ENERGY RESEARCH ACCELERATOR

HyDEX

The UK Centre for Low Carbon Fuels

Driving clean fuel innovation

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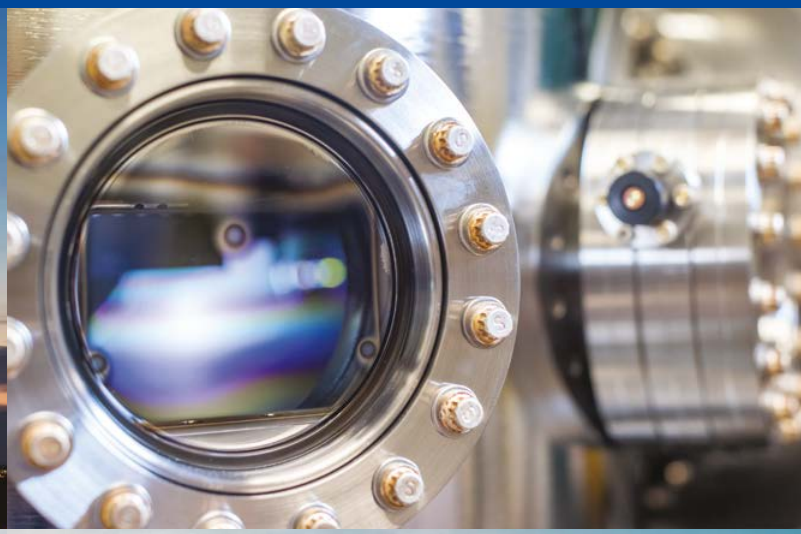

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The UK can lead the way in clean, low-carbon fuels

The UK is at a turning point in the race to net zero. To reach our climate goals and build a more resilient, competitive economy, we need more than just renewable electricity—we need a new generation of clean, low-carbon fuels.

From sustainable aviation fuel (SAF) to green hydrogen, ammonia, methanol, and ethanol, these fuels will play a crucial role in decarbonising the hardest-to-abate sectors—aviation, shipping, heavy industry, and freight—where electrification alone isn't enough.

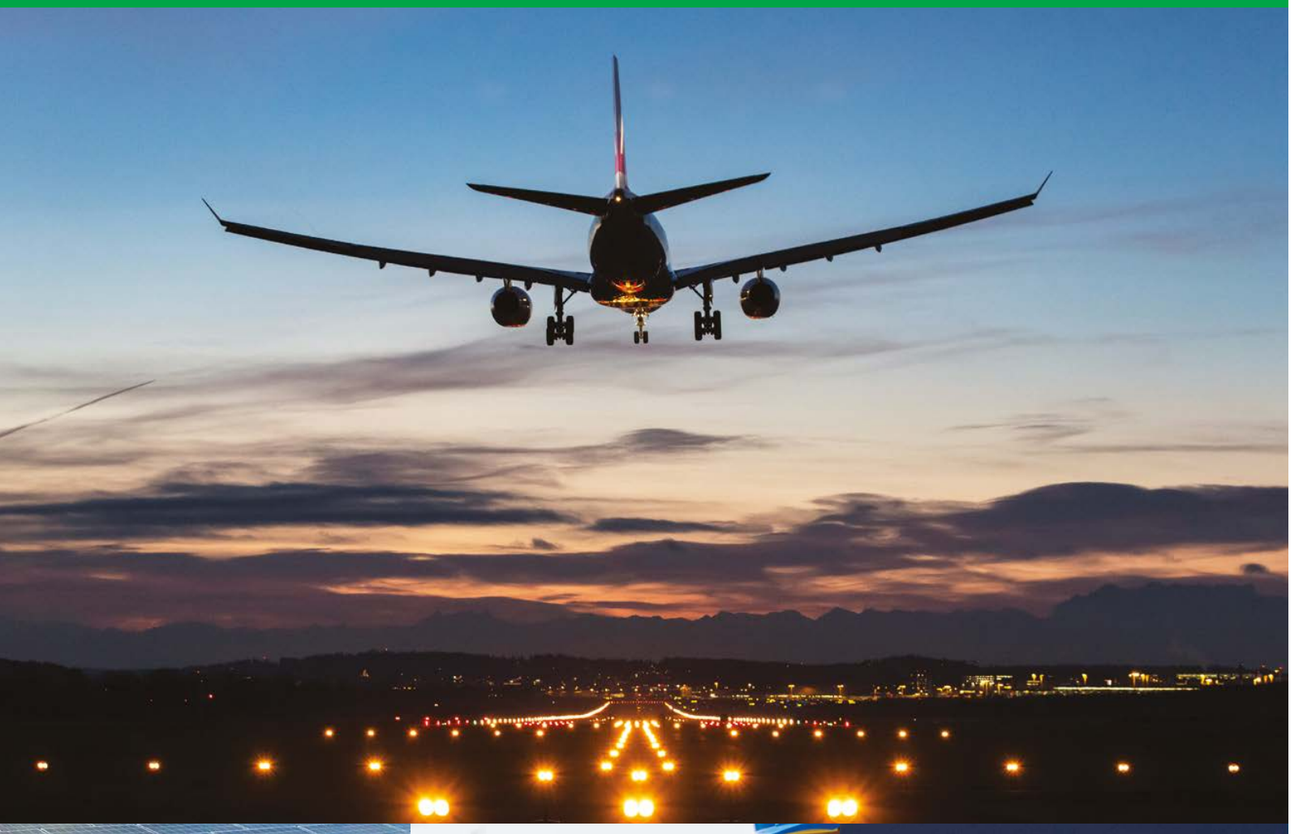
Now is the time to accelerate the development, deployment, and adoption of these technologies.

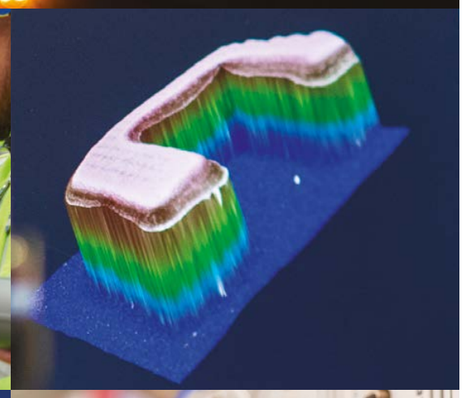
That's why we are proposing a bold new initiative: The UK National Centre for Low Carbon Fuels.

Why clean fuels? Why now?

Clean fuels are essential to:

- **Achieving net zero:** Fuels like hydrogen and SAF are key to decarbonising sectors with limited alternatives.
- **Securing energy resilience:** A diversified, domestic clean fuel supply reduces dependence on volatile global markets.
- **Driving green growth:** The UK clean fuels sector **could support up to 200,000 new jobs** by 2050, from engineering and science to logistics and manufacturing.
- **Creating opportunity everywhere:** Many of these jobs will emerge in regions historically reliant on fossil fuels, helping level up the UK economy.
- **The Centre will lead a coordinated national effort to connect** science, industry, and policy, helping to deliver scalable, real-world clean fuel solutions.



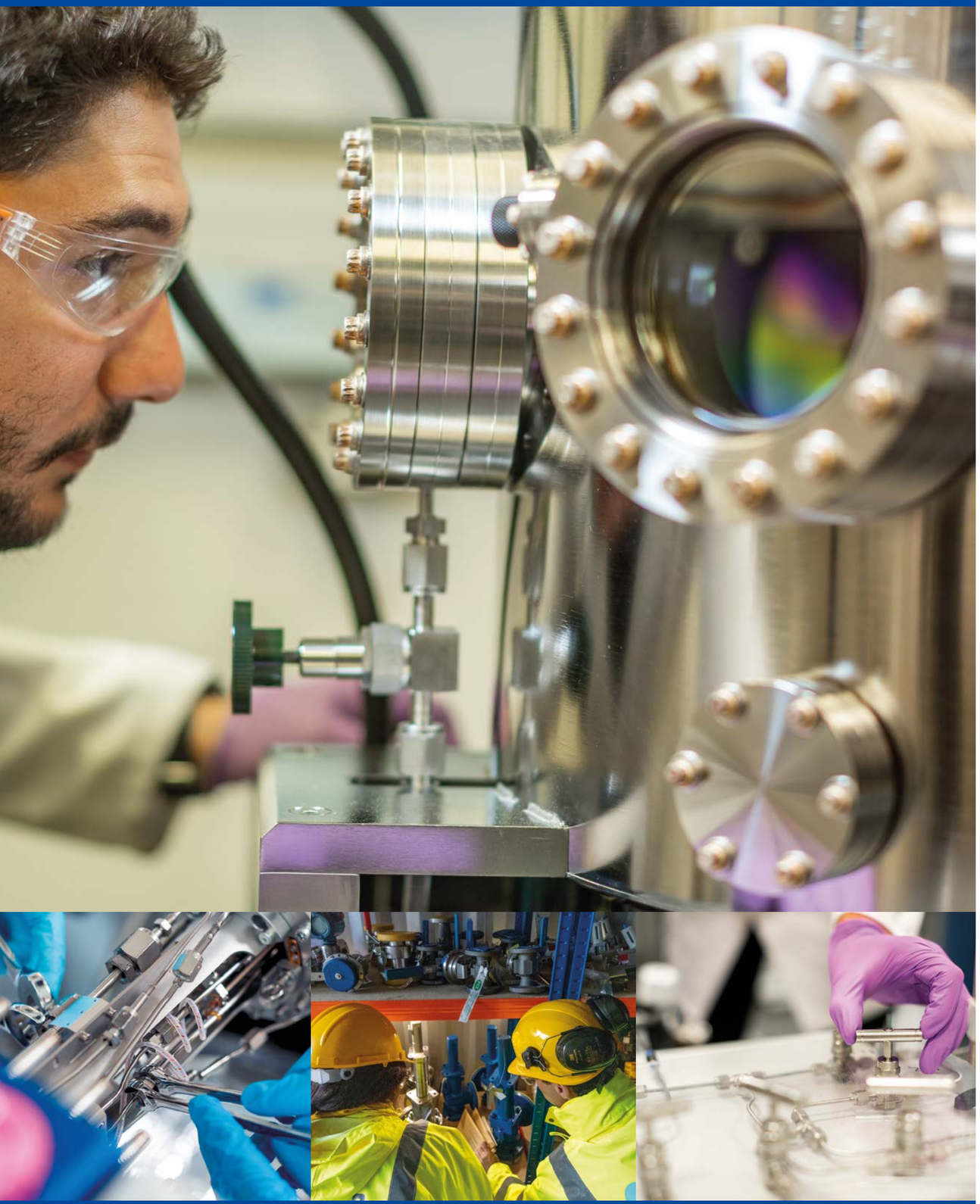


A comprehensive approach

The proposed UK Centre for Low Carbon Fuels will focus on the entire clean fuel value chain:

- **Feedstocks**
  Harnessing renewable and waste sources—such as water, solar, wind, and biomass—for clean fuel production.
- **Fuel production**
  Innovating across technologies including electrolysis, gasification, waste-to-fuel, fuel blending, and catalyst development.
- **Storage solutions**
  From hydrogen-to-ammonia conversions to advanced fuel tanks, tackling flashpoints, corrosion, and switchable storage methods.
- **Standards and certification**
  Developing robust, traceable standards for quality, safety, emissions, and cross-border compatibility (for example, ASTM, ISO).
- **Supply chains**
  Ensuring safe, scalable transport and distribution—road, rail, air, marine—with real-time tracking of carbon impact (Scope 3).
- **Skills and training**
  Delivering training at all levels—apprenticeships, CPD, research fellowships—to grow a workforce fit for the clean fuels economy.
- **Symbiosis and systems thinking**
  Enabling circular systems, multi-sector integration, and cross-cutting innovation across fuels and technologies.
- **Policy, regulation and impact**
  Working with government to co-develop regulation, support investment, and embed public confidence in clean fuels.

Driving green growth: The UK clean fuels sector could support over **200,000 new jobs by 2050**



Technology acceleration through Fellowships

The Centre will also be powered by a prestigious new International Postdoctoral Fellowship Programme led by ERA.

- **Supporting 59 postdoctoral researchers over 3 years**
- **Advancing end-to-end SAF and clean fuel research**
- **Driving international collaboration, researcher mobility, and industrial placement**
- **Aligning with UK priorities in aviation decarbonisation, hydrogen systems, and biofuels**

By developing global clean fuel leaders, the Centre will build long-term capability across science, engineering, policy, and innovation.

Backed by the Energy Research Accelerator (ERA)

Led by the Energy Research Accelerator (ERA), the proposed National Centre for Low Carbon Fuels draws on the strengths of one of the UK's most successful energy innovation partnerships.

ERA brings together **over 1,400 researchers** from nine Midlands universities and the British Geological Survey. We are at the forefront of research and development in low-carbon energy, with a proven track record of working closely with industry, government, and international partners to accelerate innovation and deliver real-world solutions.

ERA has supported **more than 250 businesses** and leveraged **over £250 million** in additional investment to drive innovation in hydrogen, bioenergy, energy storage, and systems integration.

Key initiatives include:

- **HyDEX (hydex.ac.uk):** Fast-tracking hydrogen innovation and deployment, connecting industry with cutting-edge research.
- **HyPER, CH_2i,** and **Supergen Bioenergy:** National demonstrators focused on hydrogen production, clean fuels, and sustainable biomass.
- **C-DICE** and **Hydrogen CDT:** Training the next generation of clean energy experts through industry-embedded doctoral and postdoctoral programmes.

With established infrastructure, deep regional ties, and a national outlook, ERA is ideally positioned to lead the coordination and delivery of a world-class National Centre for Low Carbon Fuels.

Learn more at **era.ac.uk** and **hydex.ac.uk**

UK-wide expertise in low carbon fuels

The National Centre for Low Carbon Fuels will build on extensive capabilities across the UK's leading universities and innovation partners. From fuel production to emissions testing and economic modelling, we already have the tools in place to lead the clean fuel transition.

Fuel type	Key capabilities
Hydrogen (H_2)	■ Green hydrogen production and storage ■ Fuel cells and electrolysis ■ Engine testing and emissions ■ Life Cycle Assessment and economic modelling
Ammonia (NH_3)	■ Ammonia cracking and combustion ■ Dual-fuel systems (NH_3 + biodiesel) ■ NOx mitigation ■ Refuelling station development and emissions testing
Sustainable Aviation Fuels (SAF)	■ End-to-end SAF production pathways (alcohol-to-jet, gasification) ■ SAF combustion and emissions testing ■ Certification and life cycle analysis ■ Rig-based testing for aviation
Methanol	■ Syngas-to-methanol synthesis ■ Methanol reforming and combustion ■ Fuel cell integration ■ Marine engine and burner testing
Ethanol	■ 2nd-generation ethanol production ■ Ethanol combustion studies ■ Aerospace and automotive testing ■ CO_2 purification and gas fermentation
Biofuels	■ Pilot-scale biogas and biofuel production ■ Biohydrogen and biomethane development ■ Life Cycle and Techno-Economic Analysis ■ SME and supply chain engagement
Liquid Organic Hydrogen Carriers (LOHCs)	■ LOHC production and integration with fuel cells ■ Corrosion testing in transport systems ■ Economic and pricing models

Join us to power a cleaner future

The UK has the talent, technology, and track record to lead the world in clean fuel innovation, what we need is a coordinated national effort to scale, standardise, and succeed.

The UK National Centre for Low Carbon Fuels will make clean fuels a cornerstone of our net zero transition, delivering impact from lab to launchpad to every community in the country.

Email **enquiries@era.ac.uk** if you want to be involved.

ERA's HyDEX partnership

Aston University Birmingham UK
University of Birmingham
Cranfield University
Keele University
University of Leicester
Loughborough University
University of Nottingham UK | China | Malaysia
University of Warwick
British Geological Survey

Heating partners

Cadent Your Gas Network
centrica
Equans
Progressive Energy
Siemens Ingenuity for life
Worcester Bosch

Manufacturing partners

British Ceramic Confederation
Siemens Ingenuity for life
Worcester Bosch
Toyota

Regional policy and skills partners

West Midlands Combined Authority
East Midlands Combined County Authority
Midlands Energy Hub

Production partners

EDF Energy
Progressive Energy
Uniper

Transport partners

MIRA
cenex
Intelligent Energy
JCB
Siemens Ingenuity for life
Motive
FAUN Kirchhoff Gruppe
Zoeller
Toyota

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Find out more at:
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