Update on InfinityWEC G7 Power Take-Off Improvements

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Eight years of simulation driven wave power technology development and optimization has resulted in the highly efficient InfinityWEC G7 Power Take-Off (PTO). Ball screw actuators in combination with hydrostatic pre-tension provides an instantly controllable force and phase control technology (MPC) to optimize the power capture and electricity production from ocean waves.

During 2025, several improvements to the InfinityWEC PTO design have been made, within the EU-financed INFINITY Project:

1. New hull design with conventional cylinder seal and linear guiding, protecting the ball screws from side forces and bending moments.

2. Survival functionality with a new hydraulic cylinder with slack-catch, to eliminate snap loads in the tether and to maintain motion control of the buoy in large waves.

3. Axial flux motors and silicon carbide inverters from EV reduce weight, cost and improve overall efficiency.

4. High-speed flywheel energy storage system to provide reactive power for MPC control and up to 500 kW continuous power output.

Mikael Sidenmark, CEO, says: "Simulations of energy production and cost estimations for InfinityWEC generation 7 show very competitive metrics. The reason is the exceptional performance in combination with use of low-cost materials and simple methods for manufacturing and installation."

Mikael Sidenmark continues, "The weight of the PTO has been reduced from 40 to 30 ton. Annual energy production is furthermore estimated to increase from 2.0 to 2.5 GWh per 500 kW WEC at high energy sites with a new high fidelity MPC algorithm being developed in the project. The structural efficiency is improved from 13 to 18 MWh AEP / ton. "

The PTO technology and a moment-based MPC algorithm are developed and validated in a 1:4 scale prototype on a real-time control system in a test-rig, in the 2.7 MEUR EU-funded project INFINITY (2025-2027).

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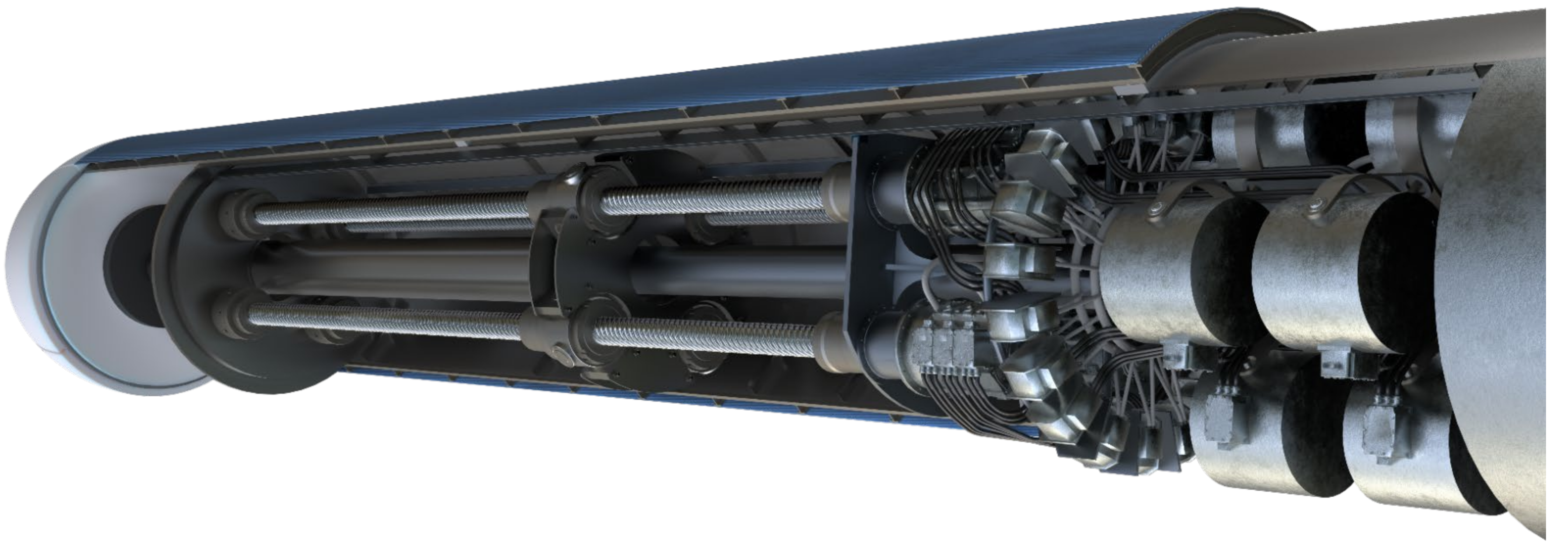


About Ocean Harvesting and Wave Power

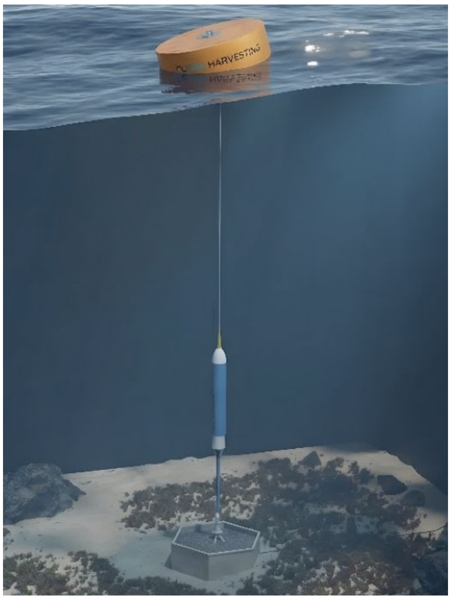
Ocean Harvesting Technologies AB, based in Gothenburg and Karlskrona, aims to become an important part of the future renewable energy mix by developing and commercializing InfinityWEC, a 500 kW wave energy converter (WEC) combining high energy output, high material efficiency and low-cost materials.

A transition from fossil fuel to renewable energy is critical to mitigate climate change. Furthermore, electricity demand is growing very fast. Solar and wind power are leading the renewable transition but will not be sufficient given the enormous scale of the transition. As the share of renewable energy grows, energy systems require increasing amounts of costly storage and over-capacity as well as grid flexibility.

Wave power is an enormous, untapped source of clean energy and its complementary power profile will mitigate these problems and improve grid balance, as it produces electricity more consistently and at different times than wind and solar.

Project INFINITY (2025–2027)

The 2.7 MEUR project is coordinated by RISE and funded by the Clean Energy Transition Partnership program (EU) and the Swedish Energy Agency.



A moment-based Model Predictive Control (MPC) algorithm is developed for InfinityWEC's real-time control system, to optimize electricity production while also taking the system's lifespan into account using a damage accumulation model for the ball screws.

A 1:4 scale prototype of InfinityWEC's power take-off will be built and tested with the new MPC algorithm in a Hardware-in-the-Loop (HIL) test rig at VGA in Italy.

The potential to reduce the use of natural resources and materials and cost, extend service life, create circular resource flows and enhance ocean ecosystems through regenerative solutions is explored, using design methodologies and scenarios.

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