SOUTHEAST CONFERENCE
ANNUAL MEETING
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COLUMBIA POWER TECHNOLOGIES
power from the next wave

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CEO
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To help satisfy the growing, global demand for reliable, consistent renewable energy, we are commercializing a cost-effective wave power system.
COMPANY OVERVIEW

History
- started in 2005
- technology started at Oregon State University
- 11 employees
- US Offices
  - Product Development - Corvallis, OR
  - Admin - Charlottesville, VA
- international design and manufacturing supply chain

Federal Partners
- US Department of Energy
- US Department of Navy

Product Line
- “RAY” Series – scalable system (<1kw to Megawatt scale)
- proprietary design; 3 patents issued
BP has built over $2 billion of wind facilities on Greenlight projects since the acquisition.

SunEdison has financed or started construction on $320 million of Axio projects since the acquisition.

Maximum build-out of current portfolio is $12 billion.

Utility and tactical scale markets represent multi-billion annual market.
**WHY WAVE ENERGY?**

The ocean is a desirable energy resource:

- energetic
- consistent
- predictable
- supply tends to be close to the demand
- seasonality tends to be demand matched
potential for SE Alaska to leverage its position and natural resource

- “bridge” opportunity
- help with federal push to utility-scale technology
- economic development
- smaller loads
- ability to improve local COE
BUT A TOUGH PLACE TO OPERATE

- Survivability
- Cost Viability
- Low Impact

*this includes some obvious assumptions about customers, markets, national policy...
Our Focus

- simple is better
- offshore where the energy is greatest with the lowest impact
- low cut-in/no cut-out
- on-station maintenance
- no specialized equipment
- end of life recovery only
**STINGRAY**

Floating, offshore, mega-watt scale device

- Composite structure
- Very few moving parts
- 2 direct-drive permanent magnet generators
- Devices to be arrayed in arrays
- 3rd generation design
- Over 15 years of academic and corporate R&D
SEARAY SEA TRIALS
STINGRAY
StingRay

- Wave direction
- Electricity flow
- Reduced-impact mooring
- Feeder line from other unit(s)
- To onshore substation
STINGRAY

Transport Mode

Extreme Survival Mode
WAVE ENERGY COMPETITION

**Competitive Difference**

<table>
<thead>
<tr>
<th></th>
<th>StingRAY</th>
<th>Competitors</th>
<th>Unique Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Capture</td>
<td>Heave &amp; Surge</td>
<td>Heave or Surge Only*</td>
<td>2x Potential Energy Capture</td>
</tr>
<tr>
<td>Generator</td>
<td>Direct-Drive, Perm. Mag.</td>
<td>Hydraulics, Air Turbines</td>
<td>Higher Efficiency, No Heavy Sea Shutdown</td>
</tr>
<tr>
<td>Structure</td>
<td>Fiberglass</td>
<td>Steel</td>
<td>Lower Cost Manufacturing and Operations</td>
</tr>
</tbody>
</table>

*Pelamis claims heave and sway

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TESTING MILESTONES

1:50 Scale Unit Test (v3.0)
1:33 Scale Unit Test (v3.0)
1:15 Scale Unit Test (v3.0)
5 x 1:33 Scale Units Wave Farm Tank Test (v3.1)
1:4.5 Scale Unit Sea Trial (v3.1)
Design Optimization Complete (v3.2)
1:33 Scale Unit Test (v3.2)

Apr 2009
Jan 2010
Jan 2011
Jan 2012
Dec 2012

For sake of presentation, project milestones show starting point only

Test Location
OSU – Test Facilities
Puget Sound, USA

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MARKET PATH

- StingRAY Design & PTO Validation 2013-14
- StingRAY1 Build & Test 2014-15
- StingRAY Small Wave Farm 2015-16
THANK YOU

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