Buildings & Energy

Research outputs from EPSRC'S Sustainable Urban Environments (SUE) programme

The ISSUES Project

Energy Demand Assessment

Potential users/Target audience: Building managers; Estates departments; Architects, building service engineers and other built environment professionals

B-space (Building Specific Pre-refurbishment Assessment of Comfort and Energy) is an energy demand assessment tool for multi-storey office buildings that takes into account occupier comfort. Developed by IDCOP, it is designed for use by non-specialists and enables calculation of a building's carbon footprint which can be related to a building asset portfolio. Data is entered in a standard online form format. The tool is aimed at asset managers across all sectors.

website	http://www.idcop.soton.ac.uk/index2.html
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk

IDCOP

Building Performance Assessment

Potential users/Target audience: Local Authorities; Housing Associations; Architects, building service engineers and other built environment professionals

The IDCOP consortium has developed a suite of building performance rating and decision-making tools aimed at building professionals. The toolkit comprises: a façade rating system; a decision-making model using an Analytic Hierarchy Process (AHP) approach; a knowledgebase and key performance indicators for the study of building façades; and a Multi-Criteria Decision Making (MCDM) tool for sustainable maintenance in social housing.

website	http://www.idcop.soton.ac.uk/index2.html
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk

IDCOP

Domestic Energy Consumption

Potential users/Target audience: Policy makers (domestic energy consumption); Building energy modellers

The CityForm consortium's energy group developed a new methodology for determining indicators of domestic energy consumption using annual energy consumption data obtained for individual households. The results provide evidence that several factors that are indicative of known changes in the ways occupants are using their homes (number of bedrooms, occupants working from home, and ownership of technology) have become significant indicators of differences in energy consumption. The evidence has been submitted to the UK Government's Foresight study.

website	

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contact	Dr. Keith Baker at keith.baker@sistech.co.uk
	CITYFORM

Environmental Technologies for Social Housing

Potential users/Target audience: Local Authorities; Housing Associations; Policy makers (public sector housing); Other housing professionals

The IDCOP consortium investigated the barriers to integrating innovative environmental technologies in sustainable refurbishments for social housing projects. Value for money was found to be a major governing factor in selecting environmental systems and components. They also found that confidence levels in new products and processes are generally low and misconceptions regarding durability and performance of these new technologies are commonly prevalent among housing professionals.

website	http://www.idcop.soton.ac.uk/index2.html
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk
	IDCOP

Effectiveness of Environmental Controls

Potential users/Target audience: Building energy modellers; Architects, building service engineers and other built environment professionals

The IDCOP consortium investigated the effectiveness of environmental control facilities and found that they are often not correctly applied, or more usually, incorrectly used due to their complexity or unintuitive mode of operation. The research which included extensive monitoring of environmental comfort parameters in office environments has provided robust evidence that occupant behaviour and expectation should be treated as critical issues. A prototype personalised agent software system has been developed which allows users of open plan offices to negotiate on the environmental building conditions in order to provide more 'intelligent' building control.

website	http://www.idcop.soton.ac.uk/index2.html
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk
	IDCOP

Investigation of Light Directing Holographic Optical Elements (HOE)

Potential users/Target audience: Architects, building service engineers and other built environment professionals; Lighting industry professionals; Organisations such as the National Physical Laboratory (NPL)

The IDCOP consortium has installed a test facility for building integrated HOEs in front of a facade at the University of Southampton. HOEs are light guiding elements consisting of a holographic film laminated between two sheets of glass. The primary application of HOEs as a building product is for enhanced daylighting by redirecting natural light onto the ceiling of an internal space. This natural light should enhance comfort for users and reduce artificial lighting requirements. This in turn reduces the air-conditioning loads associated with the heat gains that artificial lighting produces. The theoretical function and potential benefits of HOEs have been known for many years. However, to date no extensive data on factual HOE performance has been published. Data monitoring of the HOE test façade showed a good light directing performance of the HOEs. However, some issues with glare on the HOE glazing were also observed.

website	http://www.idcop.soton.ac.uk/index2.html
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk

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	IDCOP

Accessibility of Public Toilets

Potential users/Target audience: Toilet manufacturers; All providers of public toilets; Local Authorities; Disabled and Parental advocacy / lobby groups

Vivacity2020 consortium has conducted extensive research on best practice in designing public toilets, including issues such as disabled access and provision of facilities such as baby changing tables. The result of the research, the Accessible Toilet Design Guide, is now in use by Toto (a major Japanese toilet manufacturer), Tesco, the Olympic Delivery Authority, the British Standards Institute, and the Department for Communities and Local Government.
Along with the Accessible Toilet Design Guide, a number of tools concerning the accessibility of public toilets have been published on the VivaCity2020 website. These tools include: an Inclusive Toilet Hierarchy; a Toilet Audit Tool; Toilet Case Studies; Toilet Design Templates; Toilet User Personas; and Toilet User Surveys.

website	See 'Toilet Paper' newsletters, publications and numerous tools at: http://www.vivacity2020.eu
contact	Prof. Julienne Hanson at j.hanson@ucl.ac.uk, Joanne Leach at joanne@joanneleach.co.uk
	VivaCity2020

Climate Change Weather File Generation

Potential users/Target audience: Architects, building service engineers and other built environment professionals

A tool for generating hourly climate change weather data in standard weather file formats has been developed within the framework of IDCOP. This tool which is available for public download uses the 2002 climate change scenario predictions provided by the UK Climate Impacts Programme (UKCIP) and is listed as 'UKCIP02 extra' on the UKCIP website. The underlying weather file transformation routines of the tool are based on the so-called 'morphing' methodology for climate change transformation of present day weather files. The tool has been used within IDCOP to generate weather data for assessing different building refurbishment solutions in their robustness for a future climate by means of building performance simulation.

website	http://www.idcop.soton.ac.uk/index2.html http://www.energy.soton.ac.uk/ccweathergen
contact	Prof. AbuBakr Bahaj at A.S.Bahaj@soton.ac.uk
	IDCOP

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