

HEATING AND COOLING
IN BUILDINGS,
TRANSPORT AND
INFRASTRUCTURE

THE THERMAL ENERGY



THERMAL ENERGY TECHNOLOGIES

ERA is investing
£20m
in Thermal Energy
technologies

Thermal energy, both hot and cold, is one of the major energy challenges. The provision of cold, or cooling, is integral to modern society; without it, the supply of food, medicine and data would simply break down. Yet cooling currently consumes large amounts of energy and causes a great deal of pollution.



WHAT ERA IS DOING

ERA is working collaboratively with Midlands Innovation universities and other partners, to drive the development and integration of a range of thermal and cryo-energy technologies. These will deliver jobs and apprenticeships, wealth creation and the next generation of scientists and engineers in the energy sector and emerging industries.

ERA is working to support thermal and cryogenic research and is both investing in and utilising a number of facilities.

These include:

The European Bioenergy Research Institute (EBRI)

EBRI at Aston University, is a focus for innovation in biomass production and the utilisation of products for renewable power, heat, transport fuels, hydrogen and chemicals. ERA's investment at EBRI includes:

- X-ray photoelectron spectroscopy machine (XPS)
- Scanning Electron Microscope (SEM)
- Bioreactor suite

Thermal Testbeds

ERA is supporting Loughborough University to enhance existing thermal characterisation facilities and provide testbeds to evaluate thermal storage system performance. Facilities will also support the development of new high performance insulation and building façade systems. The university is also establishing a cryogenic engine test facility to support the development of Cold Engine Technology.

Manufacturing Technology Centre

The Manufacturing Technology Centre (MTC) develops and proves innovative manufacturing processes and technologies in partnership with industry, academia and other institutions. The MTC is working with ERA on the 'Factory in a Box' concept, which will allow manufacturers of energy products to have a British technology solution delivered to their doorstep. The mobile factories will use smart sensors, super-fast broadband and big data to measure and control production processes remotely.

ERA has also installed a Thermo-Catalytic Reformer at Tyseley Energy Park in Birmingham, which converts waste into energy, creating green fuel for the city.





£5.2 billion
is spent on
energy in the
UK each year for
refrigeration and
cooling.

Highview Liquid Air Energy Storage Facility

The UK's first dedicated research facility for energy storage using cryogenic liquids, opened at the University of Birmingham in 2015. The technology can integrate waste heat or cold from industrial processes to increase the system's overall efficiency to over 70%. This facility, which is also used for ERA funded research, has the potential to transform future energy systems, reducing the costs of integrating intermittent generation into the electricity system and ensuring power is available when it is most needed.

Thermal Technologies Laboratory

The Thermal Technologies Laboratory is being enhanced by the provision of further test equipment and data logging facilities. New in-house manufacturing capability is also being provided by the purchase of micro-TIG welding systems and a laser cutter to allow rapid proto-typing of the bespoke heat-exchangers being developed. New thermal baths will extend the ability to test thermal systems that require controlled heating and cooling.



THE IMPACT

ERA is working with industry and consumers to help to develop ways to produce cheaper and greener sustainable cold energy for air conditioning and refrigeration. The work of ERA partners will both reduce the energy consumed for thermal loads and move away from the use of fossil fuels.

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.

For more information visit:

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Innovate UK
investment

Over
40
industrial
partners

£120m
industrial
co-investment

More than
1,000
researchers

7
partners

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