EMEC's Hydrogen Journey

Rob Flynn

International Development Manager, EMEC

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Grid-connected test sites for wave & tidal energy

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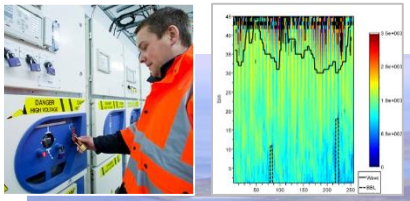
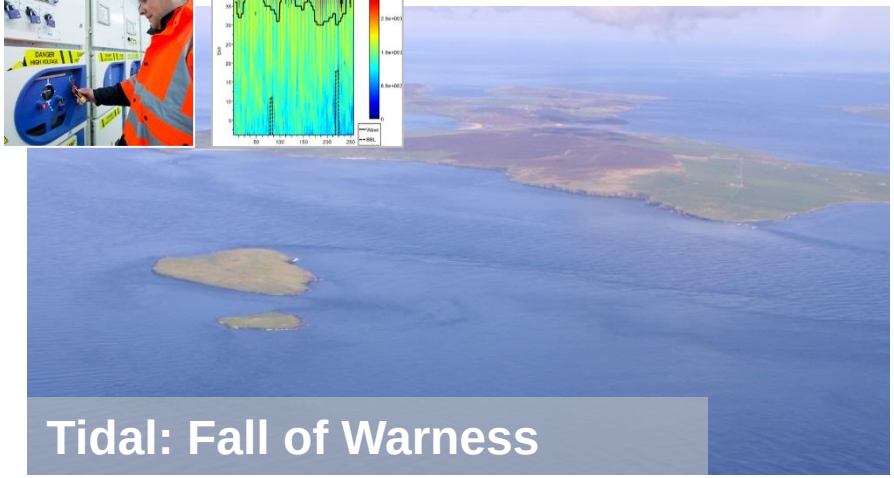
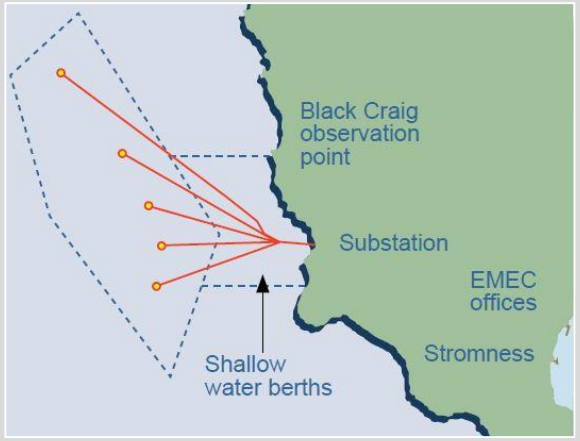
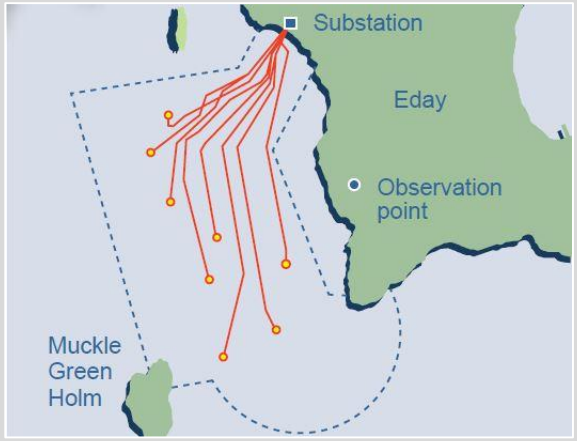
Wave: Billia Croo





Tidal: Fall of Warness





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Scale test sites

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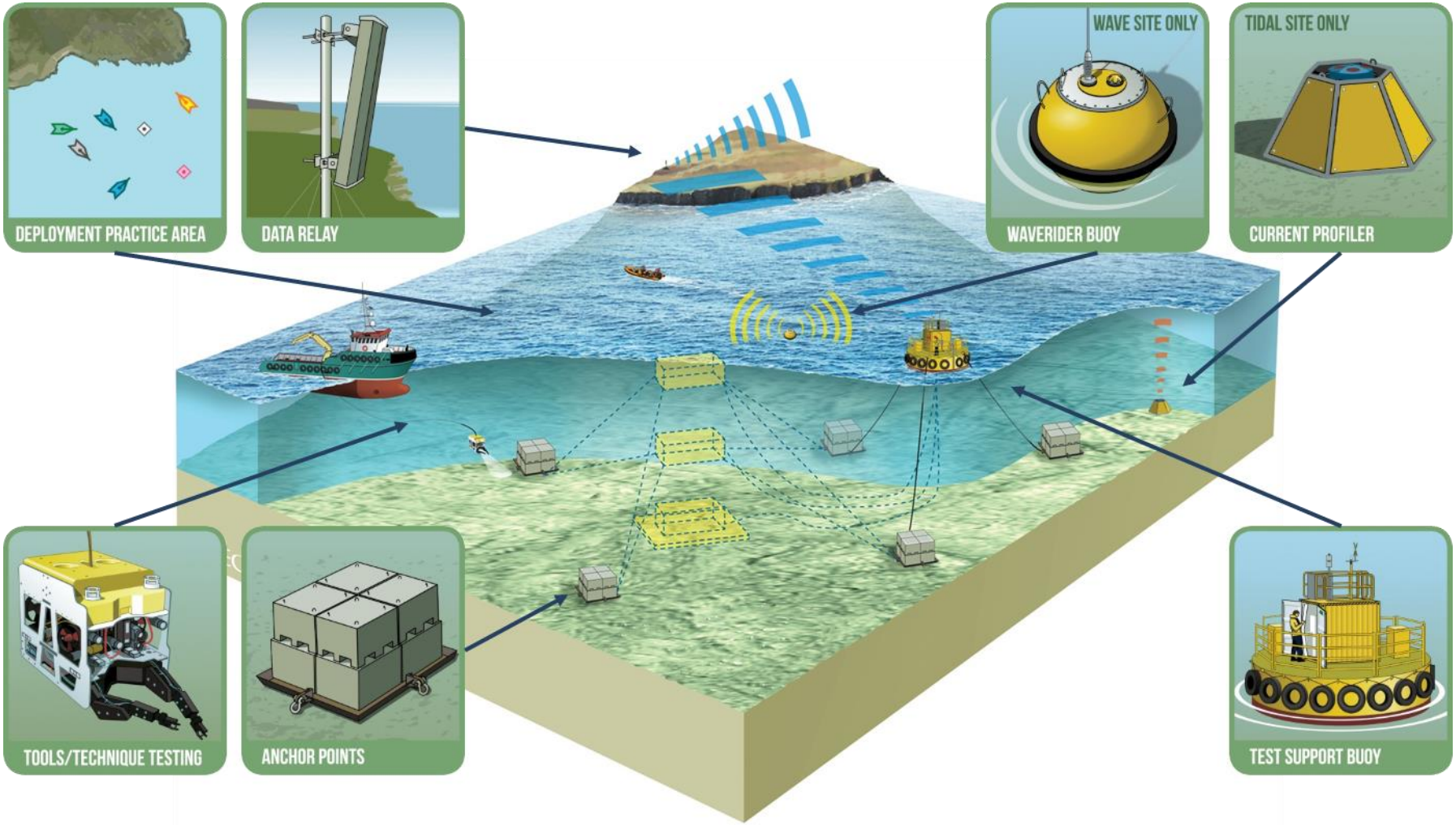

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EMEC HYDROGEN

32 devices • **20** developers • **11** countries

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Developer timeline

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Orkney

- Big winds
- Big waves
- Big tides

⇨ Big electricity generation potential

BUT….

- Constrained grid
- Remote & rural

Energy Storage and Hydrogen

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Initial Projects

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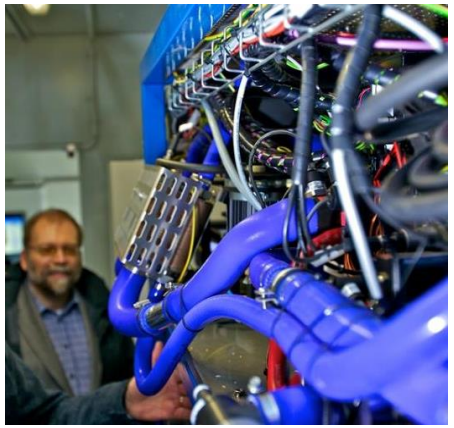
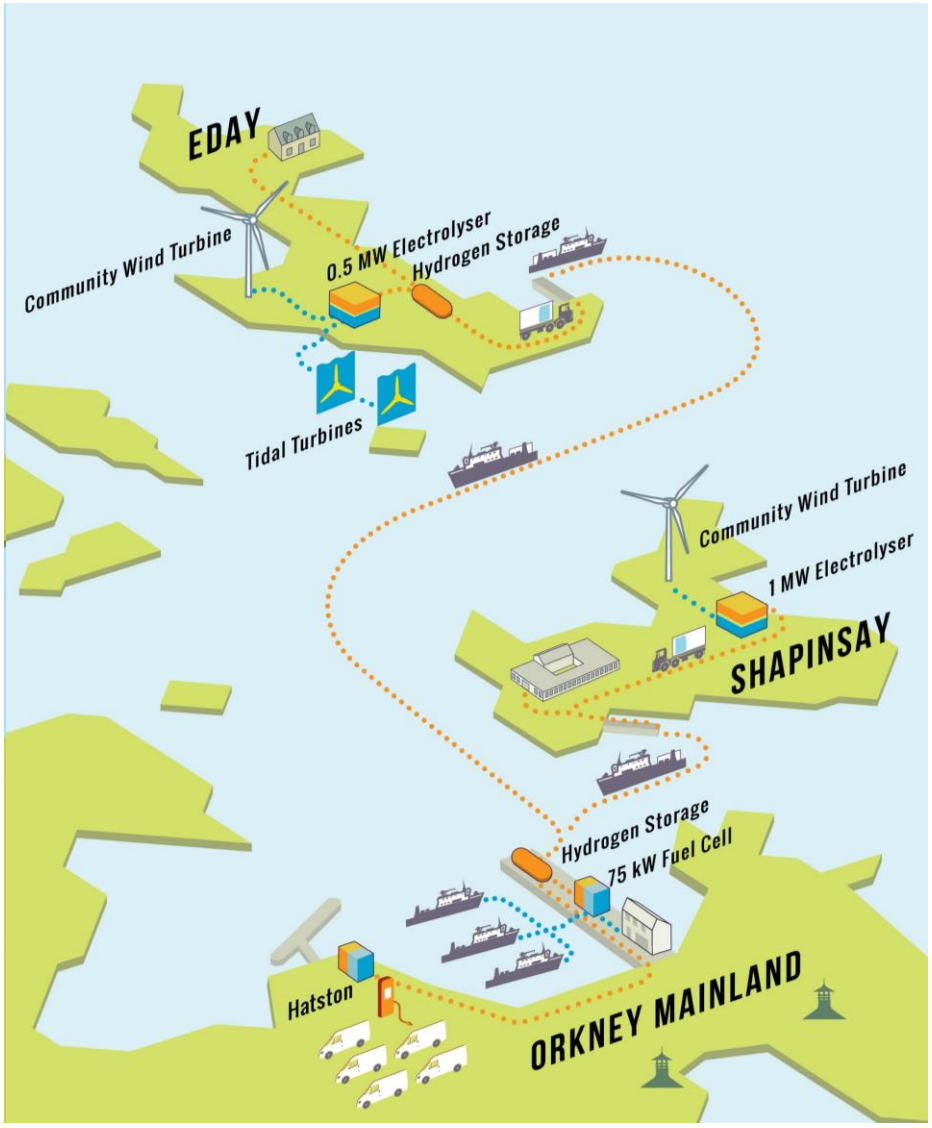
SURF 'N' TURF
Tide | Wind | Hydrogen

BIG H_2IT
Building Innovative Green Hydrogen Systems in Isolated Territories





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ITEG - Overview

- Demonstrate a combined tidal energy and hydrogen production solution
- Clean energy generation in remote areas facing grid export limitations.
- 3 year project, ending December 2020
- € 11m budget

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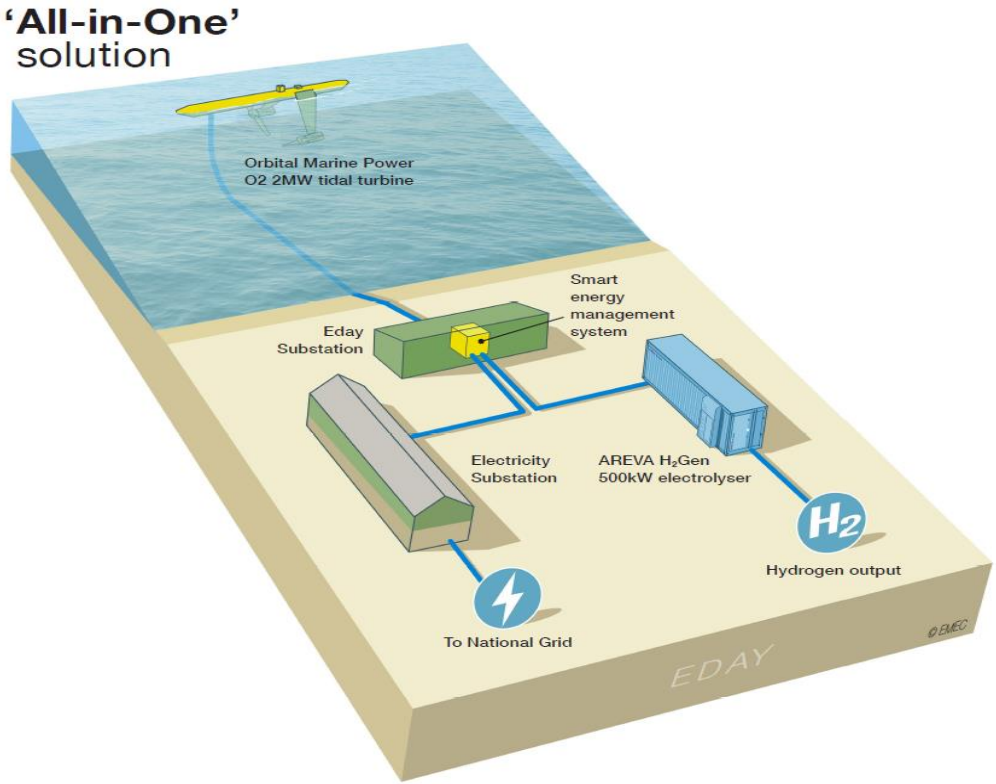
ITEG Location



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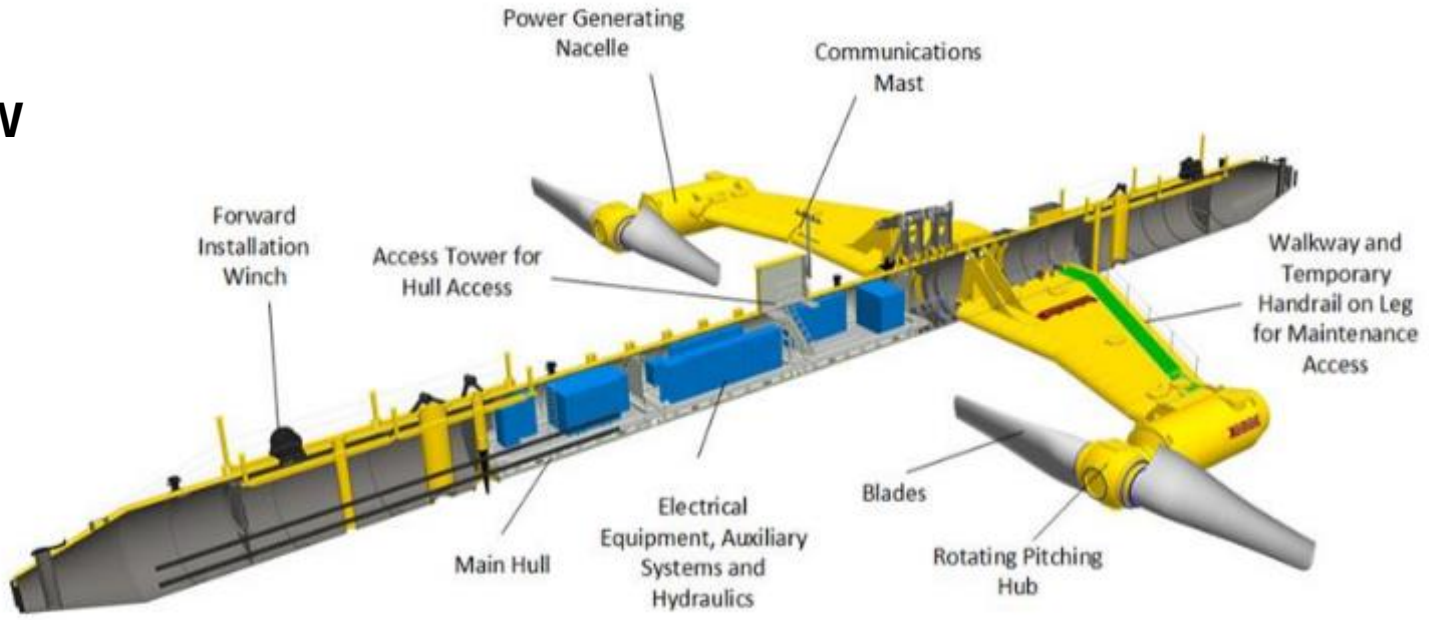
ITEG – Tidal Turbine

ORBITAL MARINE POWER

O2 2MW



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ITEG - Electrolyser

- 500kW PEM Electrolyser
- Ability to ramp up to 1MW for short durations
- Producing green hydrogen
- Resilience for Orkney hydrogen ecosystem

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Energy Management

- Optimise the EMS
- Fast-track a clean energy generation, management and storage solution towards commercialisation
- Control whether power is fed to national grid or to electrolyser to produce hydrogen.

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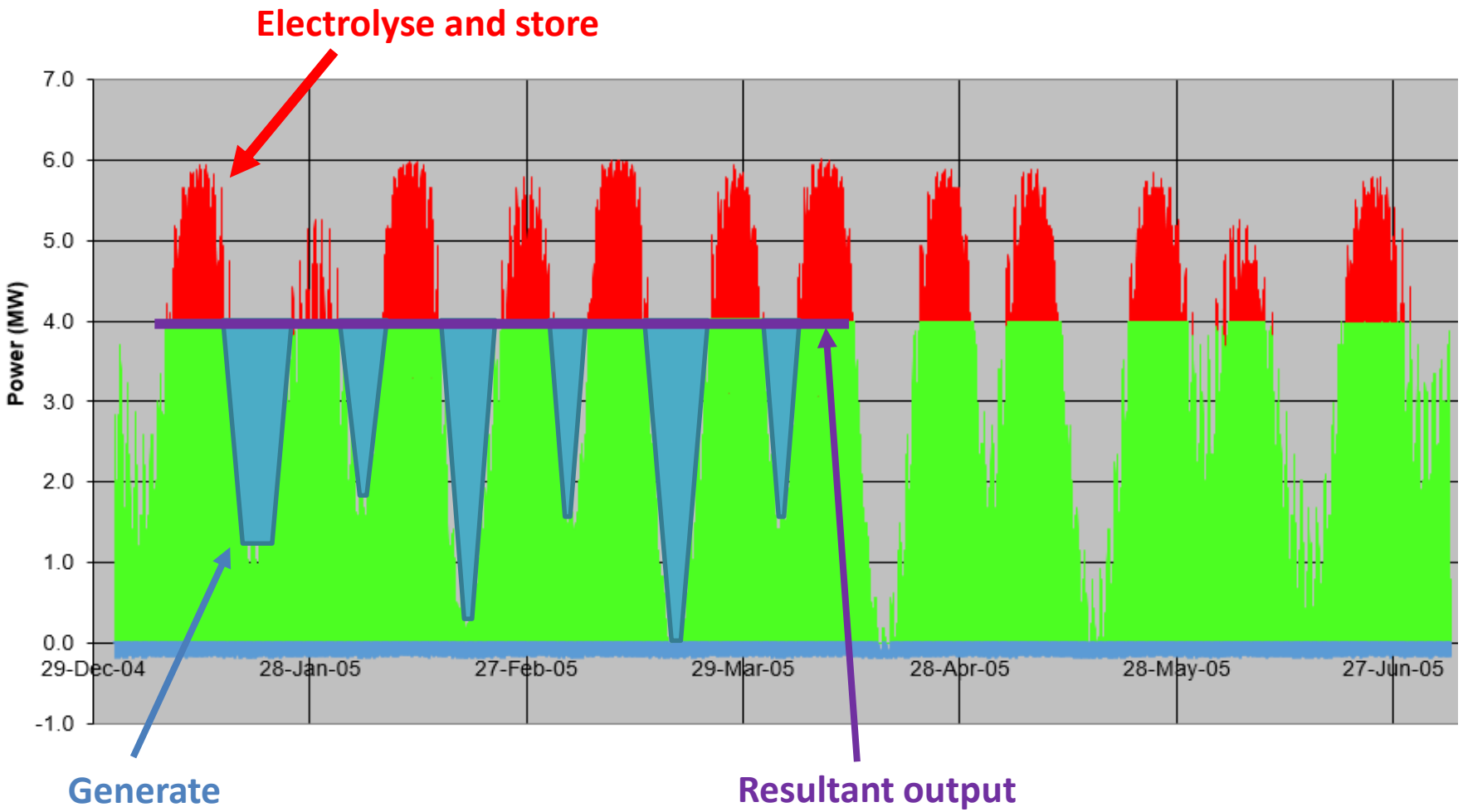
Tide to hydrogen



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H2 Transport Projects

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Marine

- HyDIME
- HySEAS 3

Air

- HyFLYER

Industrial

- HySPIRITS

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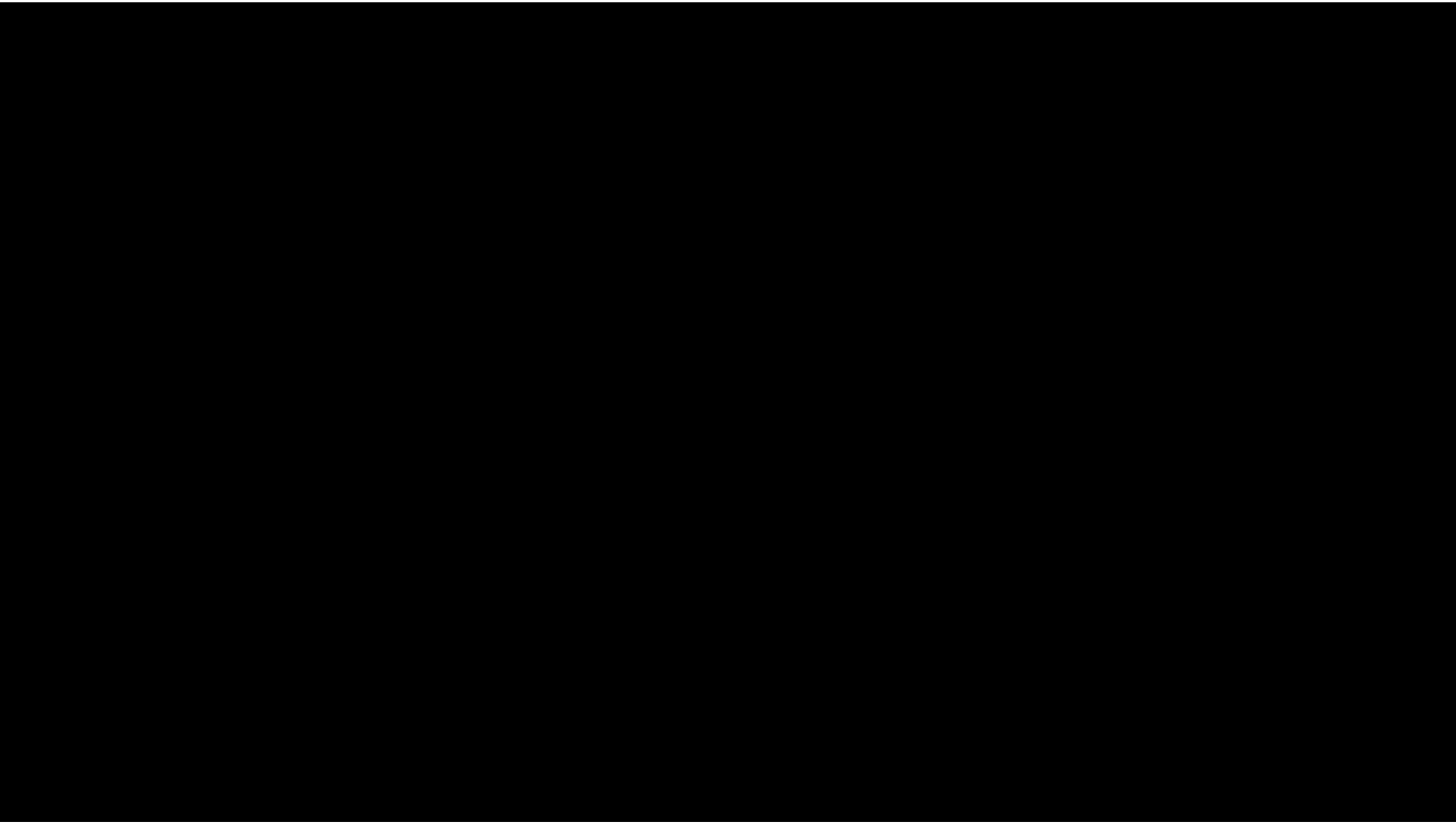
Orkney Hydrogen



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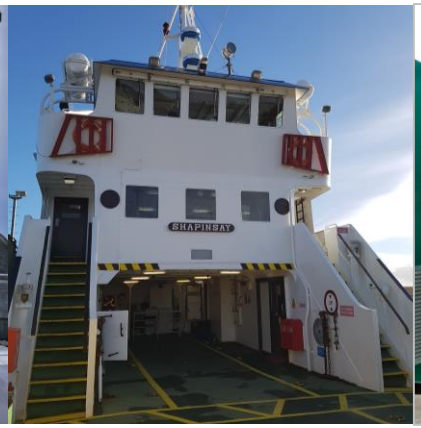


THANK YOU

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Orkney – H2 growth

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2016

- 1 project
- 0.5MW electrolysis
- £3 million projects

2019

- 9 projects
- 2 MW electrolysis
- £63 million projects

2022

- 1 ferry
- 1 major FC installation
- ?? MW electrolysis
- Projects + transition

2.5 Tpa H_2	5 Tpa H_2	25+ Tpa H_2

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HySEAS III

- 100% Fuel Cell Ferry
- Hydrogen supply – increased demand for Orkney hydrogen
- Zero-carbon marine transport
- Replication across Scotland and beyond

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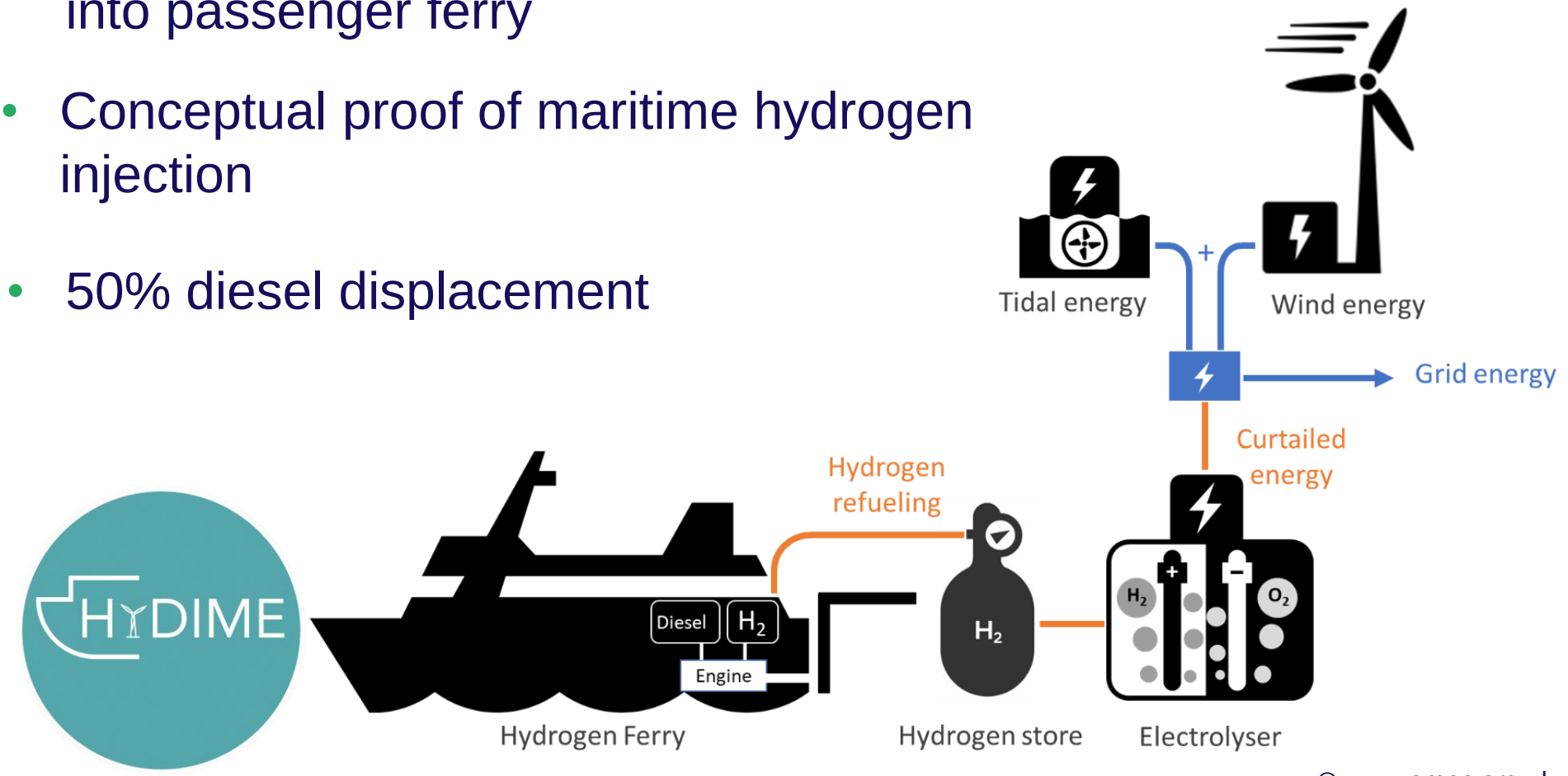
HyDIME

- Integrating hydrogen injection system into passenger ferry
- Conceptual proof of maritime hydrogen injection
- 50% diesel displacement



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