Versatile Marine Energy Point Absorber by Duck Duck Goose

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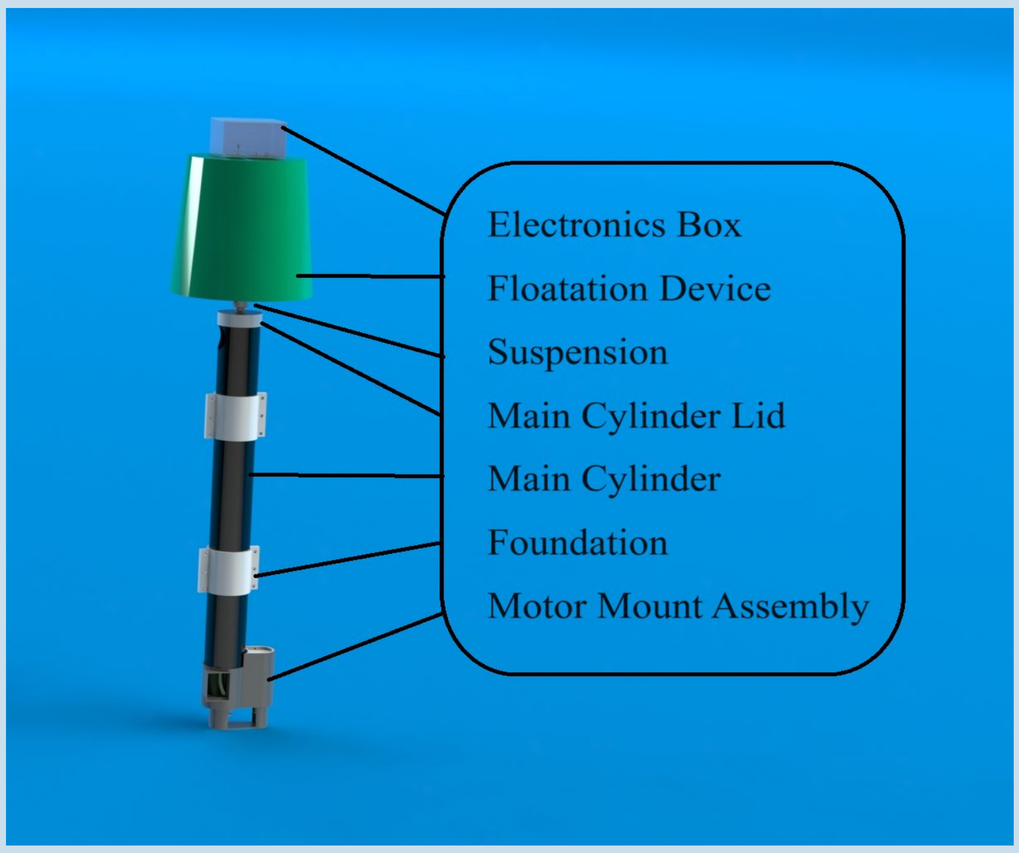
Product Overview

Duck Duck Goose has gone through the design process to develop a wave energy point absorber called the Versatile Marine Energy Point Absorber or V-MEPA.

The product is designed to be simple, cost effective and easy to manipulate. To accomplish this, DDG has implemented a design with:

- Versatile and modular foundation
- Ability to change design for a specified wave height.
- Low profile design for use in non-industrial applications.



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Market Sector

Remote and Isolated Communities

This product will be marketed towards consumers and industries around isolated communities. To do so the maximum wave height and scale can be manipulated to meet environmental requirements.

- Large Scale for Industrial Collocation and MicroGrids
- Small Scale for Consumer use

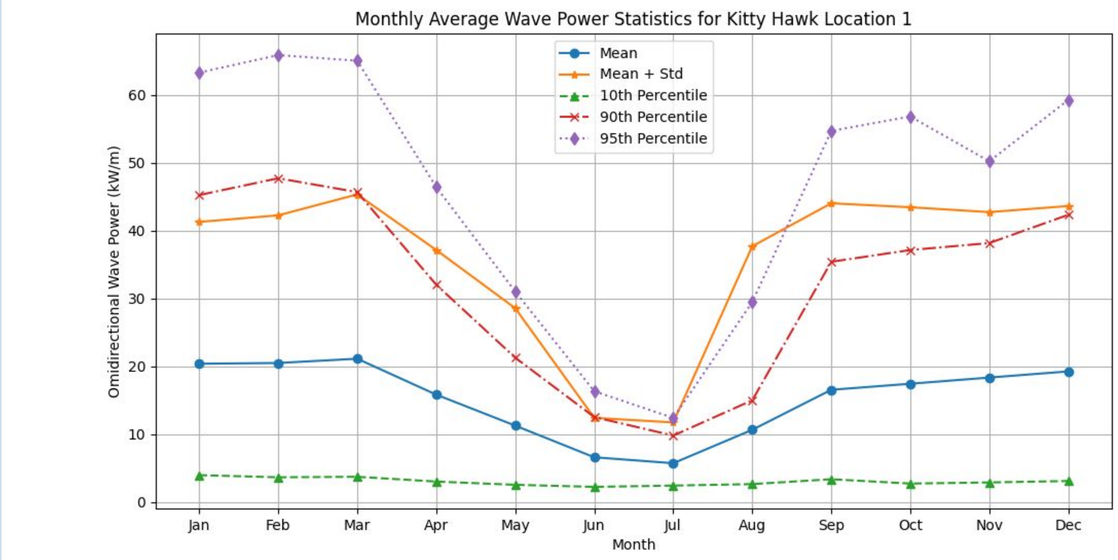
Product Benefit

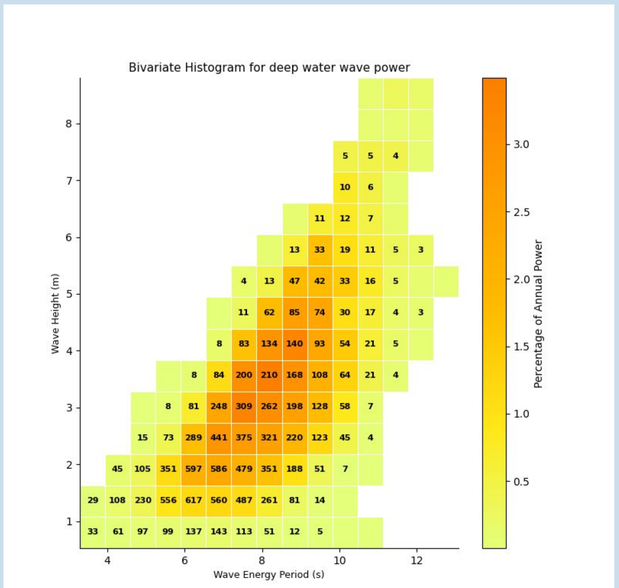
Collocation

- Increases efficiency of power output per unit area.
- Decrease cost of installation and maintenance.
- Wave activity throughout year compliments wind activity.

Consumer

- Charges a battery overtime for emergency use
- Natural wave activity complimented by wakes.





Technical Overview

Concept

- Main Cylinder is anchored by the foundation
- Floating assembly creates a moveable seal inside cylinder, which moves axially with waves
- Water is suctioned through inlet and forced over turbine, water is then pushed out the same path.
- Turbine rotation forces rotation of power motor generator, 3 to 1 gear ratio.

Location

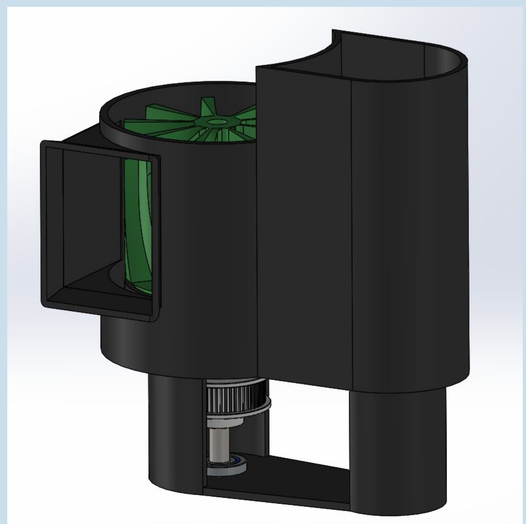
Design is based on wave analysis from Kitty Hawk. Highest percentage of annual wave power comes from a wave height and period of: 3 meters and 7 seconds

Other locations identified

- Aleutian Islands
- Southern coast of Maine

Key Design Aspects

- Turbine based design
- Turbine geometry forces a constant direction of rotation despite the direction of flow
- Foundation design allows for multiple anchorages
- Main Cylinder length is able to be manipulated for environments maximum wave height.



Build and Test

Fabricated using ABS Tubing, 3D printed parts and bought materials.

- Floatation and Actuation tested in a tank and the ocean:
  - Worked as designed
- Seal and Vacuum capabilities
  - Worked as design
- Rotation of Turbine
  - Proved proof of concept