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<tr>
<td><strong>Docket Number:</strong> 19-IEPR-07</td>
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<tr>
<td><strong>Project Title:</strong> Electricity Sector</td>
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<tr>
<td><strong>Document Title:</strong> Floating Offshore Wind Ready for Commercial Deployment Around the World</td>
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<tr>
<td><strong>Description:</strong> Presentation by Kevin Banister, Principle Power</td>
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<td><strong>Filer:</strong> Harrison Reynolds</td>
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<td><strong>Organization:</strong> California Energy Commission</td>
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Floating Offshore Wind: Ready for Commercial Deployment around the World

October 2019
Introduction to Principle Power

Global Presence

- Founded in 2007
- > 70 employees - Offices in California, FR, and PT

Strong Backing

- Shareholders
  - Aker Solutions
  - EDP
  - Repsol Ventures
  - Portugal Ventures
  - ASALMATOS
- Partners
  - ERT

A Proven Technology

- Successful 5-year Full Life-Cycle Demonstration
  - 2MW Vestas, Identical Performance to Fixed Foundation
  - 17GWh, Produced in 12m waves; Survived 17m waves

Project Pipeline

- 3 Precommercial Projects in Progress (~100MW of installed floating capacity by 2021 in Europe)
- Commercial Developments in Europe, USA, Asia
The WindFloat, a versatile semi-submersible floating foundation

1. Wind Turbine Agnosticity
2. Inherent Stability at shallow draft and in transit
3. Quay-side Final Assembly and Commissioning / Minimum Offshore Operations
4. Low pre-tension conventional Mooring System for Station-Keeping
5. O&M Revolution with Tow-to-Shore Strategy

Reduction of costs and risks throughout entire lifecycle
WindFloat technology signed off by Key International Certification bodies in different markets, prepared for deployment in China

**WindFloat Pacific, US**
- US West Coast – high wind, high wave
- 8MW turbine, Turbine TBD
- Approval in Principle
- Full Document and Project Review with no critical findings

**WindFloat Atlantic, Portugal**
- Portugal – medium wind, high wave
- 8 MW turbine, MHI Vestas
- AFC stamped Drawings
- DNV certified MHI Vestas turbine (coupled system)

**Golfe du Lion, France**
- France – high wind, medium wave
- 6+ MW turbine, GE/Alstom
- Approval in Principle issued

**WindFloat Japan**
- Japan – medium wind, medium wave
- 5 MW downwind turbine, Hitachi
- Japan Model Testing performed
- Passed all technical committees with Class NK and NEDO
- Approval in Principle issued
3 Floating Wind Farms underway
3 Different Markets and Customers

75 MW currently under Construction and Installation

100 MW in Operation by 2021
Next Generation WindFloat has been engineered with all major offshore WTMs

<table>
<thead>
<tr>
<th>Project</th>
<th>Turbine OEM</th>
<th>Turbine Model</th>
<th>Power</th>
<th>Diameter</th>
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<tr>
<td>WF1 prototype</td>
<td>MHI VESTAS OFFSHORE WIND</td>
<td>V80</td>
<td>2MW</td>
<td>80m</td>
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<td>MHI VESTAS OFFSHORE WIND</td>
<td>V164</td>
<td>8.3MW</td>
<td>164m</td>
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<td>MHI VESTAS OFFSHORE WIND</td>
<td>V164</td>
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<td>150m</td>
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<td>Adwen</td>
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<td>6.2M 152</td>
<td>6.2MW</td>
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Jump-starting the industry in CA with the Redwood Coast Offshore Wind Project…

100-150 MW, Humboldt County, California, Operational 2024
Flagship project for offshore wind industry in CA and the West Coast

• 12+ MW offshore wind turbines
• 25+ miles out; 700-900 m deep; world-class wind resource (9.5+ m/s)
• Deployable by 2024
• Creation of a public-private partnership with RCEA
  • PPI part of Consortium and WindFloat tech selected by RCEA’s RFQ in March 2018
• Strong local community support and control
• Potential to revitalize the Port of Humboldt Bay; could become leading hub on West Coast
• Large potential to drive investments in infrastructure and create local jobs
The WindFloat is on track to compete with conventional power, other renewables, and bottom-fixed offshore wind.
Key Take Aways

1. Floating wind is proven technically, and is now proving its financial and economic viability;

2. The WindFloat addresses the industry’s bottom-fixed foundation challenges, while enabling offshore wind to reach its full potential;

3. Companies like Principle Power are already executing on several pre-commercial projects globally => ~100MW of expected floating wind capacity installed by 2021);

4. Floating Wind expected to be deployed commercially in the marketplace by end of decade;

5. The key for market leadership is to advance to ‘next scale’ projects and to prepare for developing utility-scale commercial projects.
Thank you!