

Institute of Energy and Sustainable Development

The **Institute of Energy and Sustainable Development (IESD)** focuses on improving the built environment through the application of computer modelling and performance monitoring, behavioural studies, and the development of energy and environmental policies for a low-carbon future. IESD's activities respond directly to the world-wide concerns about climate change, energy supply and security, and social equity.

Background

The IESD has undertaken research and consultancy for many years to create the underlying knowledge and technologies necessary to achieve more energy-efficient and sustainable lifestyles. From design advice for low energy buildings, to studies of environmental behaviour, the Institute is able to provide advice, with experts from the fields of engineering, building physics, sociology and psychology.



Airport, Low Carbon Retrofit

The Institute of Energy and Sustainable Development can offer businesses:

- Innovative environmental design concepts for buildings and low energy systems
- Advice on building-integrated low and zero-carbon technologies
- Analysis of building performance through simulation and monitoring
- Advanced daylighting assessment of innovative and light sensitive facilities
- Detailed fluid dynamic analysis of air flows within and around buildings
- Building occupancy surveys, and occupant interaction with tech
- Climate and sustainability policy development
- Smart grids and community energy/carbon flow analysis
- Innovative public engagement, how we move to a low carbon society
- Visualising energy
- Training and education

Clients

The IESD works on building design with teams of designers, engineers, social scientists and building physicists. Clients include international architects such as McCormack, Jameson, Van Heyningen and Howard. The IESD also works with clients and partners in other areas, such as utilities (E.ON, British Gas, EDF), other industries (Airbus, Toyota), and national and local government departments.

Buildings to have benefited include:

- Australia Stadium, the focal point of the Sydney Olympics
- Lanchester Library, Coventry University
- School of Slavonic and East European Studies, University College London
- Harm A. Weber Library, Judson College, near Chicago (Illinois)
- Navigation Primary School, Altrincham, Cheshire
- Low-energy demonstration building, Hangzhou (China)
- New York Times Building (USA)
- The Hermitage, St Petersburg (Russia)

Strategic environmental and policy advice has been given to:

- City Mayor of Leicester
- Nottingham and Derbyshire Local Authorities Energy Partnership
- UK Local Government Association
- UK Delegation to the Committee of the Regions
- United Nations Framework Convention on Climate Change (UNFCCC)
- Department of Health
- Department for Education
- Office of Science and Innovation.

We have European experts advising on energy efficiency in Eastern Europe and China and on sustainable development in the USA and Canada. We also work with networks such as the Energy Cities network of European energy and environmentally conscious cities and with the International Council for Local Environmental Initiatives.

Research Grants and Projects

The IESD has been very successful in winning research grants/contracts from the Engineering and Physical Sciences Research Council (EPSRC), Economic and Social Research Council (ESRC), European Union (EU), and the Technology Strategy Board working with industrial partners. Current annual turnover exceeds £1.8 million, with a research portfolio worth close to £5 million. Recent examples include:

- Wi-be: Reduction of Energy Demand in Buildings through Use of Wireless Behaviour Information
- CASCADE: agent-based modelling of the complexity arising in smart grids
- THERM: modelling energy and material flows in factory buildings and manufacturing systems, for improved efficiency
- 4M: Investigating the carbon footprint of Leicester, including emissions from buildings, vehicles and urban biological processes.
- CREW: Community Resilience to Extreme Weather Events, such as heat waves, and implications for building design
- A novel heat pump assisted solar façade water heating system, EU
- Building retrofit projects with UK housing associations, and EU funded R&D.



Public Engagement

We undertake innovative public engagement work focusing on the science and engineering of moving to a low carbon society. This includes the design and operation of low energy buildings, visualising energy consumption in buildings and engaging with the public at festivals.

Our work with Arup won the 2011 Management Consultancies Association Environment Award for carbon footprinting of the university. The project also won the inaugural The Times Award for Best Consultant/Client Team, in recognition of the excellent cooperation.

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