The European Marine Energy Centre (EMEC)

EMEC is a not-for-profit innovation catalyst, pioneering the transition to a clean energy future. EMEC drives innovation in the integration of renewables with complementary energy vectors and alternative offtake industries. Its goal is to accelerate the commercialisation of offshore energy and demonstrate new solutions for decarbonising power, heat and transport.

Key Capabilities / Centres	Descriptions
Test and demonstration facilities	EMEC operates onshore and offshore facilities providing a test platform for first-of-a-kind and pilot scale demonstrations such as green hydrogen, battery storage, e-fuels and refuelling technologies. EMEC works closely with innovators to test and demonstrate technologies across the hydrogen value chain and energy ecosystem.
Technical services	EMEC delivers a range of technical and techno-economic services, from feasibility studies and system modelling to socio-economic and environmental impact assessments. EMEC offers expert technical advice and conceptual design support for demonstration projects, helping clients de-risk innovation and accelerate deployment.
Regulation development support	EMEC supports the development of green hydrogen and integrated energy systems by acting as a trusted interface between project developers and regulators. The organisation provides regulatory insight and strategic guidance, including health and safety regulatory reviews and regulatory feasibility assessments.
Collaboration and knowledge exchange	EMEC plays an active role in collaborative innovation, supporting local and industry stakeholder engagement, drawing on its strong network of public and private partners in the marine, hydrogen and wider energy systems sectors. Having been at the forefront of green hydrogen R&D, EMEC has generated valuable insights into hydrogen production, storage, transport and end-use. EMEC shares this learning through tailored knowledge-exchange workshops, offering in-depth reviews of project findings and emerging best practice to inform future system design and deployment.

Collaboration opportunities

- Onshore and offshore facilities providing a test platform for first-of-a-kind and pilot scale demonstrations.
- Knowledge exchange workshops
- Access to data interfacing with deployed technologies.
- Technical, socio-economic and environmental impact assessments.
- Regulation development support.
- Collaboration hub enabling stakeholder engagement.
- Funding opportunities: **emec.org.uk/funding-opportunities/**

Centre location

Value Chain Areas	Testing & validation	Pilot manufacturing	Digital tools & simulation	Open innovation spaces	Skills development
Production	O	O	✓	✓	✓
Networks	O	✓	✓	✓	✓
Storage	✓	✓	✓	✓	✓
Transport	O	✓	X	O	✓
Industry	O	X	X	O	O
Power	✓	✓	X	O	X
Heat	O	X	X	X	X

*Tick = yes, O = potential, X = no

Hydrogen case studies

EMEC has been involved in over 20 hydrogen innovation projects in collaboration with companies working across production, storage, transportation and end use.

- **Surf n Turf (2015-2017)** - Orkney's first hydrogen project, aiming to produce green hydrogen from wind and tidal power using a 500 kW electrolyser. In August 2017 **the world's first tidal-powered hydrogen** was generated at EMEC's tidal test site.
- **3-in-1 tidal energy, hydrogen and battery demo (2025)** - **A world-first demonstration**, trialling multiple energy flow scenarios to smooth out the cyclical nature of tidal energy and enable on-demand electricity to power an electrolyser
- **Kirkwall Airport CHP (2021-25)** - This project involved installing and demonstrating a hydrogen-ready combined heat and power (CHP) unit at Kirkwall Airport in Orkney.

Key hydrogen contact:

George Colcomb
Business Development Coordinator

George.colcomb@emec.org.uk

Scottish Enterprise