



University of
St Andrews

The University of St Andrews (Eden Campus)

The University of St Andrews provides an integrated portfolio of hydrogen research, development and innovation capabilities spanning fundamental chemistry, materials science, electrochemical systems and pilot scale demonstration. Drawing on world leading expertise within the School of Chemistry and applied facilities at Eden Campus, the University supports hydrogen innovation across the value chain; from catalyst and materials development, through electrolysis and fuel cell components, to system integration and real world testing. This combined capability enables collaboration with industry, public sector and research partners at multiple technology readiness levels, from early stage discovery through to applied development and demonstration.

Key Capabilities / Centres

Descriptions

Hydrogen production & systems integration	Pilot-scale infrastructure for green hydrogen, Power-to-X and electrochemical systems testing, covering electrolysis and hydrogen-derived fuel and chemical pathways. Flexible space supports industry demonstrators and containerised technology deployment across a range of readiness levels.
Materials, components & characterisation	End-to-end electrochemical component development from ceramic synthesis and ink formulation through to cell printing and thermal processing, enabling fuel cell and electrolyser scale-up. Supported by expertise in catalysis, functional and porous materials, and a full characterisation suite including electron microscopy, XRD, NMR and spectroscopy.
Modelling, separation & downstream chemistry	Computational chemistry and HPC simulation for materials discovery, reaction modelling and experimental interpretation. Complemented by expertise in gas separation and storage materials, and chemistry for hydrogen-derived molecules including green ammonia and sustainable fuels.

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

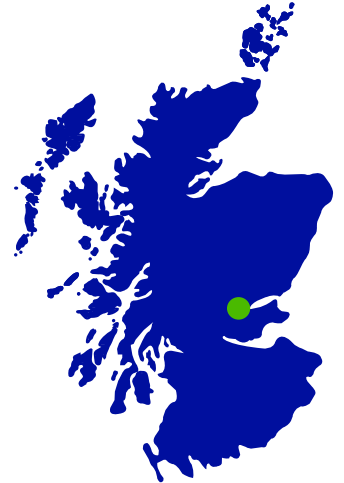
*Tick = yes, ○ = potential, X = no

Collaboration opportunities

The University of St Andrews' hydrogen activities allow for collaboration in the following technologies:

- Electrolysis — materials, components and processes
- Power-to-X, including sustainable fuels and green ammonia
- Ceramic and electrochemical fuel cell technologies
- Catalyst and materials development for hydrogen production and utilisation
- Porous and interface materials for gas separation, purification and storage
- Advanced characterisation, modelling and computational chemistry

Centre location



Hydrogen case studies

- **Reflex Orkney** - The ReFLEX project is aiming to build an 'integrated energy system' (IES) which will coordinate and combine multiple energy assets across electricity, transport and heat.
- **Innovatus Tech & Clyde Hydrogen Solutions** - Innovatus Tech's product, SHyFT is the world's first to market lightweight Type 4 composite high-pressure vessel for efficient hydrogen storage.

Clyde Hydrogen Solutions are developing a decoupled electrolyser technology to deliver high pressure green hydrogen safely at scale and at low cost. The company recently secured over £1m in pre-seed funding.

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