Global Partnership for Ocean Wave Energy Technology

Stakeholder Forum





A Partnership to Address Gaps and Priority Areas of the SAMOA Pathway Global Multi-stakeholder SIDS Partnership Dialogue – 10 July 2019 Charles Nouhan, Chairman Stakeholder Forum for a Sustainable Future The partnership's goal: To delivery utility level power generation to support resilient societies and economies that can adapt to climate change





Surf-making Wave Energy Converter – SurfWEC A new, patented addition to the global energy supply mix that dramatically increases the cost effectiveness of wave energy conversion to the utility level



Surf-making Wave Energy Converter – SurfWEC How it works



10,000+ Megawatt-hours of Electricity per unit per year

Surf-making Wave Energy Converter – SurfWEC Disaster risk reduction: The Storm Avoidance Feature



When waves exceed 3 meters-high, the platform is lowered to reduce wave loads. Smart technology can 'learn' to become a severe-storm early warning system.

Potential benefits to SIDS

Improved Quality of Life on Land and Below Water Biodiversity/Disaster risk reduction/Sustainable transportation

- Diversification of the power grid to reduce outages;
- Electrification of ground and marine transport systems;
- Wave-farms offer a reef-like environment with the potential to improve ocean health, biodiversity, and tourism;
- Smart technology that can 'learn' over time, becoming a data source for severe weather early warning systems; and
- In the most severe storm conditions, the SurfWEC platform can be retracted (submerged) on-site autonomously and remain fully operational.



The Economics of SurfWEC (US Dollars)

Capital Expenditure (CAPEX)

\$13 million for 1 prototype unit connected to onshore grid \$9 million per unit at the 100 units production level

Operating Expenditure (OPEX)

<u>Prototype</u>: \$300K/year with 5-year major overhaul cycle <u>100 unit</u>: \$200K/unit per year with 5-year major overhaul cycle

Revenue per year from electricity sales

<u>Caribbean (average)</u>: 10K MWh¹/year x \$330²/MWh = **\$3.3 million** <u>Fiji</u>: 10K MWh/year x \$470/MWh = **\$4.7 million** <u>Solomon Islands</u>: 10K MWh/year x \$990/MWh = **\$9.9 million**

Headline: SurfWEC is projected to produce up to two times more electricity than a similar investment in off-shore wind.

¹ A MWh is 1,000 kilowatt-hours (kWh)
² Electricity rates from: https://www.nrel.gov

Development Timeline

Scale Model (1/17th scale) wave tank, then sea trial

- Build; wave tank tests; followed by 6-12 months sea trial
 - 2 years 2021

Prototype (full scale) x 3 introductory locations

- Build, followed by 1-2 years sea trials
 - 3 years 2024

Multiple unit expansion at the 3 introductory locations

• 2025 onwards

Commercial Deployment – 100's of units to utility-scale

• 2026 onwards

Thank you

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