

# sustainable energy

## improving by design

### Sustainable Heating and Cooling Technology

The University of Warwick has established a dynamic new research group, Sustainable Energy Engineering Design (SEED) led by Professor Bob Critoph, to undertake research in low carbon energy technologies and design essential to underpin a sustainable built environment. This research group, along with partners from industry and academia, are using new state of the art Birmingham Science City facilities – funded by Advantage West Midlands (AWM) and the European Regional Development Fund (ERDF) – to undertake research on sustainable heating and cooling technologies. Such technologies include low-carbon heat driven refrigeration, air conditioning and heat pumping systems, solar heating systems and analytical property measurement of materials used in these technologies.

#### The following facilities are available for heating and cooling systems testing:

- Environmental chamber enables the evaluation of the thermal performance of heat pump, refrigeration and air conditioning systems as well as building fabric components
- Infra red camera suitable for characterising the thermal performance of large scale building façades, heat stores or solar collectors and small-scale items
- Equipment for characterising the thermal and mass transfer properties of new materials and fluids for application in low carbon heating and cooling technology

Birmingham Science City

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## Cutting edge facilities are also available for solar energy evaluation and testing:

- A large area (3.2m<sup>2</sup>) continuous solar simulator allows evaluation of the performance and detailed characterisation of solar thermal and photovoltaic systems
- Highly instrumented outdoor and laboratory test facilities for complete solar energy systems analysis including commercial systems for domestic use
- Indoor and outdoor solar radiation characterisation equipment for testing solar thermal and photovoltaic collectors and building façade components
- Evacuated tube solar collectors for detailed experimental characterisation of the performance of medium-sized standard solar thermal systems for prediction of utility of solar energy in the UK
- Optical characterisation equipment for coated glasses and textured or selective surfaces (solar thermal or photovoltaic, samples of any size)

## Analytical property measurement facilities include:

- Differential scanning calorimeter
- Porosimetry
- Rheometry
- Thermal conductivity measurement
- Fluid flow velocity profiling

The set up of this new facility is part of the £10.5m Energy Efficiency & Demand project, funded by AWM and ERDF under the Birmingham Science City initiative. It is a key part of a larger investment in the research infrastructure of the West Midlands region, which unites the Universities of Warwick and Birmingham in a newly-formed Science City Research Alliance (SCRA).

The Energy Efficiency and Demand project, led by the University of Warwick, sits alongside the Hydrogen project, led by the University of Birmingham, under the umbrella of the Energy Futures theme. The investment aims to develop and promote a regional hub for academic and industrial expertise in energy efficiency and demand reduction as part of the Government's mission to achieve a strong knowledge-based economy.

## For further information and business enquires, including proposals for collaboration or access to the facilities:

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[www2.warwick.ac.uk/fac/sci/eng/research/seed](http://www2.warwick.ac.uk/fac/sci/eng/research/seed)



Prof. Bob Critoph – Head of S.E.E.D



Solar Simulator installation

[www.birminghamsciencecity.co.uk](http://www.birminghamsciencecity.co.uk)

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