CHANGE

North Sea Climate Conference 2019
Marstrand, 26 June
Dr Martin Edlund, CEO

An equipment provider of a game-changing renewable energy technology

Founded 2007 – SAAB Group spinoff	Main owners: BGA Invest and Midroc New Technology	55+ employees in Sweden, UK and Taiwan	€80m invested to the Deep Green technology

2007 2019

Our mission

LOW-COST RENEWABLE BASELOAD POWER

- ✓ Patented technology unlocks an untapped natural resource
- ✓ Complements other renewable energy
- ✓ Competitive cost of energy

The rationale for tidal stream and ocean current energy

1

The global transition to clean energy

- $15.5 trillion zero-carbon investments needed to reach 2-degree's scenario by 2040[1]
- IPCC: up to 80% renewable share of electricity by 2050

2

The need for balanced energy systems

- Complement unpredictable generation and regional supply/demand mismatches

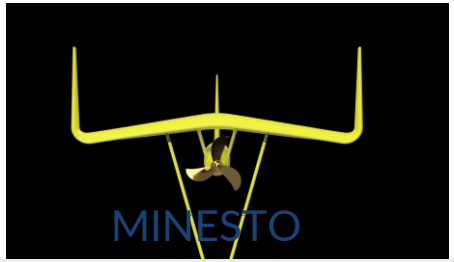
3

The advantages of marine current energy

- Global, predictable, energy-dense
- Reduced variable backup need, no seasonal storage need
- Minimal use of land
- No visual impact, minimal environmental impact

1) Bloomberg New Energy Finance New Energy Outlook 2017

Marine current energy and the future energy mix

		HYDRO	SOLAR PV	WIND
Predictable with no weather dependency	✓	(✓)	✗	✗
Significant expansion potential	✓	✗	✓	✓
Minimal use of land and physical footprint	✓	✗	✗	✗
Competitive Levelised cost of energy (€/MWh)	✓ 45[1]	✓ 44[2]	✓ 62[3]	✓ 49[4]

1) Predicted LCOE after 1GW installed capacity in tidal streams 2) International Renewable Energy Agency
3) Global LCOE benchmark for onshore wind and solar PV without tracking systems, Bloomberg NEF New Energy Outlook 2018

The power of speed in water

Sea water is 832 times heavier than air
Substantially higher kinetic energy content

+

Power is proportional to the speed cubed (v^3)
The wing multiplies the stream flow through the turbine

=

Cost-effective exploitation of a so far untapped energy source
Commercially viable electricity generation with small and lightweight systems

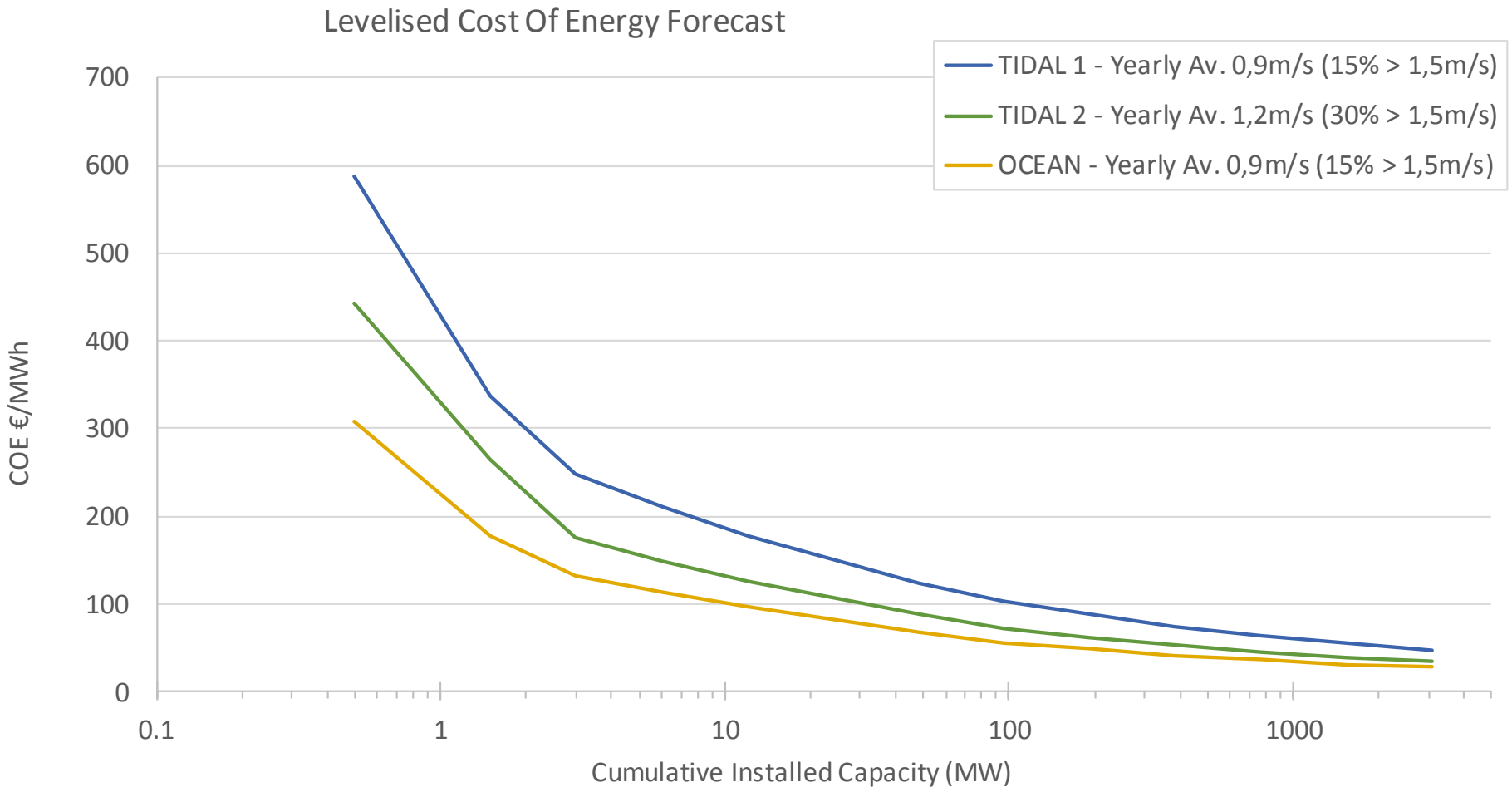
Small and efficient design

Comparative example	**Deep Green Utility** Marine current converter	**Enercon E-44** Wind turbine
Rated power	900 kW	900 kW
Rotor diameter	3 m	44 m 
Swept area	1,870 m^2	1,521 m^2
RPM	400	34
Weight	15 tons	128 tons

Low flow, low weight, low cost

Significant cost drivers:

- Weight of system
- Installing and operating at low-flow sites
- Recoverable O&M concept

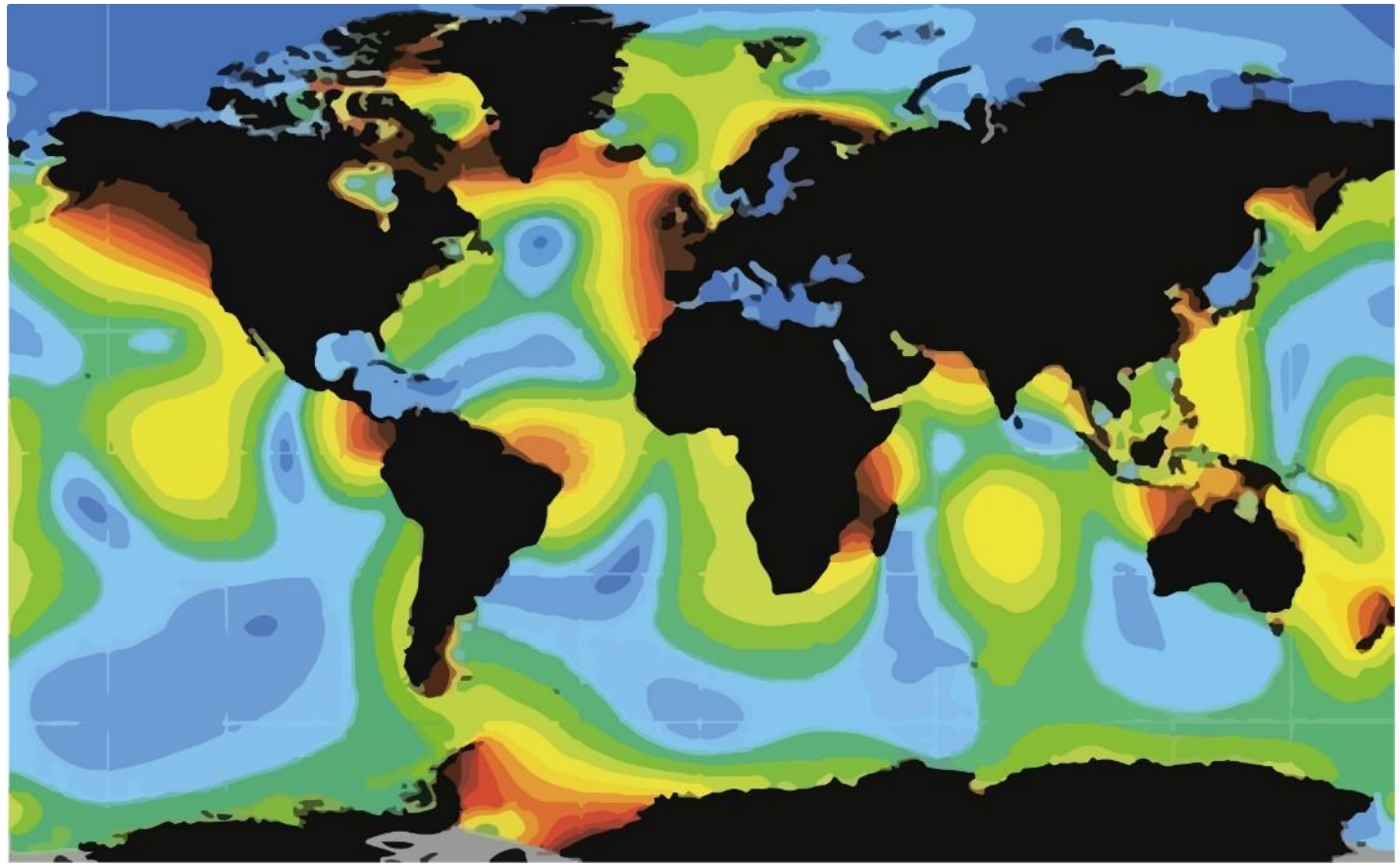


APPLICABLE IN AREAS NO OTHER TECHNOLOGY IS

Minesto expands the global ocean energy potential

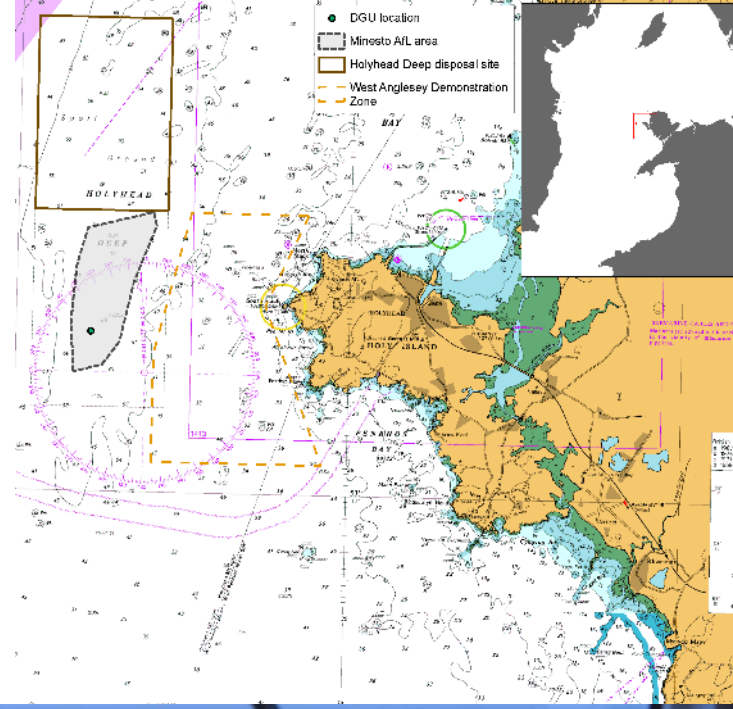
600+ GW

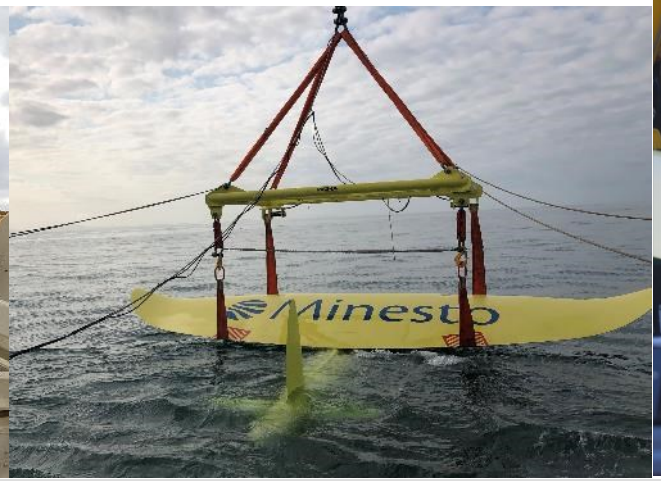
1.5x today's nuclear capacity



Technology verification at a commercial scale

- Successful and completed offshore commissioning and test programme 2018
- DG500 – the first Utility-Scale unit
  - Rated power: 500kW
  - Wing span: 12m
- Installation depth: 85m





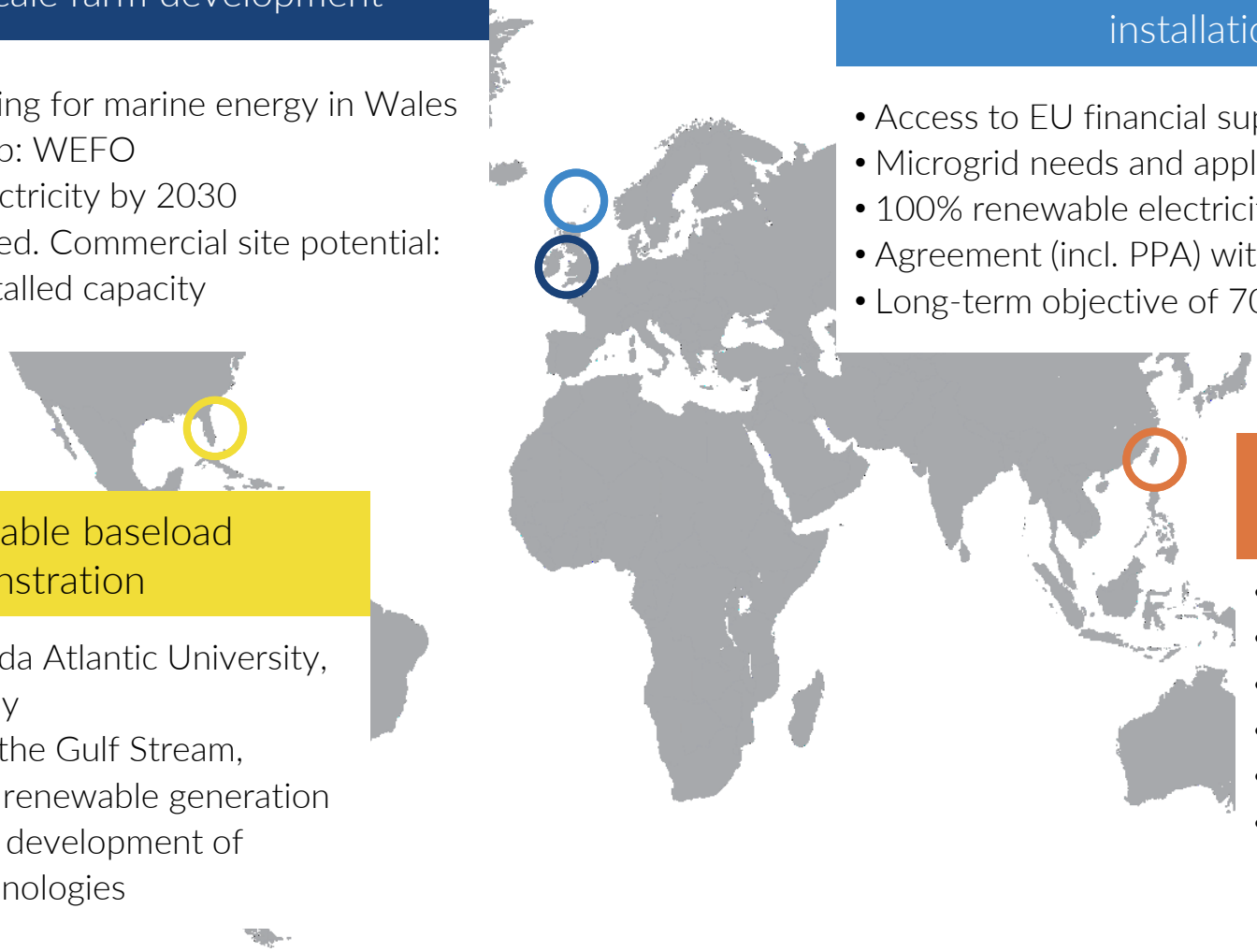
Market establishment activities

UK Utility-scale farm development

- €100m ERDF funding for marine energy in Wales
- Funding partnership: WEFO
- 70% renewable electricity by 2030
- 10MW lease secured. Commercial site potential: approx. 80MW installed capacity

Faroe Islands Customer installations, PPA

- Access to EU financial support mechanisms
- Microgrid needs and applications
- 100% renewable electricity generation by 2030
- Agreement (incl. PPA) with main electric utility SEV
- Long-term objective of 70MW capacity expansion



US Renewable baseload demonstration

- Collaboration: Florida Atlantic University, local utility company
- Target installation: the Gulf Stream, providing baseload renewable generation
- $23m allocated for development of marine energy technologies

Taiwan Stepping-stone to Asian market

- 20% renewable energy generation by 2025
- Collaboration: NTOU
- Verification in ocean currents
- Tidal stream demonstration site
- Aquaculture applications
- Stepping-stone for commercial expansion rollout in Asia

Thank you!

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