

RESEARCH
ACCELERATION AND
DEMONSTRATION
BUILDING (RAD)

RAD
BUILDING



RESEARCH ACCELERATOR

ERA is investing £12m
in the RAD building and its
equipment and facilities.

A new Research Acceleration and Demonstration building is being built in Nottingham in order to house a range of new equipment and facilities which researchers and business partners can use to help find new solutions to the energy challenges faced by industry and society. The RAD building will include laboratory space for research ranging from harvesting and storing wind energy, to the development of new materials for hydrogen storage.



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WHAT ERA IS DOING

Equipment installed in the building's research labs is designed to take novel energy materials and technologies from the test bench into working devices, ranging from gas storage materials and batteries through to water-splitting surfaces and fuel cells.

The RAD building offers state-of-the-art facilities:

Multidisciplinary Development Lab (MDL)

The MDL is designed to drive scientific discoveries and new energy technologies from bench to demonstrator. The Lab is equipped with state of the art facilities for near-ambient pressure photoelectron spectroscopy, nanoscale imaging, gas-storage & separation, thermal analysis, fuel cell testing and accelerated gas cycling. The x-ray photoelectron spectroscopy facility will enable researchers to replicate how atoms and molecules interact at pressures close to their normal operating environment to drive scientific discoveries and new energy technologies. The MDL will allow testing and development of low-cost, robust direct solar water splitting surfaces to harvest sunlight and store it as hydrogen fuel for transport and on-demand electricity generation.

Hydrogen Systems Test Bed

Hydrogen technologies will make a major impact on two important energy challenges: decarbonisation of heat, and zero emission vehicles. Hydrogen is a versatile energy source and provides an energy storage solution for grid scale and microgrid applications. This facility will be a flexible test bed for different hydrogen components - generation, gas upgrade, storage and use. The 1 MWh hydrogen store enables testing of systems up to 100 kW in scale.

High Performance Compression and Expansion Lab (HPCX)

Machines that compress or expand gas are hugely important in both generation and electricity consumption, focusing on reducing wasted energy in the system and increasing the durability of compressor technologies across a range of applications. Energy storage is a primary application area for the HPCX lab. The HPCX lab will support exploration of machine designs with much greater efficiency than their predecessors. One application instance is a power transmission system for wind turbines, capable of storing 100hrs of rated output.

The RAD building is **over 2500m²** and will house more than **50 energy researchers.**

The RAD building is designed to meet both Passivhaus and BREEAM energy efficiency standards - the first of its type in the UK to achieve this.



Carbon Capture through Solid Adsorbent Looping Technology

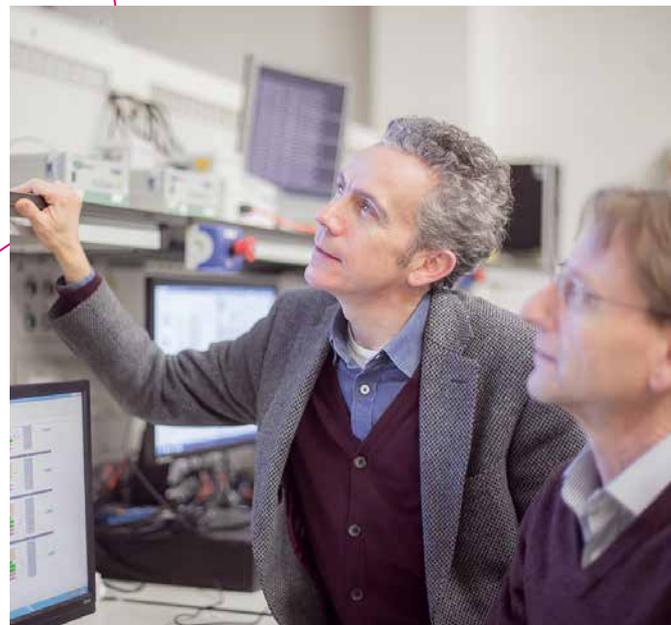
ERA is investing in a pilot-scale facility that will enable up to 50kg of adsorbent to be prepared and operated under real flue gas conditions. The facility comprises a circulating fluidised bed, where flue gas is contacted with adsorbent and a bubbling bed regenerator to desorb the CO₂ in a pure form for compression and storage. The programme will involve international collaboration with Korea and China, where successful projects have already been completed on the scale-up of adsorbents.



The Hydrogen Systems Test Bed will enable testing of hydrogen components involved in energy generation, storage and use.

THE IMPACT

The RAD building provides a purpose built centre for energy research which will provide state-of-the-art facilities for research and testing into renewable and sustainable low-carbon energy technologies. This includes the development of hydrogen as a clean energy source, carbon capture, new innovations for energy storage and development of new materials for use in energy applications.



ABOUT US

ERA is an Innovate UK funded programme within Midlands Innovation. ERA involves a consortium of six midlands based research intensive universities, together with the British Geological Survey, who are harnessing the Midlands' combined research excellence and industry expertise to play a critical role in tackling some of the biggest energy challenges facing the UK.

CONTACT US

ERA welcomes engagement with research, industry and policy-makers across the energy sector.

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ERA
ENERGY
RESEARCH
ACCELERATOR

£60m
Innovate UK
investment

Over
40
industrial
partners

£120m
industrial
co-investment

More than
1,000
researchers

7
partners

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