goals and the need to improve air quality in California's port communities, we suggest consideration of the role of electrification at ports in the assembly and logistics of offshore wind components. This could reduce manufacturing costs if California keeps energy costs low through development of a low-cost, low-carbon portfolio.

4. Analysis of interconnection and transmission for wind energy – both land-based and offshore – is underway in other venues and is therefore not a research priority for AWEA-California in 2019.

Upgrading the state's transmission system is essential to unlocking the full potential of California's wind energy resources. Transmission and interconnections are ripe for additional analysis; however several entities are conducting more granular studies of transmission needs and new research efforts should be considered in light of these efforts. A preliminary step to identify additional transmission analyses is to synthesize and elevate existing studies into ongoing state energy processes, such as the state Integrated Resource Planning process and the related California Independent System Operator (CAISO) Transmission Planning Process (TPP). The CEC should ensure that any studies completed under this initiative could be leveraged in both in the IRP and Transmission Planning Process (i.e., the results can be used as inputs into the IRP Reference System Plan or the study would result in a policy sensitivity in a future cycle of the TPP).

⁴ Schatz Energy Research Center. Humboldt State University. Offshore Wind Analysis. <http://schatzcenter.org/projects/oswstudy/>

⁵ Massachusetts Offshore Wind Ports & Infrastructure Assessment (<https://www.masscec.com/massachusetts-offshore-wind-ports-infrastructure-assessment>), NYSEDA Ports Assessment (<https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Economic-Opportunities/Ports-and-Infrastructure>)

⁶ Water Resources and Development Act, Sec. 1207. Study on Innovative Ports for Offshore Wind Development.



For all renewable energy development, the state could consider conducting an analysis of successful strategies employed in other jurisdictions to expand transmission to enable large-scale renewable energy development. The Competitive Renewable Energy Zone (CREZ) process, in particular, serves as a highly relevant case study example. Since its implementation, CREZ has enabled development of more than 18 GW of wind energy capacity while overcoming technical issues such as curtailment and transmission congestion.⁷ California of course had its own version of this effort with the Renewable Energy Transmission Initiative (RETI) and RETI 2.0, both of which resulted in valuable information to inform renewable energy development.

Offshore wind transmission and interconnection

Schatz Energy Research Center is looking at transmission constraints in the North Coast in order to better accommodate offshore wind.⁸ We also understand that the CAISO has conducted some initial analysis of transmission and interconnection constraints off the coast of California to accommodate offshore wind. Robert Collier at the University of California Berkeley is also working with E3 to examine the grid integration benefits of offshore wind for California⁹.

Land-based wind transmission and interconnection

As a result of the 2019 IRP Decision adopting the Preferred System Plan, the California Public Utilities Commission (CPUC) conveyed a policy sensitivity for the CAISO to study in the 2019-20 TPP that includes 4,250 MW of regional wind.¹⁰ Additional analysis and consideration is necessary to continue evaluate existing transmission availability and optimization opportunities as well as needs for new out-of-state facilities. If the CEC studies land-based transmission and interconnection needs as part of the EPIC, it should strategically focus on the narrow question of publishing data on transmission capacity availability in light of announced retirements of out-of-state coal facilities by various California load serving entities.

Conclusion

AWEA-California appreciates the initiative of the CEC to investigate opportunities to improve the cost, reliability, and economics of utility-scale wind both for land-based and offshore wind. AWEA-California

⁷Competitive Renewable Energy Zones in Texas, National Renewable Energy Lab (2018)

https://www.michigan.gov/documents/mpsc/tx-crez-background_258398_7.pdf

⁸ Electricity Grid Constraints, Mitigation Measures, and Associated Costs: The project team will determine the lower and upper bounds on the installed capacity of offshore wind generators in the Humboldt Bay Region considering the limits established by the existing infrastructure and by the requirements for economically viable commercial development. At present, the power capacity of the transmission lines (ca. 60-70 MW) linking the Humboldt County grid to the larger California grid, the design of local grid infrastructure, and the existing loads in Humboldt County (averaging 110 MW with a minimum load of about 70 MW) limit the amount of wind power generation that could be used. In addition, existing grid management requirements and transmission constraints must be considered to determine the bounds of project scale.

⁹ California Offshore Wind: Workforce and Grid Integration Analysis. USC Dornsife.

<https://dornsife.usc.edu/uscseagrant/opc-ucb-collier-offshore-wind/>

¹⁰ <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M284/K786/284786020.PDF>



recommends streamlining the research initiatives to strategically focus on what is truly needed for each technology and avoid duplication of existing research initiatives. Whenever possible, the CEC should seek to build on existing processes such as the Transmission Planning Process and the IRP. AWEA-California looks forward to continued participation in facilitating clean energy development in California.

Sincerely,

A handwritten signature in black ink, appearing to read 'Danielle', is positioned below the word 'Sincerely,'.

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