

# BUILT ENVIRONMENT RESEARCH INSTITUTE

ANNUAL REPORT

1 AUGUST 2014 - 31 JULY 2015



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# 1. Foreword: Research Institute Director Professor Stanley McGreal

Publication of the UK's Research Excellence Framework (REF) results in December 2014 placed Built Environment research at Ulster University amongst the leading universities in the country. Overall 97% of research activities were internationally recognised. Significantly 25% of our research achieved the top grade of 4\*, quality that is world-leading in terms of originality, significance and rigour. Furthermore 47% is rated at 3\*, research that is internationally excellent in terms of originality, significance and rigour with 25% at 2\*, research that is recognised internationally. Central to this performance is our research impact and research environment both of which are 100% rated as world-leading and internationally excellent reflecting the strategic significance and application of research in the Built Environment at Ulster, its relevance to economic and social development, the extensive portfolio of research grants obtained from prestigious funding bodies and a vibrant PhD programme. Coupled with many world-leading and internationally excellent outputs, the REF results confirm the global reputation of Built Environment research at Ulster reflecting a dynamic staff of some 60 academics, supported by 28 full time contract researchers and over 80 PhD students across the Built Environment disciplines.

Within the period covered by this annual report, a new research centre within BERI, SABER (Studies Allied to Built Environment Research) was formed to recognise the growing emphasis at Ulster University on research in construction and civil engineering. In particular SABER is actively developing research networks in areas including concrete, highways and hydraulics. Over the year, research funding was secured from Highways England, the National Roads Authority of Ireland and the Royal Society. SABER members have presented research papers at international conferences and been involved in organising national and internal

conferences. The 6<sup>th</sup> International Conference on Bituminous Mixtures and Pavements held in Greece was jointly organised by the University of Thessaloniki, University of Mississippi and Ulster University.

Highlights of the research in Fire Safety Engineering Research and Technology Centre (FireSERT) include the analysis of heat flux and temperature impact on vertical steel members, flammability and fire resistance of materials, new engineering models for the performance of intumescent coatings, the development of standards and design guides at a European level for localised fire in large compartment, new calculation methods regarding the thermal behaviour of structural elements subjected to localised fire – a key issue for the fire engineering of modern steel buildings. Research activities regarding blast resistance has led to the establishment of the spinout company Vifkon Ltd. A memorandum of understanding was signed between FireSERT and Coimbra University (Civil Engineering & Fire) in Portugal to explore and assist in developing mechanisms that will serve to encourage and enhance cooperative work between the institutions in areas of mutual interest in the domain of fire safety engineering.

In 2014-2015 the Hydrogen Safety Engineering and Research Centre (HySAFER) continued to provide high quality hydrogen safety research and education. The international team of researchers at HySAFER successfully finished a Fuel Cell and Hydrogen Joint Undertaking (FCH JU) project “Pre-normative research on safe indoor use of fuel cells and hydrogen systems”, which is impacting on the hydrogen industry through European Guidelines on Fuel Cell Indoor Installation and Use with recommendations for relevant regulations, codes and standards ([www.hyindoor.eu](http://www.hyindoor.eu)). The Fourth European Technical School on Hydrogen and Fuel Cells



(TS2015) was organized by HySAFER coordinating this activity within FP7 capacities project “Integrating European infrastructure to support science and development of H2FC technologies” ([www.h2fc.eu](http://www.h2fc.eu)) attracting 94 participants (from about 30 countries worldwide). HYSAFER has also been involved with two other key European projects related to hydrogen safety: European hydrogen emergency response training programme for first responders ([www.hyresponse.eu](http://www.hyresponse.eu)), and Support to Safety Analysis of Hydrogen and Fuel Cell technologies (<https://iaikit-sp2.iai.kit.edu/susana>).

At a national level, Ulster champions hydrogen safety research and education in the UK through EPSRC project: SUPERGEN Hydrogen and Fuel Cells Hub ([www.h2fcsupergen.com](http://www.h2fcsupergen.com)), in conjunction with partners the Centre for Doctoral Training in Fuel Cells and their Fuels, and SUPERGEN Challenge.

The Centre for Sustainable Technologies (CST) concluded its academic year with the closing conference of the £2.9M Interreg IVA SPIRE project (Storage Platform for the Integration of Renewable Energy) at the 21<sup>st</sup> ICE/IEEE International Technology Management Conference in Belfast. With over 170 delegates drawn from countries across the world, presentations were delivered from project partners, Ulster University (compressed air energy storage, demand side management and electricity market modelling) and Dundalk Institute of Technology (renewable energy integration, wind resource assessment) and by local businesses (Gaelectric – compressed air energy storage, Glen Dimplex – demand side response technology, Arbarr – battery storage for renewable energy) and from relevant sister projects (EPSRC i-STUTE and FP7 COMTES) focusing on heat pump development and energy storage and seasonal thermal energy storage respectively.

Over the year CST has made concerted efforts to shape the EU research agenda in energy storage and demand side response through co-hosting a Sustainable Energy Week event (15-19 June 2015) in Brussels. The event sponsored by Glen Dimplex and supported by Invest Northern Ireland, entitled “Contributing to a resilient Energy Union: Paving the way for a successful new European Energy R&I Approach through an Integrated Energy Storage and Smart Grid Strategy” was hosted at the Office of the Northern Ireland Executive in Brussels. Attracting over 60 delegates, the Director for Renewables, Research and Innovation, and Energy

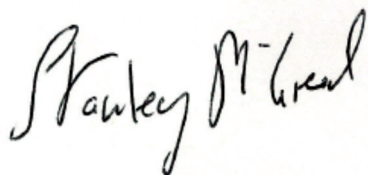
Efficiency at DG Energy delivered a highly motivational keynote speech. Challenges and solutions were raised by organisations and companies such as Glen Dimplex (Ireland), Vito (Belgium), RSE (Italy), Smart Grid Ireland & GE Energy (Ireland) and TECHNOFI (France). CST also hosted a meeting of TUD COST Action TU1205 “Building Integration of Solar Thermal Systems (BISTS)” where partners of the project visited the Jordanstown campus of the University for a 2-day event, sharing design and operating experiences for solar thermal energy integration.

In the Centre for Research on Property and Planning (RPP), activities have focused upon the successful delivery of European FP7 funded projects. In March 2015, Ulster hosted the end event of the FP7 urban security project, BESECURE, showcasing the innovative research and development achieved by the project and illustrating good practice in urban security interventions from across Europe. Approximately 120 delegates from 8 countries attended and debated the need for a more joined up approach to tackling the complex issues of urban crime and its causality. In contrast, COBACORE has focused on improving collaboration between stakeholders and more effectively harnessing resources and skills of affected communities in the event of a disaster. In the HARMONISE project, Ulster researchers have developed an innovative content recommendation system for helping urban resilience practitioners. The HARMONISE platform will allow policy makers to learn from each other in an intuitive and automated way to improve best practice dissemination and underpin resilience policy making. The INTACT project has hosted a number of case study workshops and synergy meetings with other FP7 projects throughout the year. New projects include INSPEC2T, a cross-faculty research collaboration between the Built Environment Research Institute and Institute for Research in Social Sciences contributed to the highest ranked Horizon2020 proposal within the Secure Societies Programme call in 2014. The project centres on the development of a sustainable framework for community policing with special emphasis to be placed on the use of social media.

Reflecting RPP’s strong international connections, the Centre hosted the European Real Estate Society’s Industry seminar in October 2014 in the Titanic conference centre, Belfast. On the specific theme of “Recapitalisation of the European real estate market

and lessons from Ireland”, the conference attracted delegates from across 11 countries and speakers both locally and internationally with presentations spanning the US sub-prime crisis, through to the establishment of Irish REITs and the role of NAMA in the recovery of the Irish property market. In terms of the analysis of property market performance, RPP has continued its successful partnership with MSCI (IPD) in the production of a commercial property market report for Northern Ireland supported by Belfast City Council and major commercial estate agency/surveying practices locally. In the residential property sector the Northern Ireland Quarterly House Price Index supported by the Northern Ireland Housing Executive has reached its 30<sup>th</sup> year of publication.

This brief overview captures some of the research activity in Built Environment over the last year. I would encourage you to read through this Annual Report and follow up any queries with either myself or colleagues. Further details of research expertise at the Built Environment Research Institute can be found at [www.beri.ulster.ac.uk](http://www.beri.ulster.ac.uk) or by contacting Mrs Sadie Magee (Admin Support) at (028) 90368638.



Professor Stanley McGreal  
Director Built Environment Research Institute

## 2. Research Institute: Academic Staff Members status at 31 July 2015

Surname	Forename	Title	Position	Institute Status
Adair	Alastair	Prof	PVC (Development) & Provost (Jordanstown & Belfast)	Core
Ali	Faris	Prof	Professor of Structural Engineering	Core
Anderson	Mark	Mr	Lecturer	Associate
Berry	James	Prof	Professor in Urban Planning & Property Development	Core
Blair	Neale	Dr	Senior Lecturer	Associate
Boyce	Karen	Dr	Senior Lecturer	Core
Brandoni	Caterina	Dr	Lecturer	Associate
Brennan	Sile	Dr	Lecturer	Core
Choi	Seng-Kwan	Dr	Lecturer	Core
Dahoe	Arief	Dr	Lecturer	Associate
Davis	Peadar	Dr	Lecturer	Core
Davison	Karen	Dr	Lecturer	Associate
Davison	Lisa	Dr	Lecturer	Core
Delichatsios	Michael	Prof	Professor of Fire Dynamics and Flammability	Core
Eadie	Robert	Dr	Lecturer	Associate
Gray	Paddy	Prof	Professor of Housing	Associate
Griffiths	Philip	Prof	Head, School of the Built Environment	Core
Haran	Imelda	Dr	Lecturer	Associate
Heaney	George	Prof	Professor of Construction	Core
Hemphill	Lesley	Dr	Lecturer	Associate
Hewitt	Neil	Prof	Professor of Energy/Director of CST	Core
Hine	Julian	Prof	Professor of Transport	Core
Huang	Ming Jun	Dr	Reader	Core
Huang	Ye	Dr	Reader	Core
Hyde	Trevor	Dr	Reader	Core
Keenan	Michaela	Dr	Lecturer	Associate
Lim	Lay-Cheng	Dr	Senior Lecturer	Core
Lyness	John	Dr	Reader	Associate
MacIntyre	Sean	Mr	Senior Lecturer	Associate
Magee	Bryan	Dr	Lecturer	Associate
Mahon	Clare	Ms	Lecturer	Associate



Surname	Forename	Title	Position	Institute Status
Makarov	Dmitriy	Dr	Reader	Core
McAnulty	Ursula	Ms	Lecturer	Associate
McConnell	Nigel	Dr	Lecturer	Associate
McCord	Michael	Dr	Lecturer	Core
McDermott	Rodney	Dr	Lecturer	Associate
McElduff	Linda	Dr	Lecturer	Associate
McGreal	Stanley	Prof	Professor of Property Research/ Director of BERI and RPP	Core
McLernon	Tim	Dr	Senior Lecturer	Associate
Millar	Phillip	Dr	Lecturer	Associate
Molkov	Vladimir	Prof	Professor of Fire Safety Science/ Director of HySAFER	Core
Mondol	Jayanta	Dr	Lecturer	Core
Murphy	Martina	Dr	Lecturer	Associate
Nadjai	Ali	Prof	Professor of Fire Structural Engineering	Core
Odeyinka	Henry	Dr	Lecturer	Core
Pimenidou	Panagiota	Dr	Lecturer	Associate
Rafferty	Gavan	Mr	Lecturer	Associate
Ritchie	Heather	Dr	Lecturer	Associate
Smyth	Mervyn	Dr	Reader	Core
Solan	Brian	Dr	Lecturer	Associate
Strong	Alan	Mr	Senior Lecturer	Associate
Tretsiakova-McNally	Svetlana	Dr	Lecturer	Associate
van der Krabben	Erwin	Prof	Professor of Real Estate	Core
Woodward	David	Dr	Reader	Associate
Yohanis	Yigsaw	Prof	Professor of Building Services Engineering	Core
Zacharopoulos	Aggelos	Dr	Lecturer	Core
Zhang	Jianping	Dr	Lecturer	Core



### 3. Research Institute: Research Staff Members status at 31 July 2015

Surname	Forename	Title	Position	Research Centre
Arya	Farid	Dr	Research Associate	CST
Besheer	Ahmad	Dr	Research Associate	CST
Colclough	Shane	Dr	Research Fellow	CST
Connolly	James	Mr	Research Associate	RPP
Dave	Ashok	Dr	Research Associate	CST
Devlin	Steven	Mr	Research Associate	CST
Fang	Yueping	Dr	Research Fellow	CST
Fateh	Talal	Dr	Research Associate	FireSERT
Haran	Martin	Dr	Senior Research Fellow	RPP
Hinch	Martin	Dr	Research Associate	RPP
Keatley	Patrick	Dr	Research Associate	CST
Keenan	James	Dr	Research Associate	HySAFER
Kim	Wookyung	Dr	Research Associate	HySAFER
Kim	Yangkyun	Dr	Research Associate	HySAFER
Li	Zhiyong	Dr	Research Associate	HySAFER
Lytvyn	Inna	Dr	Research Associate	CST
McIlhatton	David	Dr	Research Fellow	RPP
Miao	Yiqing	Dr	Research Associate	FireSERT
Mulligan	Conor	Mr	Research Associate	KTPCST
Ramirez	Miguel	Mr	Research Associate	CST
Redpath	David	Dr	Research Associate	CST
Rolfe	Angela	Miss	Research Associate	CST
Shah	Nikhilkumar	Mr	Research Associate	CST
Shentsov	Volodymyr	Dr	Research Associate	HySAFER
Tian	Ning	Dr	Research Associate	FireSERT

## 4. Research Students

The following research students were registered on research degree programmes in the Institute during 2014-2015.

Student Name	Thesis Title
Adi Maimun, Nural Hana	The economic values of green residential buildings
Alexander, Gareth O	Novel floor constructions to improve the performance and energy efficiency of ground source heat pump (GSHP) powered underfloor heating
Allen, David	Innovative approaches to understanding business location factors
Atefi Aghayan, Hooman	Developing a numerical method for simulating intumescent materials in fire
Beattie, Michael Robert	A fracking good time? A planned approach to energy resilience in the island of Ireland
Benson, Jordan	Resilient relationships: an investigation into the nexus between spatial planning and community planning
Bidanset, Paul Edward	Decomposing the effect of foreclosure: using locally weighted regression with spatial, temporal and attribute weighting functions to understand the externalities of foreclosed single-family homes
Bogle, Gary	A cost versus benefit analysis of delay and disruption techniques in the risk management of construction projects
Bradley, Philip	A carbon valuation model for commercial buildings in a market downturn
Byrne, Orla M	Investigation into the potential practical application of “smart growth” within an Irish case study
Byrne, Raymond	Evaluation of energy storage with wind auto-production at an industrial site connected to the distribution grid
Cassidy, Peter	Design and evaluation of community fire safety educational programmes
Chakroborti, Shauli	Design, development and experimental characterisation of an innovative solar building wall with thermal storage and heat transfer characteristics
Chotzoglou, Konstantinos	External flames on façade fires
Clarke, Mervyn C	Strategic property performance management
Cotter, Donal F	The role of building simulation as an assessment methodology for new and existing dwellings



Student Name	Thesis Title
Crinion, Kate	Disaster recovery and reconstruction: harnessing capacity and improving resilience within affected communities
Doyle, Conor	Investigation of household energy use and its effective reduction
Eghbalighazijahani, Amir	Governance and planning policies to increase the resilience of urban areas to climate change
Elder, Kyle Mark	Business location factors: investigating regional development policy in the new economy
Fadeyi, Olawumi	Capital and real estate markets in global financial cities
Farnan, Emma MA	Evaluating community planning: towards better outcomes?
Firth, Simona	Vacuum window performance evaluation and characterisation
Gamu, Faoziah	Analysing real estate values in emerging economies. A case study of Nigeria
Hall, Leaine Martine	Integrated constructed wetlands: performance and analysis
Henry, Keith	Planning and public spaces: a property rights perspective
Hossen, Ali Mahmood	Climate change and transport disruption: measuring risk and uncertainty
Isirima, Michael KE	Fire protection risk assessment: a study of offshore installations
Kahanji, Charles	Flexural and shear capacity of ultra high strength reinforced concrete beams under fire
Kang, Sungwook	Fundamental technologies for development of nanoclay dispersed intumescent polymer composition in applications for built environments and automobiles
Kashkarov, Sergii	Fire resistance of on-board high pressure storage tanks for hydrogen-powered vehicles
Larkin, Keren	Modelling risk impacts on variability between contract sum and final account in contractor design and build projects
Lim, Ohk Kun	Structural performance of shear fire
Lockhart, Danielle SE	An assessment of the impacts of air quality on public health within Northern Ireland
Lytvyn, Iurii V	Novel evacuated glazing system
MacDonald, Colin M	Law enforcement perspectives on lone actor terrorism
Mahone, Nedra	Economic base and the impact on real estate returns
McDermott, Eva	Articulating heritage values
McElduff, Patricia	Low carbon and low impact building materials
McErlane, Andrew	A risk allocation model for public private partnerships
McKane, Mark	The contributions of Building Information Modelling (BIM) to improved Construction Industry performance in Northern Ireland





Student Name	Thesis Title
McKeown, Clare	To develop an economic operator prequalification model to assist in the award of public contracts
McKinstry, Colin	Development and validation testing of an advanced domestic air source heat pump
McMenamin, Deirdre V	Developing cultural-spatial representation of the interrelationship between landscape and human agency in rural Ireland/Northern Ireland: revealing the agency of landscape strategy in Irish vernacular architecture
McQuaid, Grainne	Potholes in asphalt surfacing materials
Mellor, Kate	Slippery surfaces: photography, architecture and the cityscape of seduction
Meyer, Jean C	Optimisation of on-board hydrogen storage fire resistance
Minic, Ivica	An experimental study of air-source heat pump defrosting using solar collector as heating source
Nowlan, William K	Modelling different ways of financing social housing in Ireland using private sector finance
O'Hare, Rachel Mary	NAMA: asset management on nonperforming real estate in a depressed economy
O'Neill, Jennifer T	Emotional Mapping': exploring how participatory GIS can add value to knowledge on spatial identity, decision making and spatial planning
Pugsley, Adrian N	Development of hybrid photovoltaic/thermal (HyPV/T) facade solar collectors
Quigley, Denise	Achieving an optimum balance across capital, life-cycle and environmental costs
Quigley, Mura	Enabling a resilient future: exploring the leadership and governance of urban design
Rainey, Karina L	The air quality and health impacts of residential coal burning within Northern Ireland
Redpath, Gwyneth M	Risk mapping of minor ('B' class) roads in rural Northern Ireland, reasons for the high proportion of collisions resulting in death or serious injuries, especially to young drivers
Rice, Laura L	Planning judicial review reformation
Rogers, Jane B	Productivity benefits of green building occupancy
Sakr, Mohamed	Modelling and very large eddy simulation of large-scale hydrogen-air deflagration and deflagration-to-denotation transition
Salehi Kouhestani, Mohammad	Investigation on advanced heat pumps in domestic appliances
Shafie, Shahril	Synchronization of house price and buyer affordability: residential property in Malaysia
Shah, Nikhil K	Vapour compression heat pumps driven by advanced engine concepts and incorporating heat recovery





Student Name	Thesis Title
Shanks, Peter	A review of the corporate governance arrangements of the housing association sector in Northern Ireland
Stephenson, Jill	A study of the environmental implications and health impacts of floods in Northern Ireland
Stevenson, David M	Coastal environmental determinism. Parameters for land use planning
Tierney, Christopher A	Dynamic road/tyre Interaction
Waddell, Campbell	Variation of race track grip
Wijayanto, Arief	Property tax as a local tax in Indonesia
Wilkinson, Alistair	Development of resilient, energy efficient geo-polymer concrete road pavement solutions
Wilson, Christopher	Development of advanced heat pump and thermal storage systems capable of cost effective demand side management
Yates, David	Innovation solutions to reduce separation distance for hydrogen and fuel cell systems

### Graduated December 2014

Student Name	Thesis Title
Arya, Farid	Producing cheap vacuum glazing sheets which can be cut in different sizes
McDermott, Rodney PJ	Water conservation impact on solid transfer in sewers
McNally, Yvonne	Energy saving via retrofit compared to replacement housing
Mitchell, Ruth	Durability of warm asphalts for road surfaces

### Graduated July 2015

Student Name	Thesis Title
Banerjee, Urbi	Effect of urban form on dynamic nature of travel behaviour
Dave, Ashok	Techno – Economic assessment of novel IGCC systems with CO <sub>2</sub> capture
Keig, Peter Richard	An investigation into establishing a hierarchy of sequential retrofit solutions
McElduff, Linda	Regenerating coastal communities on the island of Ireland
Shentsov, Volodymyr	Indoor use of fuel cell and hydrogen systems
Williamson, Oscar	Assessing driver behaviour due to in-car distractions





# 5. Publications

Details of all publications by BERI staff are on the Ulster University's Institutional Repository <http://eprints.ulster.ac.uk/>. This section reports those outputs published over the period of this report and classified as either journal articles, books/chapters in books, research reports and published conference papers.

## 5.1 Journal Articles

Ahern, A and Hine, J (2015) Accessibility of health services for aged people in rural Ireland. *International Journal of Sustainable Transportation*, 9 (5). pp. 389-395.

Bakirtzis, D, Ramani, A, Zhang, J and Delichatsios, M (2014) Simplified structure of the condensed phase of fire retarded PA6 nanocomposites in TGA as related flammability. *Fire Safety Journal*, 69. pp. 69-75.

Banerjee, U and Hine, J (2014) Identifying the underlying constructs linking urban form and travel behaviour using a grounded theory approach. *International Journal of Environmental Science and Technology*, 11 (8). pp. 2217-2232.

Beekmans, J, Beckers, P, van der Krabben, E and Martens, K (2014) A hedonic price analysis of the value of industrial sites. *Journal of Property Research*, 31 (2). pp. 108-130.

Brandoni, C and Renzi, M (2015) Optimal sizing of hybrid solar micro-CHP systems for the household sector. *Applied Thermal Engineering*, 75 (22). pp. 896-907.

Brandoni, C, Arteconi, A, Ciriachi, G and Polonara, F (2014) Assessing the impact of micro-generation technologies on local sustainability. *Energy Conversion and Management*, 87. pp. 1281-1290.

Brandoni, C, Renzi, M, Caresana, F and Polonara, F (2014) Simulation of hybrid renewable microgeneration systems for variable electricity prices. *Applied Thermal Engineering*, 71 (2). pp. 667-676.

Davis, P, McCord, J, McCord, M and Haran, M (2015) Modelling the effect of energy performance certificate rating on property value in the Belfast

housing market. *International Journal of Housing Markets and Analysis*, 8 (3). pp. 292-317.

Davison, L, Ahern, A and Hine, J (2015) Travel, transport and energy implications of university-related student travel: A case study approach. *Transportation Research Part D: Transport and Environment*, 38. pp. 27-40.

Eadie, R and Graham, M (2014) Analysing the advantages of early contractor involvement. *International Journal of Procurement Management*, 7 (6). pp. 661-676.

Eadie, R, Browne, M, Odeyinka, H, McKeown, C and McNiff, S (2015) A survey of current status of and perceived changes required for BIM adoption in the UK. *Built Environment Project and Asset Management*, 5 (1). pp. 4-21.

Eadie, R, Millar, P and Boyle, J (2015) Is Design Guidance for Roads incomplete? *International Journal of Civil and Structural Engineering- IJCSE*, 2 (1). pp. 299-304.

Eadie, R, Odeyinka, H, Browne, M, McKeown, C and Yohanis, M (2014) Building Information Modelling Adoption: An Analysis of the Barriers of Implementation. *Journal of Engineering and Architecture*, 2 (1). pp. 77-101.

Fang, Y, Hyde, T, Arya, F, Hewitt, N, Wang, R and Dai, Y (2015) Enhancing the thermal performance of triple vacuum glazing with low-emittance coatings. *Energy and Buildings*, 97. pp. 186-195.

Flannery, W, O'Hagan, AM, O'Mahoney, C, Ritchie, H and Twomey, S (2015) Evaluating conditions for transboundary marine spatial planning: Challenges and opportunities on the island of Ireland. *Marine Policy*, 51. pp. 86-95.

Florian, H, Delichatsios, M, Fateh, T and Zhang,



J (2015) Comparison of methods for thermal analysis: Application to PEEK and a composite PEEK + CF. *Journal of Fire Science*, 33 (3). pp. 232-246.

Giannissi, SG, Hoyes, JR, Chernyavskiy, B, Hooker, P, Hall, J, Venetsanos, AG and Molkov, V (2015) CFD benchmark on hydrogen release and dispersion in a ventilated enclosure: Passive ventilation and the role of an external wind. *International Journal of Hydrogen Energy*, 40 (19). pp. 6465-6477.

Giannissi, SG, Shentsov, V, Melideo, D, Cariteau, B, Baraldi, D, Venetsanos, A and Molkov, V (2015) CFD benchmark on hydrogen release and dispersion in confined, naturally ventilated space with one vent. *International Journal of Hydrogen Energy*, 40 (5). pp. 2415-2429.

Glumac, B, Han, Q, Schaefer, W and van der Krabben, E (2015) Negotiation issues in forming public-private partnerships for brownfield redevelopment: Applying a game theoretical experiment. *Land Use Policy*, 47. pp. 66-77.

Hasan, A, McCormack, SJ, Huang, MJ and Norton, B (2015) Increased photovoltaic performance through temperature regulation by phase change materials: Materials comparison in different climates. *Solar Energy*, 115. pp. 264-276.

Hemphill, L, Berry, J and McGreal, S (2014) A financial appraisal of business improvement districts in the UK. *Environment and Planning C: Government and Policy*, 32 (4). pp. 680-696.

Hinch, M, Berry, J, McGreal, S and Grissom, T (2015) LIBOR, base rate spreads and the UK housing market. *International Journal of Housing Markets and Analysis*, 8 (1). pp. 118-134.

Hu, L, Lu, K, Tang, F, Delichatsios, M and He, L (2014) A global non-dimensional factor characterizing side wall constraint effect on facade flame entrainment and flame height from opening of compartment fires. *International Journal of Heat and Mass Transfer*, 75. pp. 122-129.

Hu, L, Wang, Q, Delichatsios, M, Lu, S and Tang, F (2014) Flame radiation fraction behaviors of sooty buoyant turbulent jet diffusion flames in reduced- and normal atmospheric pressures and a global correlation with Reynolds number. *Fuel*, 116. pp. 781-786.

Huang, Y, Anderson, M, Lyons, GA, McRoberts, WC, Wang, YD, McIlveen-Wright, D, Roskilly, AP and Hewitt, N (2014) Techno-economic Analysis of BioChar Production and Energy Generation

from Poultry Litter Waste. *Energy Procedia*, 61. pp. 714-717.

Keenan, J, Makarov, D and Molkov, V (2014) Rayleigh-Taylor instability: Modelling and effect on coherent deflagrations. *International Journal of Hydrogen Energy*, 39 (35). pp. 20467-20473.

Kupke, V, Rossini, P, McGreal, S and Yam, S (2014) Female-Headed Households and Achieving Home Ownership in Australia. *Housing Studies*, 29 (7). pp. 871-892.

Lamnatou, C, Mondol, JD, Chemisana, D and Maurer, C (2015) Modelling and simulation of Building-Integrated solar thermal systems: Behaviour of the system. *Renewable and Sustainable Energy Reviews*, 45. pp. 36-51.

Lamnatou, C, Mondol, JD, Chemisana, D and Maurer, C (2015) Modelling and simulation of Building-Integrated solar thermal systems: Behaviour of the coupled building/system configuration. *Renewable and Sustainable Energy Reviews*, 48. pp. 178-191.

Lu, K, Hu, L, Tang, F, Qiu, Z and Delichatsios, M (2015) Merging behavior of facade flames ejected from two windows of an under-ventilated compartment fire. *Proceedings of the Combustion Institute*, 35 (3). pp. 2615-2622.

McCarter, J, Chrisp, M, Starrs, G, Basheer, M, Nanukuttan, S, Sudarshan, S and Magee, B (2015) A Durability Performance Index for Concrete: Developments in a Novel Test Method. *Int. J. Structural Engineering*, 6 (1). pp. 2-22.

McCord, J, McCord, M, McCluskey, WJ, Davis, PT, McIlhatton, D and Haran, M (2014) Effect of public green space on residential property values in Belfast metropolitan area. *Journal of Financial Management of Property and Construction*, 19 (2). pp. 117-137.

McKay, S, Murray, M and MacIntyre, S (2015) Pitfalls in Protection: How Theory Can Enrich Our Understanding of Regulatory Compliance Problems in Planning Practice. *International Planning Studies*, Routledge Taylor and Francis Group, 20 (3). pp. 270-291.

McKay, S, Murray, M, MacIntyre, S and Kashyap, A (2015) Evidence-based policymaking and the public interest: lessons in legitimacy. *Town Planning Review*, 86 (2). pp. 133-154.



McKinney, J and Ali, F (2014) Artificial Neural Networks for the Spalling Classification & Failure Prediction Times of High Strength Concrete Columns. *Journal of Structural Fire Engineering*, 5 (3). pp. 203-214.

Molkov, V and Bragin, M (2015) Hydrogen-air deflagrations: Vent sizing correlation for low-strength equipment and buildings. *International Journal of Hydrogen Energy*, 40 (2). pp. 1256-1266.

Murphy, M (2014) Implementing innovation; a stakeholder competency approach for BIM. *Construction Innovation*, 14 (4). pp. 433-452.

Murphy, M, Perera, S and Heaney, SG (2015) Innovation management model: a tool for sustained implementation of product innovation into construction projects. *Construction Management and Economics*, 33 (3). pp. 209-232.

Nanukuttan, S, Basheer, M, Luping, T, McCarter, J, Chrisp, M, Starrs, G, Holmes, N and Magee, B (2015) The performance of concrete exposed to marine environments: predictive modelling and use of laboratory/on site test methods. *Construction and Building Materials*, 93. pp. 831-840.

Nguyen, TB, van der Krabben, E and Samsura, DAA (2014) Commercial real estate investment in Ho Chi Minh City - A level playing field for foreign and domestic investors? *Habitat International*, 44. pp. 412-421.

Root, L, van der Krabben, E and Spit, T (2015) Between structures and norms: assessing tax increment financing for the Dutch spatial planning toolkit. *Town Planning Review*, 86 (3). p. 325.

Root, L, van der Krabben, E and Spit, T (2015) Bridging the financial gap in climate adaptation: Dutch planning and land development through a new institutional lens. *Journal of Environmental Planning and Management*, 58 (4). pp. 701-718.

Samsura, DAA, van Deemen, A, van der Krabben, E and van der Heijden, R (2014) An experimental study of computer-based negotiation in property development processes. *International Journal of Strategic Property Management*, 18 (4). pp. 344-355.

Sivakumar, V, Lively, J, Solan, B and Black, J (2014) Granular anchors for stabilising slopes. *Geotechnique Letters*, 4. pp. 295-300.

Sivakumar, V, Zaini, J, Gallipoli, D and Solan, B (2015) Wetting of compacted clays under laterally

restrained conditions: initial state, overburden pressure and mineralogy. *Geotechnique*, 65 (2). pp. 111-125.

Smyth, M and Nesbitt, A (2014) Energy and English wine production: A review of energy use and benchmarking. *Energy for Sustainable Development*, 23. pp. 85-91.

Stockford, C, Brandon, N, Irvine, J, Mays, T, Metcalfe, I, Book, D, Ekins, P, Kucernak, A, Molkov, V, Steinberger-Wilckens, R, Shah, N, Dodds, P, Dueso, C, Samsatli, S and Thompson, C (2015) H2FC SUPERGEN: An overview of the Hydrogen and Fuel Cell research across the UK. *International Journal of Hydrogen Energy*, 40 (15). pp. 5534-5543.

Tretsiakova-McNally, S and Joseph, P (2015) Pyrolysis Combustion Flow Calorimetry Studies on Some Reactively Modified Polymers. *Polymers*, 7 (3). pp. 453-467.

Yang, K, Basheer, PAM, Bai, Y and Magee, BJ (2015) Assessment of the effectiveness of the guard ring in obtaining a uni-directional flow in an in situ water permeability test. *Materials and Structures*, 48 (1-2). pp. 167-183.

## 5.2 Books/Chapters in Books

Divall, C, Hine, J and Pooley, C, eds. (2015) *Transport Policy: Learning Lessons from History*. Ashgate Publishing Limited, Farnham. 500 pp.

Grantham, M, Basheer, PAM, Magee, B and Soutsos, M, eds. (2014) *Concrete Solutions*. CRC Press, London. 818 pp.

Griffiths, P and Colclough, S (2015) *Seasonal Thermal Storage*. In: *Handbook for Clean Energy System*. Wiley, Chichester, pp. 2479-2496.

## 5.3 Research Reports

Adair, A, McGreal, S, Hinch, M and McIlhatton, D (2015) Northern Ireland Quarterly House Price Index for Q1 2015 Report 122. Northern Ireland Housing Executive. Ulster University. 9 pp.

Adair, A, McGreal, S, McIlhatton, D and McCord, J (2015) Northern Ireland Quarterly House Price Index for Q4 2014 Report 121. Northern Ireland Housing Executive and Bank of Ireland. Ulster University. 8 pp.

Adair, A, McGreal, S, McIlhatton, D and McCord,



J (2014) Northern Ireland Quarterly House Price Index for Q3 2014 Report 120. Northern Ireland Housing Executive and Bank of Ireland. Ulster University. 8 pp.

Adair, A, McGreal, S, McIlhatton, D and McCord, J (2014) Northern Ireland Quarterly House Price Index for Q2 2014 Report 119. Northern Ireland Housing Executive and Bank of Ireland. Ulster University. 8 pp.

Godfrey, A, Grail, J, Clement, P, Hodgson, J and Berry, J (2014) Nationwide Business Improvement Districts Survey 2014. BIDs. British BIDs & Ulster University. 31 pp.

Gray, P, McAnulty, U and Shanks, P (2014) Private Rented Sector Stock Profile: Physical Condition and Key Government Indicators Report. Northern Ireland Housing Executive. Northern Ireland Housing Executive. 48 pp.

Haran, M, Berry, JN, Adair, AS and McGreal, S (2015) Northern Ireland Commercial Property Investment Review 2014. Belfast City Council and consortium of commercial property agents. MSCl. 12 pp.

McDaniel, R, Olek, J, Magee, B, Behnood, R and Pollock, R (2014) NCHRP 463 - Pavement Patching Practices: A synthesis of Highway Practice. American Association of State Highway and Transportation Officials. National Cooperative Highway Research Program. 87 pp.

McDaniel, RS, Olek, J, Magee, BJ, Behnood, A and Pollock, R (2014) National Cooperative Highway Research Program, NCHRP Synthesis 463, Pavement Patching Practices - A Synthesis of Highway Practice. Transportation Research Board of the National Academies. National Academy of Sciences, Washington DC. 86 pp.

McGreal, S, McCord, J and McAnulty, U (2015) Performance of the private rental market in Northern Ireland: Summary Research Report July - December 2014. Northern Ireland Housing Executive, PropertyNews.com and Ulster University. 30 pp.

McGreal, S, McCord, J, McCord, M, McIlhatton, D and McAnulty, U (2014) Performance of the private rental market in Northern Ireland: Summary Research Report January - June 2014. Northern Ireland Housing Executive, PropertyNews.com and Ulster University. 21 pp.

Rafferty, G and Lloyd, G (2014) Community Planning and Spatial Planning in the Irish Border Region: Shaping the relationship between people and place. International Centre for Local and Regional Development (ICLRD). 28 pp.

Squires, G, Hutchinson, N, Adair, A, Berry, J, McGreal, S and Organ, S (2015) Innovative Finance for Real Estate Development in Pan-European Regeneration. RICS Research. 36 pp.

## 5.4 Published Conference Papers

Banerjee, U, Hine, JP and Davison, L (2014) Using Partial Least Squares Structural Equation Modelling to assess the influence of urban form on travel behaviour. In: Irish Transport Research Network, University of Limerick. ITRN. 11 pp.

Davison, L, Ahern, A and Hine, J (2014) University Choice and the Influence upon Infrequent and Routine Mobility. In: Irish Transport Research Network Annual Conference, University of Limerick. ITRN. 8 pp.

Eadie, R (2014) Does Europe need a specific prequalification system for highway projects? In: International Conference on Civil Engineering Design and Construction (Science and Practice), Varna, Bulgaria. 7 pp.

Eadie, R, Heenan, A and Hall, J (2014) Civil Engineering and the interoperability between building information modelling (BIM) and e-procurement. In: International Conference on Civil Engineering Design and Construction (Science and Practice), Varna, Bulgaria. 7pp.

Eadie, R and McClean, M (2015) An investigation of interoperability issues between building information modelling (BIM) and e-procurement. In: Education, Science and Innovations, ESI 2015, European Polytechnical University, Pernik, Bulgaria. European Polytechnical University, 2015. 6 pp.

Eadie, R, McLernon, T and Patton, A (2015) An investigation into the legal issues relating to Building Information Modelling (BIM). In: RICS COBRA AUBEA 2015, Sydney, Australia. Royal Institution of Chartered Surveyors. 8 pp.

Eadie, R, Millar, P and Boyle, J (2014) Is Design Guidance for Roads incomplete? In: Second International Conference on Advances in Civil, Structural and Environmental Engineering- ACSEE 2014, Zurich, Switzerland. Institute of Research Engineers and Doctors, USA. Vol 1. 6 pp.

Joseph, P and Tretsiakova-McNally, S (2015) Pyrolysis Combustion Flow Calorimetric Studies on Phosphorus-modified Polymers Based on Acrylonitrile. In: 15th European Meeting on Fire Retardancy and Protection of Materials, Berlin,

Germany. Federal Institute for Materials Research and Testing, Berlin, Germany. 2 pp.

Joseph, P and Tretsiakova-McNally, S (2015) Reactive routes to flame retard some chain-growth polymers: synthetic strategies and characterization techniques. In: 35th Australasian Polymer Symposium, Gold Coast, Australia. Flinders University. 1 pp.

Joseph, P, Tretsiakova-McNally, S and Zhang, R (2014) Characterization Techniques for Assessing the Combustion Behaviours of Polymeric Materials. In: Third International Conference on Polymer Processing and Characterization, Mahatma Gandhi University, Kottayam, Kerala, India. 1 pp.

McLernon, T, McKane, M, Eadie, R and Comiskey, D (2015) A review of curriculum design for Building Information Modelling. In: RICS COBRA AUBEA 2015, Sydney, Australia. Royal Institution of Chartered Surveyors. 10 pp.

McQuaid, G, Millar, P and Woodward, D (2015) Use of 3d modeling to assess pothole growth. In: 6th International conference on Bituminous Mixtures & Pavements, Thessaloniki Greece. CRC Press / Balkema - Taylor Francis Group. 6 pp.

Solan, B, Orr, S, Whitworth, J and McMenamin, P (2014) PD6694-1 and the Design of Gravity Retaining Walls. In: Civil Engineering Research in Ireland, QUB Belfast. Civil Engineering Research Association of Ireland. 6 pp.

Wilkinson, A, Woodward, D, Magee, B and Tretsiakova-McNally, S (2015) A state of the art review into the use of geopolymer cement for road applications. In: 6th International Conference on Bituminous Mixtures & Pavements, Thessaloniki, Greece. CRC Press/Balkema. 6 pp.



## 6. Research Funding: Portfolio of Research Grants active during period 1 August 2014 - 31 July 2015

Research Institute Member	Title of Award	Funding Body	Value
<b>Anderson, Mr M</b>	Pelletisation (READ)	Invest NI	£108,184
<b>Blair, Dr N</b> <b>McIlhatton, Dr D</b>	Re-imaging the Peace Walls	Lower Oldpark Community Association	£6,500
<b>Hemphill, Dr L</b> <b>Lim, Dr LC</b>	International Residential Property Measurement Approach and Practice	RICS	£16,518
<b>Hewitt, Prof NJ</b>	Eco-City Research Project	ILEX Co Ltd	£49,207
<b>Hewitt, Prof NJ</b> <b>Huang, Dr Y</b>	TEMPO: Total Energy Management for Production Operations – Stage 3	Enterprise Ireland	£247,772
<b>Lloyd, Prof MG</b>	Communities as constructs of people and architecture	AHRC	£312,276
<b>Makarov, Dr D</b> <b>Molkov, Professor V</b>	EPSRC Centre for Doctoral Training in Fuel Cells and their Fuels: Clean Power for the 21 <sup>st</sup> Century	EPSRC	£135,000
<b>Makarov, Dr D</b>	GENFUEL	CEC – Framework 7 – MC (IAPP)	£17,471
<b>Pimenidou, Dr P</b> <b>Hewitt, Professor NJ</b> <b>Huang, Dr Y</b> <b>Shah, Dr N</b> <b>Mondol, Dr J</b>	Performance and emission studies on biofuel blended with high oxygen storage capacity nanoparticles using an indirect injection engine	UKIERI	£22,050
<b>Solan, Dr B</b>	Short-span bridge scour under submerged flood flow conditions	The Royal Society – International Exchange Scheme	£8,900



Research Institute Member	Title of Award	Funding Body	Value
Adair, Prof AS Berry, Prof JN Davis, Dr PT Haran, Dr ME McCord, Dr M McGreal, Prof WS McIlhatton, Dr D	Spatial Analysis and Exploration of NAMA's Northern Ireland Residential Land Development Portfolio	National Asset Management Agency	£35,000
Blair, Dr N McIlhatton, Dr D	3D Model: Re-imaging the Greater Whitewell Community	Greater Whitewell Community Surgery	£4,500
Delichatsios, Prof M	High Performance Computing Support for UK consortium of Turbulent Reacting Flows (UKCTRF)	EPSRC	£27,851
Delichatsios, Prof M Zhang, Dr J	Experimental and Modelling Large-Area Fires - Phase 2	Atomic Weapons Establishment	£131,080
Hewitt, Prof NJ Anderson, Mr M	KTP Programme between the University of Ulster and Delta Print and Packaging Ltd	TSB/INI and Delta Print & Packaging Ltd	£107,200
Huang, Dr Y McIlveen-Wright, Dr DR Hewitt, Prof NJ	SCARLET: Scale-up of Calcium Carbonate Looping Technological for Efficient Co2 Capture	CEC - Framework 7 - Energy	£188,096
Huang, Dr Y Hewitt, Prof NJ	TEMPO: Total Energy Management for Production Operations - Stage 2	Enterprise Ireland	£263,143
McCluskey, Dr WJ McIlhatton, Dr D McCord, Dr M Haran, Dr ME Davis, Dr PT Hewitt, Prof NJ McGreal, Prof WS Ryan, Dr D Haran, Dr I	INTACT	CEC - Framework 7 SEC-2013-1.6-3	£186,148
McGreal, Prof WS McIlhatton, Dr D McCord, Dr J McAnulty, Miss U	Adjustment Factors for the Valuation of NIHE Housing	NIHE	£24,750



Research Institute Member	Title of Award	Funding Body	Value
Strong, Mr WA	DEL CAST AWARD - Integrated constructed wetlands: performance and analysis	WYG Engineering Ltd	£25,200
Ali, Prof FA	The Smart Fire-blast Protection System	Invest NI – Proof of Concept	£105,455
Blair, Dr N Lloyd, Prof MG	CROSPLAN 2	INTERREG IVA	£30,335
Davis, Dr PT Ali, Prof FA Boyce, Dr KE Haran, Dr I Haran, Dr M Hyde, Dr TJ Lyness, Dr JF McCluskey, Dr WJ McCord, Dr M McGreal, Prof WS McIlhatton, Dr D	HARMONISE: Holistic Approach to Resilience and Systematic Actions to make Large Scale Urban Built Infrastructure Secure	CEC – Framework 7 Security	£284,761
Delichatsios, Prof M	Experimental and modelling work on large-area fires	Atomic Weapons Establishment	£90,000
Delichatsios, Prof M	Flame behaviours from enclosure fires over facades in tall buildings	The Royal Society	£12,000
Delichatsios, Prof M Zhang, Dr J	ELISSA: Energy efficient lightweight-sustainable-safe-steel construction	CEC – Framework 7	£285,996
Delichatsios, Prof M Zhang, Dr J	Fire hazards of exterior wall assemblies	Fire Protection Research Foundation	£9,641
Griffiths, Dr PW Huang, Dr M Hewitt, Prof NJ	MERITS – More Effective use of Renewables Including Compact Seasonal Thermal Energy Storage	CEC – Framework 7	£233,296
Haran, Dr M McCluskey, Dr WJ Davis, Dr PT Ali, Prof FA Lloyd, Prof MG McGreal, Prof WS McIlhatton, Dr D McCord, Dr M	COBACORE – Community Based Comprehensive Recovery Security	CEC – Framework 7	£414,560
Hewitt, Prof NJ	Higher Education EU Support Fund - Theme Leader Energy (NICP)	DEL	£197,013





Research Institute Member	Title of Award	Funding Body	Value
Hewitt, Prof NJ Huang, Dr M Huang, Dr Y	POREEN: Partnering Opportunities between Europe and China in Renewable Energies and Environmental Industries	CEC – Framework 7- Marie Curie RTN	£62,273
Hewitt, Prof NJ Griffiths, Dr PW Huang, Dr M Huang, Dr Y Keatley, Dr P	SPIRE – Storage Platform for the Integration of Renewable Energy	INTERREG IVA	£2,932,732
Hewitt, Prof NJ Huang, Dr M	Interdisciplinary Centre for Storage, Transformation and Upgrading of Thermal	Energy (i-STUTE) EPSRC/ESRC	£831,903
Hyde, Dr TJ	High Performance Vacuum Flat Plate Solar Thermal Collectors for Hot Water and Process Heat	EPSRC	£270,608
Makarov, Dr DV Molkov, Prof V	SUSANA: Support to Safety Analysis of Hydrogen and Fuel Cell Technologies	CEC – Framework 7- Fuel Cell Hydrogen	£249,640
Makarov, Dr DV Joseph, Dr P Molkov, Prof V	Integrated safety strategies for on-board Hydrogen Storage Systems	EPSRC	£970,514
McAnulty, Miss U	Review of Housing Association Governance	Various Housing Associations	£17,789
McCord, Dr M Berry, Prof JN McGreal, Prof WS Haran, Dr M McIlhatton, Dr D	Unlocking Land	NIHE	£30,000
McGreal, Prof WS McCord, Dr M McAnulty, Miss U Adair, Prof AS McIlhatton, Dr D	House Prices, Rents & Affordability	NIHE	£295,000
McLernon, Dr CT	Congruent assessment and feedback that satisfies education and students in Higher Education	Higher Education Academy	£6,420
Molkov, Prof V	HyResponse	CEC – Framework 7 – Fuel Cell	£269,923
Mondol, Dr J	Development of Solar Concentrating Technologies for Rural Tanzanian Communities	The Royal Society – International Exchange Scheme	£5,950
Nadjai, Prof A	LOCAFI	CEC – Coal and Steel	£78,185



Research Institute Member	Title of Award	Funding Body	Value
Smyth, Dr MA Mondol, Dr J Zacharopoulos, Dr A McLarnon, Mr D	Hybrid Photovoltaic/Solar Thermal (HyPV/T) Façade Module	Invest Northern Ireland – Proof of Concept	£105,792
Zacharopoulos, Dr A Mondol, Dr J Smyth, Dr MA Hyde, Dr TJ	Concentrating Photovoltaic Evacuated Glazing (CoPEG) multi-functional building façade element	Invest Northern Ireland - Proof of Concept	£105,382
Adair, Prof AS McGreal, Prof WS	Northern Ireland Quarterly House Price Index	Bank of Ireland	£30,000
Adair, Prof AS Berry, Prof JN Haran, Dr M McCluskey, Dr WJ McGreal, Prof WS	Northern Ireland Commercial Property Index	Dept of Social Development, Belfast City Council, and Estate Agency Practices	£40,800
Choi, Dr SK Zhang, Dr J	Fundamental Technologies for Development of Nanoclay Dispersed in tumescent polymer composition in Applications for Built Environments and Automobiles	Korea Evaluation Institute of Industrial Technology	£174,000
Haran, Dr M Adair, Prof AS Berry, Prof JN McGreal, Prof WS McIlhatton, Dr D	Development Land in Northern Ireland	National Asset Management Agency	£20,000
Hewitt, Prof NJ Griffiths, Dr PW Huang, Dr M Yohanis, Prof YG	EINSTEIN: Effective Integration of Seasonal Thermal Energy Storage Systems in Existing Buildings	CEC - Framework 7	£429,415
Hewitt, Prof NJ Huang, Dr Y	TEMPO: Total Energy Management for Production Operations	Enterprise Ireland	£196,722
Hewitt, Prof NJ Griffiths, Dr PW Anderson Mr M	CESAR: Cost Effective Solar Air Conditioning	CEC - Framework 7	£119,787







Research Institute Member	Title of Award	Funding Body	Value
Joseph, Dr P Byrne, Dr J McBride, Dr N	KTP Programme between the University of Ulster and Precision Processing Services Ltd, Northern Ireland	The Technology Strategy Board and Precision Processing Services Ltd, NI	£107,200
McIlhatton, Dr D Berry, Prof JN Davis, Dr PT Haran, Dr M Kashyap, Dr A Lim, Dr LC McCluskey, Dr WJ McCord, Dr M McGreal, Prof WS	BESECURE	CEC - Framework 7	£450,000
Molkov, Prof V Brennan, Dr SL Makarov, Dr DV	Integrating European Infrastructure to support science and development of Hydrogen and Fuel Cell Technologies	CEC - Framework 7	£460,899
Molkov, Prof V Makarov, Dr DV	Hydrogen and Fuel Cell Supergen hub	EPSRC	£182,231
Molkov, Prof V Brennan, Dr SL Makarov, Dr DV	HYINDOOR 2010: Pre-normative research on Safe Indoor Use of Fuel Cells and Hydrogen Systems	CEC - Framework 7	£276,924
Molkov, Prof V	HyCube	European Institute of Innovation and Technology	£30,176
Mondol, Dr JD Smyth, Dr M Zacharopoulos, Dr A Anderson, Mr M Huang, Dr M Hewitt, Prof N	UKIERI Thematic Partnership (UK India Education and Research Initiative). Solar accelerator design for small scale bio-gas production	British Council	£39,901
Smyth, Dr MA Anderson, Mr M	KTP Programme between the University of Ulster and Copper Industries (Ireland) Ltd	Momenta & Copper Industries (Ireland) Ltd	£107,200
Delichatsios, Prof M Zhang, Dr J	AIRCRAFTFIRE: Fire Risks Assessment and Increase of Passenger Survivability	CEC - Framework 7	£288,302
Hine, Prof JP	Rees Jeffreys Road Fund Part Funded Lecturer	Rees Jeffreys Road Fund	£66,107



Research Institute Member	Title of Award	Funding Body	Value
<b>Lim, Dr LC</b> <b>Hemphill, Dr L</b>	The Role of the RICS and Global Valuation Standards in Influencing Practice within BRIC/MENA Countries	RICS	£25,000
<b>Molkov, Prof V</b> <b>Brennan, Dr SL</b> <b>Makarov, Dr DV</b>	HyFacts: Identification, Preparation and Dissemination Officials of Hydrogen Safety Facts to Regulators and Public Safety	CEC - Framework 7	£160,573
<b>Woodward, Dr WDH</b>	Assessment of warm mix asphalt for road surfaces	NDP - National Roads Authority	£127,992
<b>Choi, Dr SK</b> <b>Nadjai, Prof A</b>	Development of Advanced PBD method for structural fire protection using innovative insulation material	Korean Ministry of Knowledge Economy	£139,606
<b>Hewitt, Prof NJ</b> <b>Griffiths, Dr P</b> <b>Hyde, Dr T</b> <b>Smyth, Dr M</b>	Charles Parsons Energy Research Awards	Science Foundation Ireland	£2,895,714

