

NoviOcean



Co-funded by
the European Union

Our concept:

"The hybrid wave, wind & solar
power plant at sea, 1 MW"

Our mission:

"Saving the climate with
profitable ocean energy"

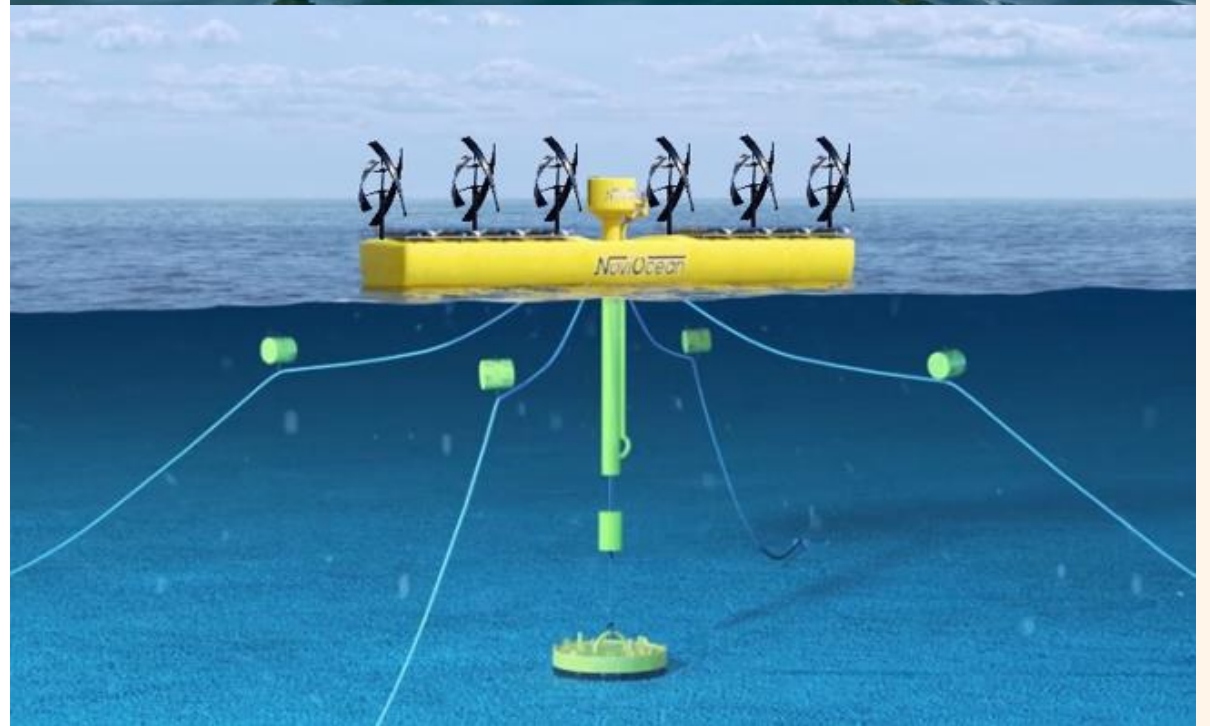
Performance:

Unique and validated numbers

Presentation at Stockholm Climate Week:
https://lnkd.in/dX_x5AXF



Our showcase, presently powering Svanholmen island



Impacts & Essentials

Weight to
power ratio

1/2

vs.
floating offshore
wind

Number
of parts

1/2

vs.
offshore wind

Sea
area used

1/2

vs.
offshore wind

LCOE

1/3

vs. start of
wind & solar

Baseload

2-3x

vs.
offshore wind

Baseload

4-5x

For wind and wave
combined

Power to
weight ratio

2-50 x

vs.
competition



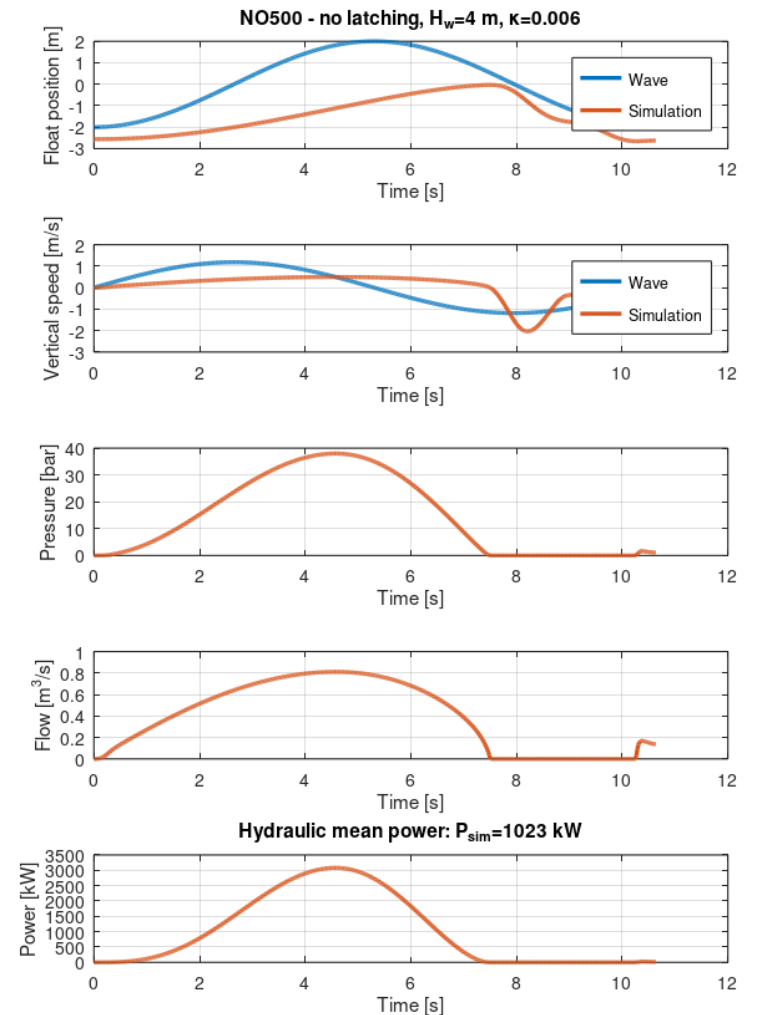
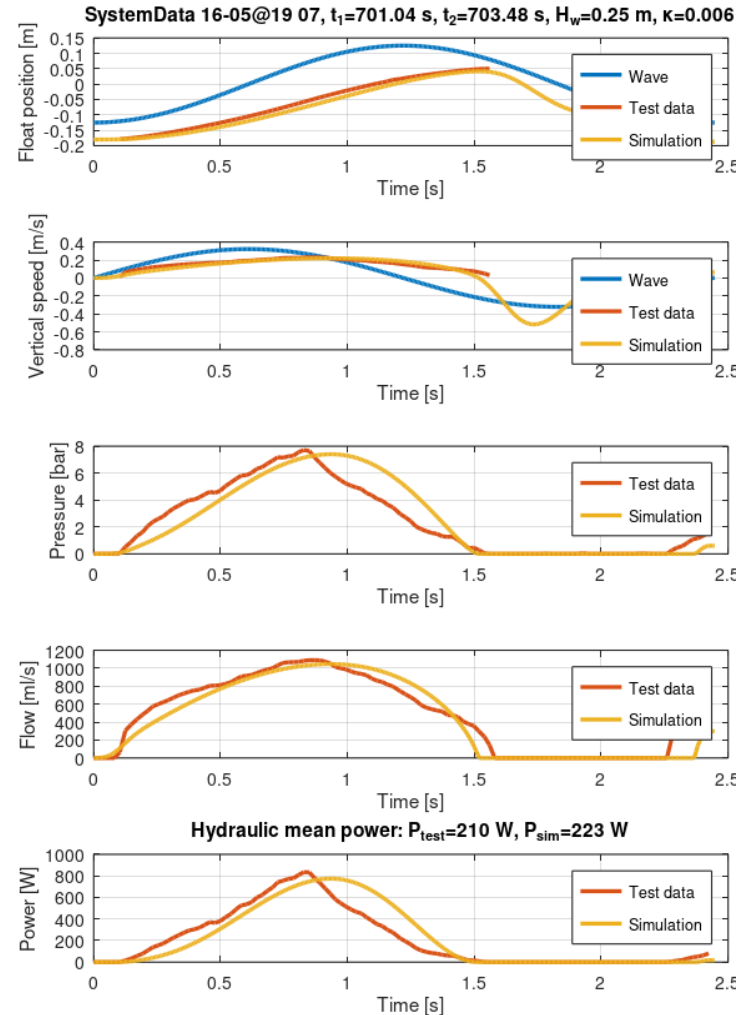
The proof is in the pudding!

Graphs showing simulations versus real time data from our **NO2** prototype tested offshore in irregular waves outside Stockholm

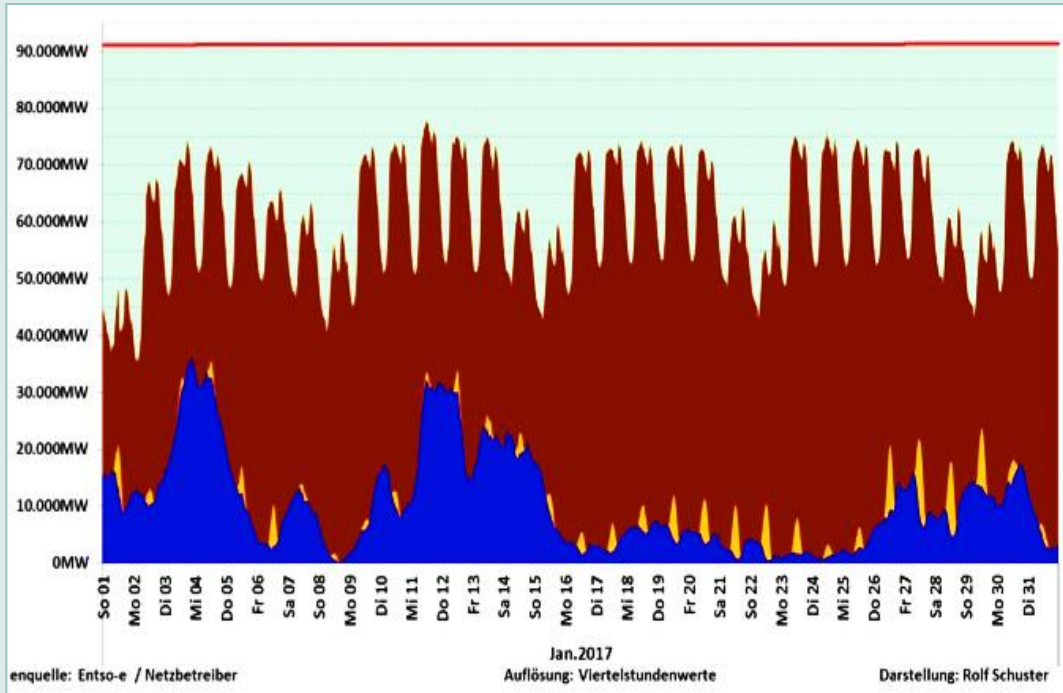
Extrapolated graphs for our coming full-size unit. Same simulations prove without doubt the wave power unit will deliver 600 kW (after losses) in 4-meter waves.


The real performance matches the simulations to the point!

Simulations and tests show 3-30 times more output vs competition for the wave energy converter part



German Energy Production – one month



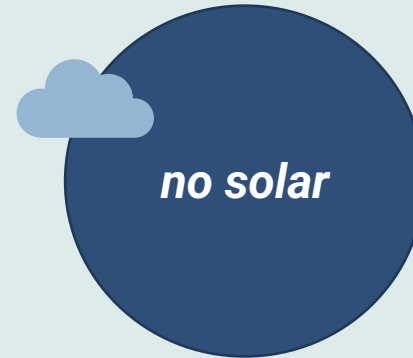
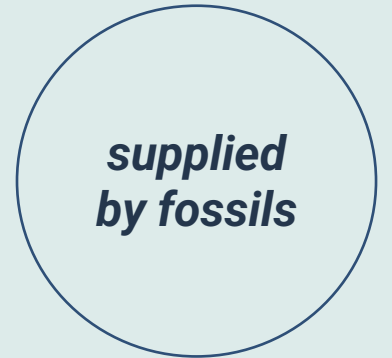
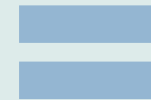
 Fossils, nuclear & others

 Wind

 Solar



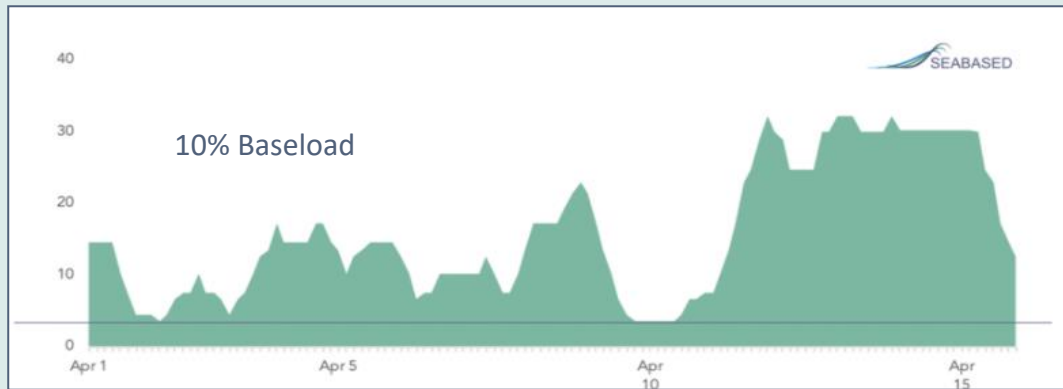
40% of the hours of the month



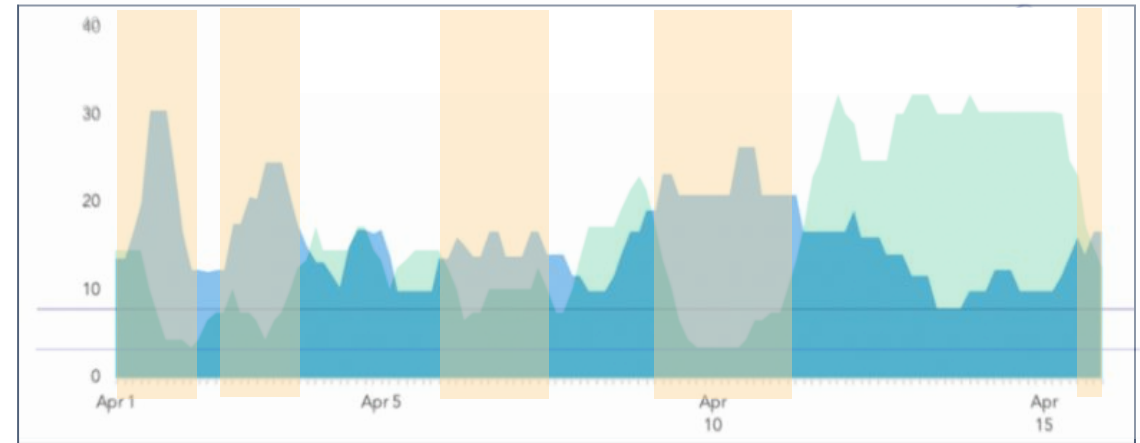
Wind & Waves are Off-phased



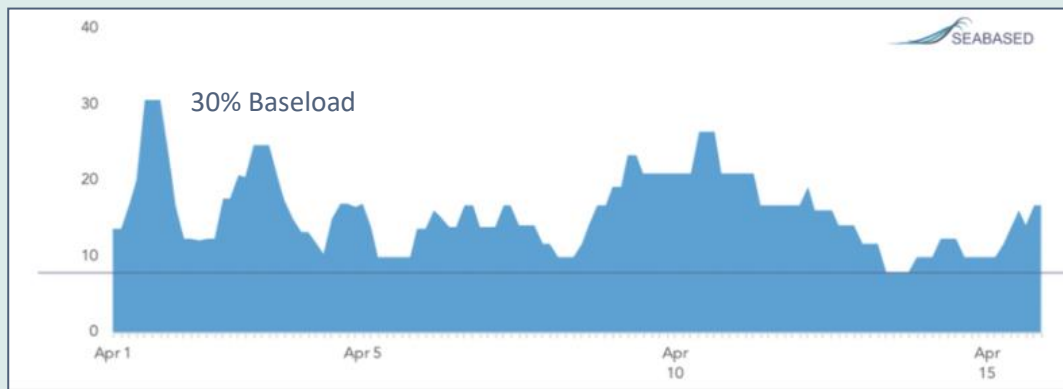
Wind Production Profile, Galway Bay, Ireland



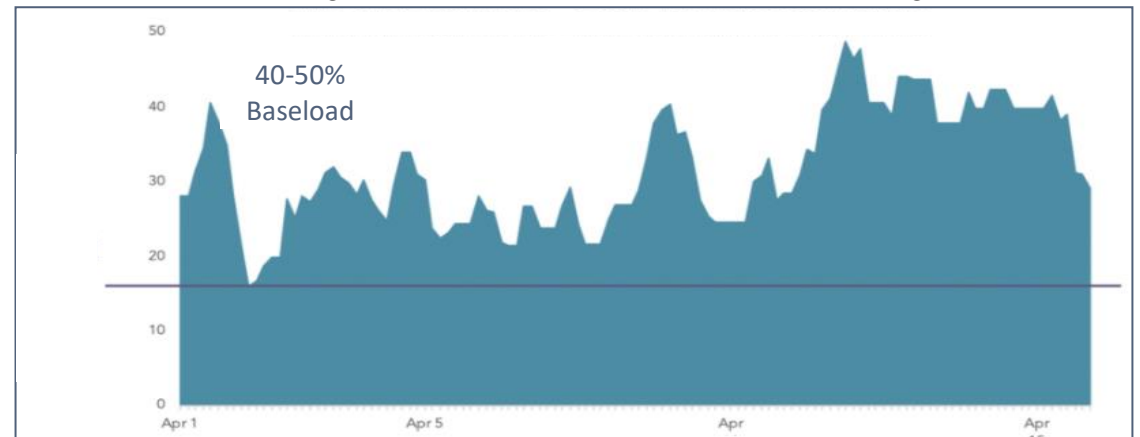
In low wind conditions, waves are instead at the highest



Wave Production Profile, Galway Bay, Ireland



The Game Changer - Wind and Wave Combined, no storage needed



Source: Seabased

1MW Hybrid Solution

600 kW wave, 300 kW wind, 100 kW solar

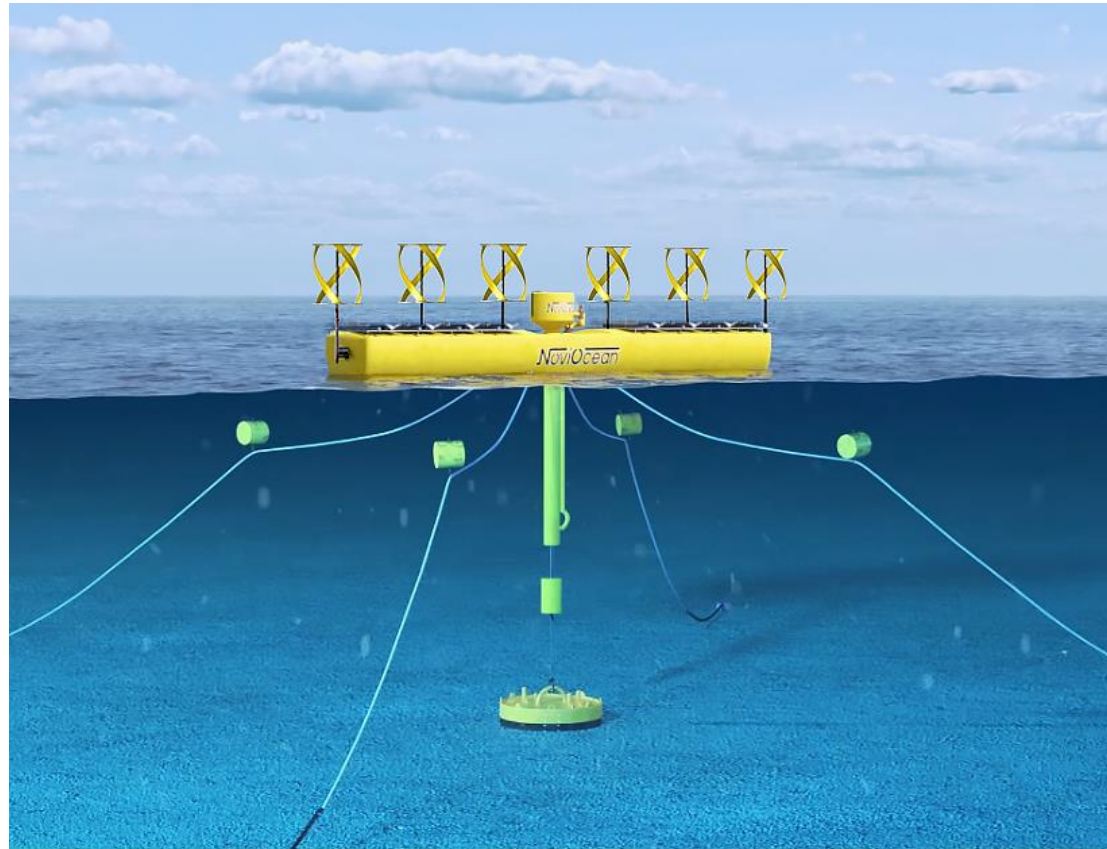
(45% capacity factor | 4.0 GWh/unit/year)

Customer add-on options:

300 kW wind turbines
4-600 sqm PV panels, Li-ion storage, H2 production, desalination

Triply Patented
with few, light, simple and well-proven components

HPAS concept
“Hydropower Plant at Sea”
38-meters long
120 tons



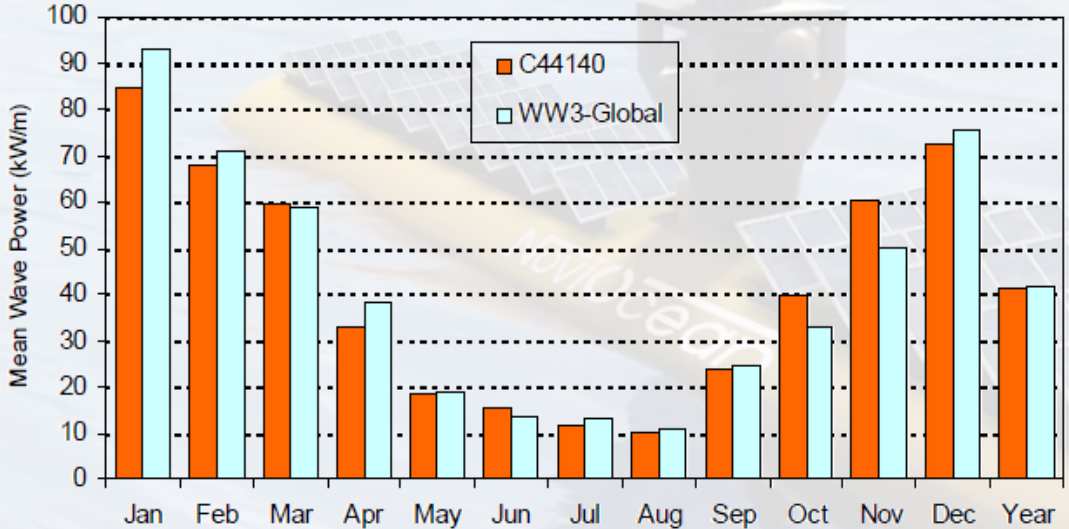
25 units = 25 MW per sq. km. = double the output per sea area vs wind power, 3 x if combined. Low noise, hardly visible, no animal harm, 40 years lifetime on structure

Other floating wind and solar solutions have 75% the costs for only the structure, systems and cable.

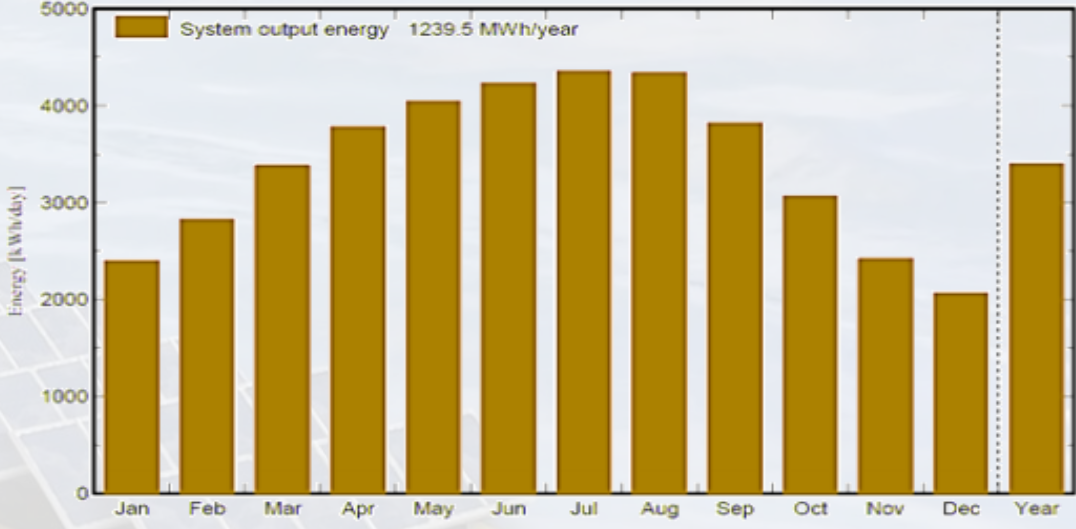
We already have the structure, systems and cable.

Our floating wind and solar cost: 25-40% of other solutions, plus survives the highest waves

Solar & Wave are complimentary

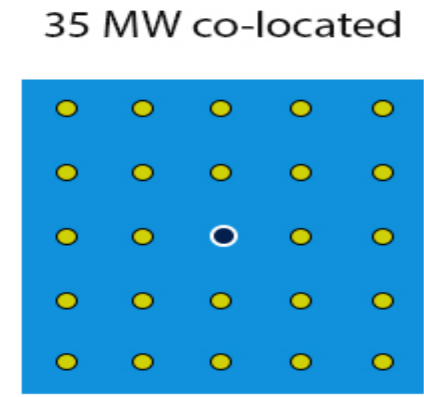
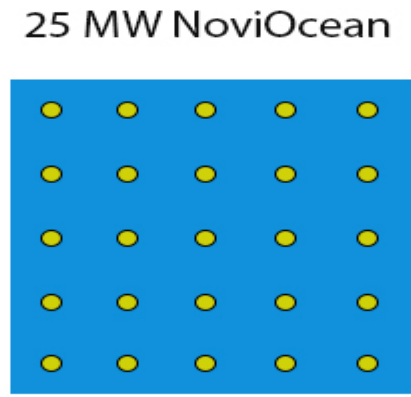
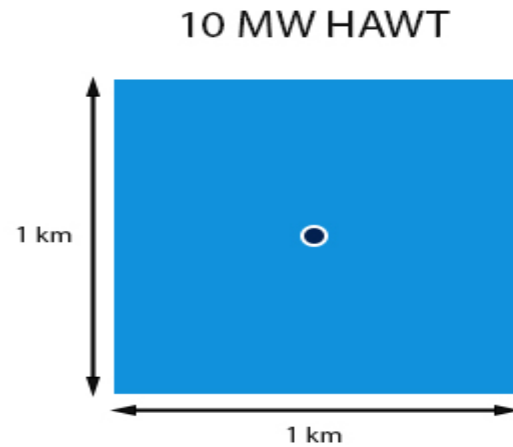


Annual variation of wave energy



Annual variation of solar energy

The essence

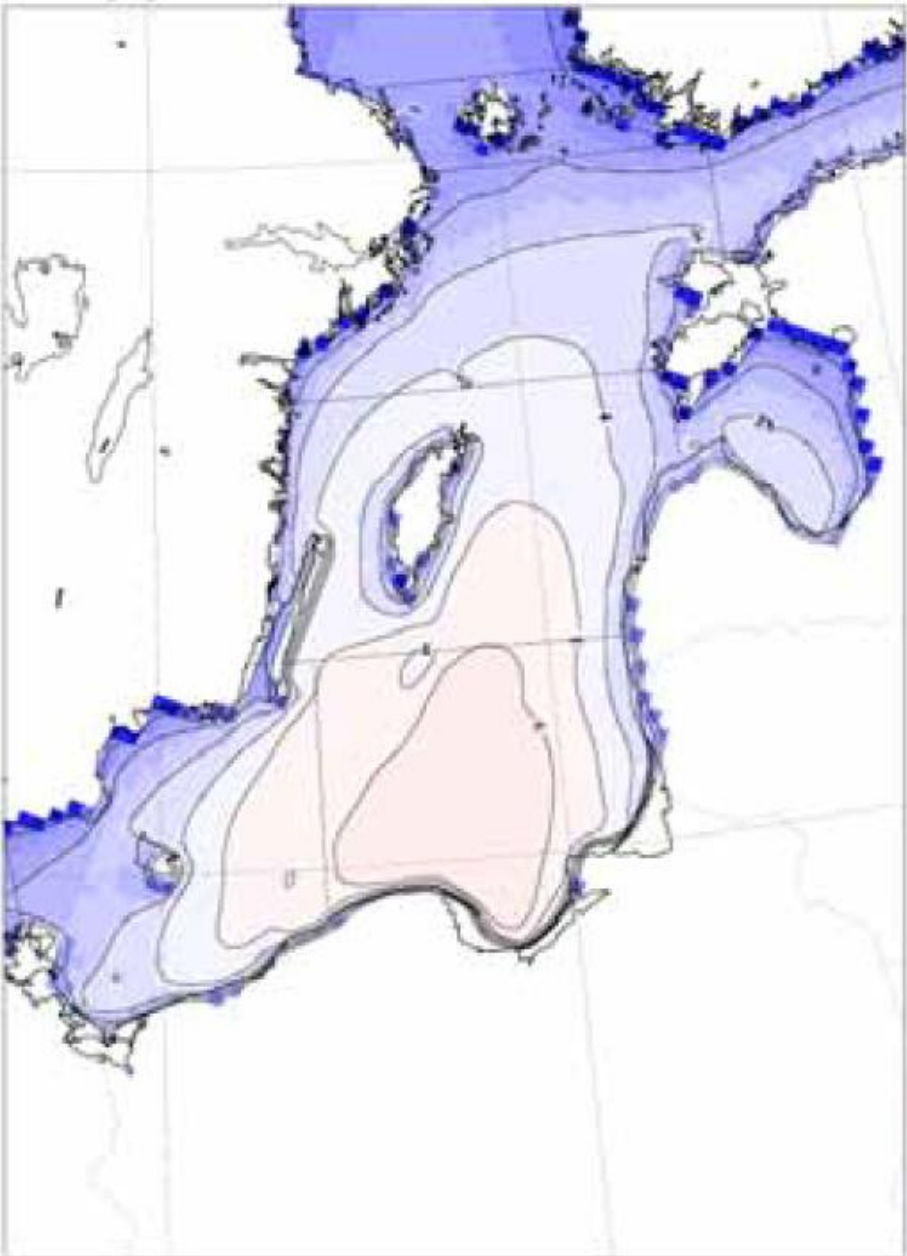


- Visual impact up to 50 km
- Audible impact within 3 km
- Impact on birdlife
- Below 10% output for 10 days a month
- Impact on sea floor
- Needs 50 km distance from shore to be out of sight

- 2.5 x the power output for same sea area and same infrastructure
- No visual impact beyond 13 km
- No audible impact
- No harm to sea or bird life
- Off-phased wave, wind and solar energy
- 24/7 delivery, more stable
- Less fossils or expensive storage needed

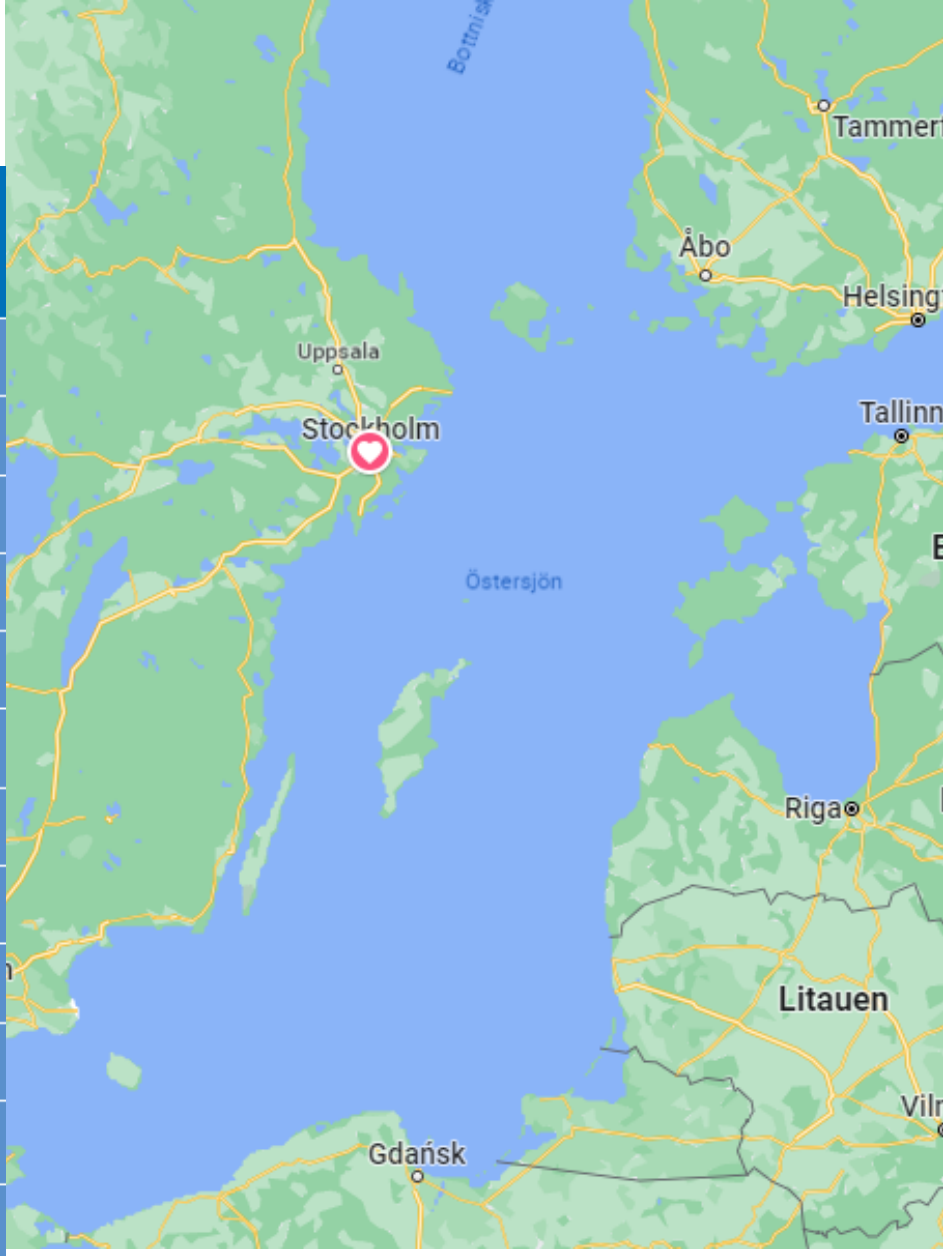
- 3.5 times the energy as opposed to only wind
- Max output per sea area
- Sharing subsea cable
- 24/7 delivery, stable
- Even less fossils or expensive storage needed

Wave energy potential in the Baltic Sea

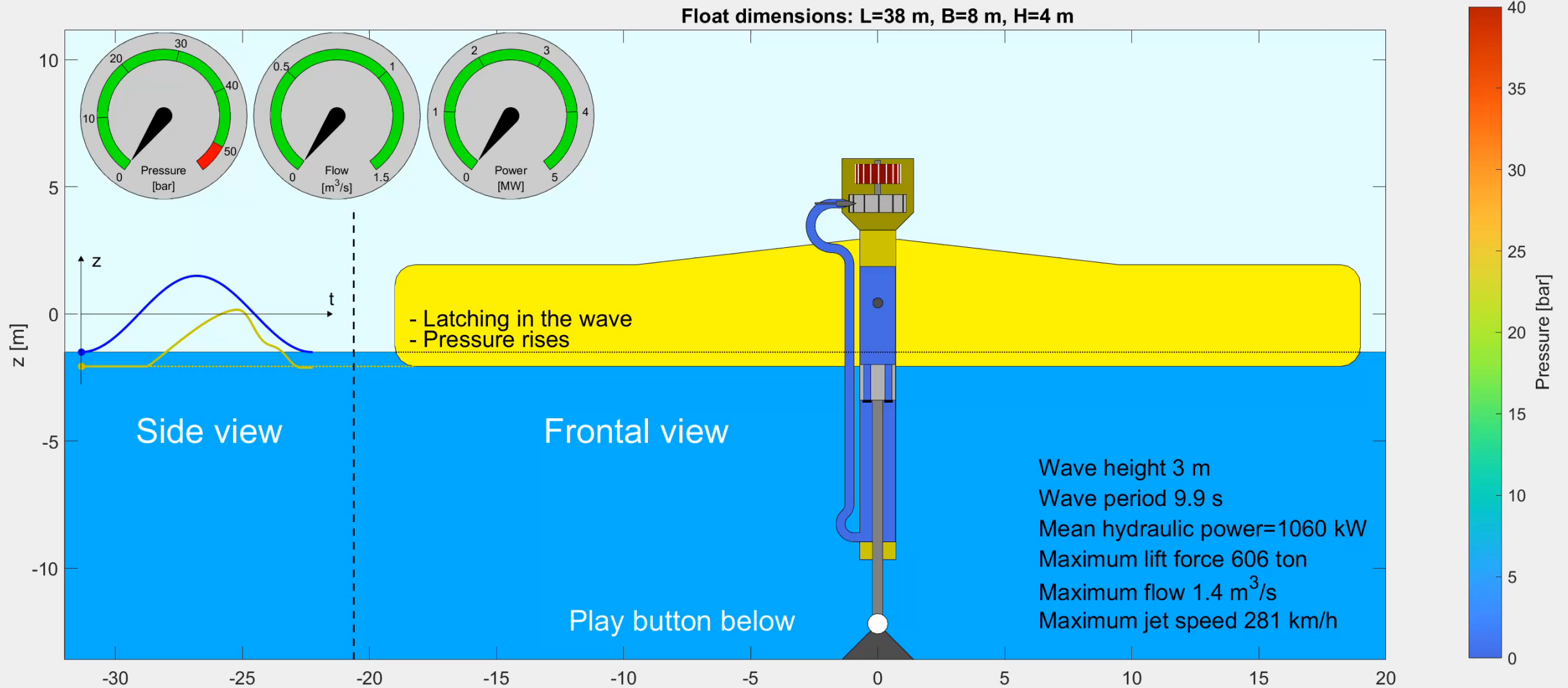


Havsområde Sydöstra Östersjön

Station	Södra Östersjön
Januari	2.3
Februari	1.7
Mars	1.1
April	0.9
Maj	0.6
Juni	0.6
Juli	0.9
Augusti	1.0
September	1.3
Oktober	1.6
November	1.9
December	1.4



How it Works



Added Values



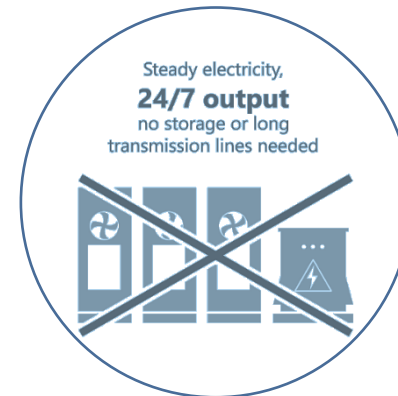
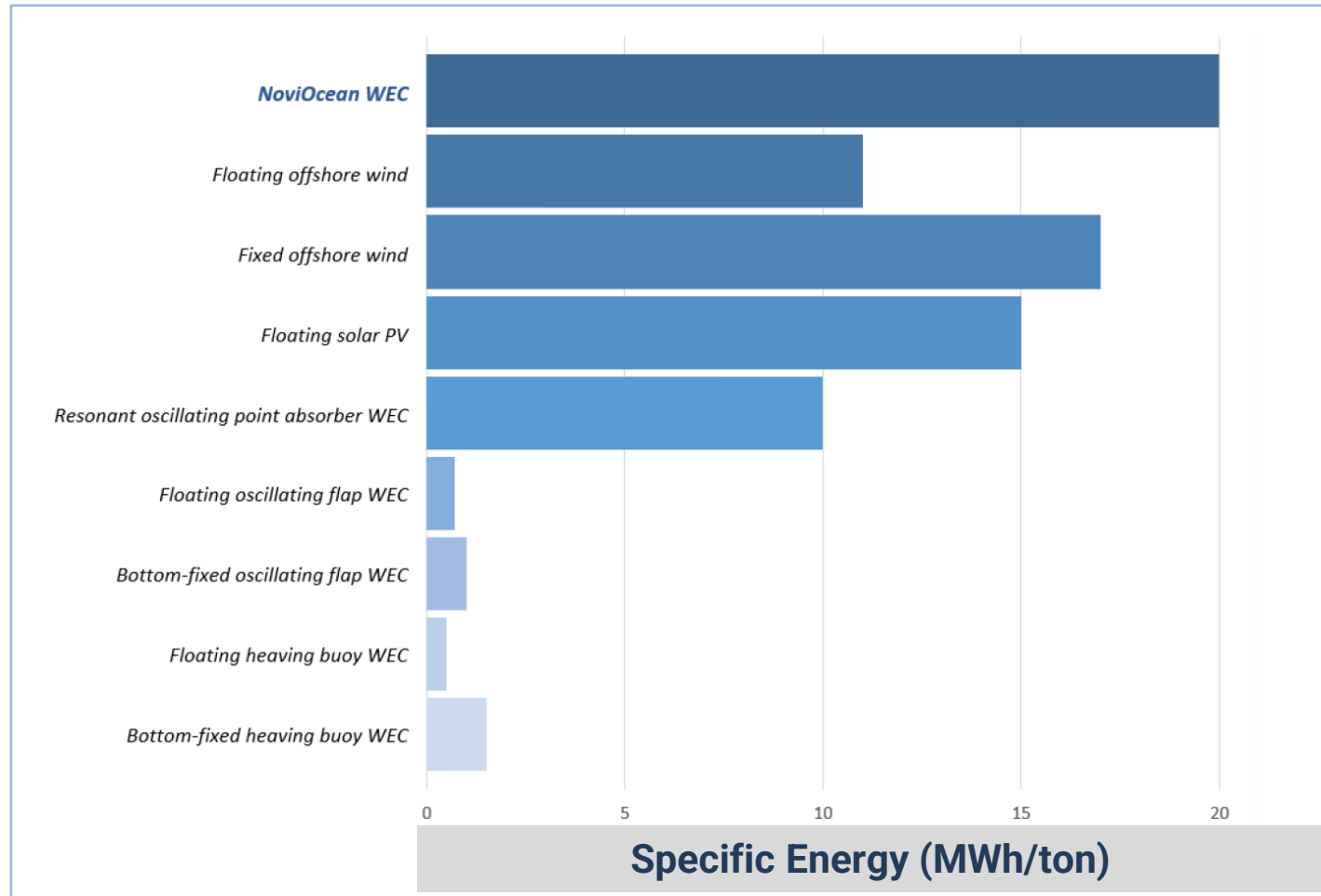
Avoided Emissions

495 tons CO2 eq./unit/yr

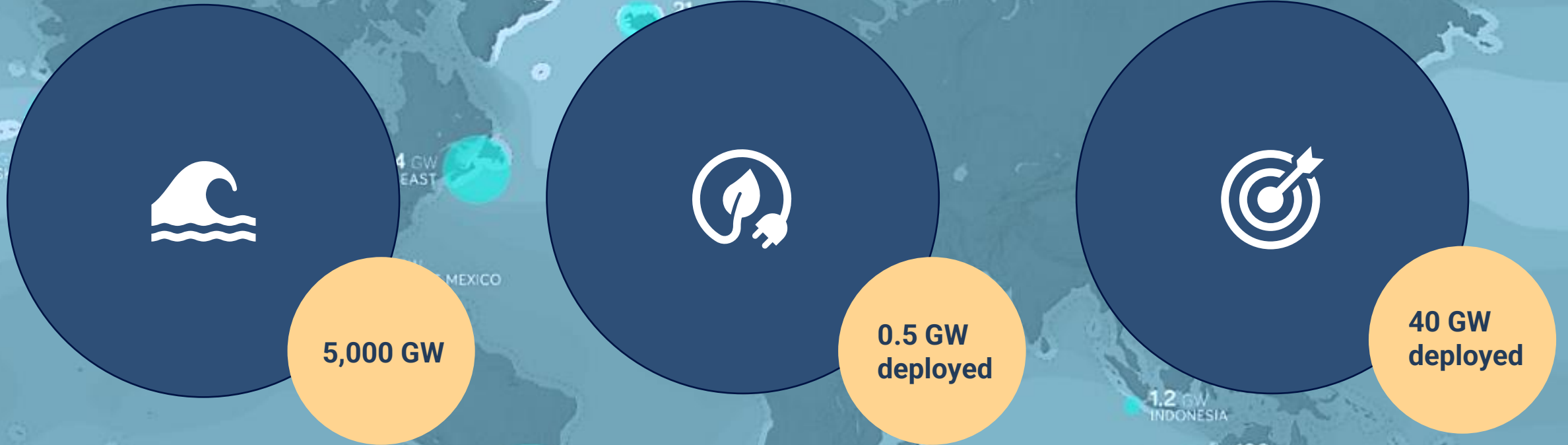
LCA

17 kg CO2 eq./MWh
7% of EU grid average

Not visually or audibly disturbing
Not harming animal life



Market Opportunity



Global wave energy potential

5,000 GW

EU's 2030 Ocean Energy target

0.5 GW
deployed

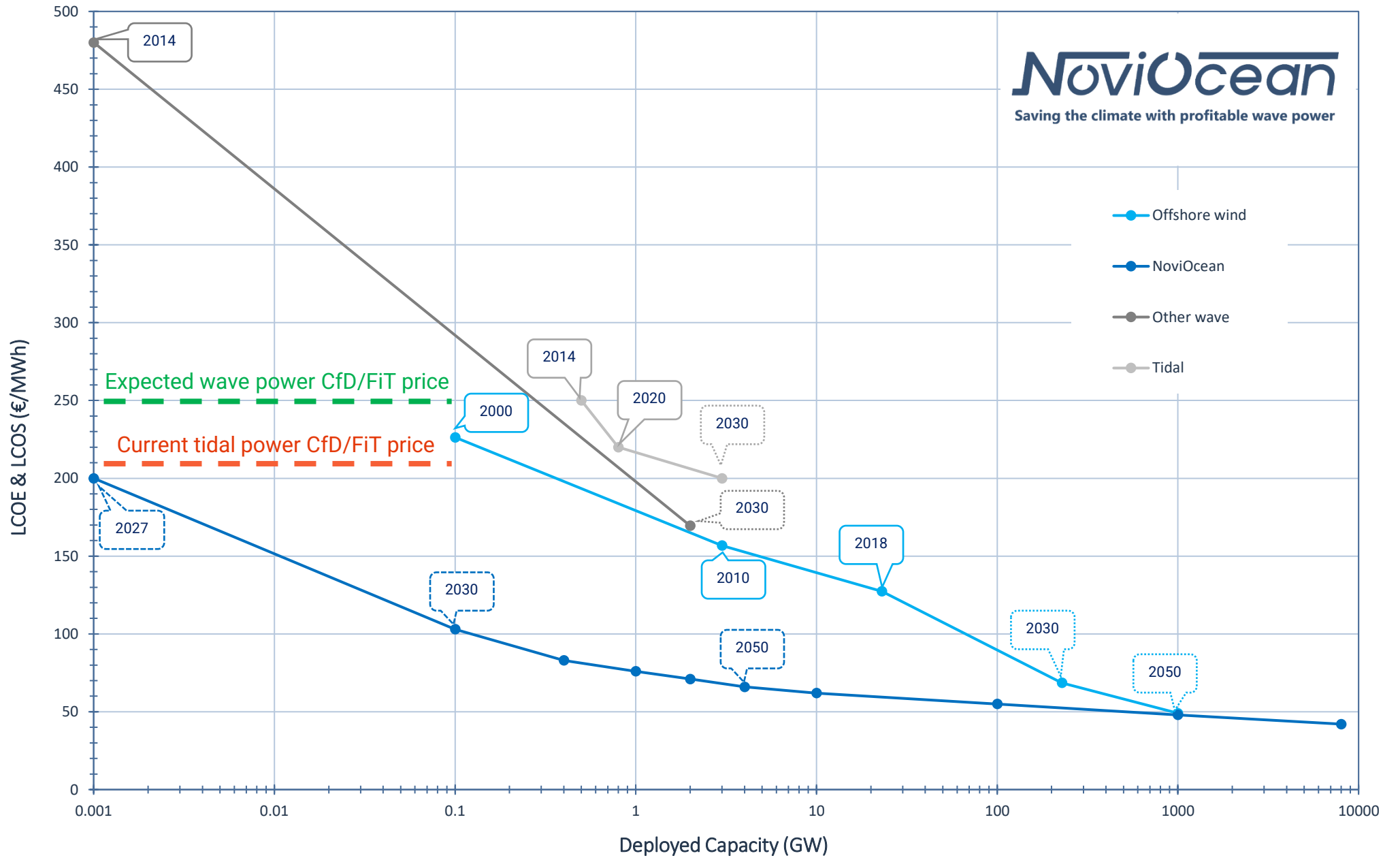
EU Commission target for 2050

40 GW
deployed

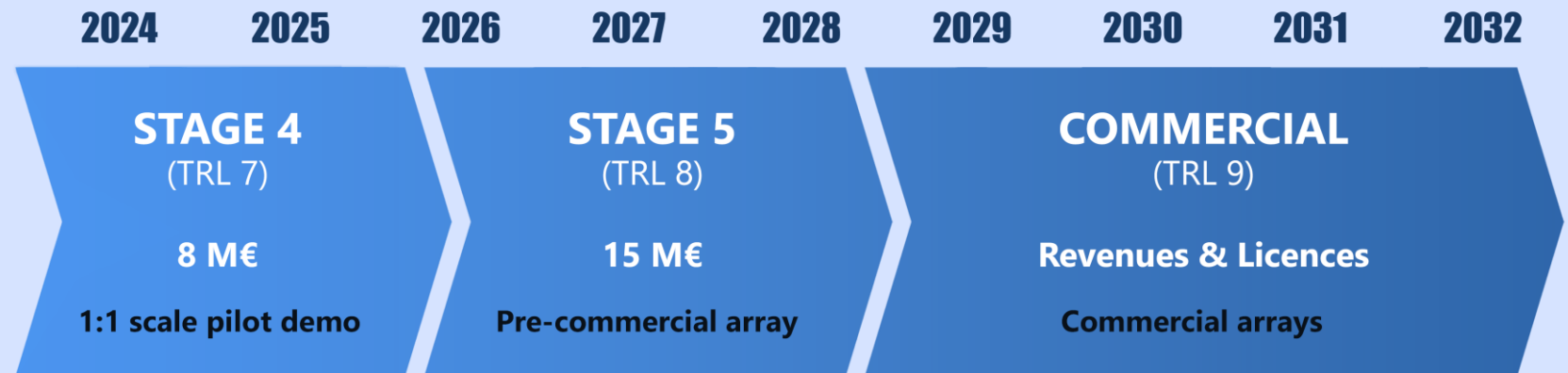
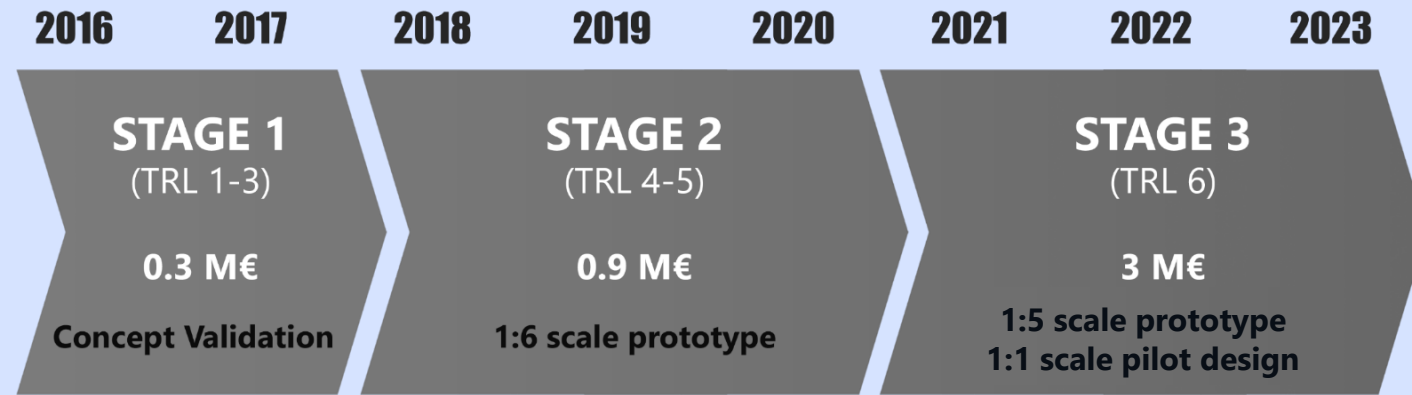
How will EU reach these targets?

By incentives & subsidies, just like with wind and solar power.

Key to Success



Plan Forward



Following a structured five-stage product verification process introduced by International Energy Agency OES & ETIP Ocean

Core Team



Jan G. Skjoldhammer; *Founder/CEO and Inventor*
Business degree, Officer, Airline Captain, and Display Pilot



Danial Hassani; *COO*
MSc. Sustainable Energy Engineering + MBA



Stefan Björklund; *CTO*
PhD Tribology; Professor at KTH



Anders Tengelin, *CCO*
B.sc. IT/IS, M.sc. Business & Finance



Erik Wedlund; *Chief Mechanic*
Technician in the construction industry



Niclas Bassili; *Head of Mechatronics Engineering*
MSc. Mechatronics Engineering

Extended Team



Mats Andersson; *Board Director*
Board Director of 7 different companies



Sara Karlin; *Board Member*
First female BCG management consultant, Nordics



Marcus Grünerwald; *Director, Gov. Affairs*
Innovation Management and Public Funding



Anna Fägersten; *PR & Comm. Manager*
Business degree, marketing & sales



Timo Pohjanvuori; *IP Manager*
Founder, partner, and senior consultant at Prospero



Tomas Carlmark; *Lawyer, Contracts*
Master of Laws (LL.M.)

Final Thoughts

If we are right that:

- The 2030/2050 targets cannot be met without ocean energy as a huge part of the solution,
- Other solutions will be both too costly or have a too long carbon payback time,
- NoviOcean will be either the only one, or one of very few solutions that can make this breakthrough,

Then...

- What you have just read may be the dawn of a new energy era.
- Big words, but this is what we see.

NoviOcean

Saving the climate with profitable wave power