

DOCKETED

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An aerial photograph of a large, blue, octagonal structure floating in the ocean. The structure has a grid-like pattern on its top surface. The water around it is a deep blue-green color.

CALWAVE

Unlocking the Power of the Ocean

CEC Public Workshop (August 8th)

xWave Architecture

Installation and maintenance on the surface.



Operates and shelters fully submerged!



Key Features

Scalable farms (1 to 500+ MW)

Operates fully submerged

Autonomous control & shutdown

Data driven / adaptive controls

~ 40 - 50% capacity factor

Designed to operate 20+ years

Active load management

Proven industrial subcomponents

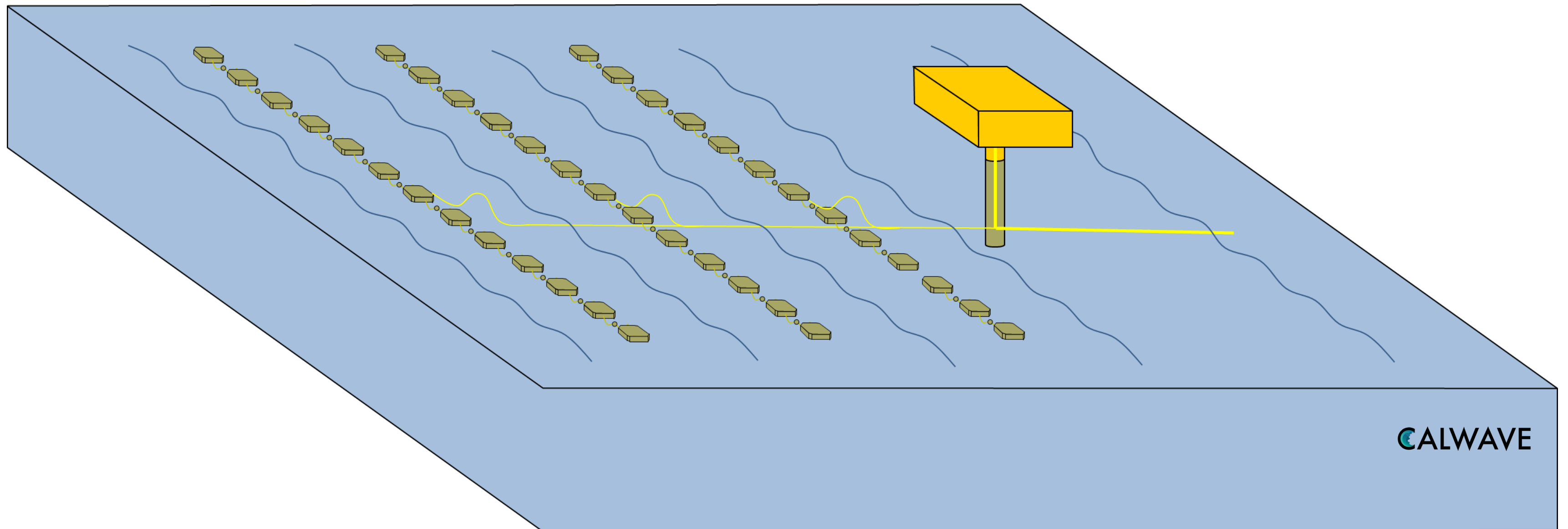
Hours operational offshore:
7000+ hours continuous
99% Uptime

Third party product validation:

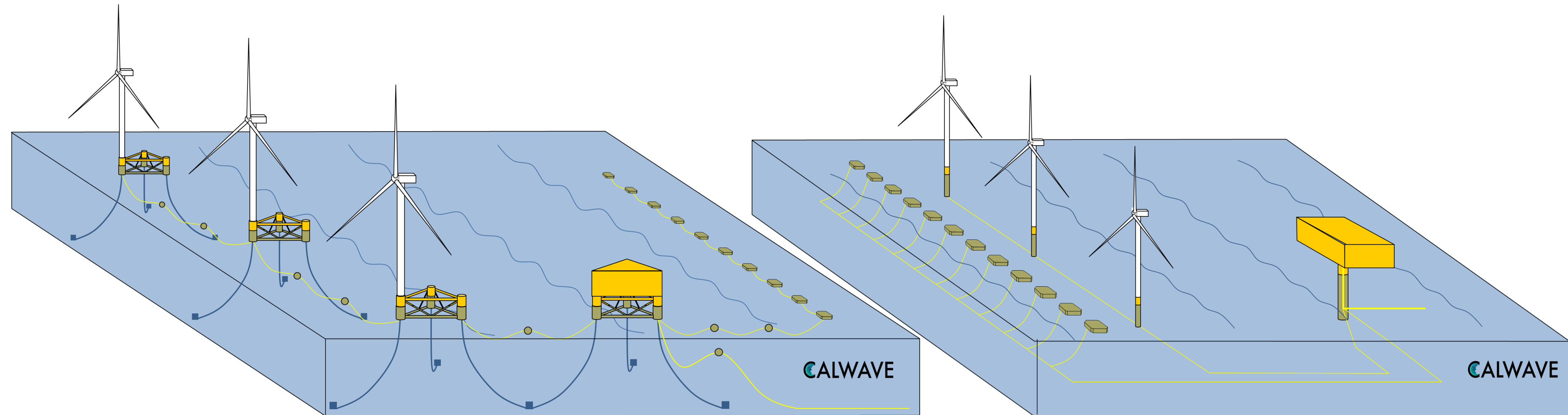


Utility scale wave parks

- 20-100 MW wave parks
- Require min. 1 – 2MW or larger rated WECs
- Deployment potential where Offshore Wind is not possible



Hybridizing with Offshore Wind



- Higher joint Capacity Factor
- Higher capacity in same lease area (up to factor 2-3x)
- Optimized utilization of shared supply chains (equipment, offshore IO&M)
- Lower steel per MW installed for wave

CalWave's Submerged Product Lines & Background

Name	x200	xMW
Power [kW]	200	1000
Capacity Factor [%]	40-50%	40-50%

Founded in 2014 in California

Offices in Berkeley, Oakland, and Alameda, CA

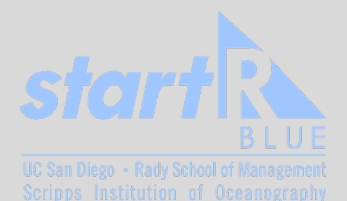
R&D contracts to UC Berkeley, UCSD, and others

Four multi \$M federal contracts from US DOE

Memberships



CA-based partners

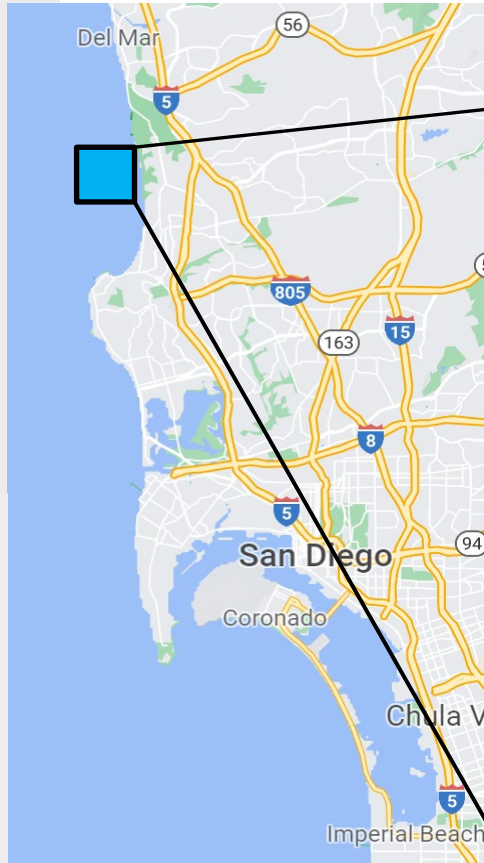


x1 Ocean Pilot – 2021 – 2022, San Diego, CA

Location: SIO, San Diego

Duration: 10 months

Partners:



Scripps Pier, CalWave deployment site



#	Test objective
1	Installation & recovery procedures
2	Operations
3	Autonomous controls
4	Performance
5	Reliability
6	Survivability

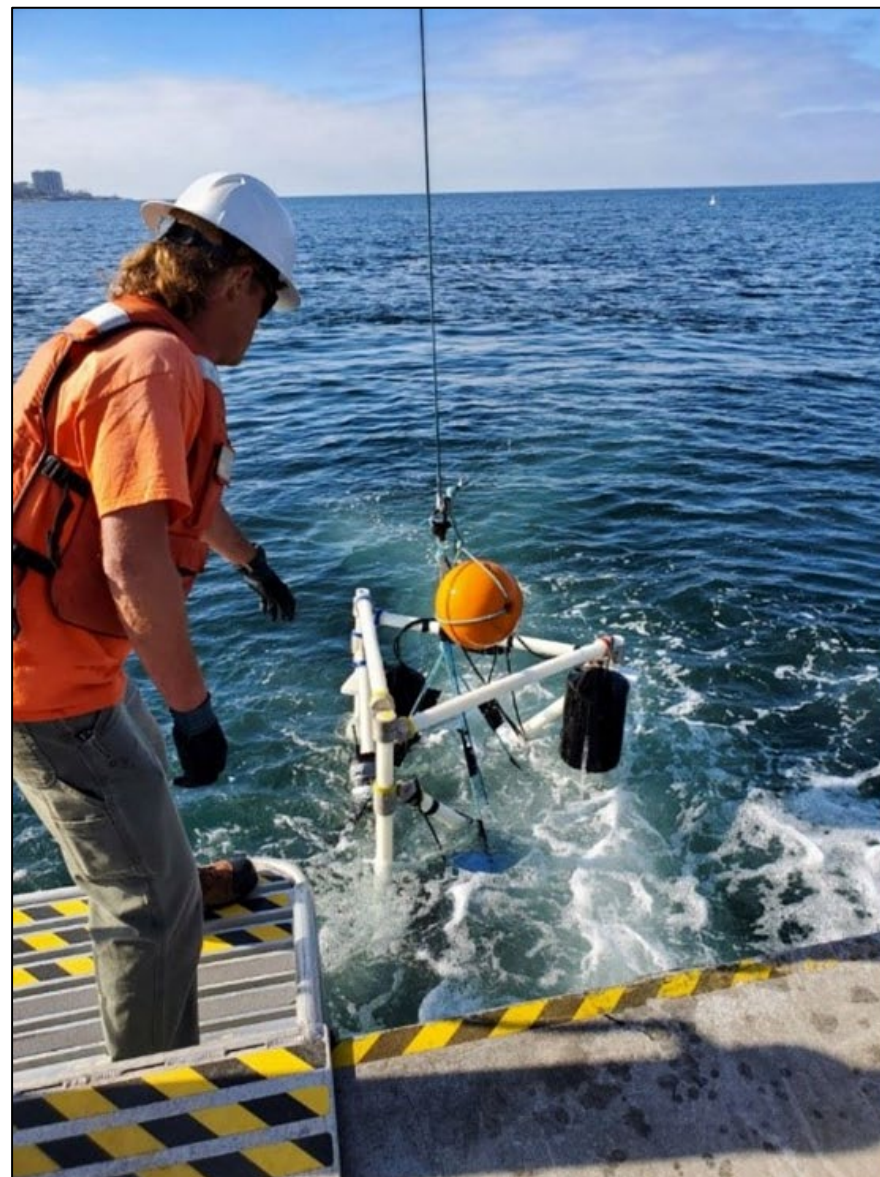
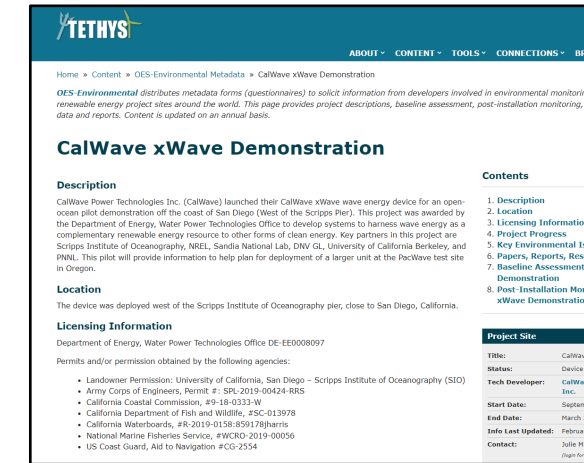


3rd Party Environmental Monitoring - PNNL

Report shows acceptability of risks:

1. Entanglement
2. Sound
3. Collision and pinch points
4. Electromagnetic fields
5. Discharge and spill

Link to report:

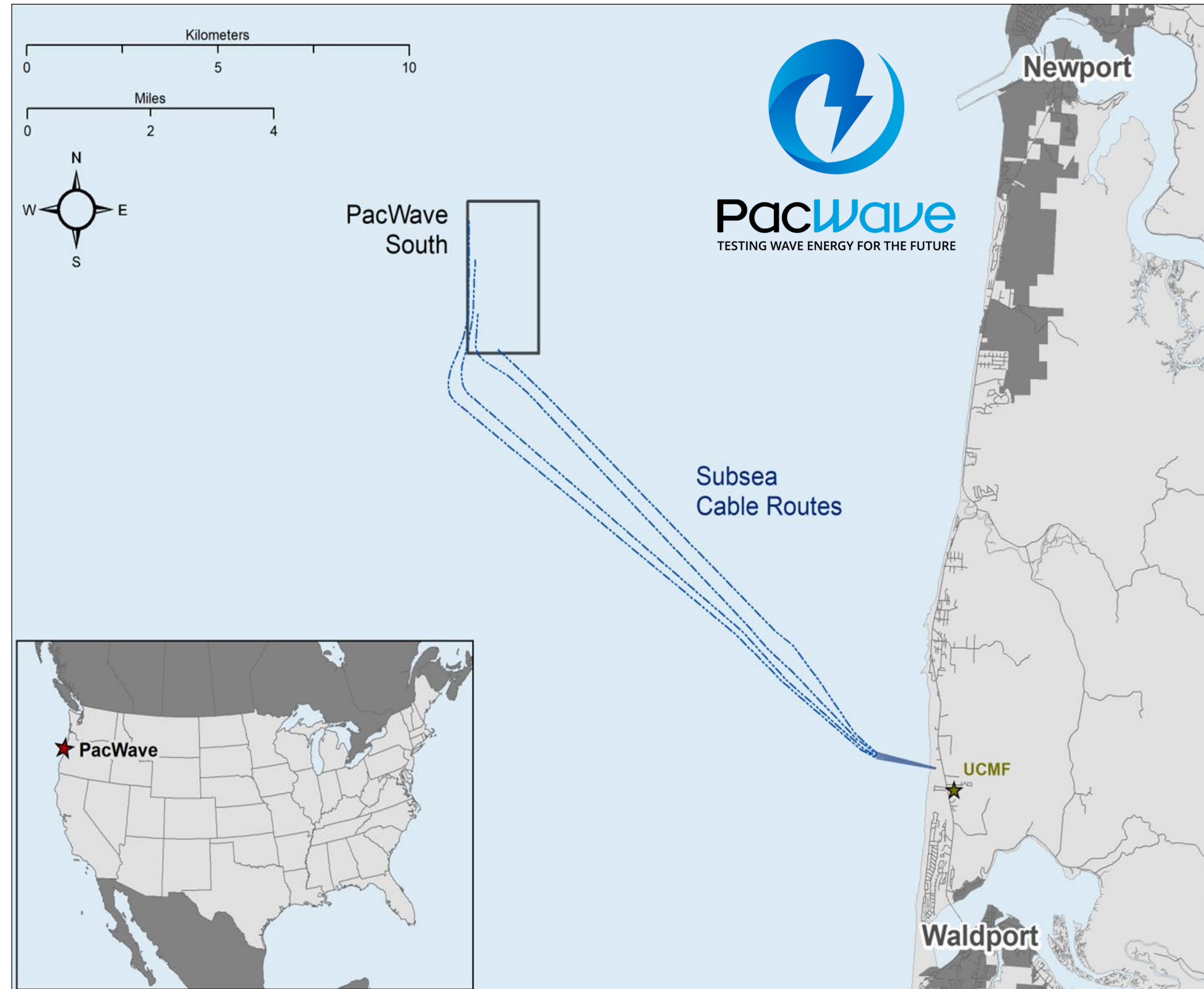


x200 at PacWave (2026)

Location: Newport, Oregon

Goal: 2 years grid connect & PPA

#	Item	Status
1	Full System & Controls Co-Optimization	✓
2	Data-driven/Adaptive Controls	✓
3	Detailed PTO, WEC, and Mooring Design	✓
4	IEC/IEEE/DNV conformity achieved	✓
5	Interconnection studies	✓
6	At-Scale PTO HIL Test Rig (In-House)	2024
5	WEC Construction & Deployment at PacWave	2025/26



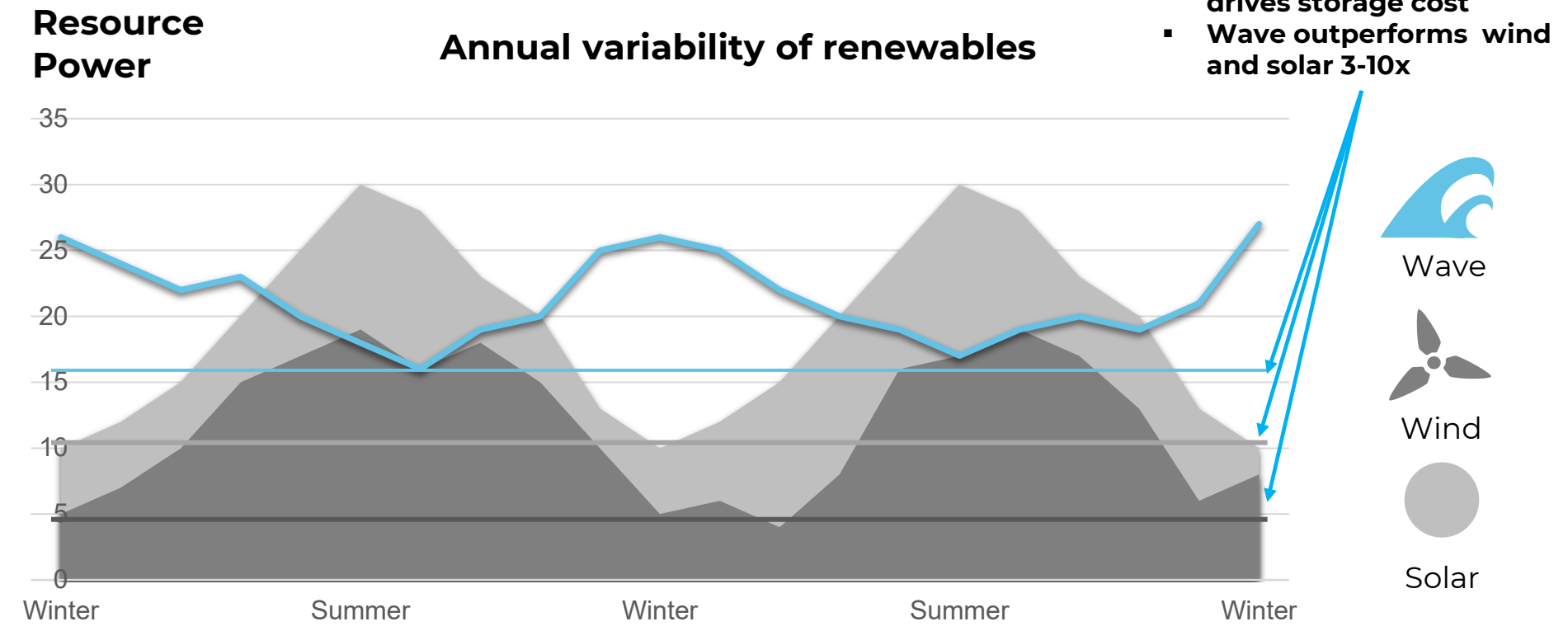
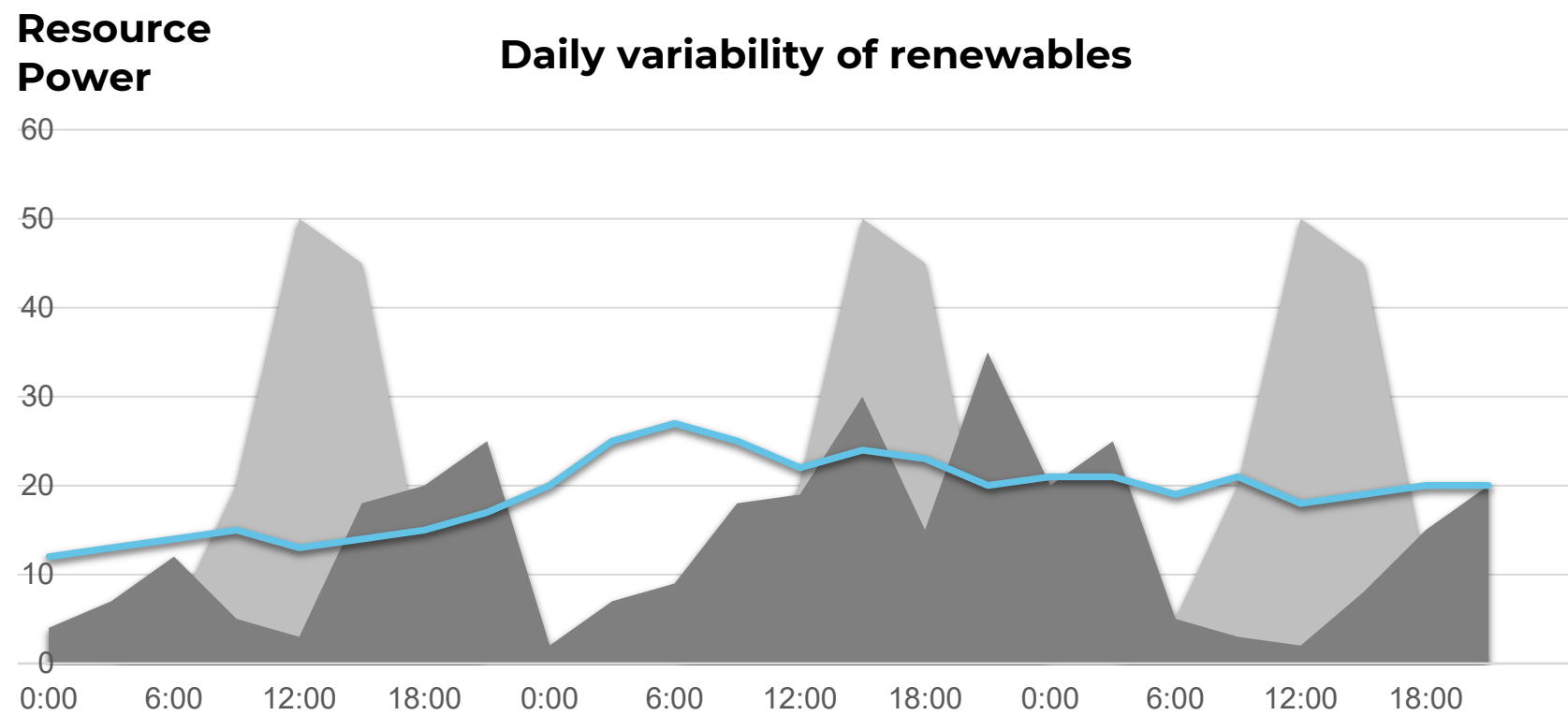
Wave power is an abundant and stable clean power source.

As a complement to other renewables:


1
It's more consistent.

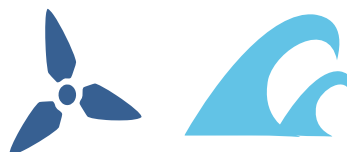
2
It's more predictable.

3
It's 20 to 60 times more energy dense.



Increasing Capacity Factor (CF):


CF Wind = 40-50%

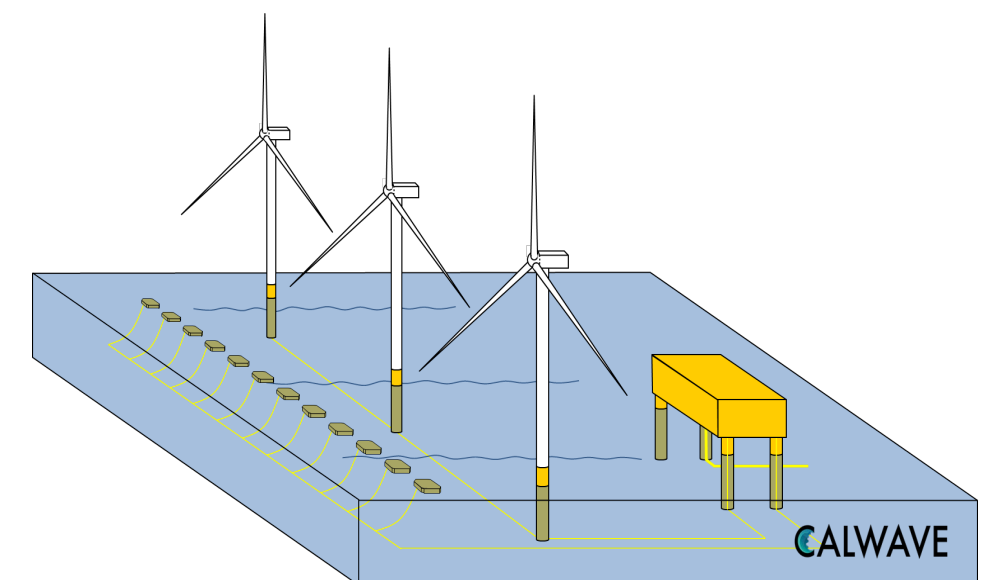

CF Wind + Wave >> 50%
[Link to Stanford Study.](#)

Reducing cost:

LCOE Wind + Wave: **12% lower**
LCOE Wave: **40% lower**
[Link to 2023 Scotland Study.](#)

Benefits of Marine Energy for CA

- 1. Reduced costs for ratepayers:** Integrating marine energy into California's energy mix would reduce reliance on solar and wind energy and would reduce the need to overbuild transmission and storage infrastructure.
- 2. Energy security and stability:** The consistency, predictability, and proximity of marine energy resources would flatten the Duck Curve, provide grid stability, and reduce transmission costs.
- 3. Job creation and industry growth:** California has an opportunity to supplement its growing offshore wind workforce with a local industry that builds and exports marine energy technologies instead of importing them.
- 4. Climate impact:** Marine energy technologies have the lowest lifecycle emissions of any renewable energy technology and can play a major role in reaching 100% renewables in California by 2045.



CALWAVE

Unlocking the power of the ocean!

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CalWave's Recommendations:

- 1) Quantify savings for CA ratepayers resulting from integration of marine energy.
- 2) Encourage further legislation to create the same pathway for marine energy as offshore wind.
- 3) Implement marine energy targets of 100 MW by 2030, 500 MW by 2035, and 2,500 MW by 2040.
- 4) Work with CPUC to determine path toward setting a price per MWh for marine energy.
- 5) Provide matching funds for U.S. DOE and other federal awards and investments in technology RDD&D relevant to marine energy.
- 6) Clarify state regulatory processes for deployment of marine energy projects and encourage the appropriate federal agencies to clarify federal regulatory processes for deployment of marine energy projects.
- 7) Partner with the BOEM to begin planning efforts related to deployment of marine energy in both federal and state waters off the coast of California, including the potential of expanding offshore wind lease areas for multi-use opportunities to include marine energy.
- 8) Encourage the Humboldt Bay Harbor, Recreation, and Conservation District to ensure that their \$426.7 million investment from U.S. DOT can also support the marine energy sector.

