

UHI and Hydrogen

The unique locational composition of the University of the Highlands and Islands (UHI) places it at the heart of many areas where both constraints and opportunities are favourable for hydrogen research and development. By supporting research, innovation, and training initiatives across different areas of

the hydrogen economy, UHI is well placed to play a key role in progression of the hydrogen sector and is open to collaboration on new opportunities.



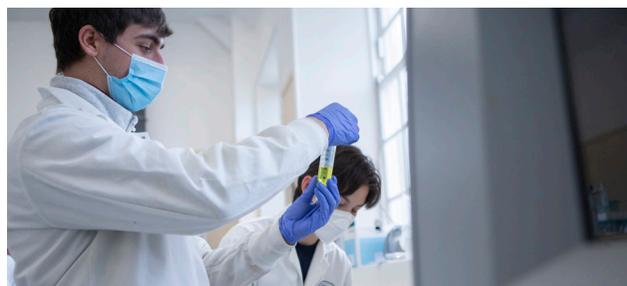
Teaching and Training

Curriculum

Supporting the regional economy is at the core of UHI's strategy through the breadth of curriculum provision available across the UHI partnership relating to the development of key growth sectors including hydrogen. UHI works with industry stakeholders and employers to create tailored sectoral provision from supporting supply chain development through emerging hydrogen technologies to lifecycle engineering and industry.

CPD Opportunities

The academic expertise located across the UHI network from Shetland to Argyll and from Stornoway to Perth supports the curriculum pipeline from Further Education to Higher Education and Research, including Foundation, Modern and Graduate Apprenticeships, HNC/Ds, Undergraduate and Masters provision, Professional Development Awards and industry-specific CPD programmes.



UHI Orkney College

World-first courses developed by UHI-Orkney College Maritime Studies department, cover areas including handling of hydrogen and the use of hydrogen as fuel in marine transport. Hardwired into UK Government Clean Maritime Plan through the Hydrogen Diesel Injection in a Marine Environment (HyDIME) project, UHI's course has produced its first cohort of hydrogen trained ferry crew members.

UHI Outer Hebrides

From September 2022 a new Professional Development Award (PDA) Hydrogen: An Introduction for Technicians module will be launched. This PDA is the only nationally recognised qualification in Scotland dedicated to hydrogen and is delivered by highly skilled and knowledgeable staff. The award has been designed in close consultation with the Scottish hydrogen sector, ensuring content is relevant, up to date, and in accordance with industry needs.



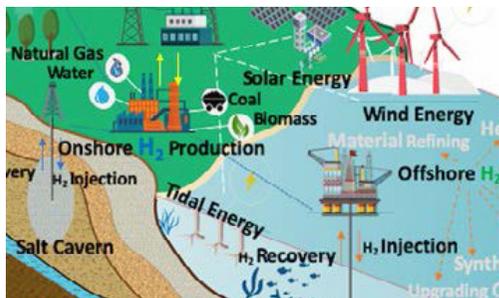
Research

Energy System Development

UHI hydrogen research focusses on the development of smart, modular and optimised Energy Management Systems (EMS) through the integration of new and existing technologies. Focus is particularly on electrolyser and hydrogen storage system capabilities. It is expected this research will create new sustainable job opportunities, increase independency on imported fossil fuels and contribute towards low-carbon targets set by the EU's Energy Union.

Aviation Technologies

Another focus of UHI hydrogen research is the delivery of an integrated net-zero aviation system at a regional level. This unites technology developers, end-users, airport operators, researchers and regulators thereby breaking-down barriers, increasing understanding and speeding-up the deployment of technology whilst ensuring that regulation keeps pace and operations are delivered safely. This is specifically achieved through the development of hydrogen-electric regional aircraft, hydrogen fuel development and refuelling systems.



Case Studies

Hydrogen Socio-Economic Assessment

A commercial developer was looking to undertake a feasibility study for development of new hydrogen production facilities in the Caithness and North Sutherland Regeneration Partnership (CNSRP) area utilising existing onshore wind farms. The UHI-ERI developed a parallel study of the socioeconomic impact of new hydrogen production facilities on the local economy.

Hydrogen Utilisation and Green Energy (HUGE) project

UHI-ERI led the HUGE project, a partnership under the Northern Periphery and Arctic Programme. The project was designed to raise the awareness of the use of green hydrogen as a viable energy vector for remote and rural communities in housing, transport, and industry. It promoted the use of hydrogen as a solution to these challenges by encouraging stakeholders such as constrained generators to produce green hydrogen, and potential end-users such as train companies, taxi fleets, or public authorities, to utilise hydrogen for their transport needs. Key outputs of HUGE included designs of a techno-economic assessment tool, hydrogen utilisation business model and a hydrogen knowledge and technology transfer platform.

Hydrogen Storage in Porous Media (HyStorPor)

UHI-SAMS was one of the partners involved in the HyStorPor project, led by the University of Edinburgh. UHI investigated the socioeconomic potential and impacts of hydrogen, including the role of hydrogen in the just transition and green recovery. Research on HyStorPor was enhanced through a partnership project in Japan (UK-Japan) to understand the international learning from a pilot-scale hydrogen energy deployment.

Sustainable Aviation Test Environment (SATE) Phase 1

UHI was a key partner in the SATE project, based in Kirkwall Orkney, supporting testing of hydrogen and other low carbon fuels. UHI Aeronautics and Aircraft Engineering departments also supported the design, certification, and flight-testing of alternatively fuelled aircraft. UHI-ERI was involved in the socio-economic impacts study, to better understand the implications of green aviation developments.

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