Analyzing the Feasibility of Ocean Wave Energy

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Abstract
The search for clean, cheap, and efficient renewable energy resources has been a main concern for researchers in recent years. Offshore wave energy technology provides reliable base load power without emissions or significant visual/environmental impacts. While the technology has the potential to alleviate the energy crisis, the young, expensive technology needs more time to develop.

Project Goals and Objectives
- Understand the technology that drives each type of wave energy converter
- To evaluate the immediate feasibility of offshore wave energy by analyzing:
  - Cost
  - Environmental impact
  - Level of development

Environmental Impact
Aspects of tidal energy will effect the environment:
- Cables: electromagnetic animals
- Tide: sedimentation along the coast and seabed microorganisms
- Physical: will act as an artificial reef
- Noise: noise sensitive marine animals

Visual Impact

<table>
<thead>
<tr>
<th>Company</th>
<th>Pelamis Wave Power</th>
<th>Ocean Power Technologies</th>
<th>Wave Dragon ApS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Attenuator</td>
<td>Point Absorber</td>
<td>Overtopper (single device)</td>
</tr>
<tr>
<td>Cost per unit</td>
<td>$8 million</td>
<td>$1.5 million</td>
<td>N/A</td>
</tr>
<tr>
<td>Power Rating</td>
<td>750 kW</td>
<td>150 kW</td>
<td>7 MW</td>
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<tr>
<td>Capacity Factor</td>
<td>20%</td>
<td>30%</td>
<td>33%</td>
</tr>
<tr>
<td>Area</td>
<td>2 sq. km per 10MW</td>
<td>0.125 sq. km per 10 MW</td>
<td>0.0255 sq. km per 7 MW</td>
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<tr>
<td>Payback Period</td>
<td>20 years</td>
<td>20 years</td>
<td>N/A</td>
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References