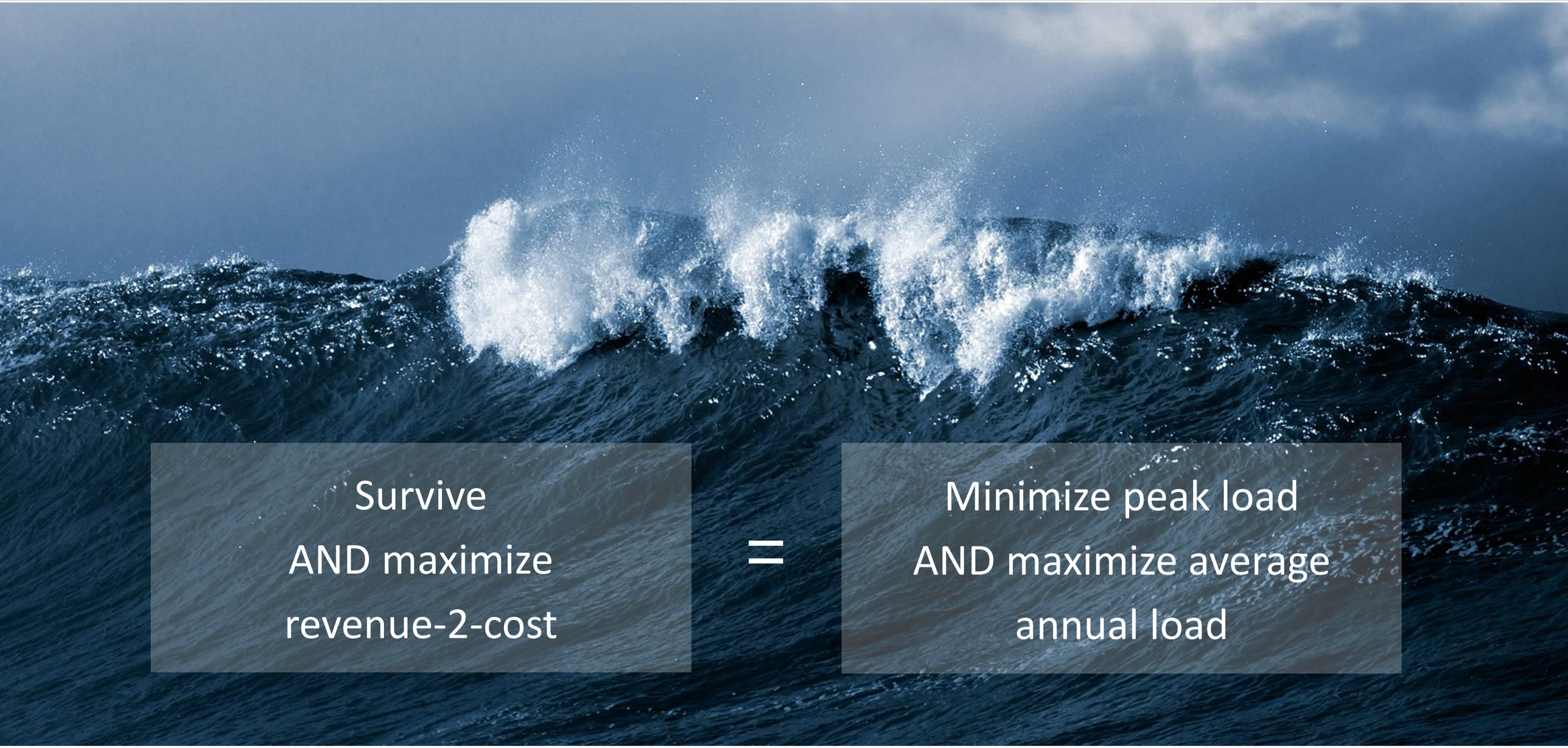
Wave Power Take Off: Have we cracked it?

Ocean Energy Europe

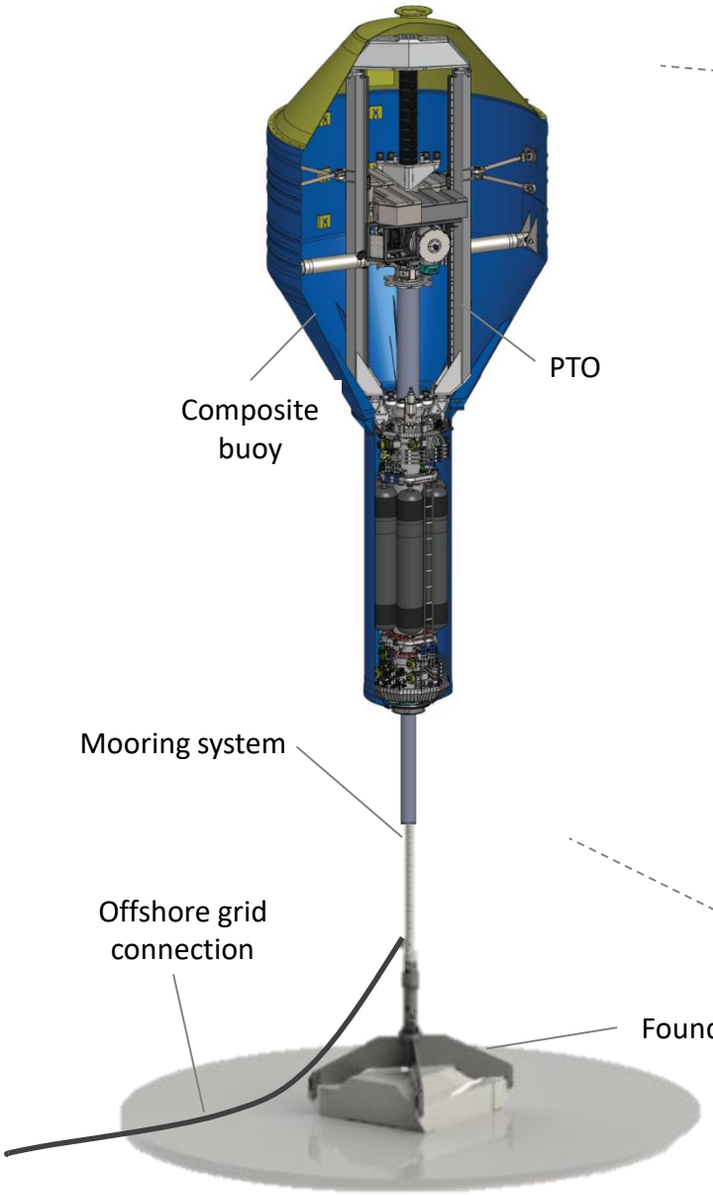
October 2017

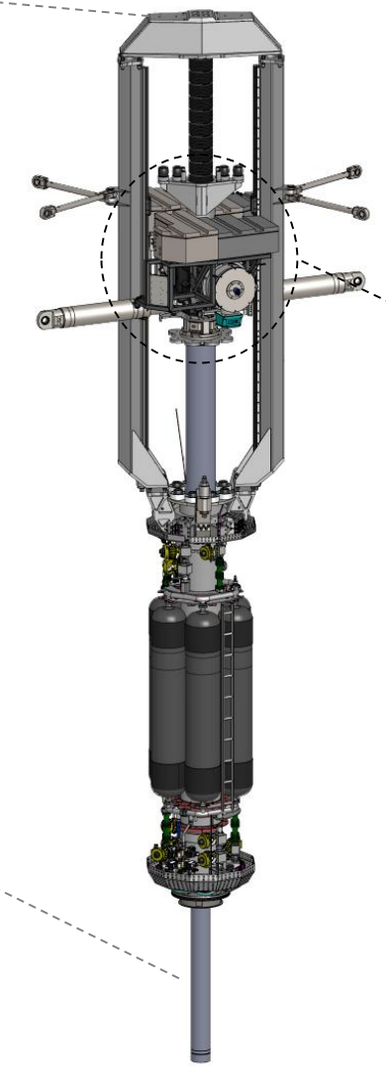
Patrik Möller, CEO

The challenge



Detuned in storms – Amplified in normal operation



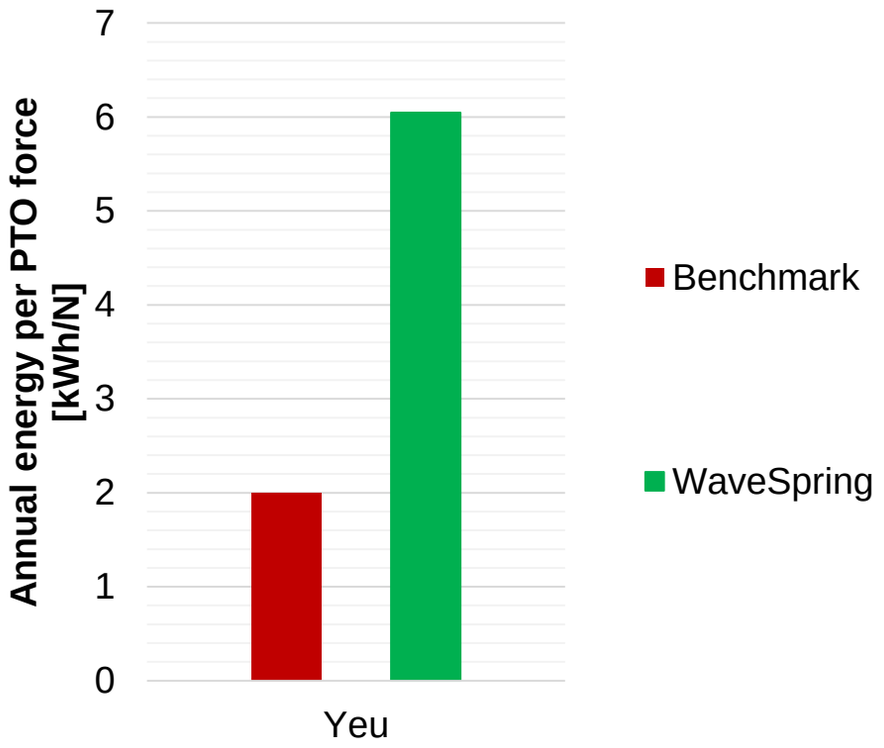


Stage 3 PTO

Performance metrics

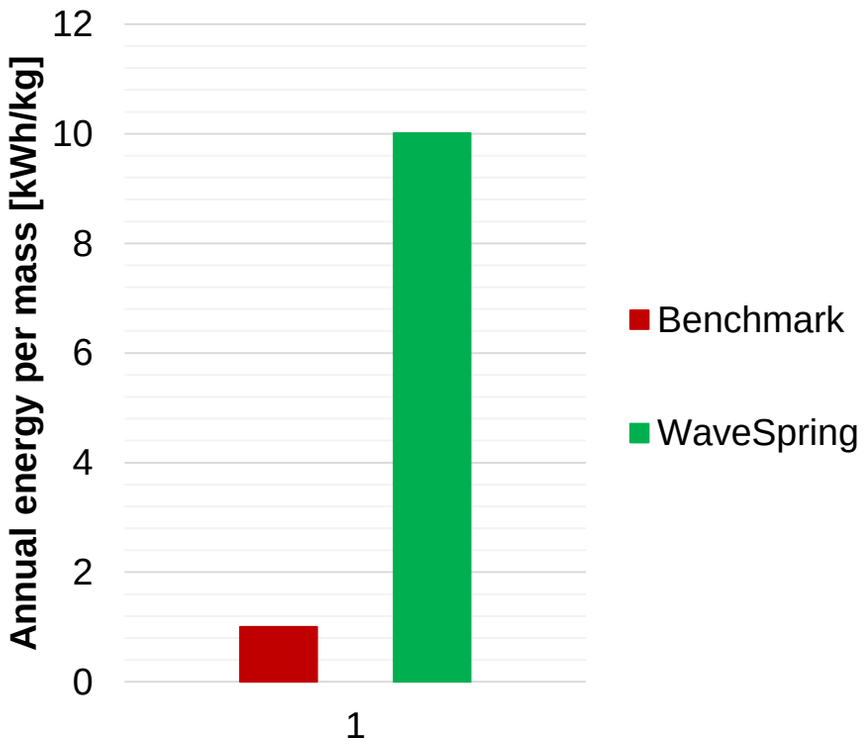
3 times

more energy per PTO force



> 5 times

more energy per ton



Benchmark: A. Babarit, J. Hals, M.J. Muliawan, A. Kurniawan, T. Moan , J. Krokstad: *Numerical benchmarking study of a selection of wave energy converters*, Renewable Energy 41 (2012) 44-63

The POWER of RESONANCE

SURVIVABILITY

Naturally transparent to storm waves

EFFICENCY

5x Energy output per ton of device

COMPETITIVE

Low capital & operations cost, high average output

GRID BALANCING

Using the ocean as the most effective solar battery on earth

CORPOWER OCEAN

www.CORPOWEROCEAN.com

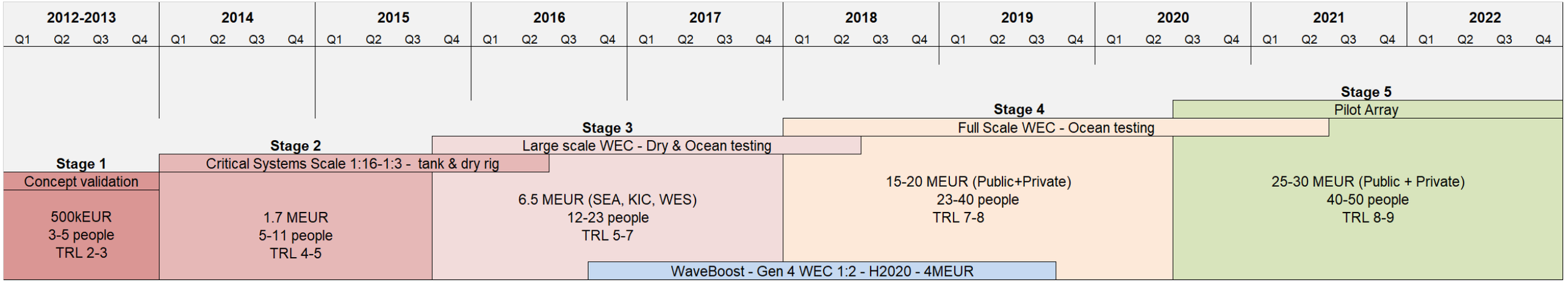
PROJECT PARTNERS

IBERDROLA · KTH · THE UNIVERSITY of EDINBURGH · EMEC · GS-Hydro · pmc cylinders · esp · RI.SE · WavEC · NTNU · swePart Transmission AB

FUNDING PARTNERS

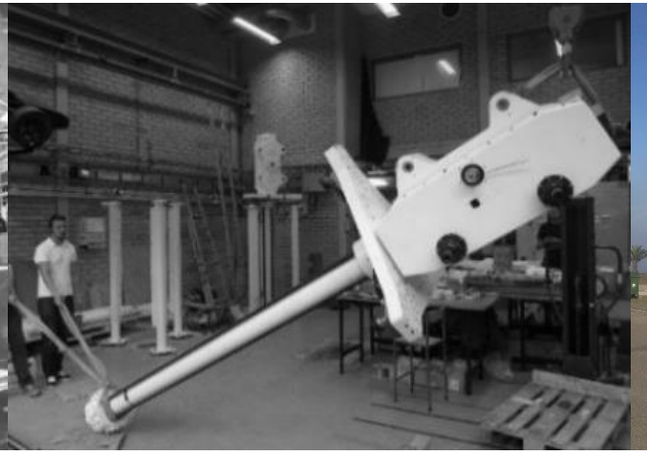
wave energy SCOTLAND · eit InnoEnergy Knowledge Innovation Community · Swedish Energy Agency

Structured product verification in five Stages



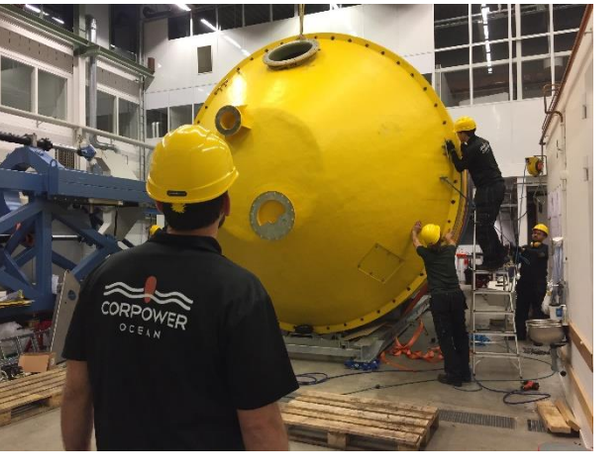
Product verification in 5 stages according to IEA-OES / equimar best practice.

Scale 1:30



Scale 1:3

Scale 1:2



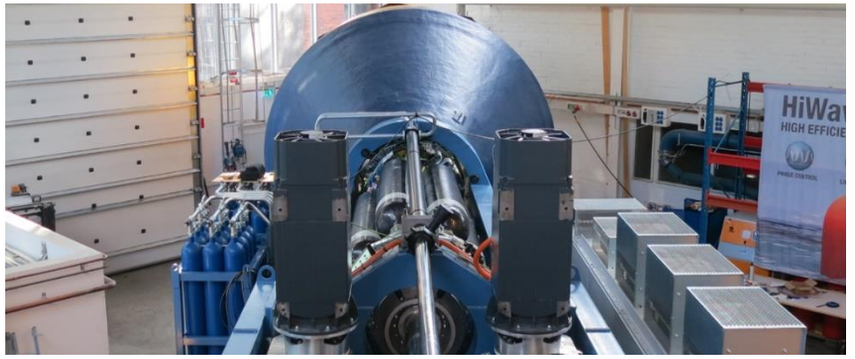
Scale 1:2

Stage 2 PTO test rig - grid connected Hardware-In-the-Loop (2014-2016)

CorPower C3 – Stage 3 WEC

Stage 3 program

- Dry rig test program in Stockholm
  - Verification and debugging of all defined functions.
  - De-risking by full range storm loading on-land



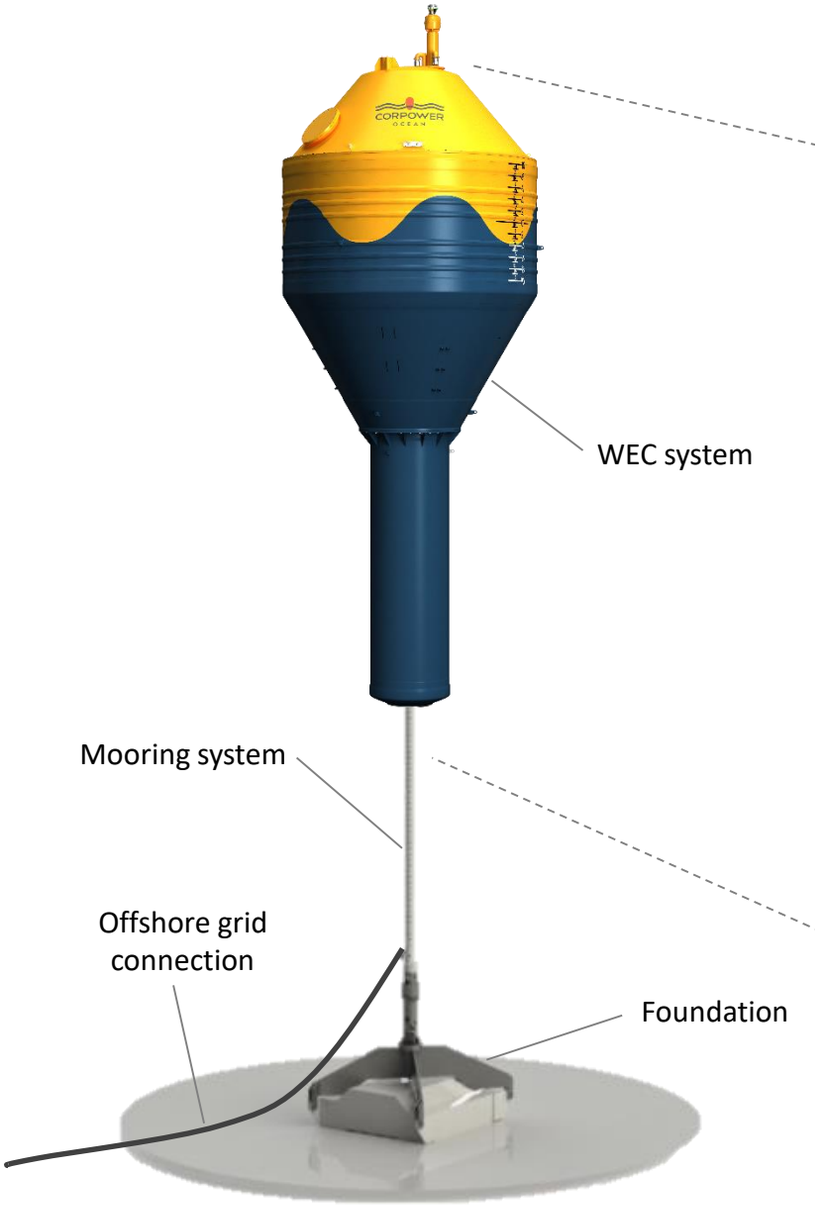
- Ocean test program at EMEC, Orkney. Final verification - > Stage 4

Dry testing of complete WEC - Hardware-In-the-Loop

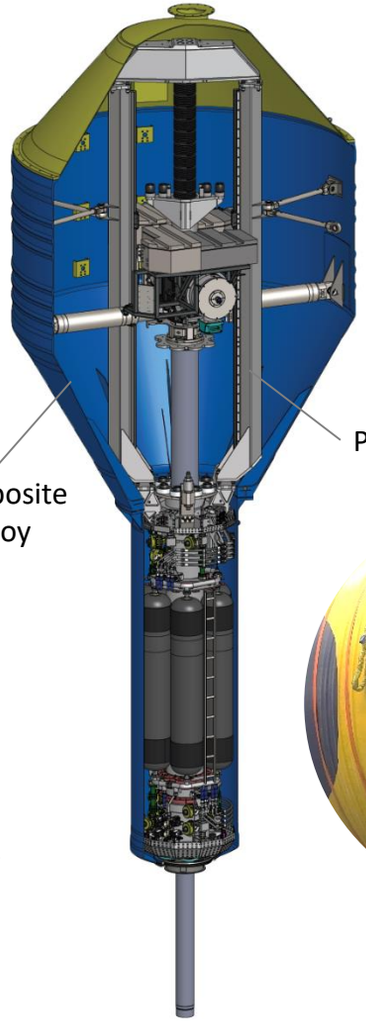
Dry testing of complete WEC - Hardware-In-the-Loop

EMEC Scapa flow deployment - Orkney during fall of 2017

Supply chain development



WEC system assembly – Locally, close to farm sites



PTO supply – CorPower Ocean AB, Sweden

Composite buoy supply – Local partner

Broad industrial backing – absorbing lessons learned

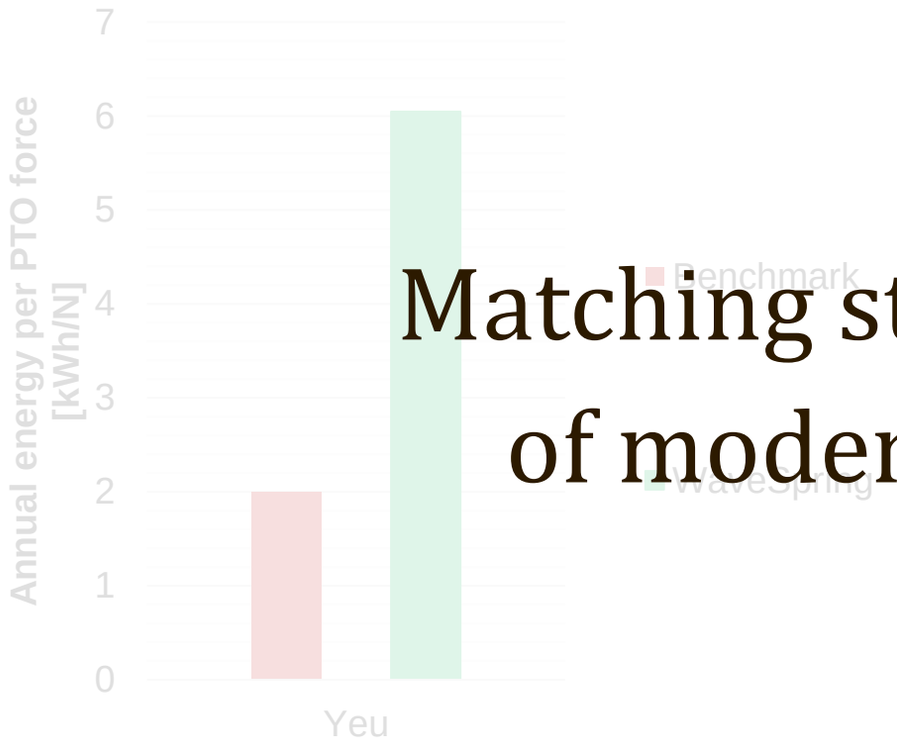
A sea change

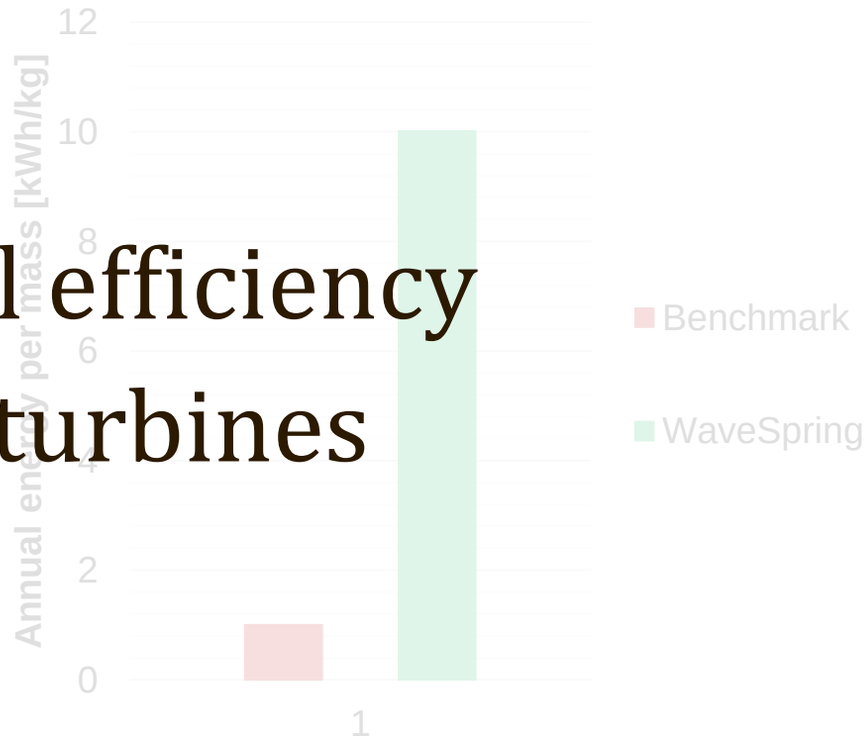
3 times

more energy per PTO force

> 5 times

more energy per ton





Matching structural efficiency of modern wind turbines

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High Efficiency Wave Energy

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