# *Energy Efficiency in Historic Buildings Conference,*

***Presented by the Department of the Environment, Heritage and Local Government & the Irish Georgian Society***

**Tuesday 10th March 2009**

**Conference Centre, Dublin Castle**

# Speaker & Chair Profiles & Abstracts

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government

Irish Georgian Society

**Paul Arnold, Paul Arnold Architects**

**Biography: Paul Arnold, B.Arch, FRIAI, RIBA.** Having studied architecture at UCD and conservation in Leuven in Belgium Paul Arnold has been practicing as an architect in Dublin for twenty-four years. Ecclesiastical projects such as St Catherine's Church, and the Star of the Sea in Sandymount have advanced alongside interventions in Leinster House and Dublin City Hall, for which the Royal Institute of the Architects of Ireland awarded its Conservation Medal, while the Ha'penny Bridge and 10 Henrietta Street were recipients of Europa Nostra recognition. All the projects have been based on a philosophy of prudent intervention and morphophylactic enhancement. Paul Arnold is Chair of the Conservation Accreditation Committee Examination Board of the RIAI and Course Director of the Masters in Urban and Building Conservation in UCD.

**Abstract:** ***Improving Thermal Efficiency: advice for owners of traditional buildings***. Traditional buildings have thermal performance characteristics arising from their design and construction which, if properly understood, can be employed to advantage. Failure to appreciate how buildings and materials behave can result in inappropriate application of technologies developed for modern construction. Issues of use and realistic expectation must also be addressed.

**Dr Paul Baker, School of the Built & Natural Environment, Glasgow Caledonian University, Glasgow**

**Biography: Dr Paul Baker** has 25 years experience in Building Science research, including air infiltration measurement and ventilation issues, passive solar energy use and moisture related problems in buildings. He has been involved in researching novel concepts such as building integrated photovoltaics, dynamic insulation and air supply windows. He has been a task leader in IEA and EU projects involved with the assessment, measurement and analysis of the performance of building envelopes and components. He has applied this experience to the measurement of the *in situ* thermal performance of walls in traditional buildings and his current study of traditional windows for Historic Scotland and English Heritage. Paul has recently been involved in UK research council funded projects examining the impact of climate change on historic buildings and innovative moisture measurement techniques for masonry.

**Abstract:** ***The thermal performance of traditional windows and measures to reduce heat loss and air leakage.*** Elements of traditional buildings, such as single glazed timber-frame windows, may with care and maintenance last for over 100 years. Whilst the heat loss through old windows is much higher than modern glazing systems, the old timber window may be a more sustainable element in the long term. The work outlined below aims to quantify the effectiveness of relatively simple measures to improve the thermal performance of traditional windows by draught-proofing and using blinds, curtains, shutters and secondary glazing. Two typical traditional sash and casement windows were selected and mounted in a partition wall between the two independently controlled rooms of an environmental chamber. Under a 20$^{o}$C temperature gradient, the heat flow through the glazing was measured with and without the various improvement options, enabling any reduction in heat loss to be quantified. The air-tightness of the test windows was also measured before and after

draught-proofing. Overall, the results indicate that significant reductions in heat loss can be achieved using simple methods whilst retaining the original window.

**Bob Barnham, Changeworks**

**Biography: Bob Barnham** trained as an architect and has worked in the public private and volunatry sectors. Ran technical aid centres in Liverpool and Dundee, including setting up the first community-based energy efficiency projecs in Scotland. Direcotr of Energy Action Scotland for 3 years responsible for the overall activity of the organisation. Barnham has worked for Changeworks for 18 years, as part of the Sustainable Futures Team delivering aspects of energy efficiency improvemetns and energy reductions.

**Abstract:** ***Energy Heritage: Energy Efficiency in Traditional and Historic Homes: a Case Study of Lauriston Place, Edinburgh.*** Changeworks' Energy Heritage project married building conservation and energy saving technologies, to show how listed homes could be made more energy efficient while retaining their historic appearance and character. The project involved extensive research and negotiations, a pilot study, and the production and distribution of a best practice guide to inform future heritage projects across the UK

**Dr Nigel Blades, National Trust for England, Northern Ireland & Wales**

**Biography: Dr Nigel Blades** is Preventive Conservation Adviser (Environment) for the National Trust for England, Wales and Northern Ireland. His main role is to advise on environmental control solutions and preventive conservation for the care of collections in the Trust's historic properties. Before joining the Trust in 2008 Dr Blades was Lecturer at the UCL Centre for Sustainable Heritage, where he was joint course director for the MSc Sustainable Heritage and undertook research into preventive conservation. He was Coordinator of the EC 5th Framework Project IMPACT (Innovative Modelling of Museum Pollution and Conservation Thresholds, 2000-04) and has participated in a wide range of European and UK national research projects.

Before joining academia Dr Blades worked for the Victoria & Albert Museum and in the brewing and chemical industries. He has a PhD in Archaeological Science and a BSc in Industrial and Natural Resource Chemistry.

**Abstract:** ***The National Trust Approach to Energy Efficiency in Historic Buildings.*** The National Trust for England, Wales and Northern Ireland has a long and distinguished history as a conservation organisation. It approaches the conservation of buildings and collections with respect to the wider context of environment; consequently adaptation and mitigation of climate change are high on The Trust's agenda. In fulfilment of this agenda the Trust has set itself the target of reducing year on year the carbon emissions and energy consumption of its historic buildings. This paper will outline the Trust's energy policy and give case studies of how that policy is being implemented in terms of efficiency measures and the switch to low-carbon energy sources. It will also address some of the difficulties encountered in implementing these solutions in historic buildings that house fragile collections and fittings displayed to the public in an authentic manner.

**Edith Blennerhassett, Buro Happold Dublin**

**Biography:** Edith Blennerhassett BE MUBC CEng MCIBSE MIEI. Edith graduated as a civil engineer from UCD in 1985 and went to work with the well known building services practice, Max Fordham and Partners, in London. Whilst at Max Fordham, Edith developed a strong interest in sustainable and low energy design. Edith found that by studying historic / indigenous buildings it was possible to find solutions to some of the questions raised in modern buildings relating to limiting summer time overheating, providing good daylight and good air quality. Thus from an interest in sustainability came a love of historic buildings. In 2000, Edith moved to Buro Happold in Dublin where she has been working on a series of sustainable and historic buildings. In 2008 Edith graduated from the MUBC course in UCD where her thesis looked at the evolution of building services in buildings in particular looking at glasshouse and garden buildings where environmental factors were key drivers. Edith regularly lectures on the integration of building services into historic buildings as part of UCD, RIAI and SCS courses. Edith also lectures regularly on sustainable and low energy design.

**Abstract:** ***Building Services Implications - Lean, Mean, Green.*** There are a number of key issues in building services design which can influence the energy efficiency of an historic building. These are as follows: Major plant items (LEAN); Minor plant items (LEAN); Zoning (MEAN); Controls strategies (MEAN). By choosing modern efficient plant immediate savings can be realised. Coupling modern plant to choice of pumps or fans including the use of variable speed drives can further increase efficiencies. Zoning is key to the successful control of energy use in any building. Zoning by orientation, use and occupancy can lead to significant savings. Controls are critical. Systems must be able to respond to changing temperatures, use and occupancies be it summer/winter, day/night, occupied/unoccupied. Lighting is a key energy user in historic buildings and tends to feature the use of high energy, high heat output lamps which fit to existing chandeliers/luminaires. The recent revolution in LED (light emitting diode) technology gives a viable, attractive, long life, low energy alternative to old GLS type lamps. Going a step further (GREEN) renewables can be considered. Sometimes our historic buildings have extensive grounds and roof scapes which can allow for the integration of efficient and green technologies such as heat pumps, biomass boilers, solar thermal and PV (photovoltaic) installations without a detrimental impact on visual amenity or space.

**Donough Cahill, Irish Georgian Society**

**Biography: Donough Cahill** is Executive Director of the Irish Georgian Society having worked with the Society since 2001. During this time he has worked as planning officer and advocate for buildings at risk; organised seminars on fire safety in historic buildings and on the promotion of heritage led regeneration of Georgian Limerick. He was also co-partner in the Council of Europe funded European Country House Project (ECHo). He is a graduate of Archaeology and Geography from UCD and has completed post-graduate studies in UCC and in TCD. Donough is a regular contributor *to Ireland's Antiques and Period Properties* and has also written for the *Irish Arts Review*. Donough is a 2006 Attingham Trust Scholar.

**Marion Cashman, Irish Georgian Society**

**Biography: Marion Cashman** BArch, MRIAI ARCUK, conservation architect has worked in England and Ireland on conservation and new build projects. A member of the Board of the Irish Georgian Foundation and committee member of the Irish Georgian Society who coordinated the production of the Society's 50th anniversary publication *The Georgian Society A Celebration* by Robert O Byrne.

**Martin Colreavy**, **Department of Environment, Heritage and Local Government**

**Biography:** Martin Colreavy**,** Dip Arch BArch Sc MSc Urban Design MRIAI is Chief Architect in Department of Environment, Heritage and Local Government. Previous extensive experience as a senior Architect in the private sector, working both in Ireland and Germany, he has been involved in many major award winning developments in the last 15 years. Martin completed a post graduate Masters Degree in Urban Design from UCD in 2003 and is Chief Architect in DEHLG with responsibility for Heritage, Architectural Policy and Urban Design. Martin has been responsible for the new Government Policy Documents on *Urban Design* and currently the proposed Government Policy on Architecture and the built Environment 2009-2015. He is currently RIAI Honorary Treasurer 2008-2009 and Chair RIAI Urban Design Education Committee.

**Abstract:** ***Towards a Sustainable Future: Energy Efficiency and the wider Context***. The DEHLG through its various mechanisms of policy, legislation and guidance focuses its aims and objectives on the promotion of Quality in the built environment. Recent guidance documents have focused on the process surrounding the delivery of quality urbanism and sustainable communities and the promotion of better place-making through the delivery of exemplary practice in Architecture and an improved existing public realm.

In the context of the above and the various policy initiatives over the last 18 months, the importance of a joined-up approach to the delivery of our built environment is paramount. This presentation places an overall context on DEHLG's approach to quality within the built environment going forward, addressing areas such as Climate change, Government Policy on Architecture and Heritage, and the role of Urban Design as a mechanism for the integrated delivery of a Sustainable Built Environment.

**Jacqui Donnelly, Architectural Heritage Advisory Unit, Department of Environment, Heritage and Local Government**

**Biography: Jacqui Donnelly,** BArch, MA (Conservation Studies), MRIAI is a Conservation Architect with the Architectural Heritage Advisory Unit of the Department of Environment, Heritage and Local Government. Graduate of the School of Architecture, UCD and the Institute of Advanced Architectural Studies, University of York. Worked in private practice in Ireland and England on a number of conservation and new-build projects before joining Dúchas the Heritage Service in 2000. Co-author of the Architectural Heritage Protection Guidelines for Planning Authorities published in 2004 by the Department of the Environment, Heritage and Local Government.

Series editor of the Advice Series for owners of historic buildings. Appointed to the Building Regulations Advisory Body in May 2008.

**Emmeline Henderson, Irish Georgian Society**

**Biography: Emmeline Henderson,** MA, MUBC, Dip. Arch. Rec., is the Conservation Research Manager and Assistant Director of the Irish Georgian Society. Emmeline has responsibility for promoting the Society's Conservation Outreach Programme, which includes the Society's annual Traditional Building and Conservation Skills in Action Exhibition and accompanying on-line database, *Traditional Building and Conservation Skills Register of Practitioners*. Other conservation outreach work includes organising seminars, such as the recent IGS & ESB *Good Housekeeping in Historic Houses*, 2008. Emmeline is the Irish Georgian Society's representative on the CIF Heritage Contractors Accreditation Board. Prior to joining the Irish Georgian Society she worked with the Dublin Civic Trust. Emmeline is a 2007 Attingham Trust Scholar, a 2003 US/ICOMOS Summer Intern, and a member of ICOMOS Ireland.

**Brian Lucas, Heritage Policy and Architectural Protection Section, Department of Environment, Heritage and Local Government**

**Biography**
Brian Lucas is the Principal Officer in the Heritage Policy and Architectural Protection Section of the Department of the Environment, Heritage and Local Government. During his civil service career he has also worked in a number of other Government Departments and also had a period of secondment with the European Commission in Brussels.

**Niall McCullough, McCullough Mulvin Architects.**

**Biography:** Niall McCullough studied architecture at UCD and in Italy and co-founded McCullough Mulvin Architects in the late 1980's, working to combine writing and research with architectural practice exploring the innovative re-use of existing buildings in Ireland. McCullough Mulvin Architects have won several awards for their work, which has been widely exhibited and published in Ireland and abroad. McCullough is the author of *Palimpsest; Change in the Irish Building Tradition* and *Dublin: An Urban History*.

**Abstract:** ***The Art of Change: a commentary on inclusive approaches to modern architecture and sustainability in old buildings***. The paper deals with methods of making choices regarding intervention and change in existing buildings that reflect inclusive approaches to sustainability- linking a cultural and historical framework with practical issues of materiality and energy management to make appropriate architecture. Specific case studies will be used as examples of the design process.

**Dr Freddie O'Dwyer, Senior Architect, Architectural Heritage Advisory Unit, DoEHLG**

**Biography: Dr Freddie O'Dwyer** is a conservation architect and an architectural historian. He joined the Office of Public Works in 1981 and has been working as a planning architect in the public service since 1989, working also in recent years on policy, legislation and guidelines. He is currently a senior architect in the Architectural Heritage Advisory Unit of Department of the Environment, Heritage and Local Government. His writings on Irish architectural history and heritage include three books and contributions to the Oxford Dictionary of National Biography (2004) and the forthcoming Royal Irish Academy Dictionary of Irish Biography. He is a former chairman of the RIAI Historic Buildings Committee and a current member of the Historic Buildings Council of Northern Ireland.

**Kevin O'Rourke, Sustainable Energy Ireland**

**Biography: Kevin O'Rourke** is Head of Built Environment at Sustainable Energy Ireland (SEI), covering programmes for building energy research, development and demonstration; information, support and promotion to the market; and policy advice to government. These programmes include Building Energy Rating, the Warmer Homes Scheme, Low Carbon Homes and the Public Sector programme. Most of his career has been in the fields of energy efficiency, renewable energy and environmental protection. He has previously worked in different government bodies, industry, academic research and the European Commission, and is a past chairman of the Energy – Environment Division of Engineers Ireland.

**Abstract:** ***Energy Performance Upgrading of Historic Buildings: need, scope, tools, options***. This presentation will outline the energy and carbon profile of the Irish domestic and non-domestic building stock, the typical energy balance for differing building types, and the challenges and priorities in upgrading older buildings in particular – both in thermal and electrical energy applications. Early indicative data from the national Building Energy Rating system will be outlined, as will tools and techniques for energy surveying, auditing and assessment of existing buildings. Emphasis will be paid to the need to address the building as a system, to ensure a balanced and integrated, realistic and ultimately sustainable approach to upgrading older buildings in particular. It will finally point to possible new opportunities for design, supplier and trades communities to create and deliver specific appropriate solutions.

**Peter Smith, Technical Advisor with Ecological Building Systems**

**Biography: Peter Smith** worked for a number of years as a Project Manager on both new build and restoration projects. Where possible, he has always tried to encourage the use of sustainable materials which combine to minimise condensation risk and mould growth, in order to maximize energy efficiency and health benefits. The restoration of Ardbraccan House, Navan, and the construction of the log golf clubhouse at Luttrellstown Castle, Clonsilla are two projects on which Peter worked. He now works full time as a Technical Advisor for Ecological Building Systems. He conducts CPD's for Architectural practices on 'Air Tightness and moisture management' and the use of 'Intelligent Membranes' and Natural Insulation, in

relation to the new Part L of the building regulations, as well as making site calls and conducting training courses on 'airtightness' in Athboy.

**Abstract:** ***The use of Appropriate Materials in Maximising Energy Efficiency and Moisture Control in Historic Buildings***. This paper deals with the theme of the use of appropriate materials in maximising energy efficiency and moisture control in historic buildings from a building contractor's perspective. It will examine the following: breathable and natural insulations; draught proofing; intelligent moisture management; and dealing with damp internal walls.

**Martin Vaughan,** Assistant Principal Officer, Building Standards Section, DoEHLG

**Biography: Martin Vaughan** is an Assistant Principal in the Building Standards Section of the Department of the Environment, Heritage and Local Government. The section aims to promote and ensure a strong and evolving building code in support of quality construction and sustainable development. Specific responsibilities include the ongoing review of both the Building Regulations Part L (Conservation of Fuel and Energy) and the Building Energy Rating system and the elaboration of future policy in relation to the energy efficiency of new buildings.

**Abstract:** ***The Building Regulations, Part L and Building Energy Ratings***. The presentation will overview the salient features and core principles of the building regulations. It will look at how international, EU and Domestic policy in the climate change and energy domains has impacted on Ireland's building code to date. The current requirements under the Building Regulations Part L (Conservation of Fuel and Energy) will be outlined together with proposed upgrades in 2010 and 2013. A brief overview of the Building Energy Rating system will be given with a look to the new requirements in the proposed recast Energy Performance of Buildings Directive.

**Dr Gary White, The Crichton, Carbon Centre**

**Biography: Dr Gary White**, PhD BSc MRM is a widely experienced environmental professional working across a broad rage of industries, including sustainable building design and construction, renewable energy technology and low carbon management for business.

The majority of the previous 15 years have been employed in the oil and gas sector with a specialism in environmental management, risk and compliance management in both the UK offshore and onshore sector, and numerous international assignments.

His current position as Director for Business and Innovation at the Carbon Crichton Centre involves developing strategic decision making for businesses to mitigate against the likely impacts of climate change, lecturing on renewable technologies for the building and construction sector, developing systems for implementing carbon management and carbon and energy assessment advice to SMEs.

**Abstract:** ***Embodied Energy Life Cycle Assessment of Replacement Options for Traditional Buildings***. This presentation details research by the Crichton Carbon

Centre which involved a comparative assessment of a range of building refurbishment and replacement options for a traditional building located in the Scottish Borders on behalf of Historic Scotland.
Our analysis of the five building option case studies showed that operational energy represents the largest part of the energy demand in a building over its lifecycle. However the results also showed that as the energy efficiency of the building improves, for example from a poorly insulated to a highly insulated building, the total embodied energy required for construction, maintenance and refurbishment becomes a greater percentage of the total embodied energy over the life of the building. These preliminary results suggest that replacing energy efficient traditional buildings is not cost effective over the full lifecycle of the building.