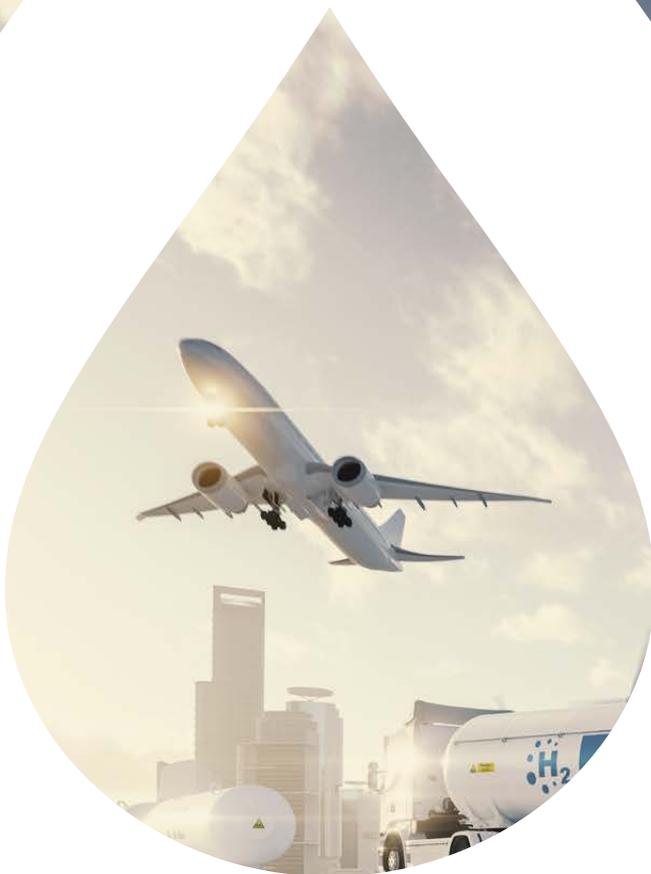




 @HyDEXMidlands

Creating a new hydrogen economy in the Midlands

HyDEX.ac.uk



Funded by



Research
England

Delivered by



Our partnership

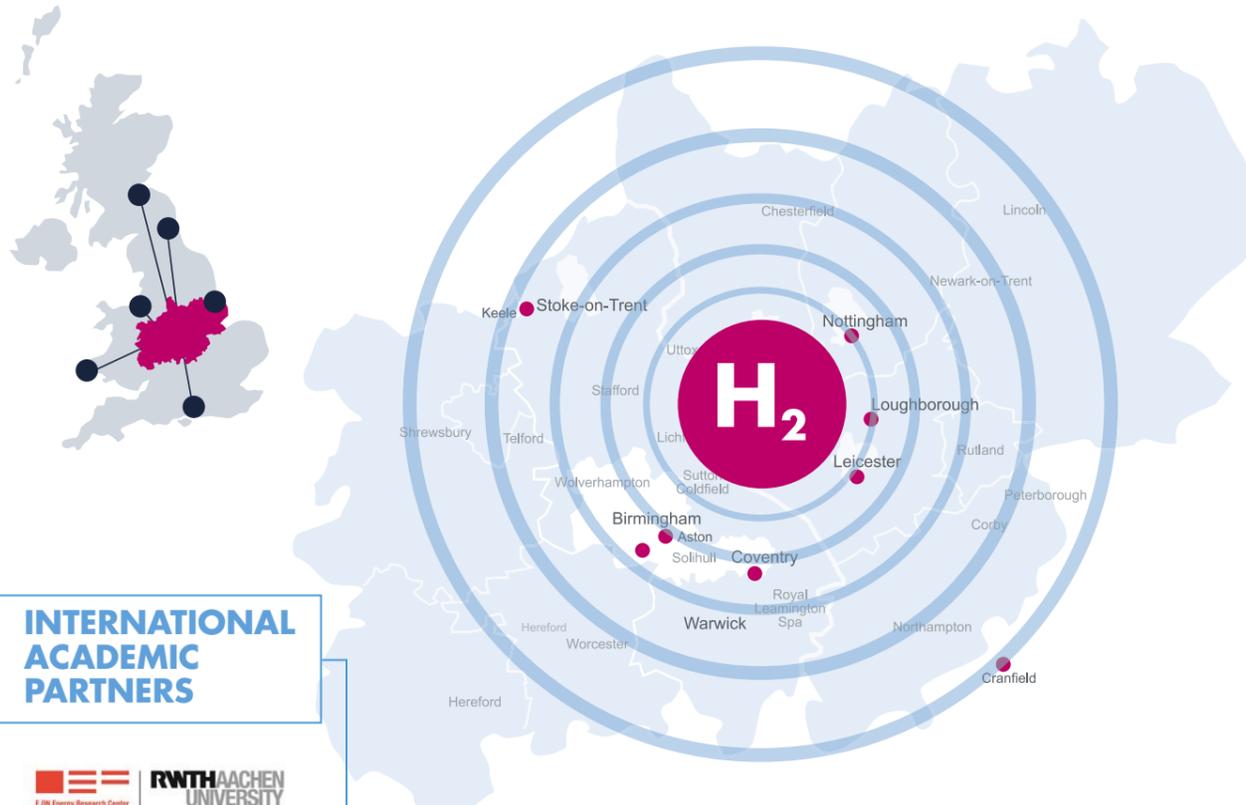
Funded by



Delivered by



Supported by



INTERNATIONAL ACADEMIC PARTNERS



TRANSPORT



ERA UNIVERSITY PARTNERS



HyDEX is designed to address a market failure and challenge: How do you rapidly build a new industrial and manufacturing sector when very little exists already?

HyDEX is supporting and fostering the creation of a new hydrogen industrial economy in the Midlands. This will be achieved by working with small and medium sized enterprises (SMEs), along with Midlands and UK based multinationals, to accelerate innovation, build markets and support the required skills transition.

HyDEX is a three-year programme with eight universities, all associated with the Midlands-based Energy Research Accelerator (ERA). These universities are making their extensive hydrogen facilities available to businesses, along with their research expertise and the large-scale hydrogen demonstrators that they have developed.

MANUFACTURING



HEATING



REGIONAL POLICY & SKILLS



PRODUCTION



Our approach

HyDEX is working with businesses to help accelerate the development of new hydrogen products and the transition from declining industrial sectors. The HyDEX programme supports the training and re-skilling of staff, and demonstrates the viability of new products. Also, by working with local government and local authorities, HyDEX is supporting the creation of a market for low-carbon hydrogen solutions as part of the net-zero transition.

In addition, the HyDEX partnership is using its connections to link businesses with growing international markets in countries such as China, Australia and South Korea in order to build commercial opportunities that reach beyond the Midlands and the UK.

HyDEX will see an ecosystem of businesses developing hydrogen products being deployed into the Midlands energy and transport system, with the creation of hundreds of new jobs.

Our services

Hydrogen is a rapidly emerging sector, but there is no established support structure for businesses.

We will undertake a series of activities including:

- **Support for technology development and R&D** using ERA's research facilities and world-leading expertise
- **Support for IP development and commercialisation** using the specialist capabilities of the HyDEX partners
- **Access to large scale demonstrator and test facilities** to validate and showcase technology solutions
- **Development of hydrogen skills and expertise** by working with our university and business partners
- **Civic engagement and policy activities** to build local government understanding of hydrogen's role in net zero
- **Development of pathways and an associated support programme** to allow businesses to access international markets

The HyDEX programme supports the training and re-skilling of staff, and demonstrates the viability of new products.



Hydrogen research and demonstration facilities

The HyDEX group boasts a number of world leading hydrogen research and demonstration facilities across its university partnership, these include:

- **Aston University:** Aston has a specialism in production methods urgently needed to provide a reliable, affordable and green supply of hydrogen, including producing hydrogen through biomass gasification.
- **University of Birmingham:** Birmingham is working with Tyseley Energy Park and other partners in the Midlands to pioneer solutions in renewable heat and power, energy storage and clean transport fuels, in conjunction with advanced waste processing. The park features a hydrogen refuelling station, and future plans include integrating an ammonia cracker.
- **Cranfield University:** Cranfield is home to the Hydrogen Research Network and the HyPER project Bulk Hydrogen Production by Sorbent Enhanced Steam Reforming). This project will produce a 1.5 MWth plant that can produce higher purity, lower carbon and lower cost hydrogen from natural gas than conventional technologies.
- **Keele University:** Keele led the way in the HyDeploy project which trialled the injection of 20% hydrogen into its gas network used on houses and buildings on campus. Keele also has its Smart Energy Network Demonstrator (SEND) exploring digital technologies to balance decentralised supply and demand, and also boasts a low-energy park with 12,500 solar panels and two wind turbines.
- **University of Nottingham:** Nottingham is home to significant expertise in hydrogen storage solutions, with hydrogen demonstrators and purpose-built hydrogen laboratories. One focus at the University of Nottingham is the development of the "Flex Dual Fuel" demonstrator engine, which can flex between H2 and ammonia (NH3) dual-fuelling as a retrofit solution for existing diesel engines.
- **University of Leicester:** Leicester is renowned for its Materials Research and its cutting-edge facilities can be applied to scientific and industrial research into new materials for hydrogen related applications.
- **Loughborough University:** Loughborough is focused on developing low-cost green hydrogen. One example of this is 'battolyser' technology. The battolyser works by charging as a battery but then uses the excess electricity to produce hydrogen.
- **The University of Warwick:** Warwick is exploring how to use renewable sources to produce hydrogen. Evaluation of the technical and economic performance is a core theme in this work which will scale up lab-scale innovative green hydrogen production to full commercial scale.



Pictures: Homes to Hydrogen research: University of Nottingham's RAD Building, Keele University's Smart Energy Network Demonstrator (SEND), and University of Birmingham's Energy Innovation Centre at Tyseley Energy Park.

Why hydrogen?

Globally, hydrogen has become the hottest topic in terms of low-carbon energy, with the potential to simultaneously decarbonise both heating and transport.

Hydrogen is set to be a crucial vector in rapidly reducing the UK's emissions across a wide range of industrial processes.

The international Hydrogen Council suggests that by 2050 the establishment of a worldwide hydrogen economy would create a \$2.5 trillion market for hydrogen and fuel cell equipment and provide sustainable employment for more than 30 million people.

Germany has announced a €9 billion hydrogen investment programme, Japan has set the target to have a complete hydrogen society by 2050, and countries such as China, South Korea and Australia have major ambitions association with hydrogen-based technology.

The UK has established a Hydrogen Advisory Council which will inform the development of hydrogen as a strategic decarbonised energy carrier.

This is amplified by the government's Ten Point Plan for Net Zero which includes the objective for hydrogen to generate 5GW of low carbon hydrogen production capacity by 2030 for industry, transport, power and homes, and the aim to develop the first town heated entirely by hydrogen by the end of the decade.

Hydrogen has the potential to simultaneously decarbonise both heating and transport



Benefits of HyDEX

HyDEX will:

- 
Develop a hydrogen economy that builds on the Midlands' strength and expertise and which is not reliant solely on imports of technology and services
- 
Develop the skills needed in the new hydrogen economy
- 
Build links to big overseas markets for hydrogen goods and services
- 
Support work to help achieve the Government's net-zero commitments

“

With our academic, industrial and public sector partners, we will be able to demonstrate the commercial potential of hydrogen technologies, support businesses to create products, and build the skills base needed to support the transition to hydrogen.”

Dr Sharon George
HyDEX Principal Investigator, Keele University



Pictures: Hydrogen HGVs, designed by Viritech



Pictures: Highview Power Energy Storage, and ITM Power hydrogen fuel station





 @HyDEXMidlands

Contact us

faye.mcanulla@era.ac.uk

s.m.george@keele.ac.uk

hello@hydrex.ac.uk



Funded by



Research
England

Delivered by

