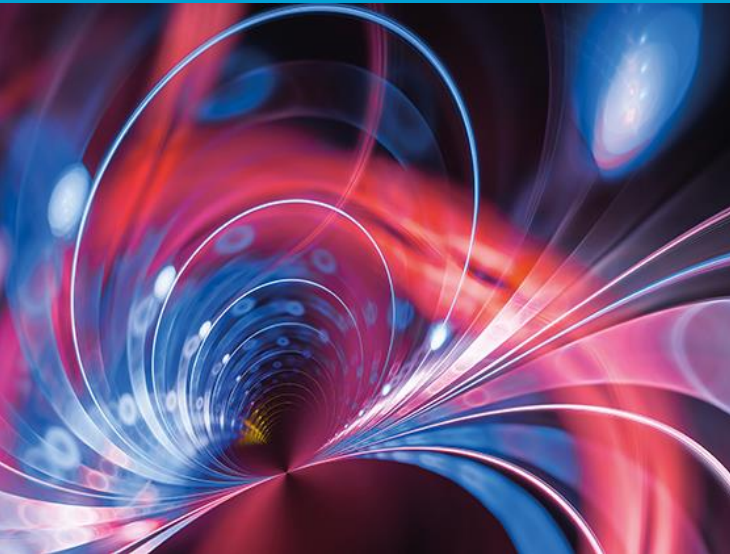


ERA ENERGY RESEARCH ACCELERATOR

At the forefront of energy transformation



Introduction to HyDEX Faye McAnulla June 2022

Delivered by



Funded by



Overview

- Introduction to ERA and hydrogen activity to date
- HyDEX programme
 - Aims
 - International activity
 - Innovation support
 - Capital plans
 - Partners
- Regional Activity
 - HGVs
 - Rail
 - Buses
 - (Pipeline, Nuclear, Heat Networks)
- How to be involved



ERA facts and figures

£120m

CO-INVESTMENT COMMITTED
From over **40 INDUSTRIAL PARTNERS**

£60m

Capital funding via **INNOVATE UK**

9

Key Midlands partners

INVESTING IN OVER

30 new R&D facilities

More than **400**

ACADEMICS

Over **1,000**

RESEARCHERS

STRATEGIC FOCUS



Energy Transformation



End Use Energy Demand



Energy Storage



Energy Integration



SKILLS EXPERTISE

- **£2.5m** pump priming for an ERA Doctoral Training Partnership
- **3 cohorts** established
- **£2.5m** addressing future industry needs through challenge-based PhD projects
- Developing **future leaders** in low carbon energy

With 2500m² of space, the **RAD Building** is the UK's largest working laboratory built to Passivhaus standards

The **GeoEnergy Test Bed** has **11 boreholes**, each drilled to depths of up to 285m

The **TCR demonstrator** at **Tyseley Energy Park** is capable of processing 80 kg of waste per hour

More than **100 businesses** have taken part in EBRI's bioenergy masterclasses

Over **20 companies** work with the Energy Innovation Centre at any time

The **2.1 MWh Tesla battery** at Trent Basin is the largest community energy battery in Europe

Delivered by



Funded by






Sustainable Hydrogen

CENTRE FOR DOCTORAL TRAINING



Delivered by



Funded by





Funded by



Delivered by



Supported by



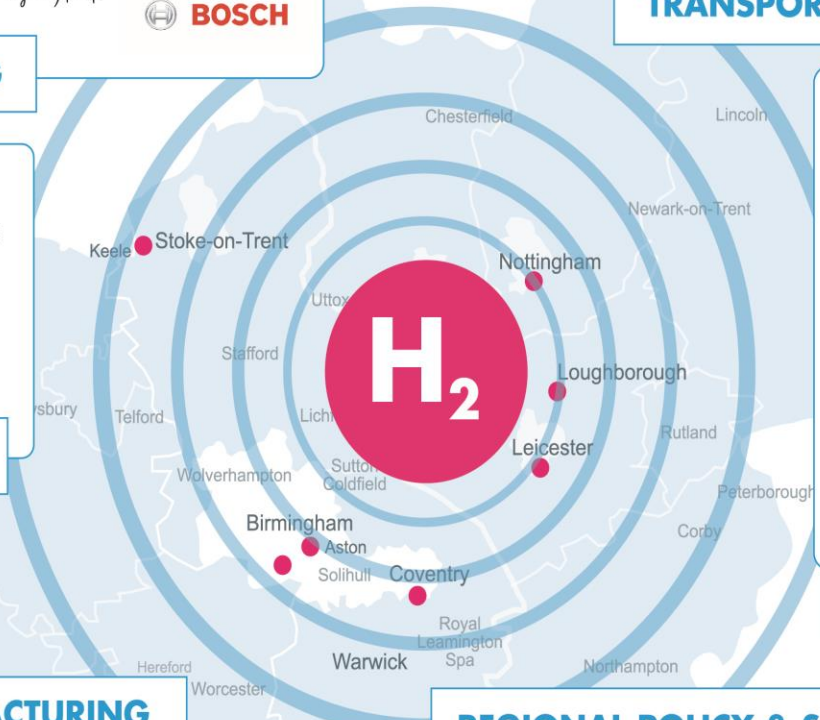
TRANSPORT



HEATING



PRODUCTION



INTERNATIONAL ACADEMIC PARTNERS

Regional focus, national impact, internationally networked

- Access to large scale demonstrator and test facilities
- Support for technology development and R&D
- Support for IP development and commercialisation
- Development of hydrogen skills and expertise in businesses
- Civic engagement and policy activities to build understanding
- Development of access to international markets and inward investment



ERA UNIVERSITY PARTNERS



MANUFACTURING



REGIONAL POLICY & SKILLS



Launch of HyDEX

- Website live hydex.ac.uk
- Launch event in Parliament 15/6
- Staff coming into roles – Policy Fellowship; Project Manager; International KT; Centre Administrator



International knowledge exchange and commercialisation

- China – relationship with Tsinghua University
- South Korea - relationship with Chungnam Province and Technology Park
- Twin city application made with South Korea region
- Australia – academic collaborations developing with UoNSW and UoS
- EU policy meeting being planned for Nov
- Engagement with Midlands DIT
- Establishing policy activity



Funded by



Lead academic partners



Establishment of a Green Innovation Network

- For organisations in process of commercialising technology or early growth
- Two meetings held so far:
 - Octopus Ventures Team
 - WMREDI and British Business Bank



octopus
ventures



BRITISH
BUSINESS
BANK

Capital Plans



University	Proposed Capital Plan	Contact
Aston University	Focus on production and fuel cells: gasification; pyrolysis; Impact through access to facility and training opportunities	Amirpiran Amiri
University of Birmingham	Tyseley Energy Park BEIC Ammonia cracker going into TEP Focus on local transport infrastructure supporting commercial fleet evolution (refuelling between Edgbaston and Tyseley)	Robert Steinberger-Wilckens
Cranfield University	Catalytic methane cracking for hydrogen production Quality assessment; blended hydrogen formulations; interacting with supercapacitor and battery manufacturers Turquoise Hydrogen demonstrator	Peter Clough; Upul Wijayantha-Kahagala-Gamage
Keele University	Green Hydrogen from renewables via Keele Smart Energy Network 100% hydrogen ceramics manufacture trial	Sharon George (PI)
University of Nottingham	"Flex Dual Fuel" demonstrator engine with ability to flex between H ₂ and ammonia (NH ₃) dual fuelling as an <u>advanced retrofit solution for existing heavy duty diesel engines, including solid state hydrogen storage</u>	Simon Gerrard
University of Warwick	Novel green hydrogen production facility with over 90% energy efficiency	Sai Gu

Organisation	Activity
Baxi	Demonstrated 100% hydrogen boiler
Bosch and Worcester Bosch	Hydrogen ready boilers; Home trials for hydrogen; Village sized trials
Equans	Provides low carbon energy solutions from homes to cities, hospitals to the heart of government, offices to industry. Supporting hydrogen being part of this solution
FAUN Zoeller	Bringing UK's first true OEM hydrogen fuel cell powered refuse collection vehicle into the UK from its German developments.
Progressive Energy	Project to develop first at scale low carbon hydrogen plant 300MW (HyNET)
Siemens	Integrating hydrogen into grids and building hydrogen plants; hydrogen to/from ammonia;
EDF	Largest UK generator with nuclear, wind, solar, batteries. Interest across all business units including nuclear. Keen to support downstream hydrogen, e.g. H2GVMids. Tees Green Hydrogen



Organisation

Activity/interests

Toyota

Mirai Hydrogen Fuel Cell vehicle on the road in UK

British Ceramics Confederation (BCC)

Use of hydrogen in ceramics production

Uniper

Large scale production of hydrogen planned

Intelligent Energy

Proton Exchange Membrane (PEM) fuel cell products into the automotive, stationary power, aerospace and Unmanned Aerial Vehicle (UAV) sectors. Office in China

Centrica

Hydrogen production and utilisation in fleet

JCB

Construction and agriculture sector – developing hydrogen engine technology prototypes and moving into production. Also supply and distribution of hydrogen

HS2

Interested in the use of hydrogen for construction and lorry movements

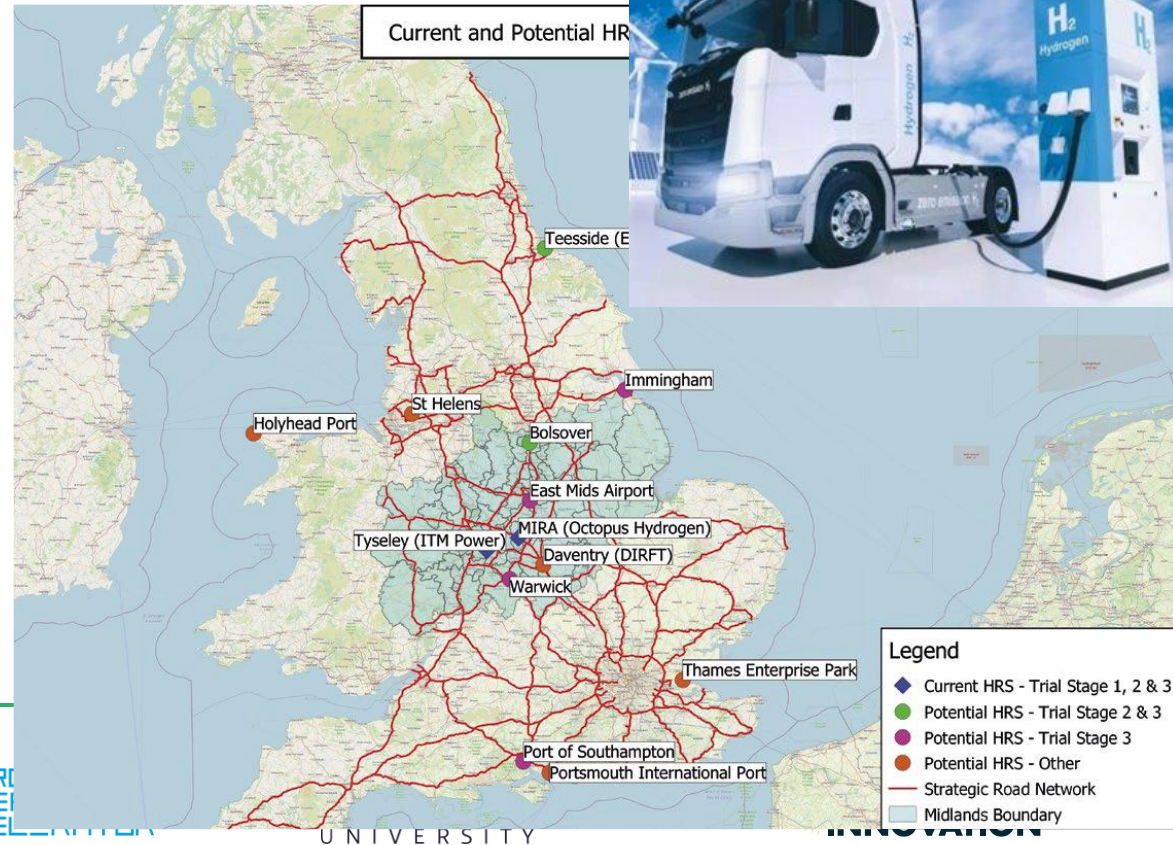
MAG Airports

Use of hydrogen at airport





Hydrogen Truck Demonstrator



Funded by



Lead academic partners



Hydrogen rail development plans.....

- Want to establish hydrogen rail programme for the region
- Meeting recently to bring together key regional stakeholders – academics, rail companies, civic
- Starting to develop a proposal for a hydrogen rail programme for up to 10 trains in E&W Midlands



The biggest hydrogen bus programme in the West...

- £30m DfT ZEBRA funding for 124 new hydrogen buses.
- TfWM will work with bus company partners and the wider hydrogen production industry to get the fleet up and running.
- Adds to 20 buses already operated in the city via BCC and operated by National Express



Overview

- Introduction to ERA and hydrogen activity to date
- HyDEX programme
 - Aims
 - International activity
 - Innovation support
 - Capital plans
 - Partners
- Regional Activity
 - HGVs
 - Rail
 - Buses
 - (Pipeline, Nuclear, Heat Networks)
- **How to be involved**



Thank you

Faye McAnulla

Programme Director, Energy Research Accelerator

faye.mcanulla@era.ac.uk

Delivered by



Funded by

