INDUSTRY DAY

Sustainable Development: Infrastructure Challenges and Solutions

26th February 2013 – Edinburgh Conference Centre, Heriot-Watt University

Taking a lead in collaboration with industry.
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Introduction

Welcome to Heriot-Watt University’s third annual industry day which this year focuses on Infrastructure Challenges and Solutions for Sustainable Development. This year is bigger and better than ever and brings together thought leaders from both academia and industry at this key event. We hope delegates can build on existing connections as well as forge new links with leading experts in this interdisciplinary field.

This year we are privileged to welcome Dr. Rajendra K Pachauri, the Chair of the Nobel Peace Prize-winning Intergovernmental Panel on Climate Change (IPCC) and director of TERI (The Energy and Resources Institute). Dr Pachauri is a prominent researcher on environmental subjects, recognised internationally for his efforts to build up and disseminate greater knowledge about man-made climate change and to lay the foundations for the measures that are needed to counteract such change. I am sure we are all looking forward to his keynote address on Meeting the Challenge of Climate Change and the Role of Industry.

Also joining us will be distinguished speakers from the world of industry, with topics ranging from water management, solar power innovations and modern building design and construction, to the infrastructure and design of the London 2012 Olympic Park. As well as industry professionals, we will have presentations by leading academics from Heriot-Watt, drawing on their vast experience and research to discuss the challenges and advancements across key themes such as railway technologies, information management, logistics and domestic energy.

Heriot-Watt University has a breadth of expertise in Sustainable Development and is developing many varied solutions to the huge challenges mankind face in this area. Throughout the day, delegates can choose between our 4 parallel sessions. The morning sessions will cover a range of subjects from the management of water resources, to environmental and social impact of material use in construction. The afternoon sessions focus on some key areas including energy efficiency in buildings and the sustainable development challenges and solutions in networks and infrastructure.

I would also encourage delegates to view the posters that will be on display around the centre, which demonstrate some of the research we currently undertake. If you wish to find out more about anything you hear or see today, please contact one of our Business Development Executives, whose details are to the rear of this booklet.

Thank you for joining us today at Heriot-Watt, I hope you will have an enjoyable and enlightening day.

Prof. Steve Chapman
Principal & Vice-Chancellor,
Heriot-Watt University
Prof. Steve Chapman
Principal & Vice-Chancellor, Heriot-Watt University

After receiving his PhD in 1983, Professor Chapman moved to the Massachusetts Insitute of Technology on a NATO fellowship. He returned to the UK to lecture at the University of Edinburgh, before progressing to the positions of Chair of Biological Inorganic Chemistry, Head of School for Chemistry and finally Vice-Principal for Planning, Resources & Research Policy in 2006. He became Principal & Vice-Chancellor of Heriot-Watt University in 2009.

He has received widespread recognition for his research, receiving the Interdisciplinary Award of the Royal Society of Chemistry for ground-breaking work at the interface of Chemistry and Biology. He has published over 200 scientific papers in prestigious journals and has given numerous Plenary Lectures at international conferences. In 2005 he was elected as a Fellow of the Royal Society of Edinburgh and a Fellow of the Royal Society of Chemistry.

Dr. R.K. Pachauri
Chair of the Intergovernmental Panel on Climate Change (IPCC), Director General of TERI

Dr Pachauri assumed his current responsibilities as the Chief Executive of TERI (The Energy and Resources Institute) in 1982, first as Director and, since April 2001, as Director-General. TERI performs original research and provides knowledge in the areas of energy, environment, forestry, biotechnology, and the conservation of natural resources to governments, institutions, and corporate organisations worldwide.

In April 2002, Dr Pachauri was elected the Chairman of the Intergovernmental Panel on Climate Change, established by the World Meteorological Organization and the United Nations Environment Programme in 1988. The IPCC along with former US Vice President Al Gore was awarded the “Nobel Peace Prize” in 2007.

Dr Pachauri is a prominent researcher on environmental subjects, recognised internationally for his efforts to build up and disseminate greater knowledge about man-made climate change and to lay the foundations for the measures that are needed to counteract such change. He is currently serving as the head of Yale University’s Climate and Energy Institute (YCEI).

Dr Pachauri’s wide-ranging expertise has resulted in his membership of various international and national committees and boards. At the international level, these include his positions as:

- Member, Advisory Board for the Clinton Climate Initiative, USA, January 2010 onwards;
- Member of a High Panel on Peace and Dialogue among Cultures, UNESCO, France, December 2009 onwards;
- Adviser, International Advisory Board, Toyota Motor Corporation, Japan, April 2006 – March 31st, 2009;
- Member, Board of the International Solar Energy Society (1991-97);
- Member, World Resources Institute Council (1992);
- President and Chairman, International Association for Energy Economics, Washington, D C (1988, 1989-90, respectively);
- President, Asian Energy Institute (1992 onwards);
- He was a member of the board of the Global Humanitarian Forum (founded by the former United Nations Secretary General Kofi Annan) from 2007 to 2010.

He is active in several international forums dealing with the subject of climate change and its policy dimensions. He has also authored 27 books and several papers and articles.

Prof. Alan Miller
Deputy Principal, Research and Knowledge Transfer

He is a Fellow of the Royal Society of Edinburgh, the Institute of Physics, the Institution of Electrical and Electronic Engineers, and the Optical Society of America. His research covers nanostructure semiconductors, ultrashort pulse lasers and optoelectronic devices that bridges between fundamental physics, electrical engineering, and photonics applications.

He is currently the Research Awards Convener for the Royal Society of Edinburgh and is a member of the Scottish Funding Council Research and Knowledge Transfer Committee.
# Programme

## Introduction, Overview and Keynote speaker

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<th>Time</th>
<th>Activity</th>
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<td>8:15 – 9:00</td>
<td>Registration (refreshments available)</td>
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<tr>
<td>9:00 – 9:10</td>
<td>Welcome</td>
<td>Prof. Steve Chapman, Principal &amp; Vice-Chancellor, Heriot-Watt University</td>
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| 9:10 – 9:50| Keynote presentation                          | Dr Rajendra K Pachauri  
Chairperson of the Intergovernmental Panel on Climate Change (IPCC);  
Director General, The Energy and Resources Institute (TERI) and chancellor  
of TERI University.  
Title: Meeting the Challenge of Climate Change – the Role of Industry |

## Parallel Session 1 – Meeting the Hydro-nation Challenge

**Chair – Prof. Garry Pender, Head of School, School of the Built Environment, Heriot-Watt University.**

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<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker</th>
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| 10:00 – 10:30|                                              | John Morgan, Technical Manager Water Solutions, Barr and Wray.  
Title: 'Treatment of Scottish Water for Private Communities.' |
Title: 'Shaping the Future of Water and Waste Water Services.' |
| 10:50 – 11:10|                                              | Refreshment Break                                                     |
| 11:10 – 11:30|                                              | Prof. Lynne Jack (Director of Research, School of the Built Environment, Heriot-Watt University)  
Title: 'Water Resources: A Property Perspective.' |
| 11:30 – 11:50|                                              | Dr David Campbell (School of the Built Environment, Heriot-Watt University)  
| 11:50 – 12:10|                                              | Dr Adebayo Adeloye (School of the Built Environment, Heriot-Watt University)  
Title: 'Enhancing the effectiveness of heuristic rule curves for water supply reservoir operation.' |
| 12:10 – 12:30|                                              | Q&A Session 1                                                         |

## Parallel Session 2 – Materials and Design technology

**Chair – Dr Ian Brotherston, Business Development Manager, Research & Enterprise Services, Heriot-Watt University.**

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<tr>
<th>Time</th>
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<td>10:00 – 10:30</td>
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<td>Alex MacLeod (Operations Director, Skanska Scotland)</td>
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| 10:30 – 10:50|                                              | Jonas Runberger (Director of Dsearch: Digital design development at White arkitekter AB)  
Title: 'Digital Design in Architectural Practice - Learning From Experimental Approaches.' |
| 10:50 – 11:10|                                              | Refreshment Break                                                     |
| 11:10 – 11:30|                                              | Dr. Frédéric Bosché (School of the Built Environment, Heriot-Watt University)  
Title: 'Dimensional control in the age of BIM.' |
| 11:30 – 11:50|                                              | Prof Jim Ritchie (School of Engineering and Physical Science, Heriot-Watt University)  
Title: 'Digital Tools for Design and Manufacture.' |
| 11:50 – 12:10|                                              | Prof John McCarter (School of the Built Environment, Heriot-Watt University)  
Title: 'A performance-based strategy for ensuring sustainable concrete infrastructure.' |
| 12:10 – 12:30|                                              | Q&A Session 2                                                         |
### Parallel Session 3 – Energy conservation and usage in homes of the future
Chair – Prof. Mercedes Maroto-Valer FRSC, Robert M Buchan Chair in Sustainable Energy Engineering, Heriot-Watt University.

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<thead>
<tr>
<th>Time</th>
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<th>Title</th>
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<tr>
<td>14:00 – 14:30</td>
<td>Andy Ford</td>
<td>Mott MacDonald Fulcrum Technical director for buildings and infrastructure</td>
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<td></td>
<td><strong>Title:</strong> Future Cities – Existing Buildings: Addressing The Conundrum.</td>
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<tr>
<td>14:30 – 14:50</td>
<td>Jeremy Leggett (Executive Chairman of Solarcentury)</td>
<td>Latest dispatches from the front lines of the solar revolution</td>
</tr>
<tr>
<td>15:10 – 15:30</td>
<td>Refreshment Break</td>
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<tr>
<td>15:30 – 15:50</td>
<td>Prof Susan Roaf (Professor of Architectural Engineering, School of the Built Environment, Heriot-Watt University)</td>
<td>The role of domestic energy choices in building social resilience.</td>
</tr>
<tr>
<td>15:50 – 16:10</td>
<td>Prof Phil Banfill (Professor of Construction Materials, School of the Built Environment, Heriot-Watt University)</td>
<td>Homes fit for zero: dwellings in a zero carbon climate change future.</td>
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<tr>
<td>16:10 – 16:30</td>
<td>Q&amp;A Session 3</td>
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### Parallel Session 4 – ‘Networks and Infrastructure’
Chair – Dr Ian Brotherston, Business Development Manager, Research & Enterprise Services, Heriot-Watt University.

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<tr>
<th>Time</th>
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<th>Title</th>
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<tr>
<td>14:00 – 14:30</td>
<td>Prof. Dorte Rich Jørgensen (Sustainability Manager, Atkins Infrastructure; Royal Academy of Engineering Visiting Professor of Innovation at Heriot-Watt University)</td>
<td>The London 2012 infrastructure design, sustainability and innovations - Inspiring an industry and a nation.</td>
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<tr>
<td>14:30 – 14:50</td>
<td>Barry Colford, Bridge Master and Chief Civil Engineer for the Forth Road Bridge</td>
<td>The maintenance of long span bridges.</td>
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<tr>
<td>14:50 – 15:10</td>
<td>Prof Peter Woodward (Director of Institute for Infrastructure and Environment and Professor of Railway Geotechnical Engineering, School of the Built Environment, Heriot-Watt University)</td>
<td>The geotechnical challenges and solutions of next generation ultra-speed trains.</td>
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<tr>
<td>15:10 – 15:30</td>
<td>Refreshment Break</td>
<td></td>
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<tr>
<td>15:30 – 15:50</td>
<td>Dr Guy Walker (School of the Built Environment, Heriot-Watt University)</td>
<td>Roadworks ahead: how human factors are being used to design faster, safer traffic management.</td>
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<tr>
<td>15:50 – 16:10</td>
<td>Dr Maja Piecyk (School of Management and Languages, Heriot-Watt University)</td>
<td>Logistics in a low carbon world.</td>
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<td>16:10 – 16:30</td>
<td>Q&amp;A Session 4</td>
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### Conclusion

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<td>16:30 – 16:45</td>
<td>Wrap Up</td>
<td>Prof Alan Miller (Deputy Principal Research and Knowledge Transfer, Heriot-Watt University)</td>
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<td>16:45 – 18:30</td>
<td>Drinks Reception</td>
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A hydro nation is one which recognises that the wise management of its water resource is crucial to its future success. Across the globe, countries are waking up to the importance of water and to its scarcity. Along with oil, water lubricates globalisation and underpins geo-security. A hydro nation manages its water to drive its economy, improve its society, protect its environment and contribute to its international obligations.

When dealing with water, and associated issues like climate change, trade and humanitarian assistance, anything but an international view is counter-productive. The prize is the long-term protection of our own environment and the chance to lead a global sector of potentially great economic worth, and certainly of ethical importance. Developing a hydro nation will engage many parts of economy and society.

**Dr John Morgan**

Technical Manager, Barr & Wray Ltd

**TITLE – “THE TREATMENT OF SCOTTISH WATER FOR PRIVATE COMMUNITIES”**

John Morgan is a qualified Environmental Engineer with over 25 years experience in design and application of water and wastewater treatment.

John has worked for various specialised contractors including Biosystems International, Yorkshire Water Plc, and The Brackett Group.

His post at Barr & Wray includes design, installation and operation of water treatment systems for a wide range of applications. He has gained considerable experience in all aspects of treatment design and successfully installed more than 100 systems throughout Scotland and England.

**Jim Conlin**

Acting General Manager, Asset Strategy, Scottish Water

**TITLE - “SHAPING THE FUTURE OF WATER AND WASTEWATER SERVICES”**

Jim Conlin is a Chartered Civil Engineer who through his work in the Water Industry has gained considerable experience and understanding of the environmental challenges facing the UK Water Industry. He has worked on the development and implementation of capital investment programmes for wastewater networks and treatment facilities required to meet these challenges. He also played a key part in developing Sustainable Urban Drainage systems (SUDs) in Scotland and the UK. In his current role he is involved in devising strategies for water and wastewater systems looking 25 years into the future.
**Prof. Lynne Jack**  
Director of Research, School of the Built Environment, Heriot-Watt University  
**TITLE - “WATER RESOURCES: A PROPERTY PERSPECTIVE”.**  
Professor Jack is Director of Research in the School of the Built Environment. She is a Chartered Engineer, member of the Chartered Institution of Buildings Services Engineers, and a Fellow of the Society of Public Health Engineers. She joined Heriot-Watt in 1993 and began her research career by developing the modelling techniques defining the fluid flow mechanisms present within multi-storey building drainage systems. Dr Jack also leads the EPSRC project, DOWNPIPE, using the latest climate predictions to estimate the probability of various changes taking place and identify the areas where drainage systems for properties might be at risk of flooding.

**Dr David Campbell**  
Senior Lecturer, School of the Built Environment, Heriot-Watt University  
**TITLE - “FEASIBILITY STUDY FOR THE DEVELOPMENT OF A WATER & WASTE WATER INNOVATION PARK”.**  
Dr David Campbell has worked in the field of water quality, water supply and building drainage since 1988. He has contributed to national level building standards and has generated several patented technologies in the field. Current research interests include water conservation measures and the problems that they could bring, and the effect of climate change on water quality.

**Dr Adebayo Adeloye**  
Senior Lecturer, School of the Built Environment, Heriot-Watt University  
**TITLE - “ENHANCING THE EFFECTIVENESS OF HEURISTIC RULE CURVES FOR WATER SUPPLY RESERVOIR OPERATION”.**  
Dr Adeloye is a Senior Lecturer in Heriot-Watt’s School of the Built Environment. Prior to this he had worked in a consulting practice, before obtaining his MSc and PhD degrees at the University of Newcastle Upon Tyne, specialising in Water Resources engineering and management. In 1987 he was awarded the prestigious Fellowship of the Royal Commission for the Exhibition of 1851 at the Imperial College of Science, Technology and Medicine, London. In addition to being a chartered engineer, and a chartered water and environmental manager, Dr Adeloye is also currently a Fellow of the Higher Education Academy.
The environmental and social impact of material use is recognised across the construction industry. Sustainable materials reduce impact on the environment and provide a long term durable solution for the built environment. As the industry moves towards designing zero carbon buildings, increasing attention is paid to the materials used in the construction of buildings and civil engineering work.

Building information modeling (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of a facility. The resulting building information models become shared knowledge resources to support decision-making about a facility from earliest conceptual stages, through design and construction, through its operational life and eventual demolition. In June 2011 the UK government published its BIM strategy announcing its intention to require collaborative 3D BIM (with all project and asset information, documentation and data being electronic) on its projects by 2016.

Alex McLeod
Operations Director – Scotland (BSc (Hons) Civil Engineering CEng MICE)

Alex is responsible for Skanska’s Scottish business and as such is a member of the Executive Team with joint responsibility for projects in the area. Alex also sits on the Development Board of the UK business. He is the current President of the Edinburgh Chamber of Commerce and sits on the board of directors for The Civil Engineering Contractors Association for Scotland.

Jonas Runberger
Jonas Runberger, Director of Dsearch: digital design development at White arkitekter AB

TITLE - “DIGITAL DESIGN IN ARCHITECTURAL PRACTICE - LEARNING FROM EXPERIMENTAL APPROACHES”.

Jonas Runberger is an architect active in practice, research and education, currently based in Stockholm. He is director of Dsearch – a digital development environment at White Arkitekter AB, affiliate partner in Urban Future Organization and founding partner of the research collaborative Krets. His main interests involve the relation between design techniques, architectural production and experiential effect, with an emphasis on the impact of digital technology on both experimental and conventional practice.
Dr Frédéric Bosché
Lecturer, School of the Built Environment, Heriot-Watt University
TITLE OF PRESENTATION - “DIMENSIONAL CONTROL IN THE AGE OF BIM”.

After gaining his PhD in Civil Engineering from the University of Waterloo, Canada in 2008, Dr Bosché spent some time working in the construction industry in France. He went on to spend two years with the Computer Vision group of ETH Zurich, Switzerland, working on multiple projects with focus on image-based 3d reconstruction for urban and Cultural Heritage modelling. He became a lecturer in the Institute of Building & Urban Design at Heriot-Watt University in 2011. His main research interests include as-built dimensional control, life-cycle asset dimensional control and construction industrialisation.

Prof. Jim Ritchie
Head of Energy, Process & Manufacturing Engineering Research Institute, School of Engineering & Physical Sciences, Heriot-Watt University
TITLE OF PRESENTATION - “DIGITAL TOOLS FOR DESIGN”.

Professor Jim Ritchie is the Head of Institute (Institute of Mechanical, Process and Energy Engineering) at Heriot-Watt University. He is a Chartered Engineer with substantial industrial and engineering management experience in both design and manufacture. He has also been involved extensively in TEMPUS, EU, EPSRC and KTP projects.

John McCarter
Professor, School of the Built Environment, Heriot-Watt University
TITLE - “A PERFORMANCE-BASED STRATEGY FOR ENSURING SUSTAINABLE CONCRETE INFRASTRUCTURE”.

Professor McCarter’s research has focussed, in the main, on cementitious materials, particularly in the development of monitoring and characterisation techniques of this group of materials at both the micro- and macro- scale. His research activity also embraces the study of low-energy and low-carbon cementitious systems such as alkali-activated materials and geopolymers. Multi-functional and nano-engineered cementitious composites also represent a new direction in his research. He is a member of the international RILEM Technical Committee: Performance-based Specifications and Control of Concrete Durability.
The provision of well-designed, functional and energy-efficient buildings is now a fundamental pre-requisite within today’s society. The challenge of climate change and the UK goal of achieving an 80% reduction in carbon emissions by 2050 also pose serious questions for building designers and architectural engineers. Buildings presently account for some 45% of carbon emissions and it has been estimated that 80% of the buildings that we will be occupying in 2050 have already been built.

The rapid pace of change in the regulation of building energy performance has already created a high demand for research to support the move to zero carbon new buildings by 2020. Building design must therefore encompass all aspects of contemporary and traditional construction techniques alongside the provision of suitably-designed building services systems to provide a safe and comfortable habitable environment.

Andy Ford
Technical Director for Buildings & Infrastructure, Mott MacDonald Fulcrum
TITLE – “FUTURE CITIES – EXISTING BUILDINGS: ADDRESSING THE CONUNDRUM”.

Andy Ford is the Immediate Past President of CIBSE, chair of the UK Green Building Council policy committee and a member of the National Platform for Construction. He has worked extensively on innovative buildings throughout his career and contributed to many award winning designs, specialising in creative and sustainable low energy design solutions. His was awarded the IMechE Construction Division Prize in 2009 for “significant contribution made in the execution, promotion and advancement of mechanical engineering applied in the building services and construction field”. In 2012 he received an honorary PhD from Heriot-Watt University for his contribution to sustainable design.

Jeremy Leggett
Executive Chairman of Solarcentury
TITLE “LATEST DISPATCHES FROM THE FRONT LINES OF THE SOLAR REVOLUTION”.

Jeremy Leggett is founder and chairman of Solarcentury, one the UK’s fastest growing renewable energy companies, and of SolarAid, an African solar lighting charity. He was the first Hillary Laureate for International Leadership on Climate Change, a CNN Principal Voice, and Entrepreneur of the Year at the New Energy Awards.

He writes and blogs for the Guardian and the Financial Times, lectures on short courses in business and society at the universities of Cambridge and St Gallen, and is an Associate Fellow at Oxford University’s Environmental Change Institute.
Prof. Hari M. Upadhyaya  
Head, Energy Engineering Group, Institute of Mechanical Process and Energy Engineering (IMPEE) School of Engineering and Physical Sciences, Heriot-Watt University  
TITLE: “BUILDING INTEGRATED PHOTOVOLTAICS: NEW TRENDS AND CHALLENGES”.  
Before joining Heriot-Watt, Prof. Upadhyaya lead the Thin Film & Excitonic PV group at CREST, Loughborough University. He has over 20 years’ experience in thin film PV, and has established strong links with industries in the UK and abroad. His research includes activities on Transparent Conducting Oxides, Dye Solar Cells, hybrid solar cells, CdTe and CIGS thin film solar cell technologies. He is also involved in Technology Strategy Board and Engineering & Physical Science Research Council projects.

Prof. Susan Roaf  
Professor of Architectural Engineering,  
School of the Built Environment, Heriot-Watt University  
TITLE - “THE ROLE OF DOMESTIC ENERGY CHOICES IN BUILDING SOCIAL RESILIENCE.”  
Professor Roaf is an award winning designer, teacher and author. She has sat on wide range of committees related to planning, urban design, architecture and local government. She has practiced for a number of years on the design of housing, schools, hospitals and town planning and taught at Oxford Brookes University before joining Heriot-Watt in 2007. Professor Roaf is one of the country’s foremost experts on the design of Ecohouses, and is best known as a designer for her Oxford Ecohouse which was the first UK building with an integrated photovoltaic roof.

Prof. Phil Banfill  
Professor of Construction Materials, School of the Built Environment, Heriot-Watt University  
TITLE - “HOMES FIT FOR ZERO: DWELLINGS IN A ZERO CARBON CLIMATE CHANGE FUTURE”.  
Phil Banfill is a materials scientist, with over 30 years’ experience in education and research. He became Professor of Construction Materials at Heriot-Watt University in 1995 and has published two books and over 160 papers. Most of his research is concerned with materials and energy utilisation in buildings. He currently leads the Urban Energy Research Group whose interests include climate change, sustainability, low and zero carbon technologies, energy consumption and human factors.
For the past 4,000 years, civil engineers have provided the infrastructure necessary to support the development of civilisation. Iconic structures from the Forth Bridge to the Burj Khalifa Tower in Dubai rely on the application of the principles underpinning civil engineering. Hand-in-hand with the development of this infrastructure has been the development of supply chains and logistical solutions.

Despite this long tradition of successful infrastructure and logistics provision many research challenges remain. Maintenance of civil society and key utility services and supply chains, global security concerns, sustainability and international development all rely on the provision of critical infrastructure and its efficient use. Therefore increased understanding of the interdependence of our infrastructure assets and how logistics can lead to increased utilisation of this infrastructure is vital.

Prof. Dorte Rich Jorgensen
Sustainability Manager, Atkins Infrastructure; Royal Academy of Engineering Visiting Professor of Innovation at Heriot-Watt University
TITLE - “THE LONDON 2012 INFRASTRUCTURE DESIGN, SUSTAINABILITY AND INNOVATIONS – INSPIRING AN INDUSTRY AND A NATION”.

Prof. Jorgensen works as Sustainability Manager for Atkins in London, and was on the infrastructure design team for the Olympic Park site in East London. Since 2011 she has been the Royal Academy of Engineering Visiting Professor in Innovation at Heriot-Watt University. With more than 20 years’ experience on a range of cutting-edge and award-winning projects, she brings a unique practice-based perspective to the School of the Built Environment’s undergraduate and postgraduate teaching. She is also a member of the leading Built Environment think-tank ‘EDGE’, and is the CIBSE representative on the Construction Industry Council diversity panel.

Barry Colford
Chief Engineer and Bridgemaster, Forth Estuary Transport Authority
TITLE - “THE MAINTENANCE OF LONG SPAN BRIDGES”.

Barry Colford began his career as a Chartered Civil Engineer working for the Babtie (now Jacobs) Group in Glasgow both in their design office and on site in the UK and abroad. After working for Strathclyde Regional Council, he then joined Forth Estuary Transport Authority as Deputy General Manager in 1996, and in 2008 became Chief Engineer and Bridgemaster. He is the author of a number of technical papers on bridge engineering, works closely with a number of Scottish Universities, and is looking at ways to bring bridge engineering to schools.
Prof. Peter Woodward  
Director of Institute for Infrastructure & Environment and Professor of Railway Geotechnical Engineering, School of the Built Environment, Heriot-Watt University  
TITLE - “THE GEOTECHNICAL CHALLENGES AND SOLUTIONS OF NEXT GENERATION ULTRA-SPEED TRAINS”.  
Professor Woodward joined Heriot-Watt University as a Lecturer in 1994, and in 2010 became Professor of Railway Geotechnical Engineering. Since 2001 he has been seconded to industry part-time, working on the application of polyurethane geocomposites to railway track stabilisation and reinforcement. He has won multiple awards for his developed technologies, including the Highly Commended Award at the 2005 National Rail Awards, in the Innovation of the Year category. He has acted as Principal Investigator on many research grants, most recently on EPSRC funded research on high-speed train track interactions at critical track velocities.

Dr Guy Walker  
Lecturer, School of the Built Environment, Heriot-Watt University  
TITLE - “ROADWORKS AHEAD: HOW HUMAN FACTORS ARE BEING USED TO DESIGN FASTER, SAFER TRAFFIC MANAGEMENT”.  
Starting out as a Research Fellow, Dr Walker has worked with Brunel University, where he and his colleagues were awarded the Ergonomics Society’s President’s Medal for the impact and practical application of their human factors research. From there he became a Senior Research Fellow at the University of Southampton before joining Heriot-Watt University in 2009 as a lecturer in Infrastructure and Transports. Dr Walker is the author of a number of highly regarded publications, and is also a member of the Edinburgh Research Partnership in Engineering & Mathematics consortium.

Dr Maja Piecyk  
Lecturer in Logistics, Department of Business Management, School of Management & Languages, Heriot-Watt University  
TITLE - “LOGISTICS IN A LOW CARBON WORLD”.  
Dr Piecyk joined Heriot-Watt in 2006 as a Research Associate in the Logistics Research Centre. She completed her PhD in 2010 and stayed on as a Lecturer, specialising in green logistics, freight transport and humanitarian logistics. In 2011 she was awarded The Stinnes Foundation Prize from DB Schenker for Best European PhD on a logistics topic. Dr Piecyk is also member of the editorial board of the European Management Journal, and has contributed to a number of esteemed publications, most recently ‘Green Logistics: Improving The Environmental Sustainability of Logistics’.
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<th>Title</th>
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<tbody>
<tr>
<td>The Risks of Climate Change (CC)-A Supply Chain Perspective</td>
<td>Andre Kreie, Prof. Alan McKinnon, Dr Christine Rutherford</td>
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Leading Industry Innovation
Heriot-Watt University has a long tradition of working with industry

Heriot-Watt offers a distinctive approach to industry engagement that can be considered a model of best practice in the Scottish University sector. The approach is based on developing long-term relationships and providing customised support designed specifically to address the needs of individual industrial partners.

It differs from the approach adopted by many other UK universities in being less target-driven and more adaptive to individual company needs and for these reasons has been particularly well received by industry. This approach has enabled the team to engage several industrial partners in long-term programmes of engagement and strategic alliances with the University that are expected to generate very significant, long-term returns for both partners.

Our team of Business Development Executives play a vital role as the first point of contact for future industry partners. From here they can help identify and facilitate collaborative research and knowledge exchange opportunities. Once a project is underway they can then focus on ensuring that businesses are satisfied with the service they receive.

Areas where our Business Development Team can help include:

- Assisting businesses find innovative solutions to problems;
- Helping companies develop new technologies.
- Sharing the Universities knowledge and giving access to our academics expertise.

Convergence of business and like-minded academics
SME MULTI-NATIONAL
Long term relationships
Service led
Running Profile of HWU

Economic Impact
- Jobs supported in companies
- Turnover supported in companies

Academics
* More Entrepreneurial
* Collaborative mindset

Commericalisation
- More Licensing
- Maintain level of spinouts and startups

Students
* More Entrepreneurial
* More Experience of Industry
* Increased employability

More innovation
Better skilled workforce
More relevant research
More funding
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To find out more about working with industry, please visit us at http://www.hw.ac.uk/industry.htm

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