

IESD

Institute of Energy and Sustainable Development

Climate change, and the impact it will have on our lives, is one of the greatest problems facing mankind. The UK is at the forefront of global efforts to reduce the emission of greenhouse gases, and strategies for adapting to the global warming that will inevitably occur are being developed. The Institute of Energy and Sustainable Development (IESD) plays an important role in this by working to reduce energy consumption in buildings; to develop and apply renewable energy systems; to understand the social, economic and technical implications of climate change; and to educate current and future generations of the need to develop more sustainably.

The IESD's research work is conducted by a team of professors, readers, lecturers and research fellows – supported by higher degree students – who are internationally respected for the quality of their work. Their disciplines range from mathematics and physics, through engineering, to economics, sociology and psychology. This diverse range of skills enables staff to lead multi-disciplinary, multi-university projects and address inter-linked environmental, economic and social research problems.

Their expertise enables IESD staff to:

- Provide strategic advice to central government departments and to regional and local policy makers and planners
- Act as environmental design consultants to architects and engineers working on architecturally significant and award-winning buildings both in the UK and overseas
- Offer advice to numerous small businesses and local authorities who are seeking to adopt more sustainable business practices.

The IESD provides a high quality environment for doctoral study and its Masters programmes cater for a wide range of graduates and professionals wishing to increase their knowledge of environmental issues in an interdisciplinary context or to work more effectively as building design professionals.

Institute of Energy and Sustainable Development

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Consultancy Services

- Building integrated low and zero-carbon technologies
- Low energy buildings, concept design and control strategies
- Urban energy management and measurement
- People and climate change, training and policies
- Simulation of energy, lighting and airflow
- Building performance monitoring

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Consultancy Services



The Institute of Energy and Sustainable Development (IESD) employs staff with internationally recognised expertise in their field. They work individually or as part of a team on consultancy projects lasting from a few hours to a few years. Work is conducted through the University's commercial partnerships section, De Montfort Expertise Ltd, and is covered by extensive professional indemnity insurance.

Some of our services

- Innovative energy and environmental design concepts for buildings
- Simulation of energy, lighting and air flow in buildings
- Carbon emissions predictions
- School design, including BB101 compliance testing
- Energy and environment monitoring
- Building occupancy surveys – health and comfort
- Urban energy and environment strategies
- Social attitudes and awareness surveys
- Evaluation of policies, programmes, projects and resource allocation
- Training and education

Computational fluid dynamics

Computational fluid dynamics (CFD) enables detailed air flows and internal air temperature distributions to be predicted. The Institute is most frequently called on to analyse natural ventilation strategies.

Thermal modelling and comfort

Leading edge analysis and design work, supported by dynamic thermal simulation modelling, enables the time-varying internal temperatures, bulk air flows and energy consumption of buildings under any set of climatic and occupancy conditions to be predicted. It is possible to simulate entire buildings or individual spaces within a building. The technique is often used for carbon emissions predictions and building regulations compliance work.

Building design and analysis

Building performance consultancy services focus on the design of buildings that are environmentally-conscious and which have low energy consumption by harnessing natural renewable resources.

Strategic planning and early concept design advice is provided, for example, to support project funding bids and design competition entries. Detailed analysis supports the realisation of concepts and electrical and mechanical services design.

Daylighting simulation

The IESD has pioneered the development and application of climate-based simulation to evaluate daylight and solar penetration in buildings. In contrast to the traditional methods that rely on idealised sky conditions, the new approach offers a realistic quantification of the levels of daylight provision and the effectiveness of solar control. The technique can be applied at any scale to evaluate the design of a window reveal, the effectiveness of daylighting strategies or the solar access for an urban masterplan.

Urban environmental strategies

Energy and environmental policy expertise includes developing energy efficiency in housing policy and identifying opportunities for local authorities to implement effective energy and CO₂ reduction policies.

Policy analysis and development

Expertise in UK and international policies on climate change and energy, coupled with small-scale project experience, can be applied to develop initiatives and actions that assist the transition to a low carbon future.

Monitoring

Building and environmental monitoring is undertaken to investigate energy demands, indoor air quality, thermal comfort and lighting levels. Studies have led to reduced energy demands and improved work-space comfort.

Clients

From domestic energy systems to detailed design of large commercial buildings, the IESD is able to provide expert advice or to co-ordinate teams of planners, architects, energy experts, social scientists and building physicists. Clients include international architects such as McCormack, Jameson, Pritchard, Short and Associates, Van Heyningen and Howard.

Buildings to have benefited include:

- Australia Stadium – the focal point of the Sydney Olympics
- John Ruskin Museum and Archive, Lancaster
- Lanchester Library, Coventry University
- Lichfield Garrick Theatre, Lichfield (winner: CIBSE Project of the Year Award 2004)
- School of Slavonic East European Studies, University College London (winner: CIBSE Environmental Initiative of the Year Award 2006)
- Harm A Weber Library, Judson College, near Chicago, Illinois
- Braunstone Health and Social Care Centre, Leicester
- 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:

- Leicester City Council
- 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 (DOH)
- Office of Science and Innovation.

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