DOCKETED	
Docket Number:	19-ERDD-01
Project Title:	Research Idea Exchange
TN #:	225913
Document Title:	Magellan Wind Comments On Next Generation Wind Energy Technologies and Their Environmental Implications
Description:	N/A
Filer:	System
Organization:	Magellan Wind/Jeffrey Kehne
Submitter Role:	Public
Submission Date:	11/16/2018 1:11:16 PM
Docketed Date:	11/16/2018

Comment Received From: Magellan Wind
Submitted On: 11/16/2018
Docket Number: 19-ERDD-01

On Next Generation Wind Energy Technologies and Their Environmental Implications

Additional submitted attachment is included below.

November 16, 2018

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

Submitted Via Email to docket@energy.ca.gov

Subject: Comment in Docket No. 19-ERDD-01 – Next Generation Wind Energy Technologies and their Environmental Implications.

Magellan Wind appreciates the CEC's outreach for information on research needs and opportunities relating to next-generation wind energy technologies. Magellan, an offshore wind developer, has focused its comments on research that could advance the development of California's offshore wind resources.

Our comments are relevant to two initiatives set out in the 2018-2020 EPIC investment plan:

- Development and deployment of cost-effective real-time monitoring and control systems for offshore and land-based wind turbines (initiative 4.2.1), and
- Investigation of risks to sensitive species and habitats from renewable energy projects in California, including offshore wind (initiative 7.3.1)

We offer recommendations, in particular, on questions 5 and 6 from the panel discussion questions presented at the October 25 workshop, and discussion topics 2, 4 and 7 from the workshop notice.

Magellan Comments on Panel Discussion Questions

5. What is the current state-of-the art (e.g. use of drones and robots) for maintenance and monitoring of wind energy farms? Are there any further technological developments needed and are any of the currently available cutting-edge approaches applicable for use in any future offshore wind farms? What are the research needs to encourage proactive maintenance while reducing operational and maintenance costs and help future offshore wind projects have a competitive levelized cost of energy?

> The case for public investment for investment in underwater technology is stronger than for airborne technology. Magellan believes that the use of airborne drones to inspect turbine rotors and blades has reached a point at which commercial R&D, driven by an O&M industry that services more than 540 GW of installed wind capacity worldwide, can provide needed innovation without government support. Magellan recommends that the CEC consider supporting

research on underwater drones, known as Autonomous Underwater Vehicles (AUVs) or Unmanned Underwater Vehicles (UUVs). AUVs and UUVs serve a far smaller – though rapidly growing – market for services site characterization and operation and maintenance services in the oceans industries, including offshore wind. AUV-UUV technology exists, but has so far been deployed mainly by oil and gas companies. In California, where many potentially viable project sites are located in waters with depths ranging from 800 to 1,200 meters, offshore wind development could benefit significantly from advances in deep water AUV-UUV technology aimed at reducing the costs of pre-construction mapping of mooring locations and cable routes and post-construction monitoring of foundations and mooring systems. (For a description of a promising shallow-water AUV-UUV research effort, supported by the UK government's Offshore Renewable Energy (ORE) Catapult research and development center, see https://www.modus-ltd.com/news_011801.php (AUV-UUV advances estimated to save the UK offshore wind industry – based almost entirely on bottom-fixed technology to date – up to 1.1B GBP).

6. What research [efforts] are needed, e.g. environmental and technological, to set the stage for future development and implementation of offshore wind energy in California?

The 2018-2020 EPIC investment plan creates an opportunity for the CEC to support a systematic research effort to understand the development potential of the world-class wind resources off California's northern coast. Magellan recommends that CEC consider EPIC investments in several specific areas of environmental and technological research, including research on AUVs and UUVs for site characterization and O&M tasks (question 5 above), smarter remote monitoring and control systems (topic 2 below), wind resource and biological data (topic 4 below), and entanglement risks that could result from the suspension of abandoned fishing gear and other debris on mooring lines for floating foundations (topic 5 below). Magellan also recommends careful consideration of the proper framework for pursuit of this research.

To obtain the maximum benefit from research in these areas, as well as in others that may become important as offshore wind in California advances, Magellan recommends that the CEC consider supporting a pilot-scale research effort, undertaken in federal waters on a research lease or limited lease, on or near the Humboldt Call Area. The Eureka-Arcata area has strong research capabilities in the Schatz Energy Research Center and other parts of the Humboldt State University. The area also has a number of engaged stakeholders with demonstrated commitment to responsible, community-spirited development of renewable energy resources. A pilot-scale research project off the northern California coast would provide an unparalleled opportunity for intensive study of pre-construction, construction-stage, and post-construction environmental impacts of floating turbine deployment and operation. (In view of the rapid pace

of innovation in floating foundation technology, a research project could also provide a valuable testing ground for privately funded prototypes of promising new foundation designs.) A research facility would also provide a laboratory for evaluation of emerging technology for monitoring of wildlife populations, remote monitoring and control or turbine systems, and operation and maintenance.

Northern California is the right location for such a research facility due to its excellent wind resources and the absence of intensive military uses. If offshore wind power is to make a significant contribution to California's ambitious campaign to decarbonize its energy systems, a high proportion of the generating capacity is likely to be deployed off the north coast. EPIC funding in support of a dedicated offshore research facility could provide a solid foundation for responsible large-scale development, including investments in transition capacity needed to move power from the north Coast to California's load centers.

Magellan Comments on Discussion Topics Listed in the Workshop Notice

2. *Real-time remote monitoring systems for offshore and land-based wind technologies Advanced implementation of cost-effective instrumentation, and real-time wireless remote monitoring and control systems to extend wind turbine lifetime, reduce levelized cost of energy, and increase productivity of offshore wind energy projects*

   Magellan recommends that the CEC consider supporting research on remote monitoring and control systems, which are particularly important for offshore wind farms insofar as they can reduce O&M visits and unscheduled downtime. Although such systems are already widely used in the European offshore wind industry, California's immediate access to world-leading expertise in artificial intelligence may provide an opportunity for a CEC-administered, EPIC-funded initiative to add substantial value.

4. *Research needs, performance metrics, and economic viability to support development and deployment of next-generation wind energy technologies California*

   Magellan recommends that the CEC consider investing in the collection of data on wind speeds and biota (birds, bats, fish, sea turtles and marine mammals) at areas designated for possible leasing in BOEM's October 19, 2018 Call for Information and Nominations. As offshore wind leasing efforts off the East Coast have shown, early collection of high quality, trusted data can improve the development process by reducing total data gathering costs, shortening timelines and decreasing conflict over appropriate locations and mitigation measures.

7. *Ongoing offshore environmental research and gaps relevant to planning and operations of offshore wind energy*

Magellan recommends that the CEC consider funding research concerning (a) the potential for fishing gear or other debris to catch on mooring lines for floating turbines and create entanglement risks for fish, turtles and marine mammals; and (b) cost-effective measures to reduce entanglement risk (possibly including sensing devices on mooring lines or AUV-UUV inspection).

Conclusion

The CEC deserves credit for its thoughtful approach to identifying cost-effective ways in which EPIC funds can be used to understand and enhance the potential for offshore wind to contribute to California's clean energy transition. Magellan appreciates the opportunity to offer these comments.

Sincerely,

Jeffrey Kehne
CDO & General Counsel
Magellan Wind
jkehne@magellanwind.com