

## Innovative pre-tension solution reduces InfinityWEC electricity production cost

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**The InfinityWEC wave energy converter has been upgraded with an innovative solution which uses hydrostatic pressure to provide a constant pre-tension force in the power take-off (PTO), reducing size, weight, complexity, and ultimately cost of electricity production (LCoE).**

In the upgraded InfinityWEC design, the PTO hull is split into two halves, with the top half moving up and down with the buoy, while the bottom half is fixed to the anchor. Similar solutions have been used by pressure-modulating wave energy converters, to extract energy from the variation in pressure below waves, close to the surface. InfinityWEC however, is a *point-absorbing* wave energy converter, with a buoy on the surface driving the PTO positioned close to the seabed. At 70 m depth, the high pressure of the water provides a 100-ton pre-tension force with only a 1.6 m diameter PTO hull. A patent application has been filed for the innovation.

“The new pre-tension solution is a further improvement of the InfinityWEC wave energy converter, reducing the weight of the PTO by approximately 40%,” says CEO Mikael Sidenmark. “We take advantage of the water pressure outside the PTO to generate the constant pre-tension force, which in combination with ball screw actuators provides instant force control with very high efficiency. This enables wave-by-wave tuned force control, improving the annual energy production by up to 30% compared to sea-state tuned control.”

Ocean Harvesting is preparing for sea trials of InfinityWEC at scale 1:3, to be performed off the west coast of Sweden. The sea trial project, to validate the performance in a real sea environment, will be conducted between February 2023 – June 2025. Results will be used to further develop and improve the full-scale system with regards to energy yield, system efficiency, availability, and ultimately affordability.

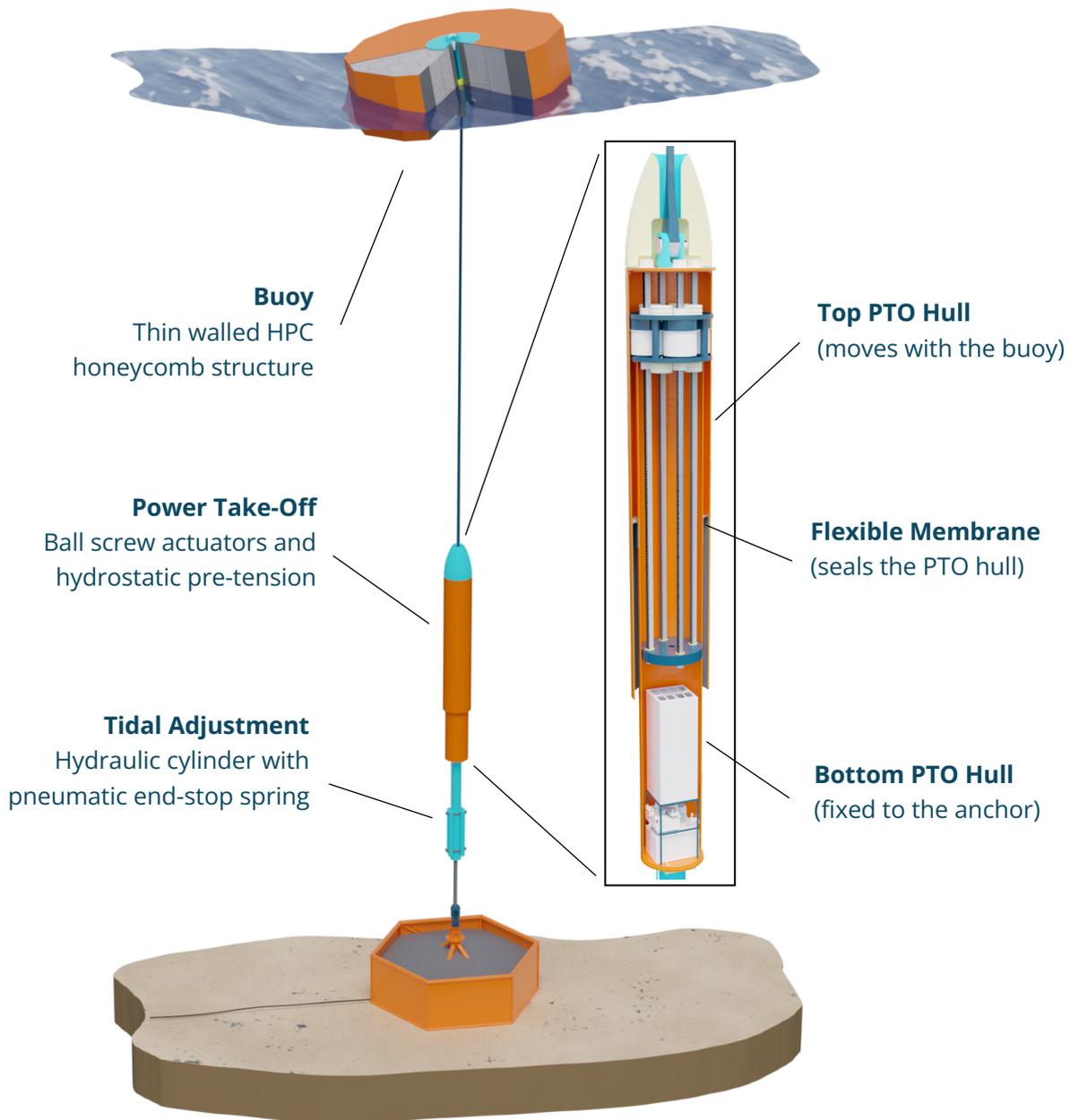
On 14 November, Ocean Harvesting was awarded a 2 MEUR grant from the Swedish Energy Agency for the project. To complete the project financing, the Company is now raising 3 MEUR in equity investment at a pre-money valuation of 7 MEUR.

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# 500 kW InfinityWEC Wave Energy Converter - Generation 6



## About Ocean Harvesting and InfinityWEC

Ocean Harvesting is a privately held company with offices in Karlskrona and Gothenburg, Sweden. After years of research within the wave energy sector, the company started in 2017 to develop the InfinityWEC wave energy converter.

### InfinityWEC is:

- **Efficient** - Breakthrough power take-off ensuring maximum power output from every wave. Structurally efficient.
- **Reliable** - Holding the buoy submerged through the crest of large waves to secure survival and to enable continued power production also in the harshest wave conditions.
- **Scalable** - High volume enabled by factory production of the PTO in a size that can be transported efficiently to the site, while the buoys are manufactured on the site with locally resourced materials.
- **Ideal partner for Wind & Solar** - Producing power at different times, improving balancing of electricity supply and demand. Shared infrastructure and operational costs.
- **Low Levelized Cost of Energy (LCOE)** - Estimated to 100 EUR/MWh at 100 MW deployed capacity and <35 EUR/MWh at 5 GW deployed capacity, highly competitive compared to all other energy production.

What makes InfinityWEC so competitive is the advanced power take-off system, which uses a combination of ball screw actuators and a constant pre-tension force using hydrostatic pressure, to provide instant control of the force applied on the buoy to control its motion (phase control) and capture energy. This enables the use of reactive force control to maximize the electricity production from every individual wave, which can provide up to 30% higher annual energy production, compared to the equivalent force control only tuned to the sea state. A unique survival function holds the buoy submerged through the crest of large waves, protecting the system from excessive load and enabling electricity to be produced also in the most severe wave conditions.

InfinityWEC is engineered for sustainable large-scale production and effective logistics. InfinityWECs prime mover (buoy), is made of concrete casted with locally sourced materials at the installation site in a process common in civil engineering, minimizing transportation. A special high strength and sustainable concrete mix has been developed in collaboration with RISE Research Institutes of Sweden, enabling a prime mover with equivalent weight to a conventional steel hull, but at 1/4 of the cost, a 1/3 of the CO2 footprint and which is 10x faster to manufacture.

The excellent performance and reliability, combined with a modular design where all critical parts are easily manufactured, transported, installed and maintained, make InfinityWEC a very competitive solution for the future global energy market.

The market for InfinityWEC ranges from utility-scale wave farms for electricity and hydrogen production to the gas and power grid on the mainland, to off-grid power supply for island communities and other offshore industrial installations such as oil- & gas platforms and aquaculture.

Read more: [oceanharvesting.com](https://oceanharvesting.com)

## About Wave Power

The estimated global theoretical potential of wave power<sup>1</sup> exceeds the global use of electricity and is available in coastal areas where most of the population lives.

Wave power produces electricity more consistently than wind power, and therefore needs only half as much energy storage to balance electricity generation to a constant power level throughout the year, reducing the overall cost of balancing electricity supply and demand. In addition, electricity is produced at different times compared to wind and solar power, which helps to reduce variations and interruptions in the grid, further reducing the overall cost of electricity.

Wave power will be an important part of the future renewable energy mix, contributing both to lower cost of energy and a more stable energy system.

1. OES An International Vision for Ocean Energy 2017