Cost Analysis of Osprey C.R.E.W.

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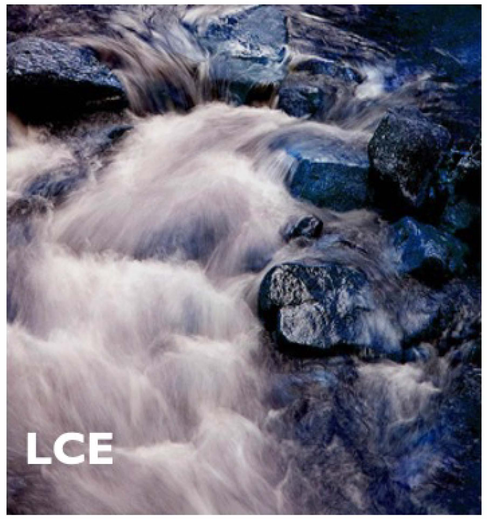

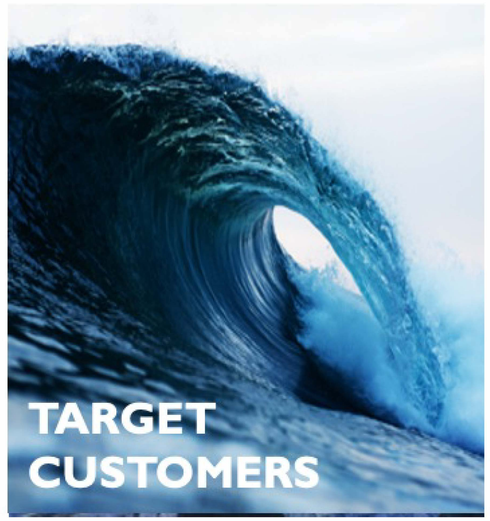

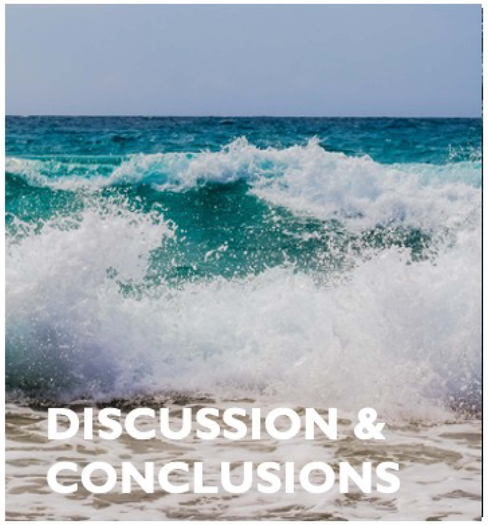

THE WORLD NEEDS OUR HELP

- We need green energy to prevent further harm perpetuated by fossil fuel usage.
- Fossil fuels emit harmful pollutants that harm the environment and public health.
- There are ample opportunities for green energy in the post Covid environment because:
  - The Biden administration is very eager to support renewable energy production.
  - There is growing public sentiment and desire for more renewable energy sources.

OSPREY C.R.E.W. WEC

- Osprey C.R.E.W. wave energy converter (WEC) is a linear generator that consists of a small buoy and a housing relative to the incident wavelength .
- The cylindrical housing holds multiple smaller devices that generate energy based on Faraday's Law of Electromagnetic Induction.

EXISTING ALTERNATIVES

- The existing green energy alternatives are not very reliable.
- Solar can't run continuously, and wind turbines are subject to changes in weather adversely affecting their services.
  - Best exemplified by what recently occurred in Texas. Unpredicted weather conditions can cripple entire electric grids.

OSPREY C.R.E.W. WEC

- Provides reliable renewable energy.
- Harnesses constant wave energy.
- It is flexible and scalable . WEC allows for seamless changes in production level to suit needs and scalability can reduce average cost per device making our device cost effective.

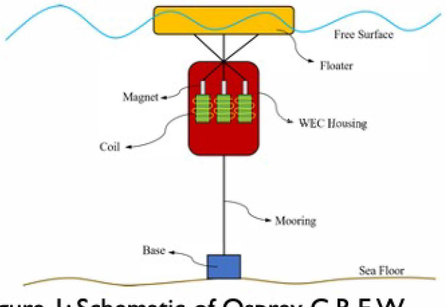

Figure 1: Schematic of Osprey C.R.E.W.

ASSUMPTIONS FOR COST CALCULATIONS

- The wave energy farm is designed for a 20-year life-cycle.
- A discount rate of 8% has been chosen following Guanche et al. (2015).

COST OF ENERGY

- Total cost of producing wave energy is categorized into two components:
  - Capital expenditures (CapEx)
  - Operational expenditures (OpEx)
- Our Capex is $25,029,612 and OpEx is $2,926,429.

KEY METRIC

We use levelized cost of energy (LCE) to compare different energy sources.

$$LCE = \frac{\text{PV of total cost over project lifetime}}{\text{PV of all energy over project lifetime}}$$

- Our device's LCE is 51.69.
- According to Astariz et al. (2015), the LCE of other renewable energy sources is changing between 101.43 and 67.68. On the other hand, the LCE of fuel and coal are 32.57 and 44.40, respectively.
- This shows that our device provides very competitive renewable energy alternative.

Our customers can be categorized in to 2 groups:

Primary Customers

Our primary users will be offshore operations such as

- Drilling
- Mining
- Farming
- Exploration

Secondary Customers

These will be utility scale consumers with a strategic target being those with a more aggressive renewable requirement that are in search of reliable capacity.

OSPREY C.R.E.W STANDS OUT

- Cheap
- Reliable
- Simple design = lower Maintenace
- Ease of deployment
- Mobile/stationary options

Our primary market suffers from expensive variable fuel costs as well as costs of storage. We predict a high adoption rate by our primary market.

The need for reliable and predictable renewable energy will lead to large growth potentials for our secondary market.

While other wave energy devices in the market are not commercially viable yet, our cost figures show that Osprey C.R.E.W. is a very competitive alternative to coal and fuel. This is great news for the world since wave energy is one of the world's largest untapped source of energy!

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