



60 second interview with... Jeremy Broadbent Chief Executive, Johnson Construction

Reading Half Marathon 2012

The Reading Half Marathon was run on a lovely, sunny spring morning on the 1 April this year, and amongst the 18,500 runners were the TSBE Trotters Relay Team and six other individual runners from the TSBE.

As always, the 13.1 mile course was lined with cheering crowds and lively music bands as it meandered from the start at the Madejski Stadium, through the University Campus, into the town centre and past Prospect Park before returning to the stadium.

The TSBE Trotters with Soi Luong and Jeremy Rawlings from the TSBE, together with James Heptonstall and Steve Milns from PBA (the sponsoring company), finished a very creditable 4th out of the 55 relay teams, and all six of the individual runners, Chris Knight, Dan Saker, Howard Darby, Jenny Berger, Marek Kubik and Ruth Dowsett ran very respectable times, with the pick of the bunch being Marek in 1hr 33mins.

The runners raised around £2000 for the chosen charities of Leukaemia and Lymphoma Research, Anthony Nolan UK and Alzheimers Society.



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Tell us in one sentence what your company does?

All aspects of construction work from acquisition and design through to maintenance of real estate.

What is the key sustainability/environmental issue your company faces at the moment?

Reducing our carbon foot print.

How is the economic situation affecting the drive for sustainability in the construction industry?

Money is more tight so establishing the priorities for return on spend is key.

Name the top three ideas or projects that your company has initiated to tackle sustainability and environmental issues.

Sponsoring our research doctorate, waste segregation on sites, reducing emissions from vehicles.

If you had a million pounds to tackle environmental issues, what project or idea would you start or add to.

I would sponsor some more research doctorates and try to set up a scheme whereby the river and weir outside our head office is used to generate our own power.

Has the EngD partnership helped your organisation?

Yes in terms of raising staff awareness and as a marketing tool to the outside world that we take environmental issues seriously.

What part should academia play in aiding businesses with environmental issues and sustainability in the future?

Providing research and knowledge to provide practical solutions

Tell us one thing that not many people know about you

Ha - I left the last home game at Manchester City on the goth minute because my son could not take any more, city went on to score 2 goals in injury time to win the title and we could not get back inside. Fate!!

Retailers Shop at TSBE Centre for Sustainability Research

The UK has the most progressive retail sector in the world for sustainability. Newly commissioned research at the TSBE Centre will support major retailers in meeting challenging environmental goals.

Johnson Construction sponsors Research Engineer Sahm Sawaf, whose project aims to reduce energy use in supermarkets by mitigating the effect of the weather on the indoor environment. Sahm is supervised by Prof. Janet Barlow and Dr. Emmanuel Essah.

Marks and Spencer have just started working with the TSBE Centre and the School of Systems Engineering to research remote building control systems and their contribution to energy efficiency. Sainsburys will be the latest retailer to

work with the TSBE Centre, when their research project investigating embodied carbon within the construction of supermarkets starts in the autumn.



footprint

The TSBE Centre newsletter

Green Gown Award for Carbon Brainprint project



From left to right: Howard Darby, Abbas Elmualim, Tom Yearly, Derek Clements-Crome

Researchers from the Universities of Reading and Cambridge, contributed to the 'Carbon Brainprint' project led by Cranfield University which achieved 'Highly Commended' from the Green Gown Awards for sustainability excellence. The project developed a robust lifecycle-based methodology for quantifying the intellectual contribution of higher education institutions in reducing CO2 emissions through research activities

TSBE research engineer, Howard Darby, analysed two building case studies, for the project. These investigated; Influencing user behaviour and 'Intelligent' monitoring and control systems, as complimentary approaches to energy efficiency and CO2 reductions in buildings. The studies were based on work carried out by Tom Yearly from the Facilities Management Directorate (FMD), Carnego Systems Ltd and Newera Controls as part of the University of Reading's Carbon Management Plan. The former resulted in a 20% saving in lighting, office equipment and catering energy use in the Carrington building and the latter

demonstrated a 24% reduction in heating energy at Henley Business School, Greenlands campus.

The University of Reading team, led by Professor Derek Clements-Crome and Dr. Abbas Elmualim from the School of Construction Management, highlighted the benefits of a collaborative approach to research. The project showed that that research and innovation have huge potential to reduce emissions.

Further details on the Carbon Brainprint project can be found on the project website: www.carbonbrainprint.org.uk

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Royal handshake for researcher

TSBE Centre researcher Michelle Agha- Hossein, sponsored by Halcrow, was in the royal spotlight when she was invited to meet and discuss her work with the Prince of Wales at the Institute of Civil Engineers/Halcrow Sustainability lecture. The Prince, who is well known for his interest in architecture, delivered a keynote lecture and called for engineers to work with communities and the landscape to create different structures which are 'in harmony' with nature and produce less carbon.

STEMNET

Passionate about their own research, the TSBE Centre researchers and staff are keen to share their enthusiasm about science, which is why they are supporting the STEMNET Ambassadors Scheme.

STEMNET aims to create opportunities to inspire young people in Science, Technology, Engineering and Mathematics (STEM). Its Ambassadors volunteer their time to provide a free resource for teachers and schools contributing through a variety of activities such as events, clubs, careers talks, lessons and competitions.

To find out more visit:

www.reading.ac.uk/stemnet or www.stemnet.org.uk



Energy and Greenhouse Gas Emissions model published

Environmental Science and Technology journal have published research carried out by TSBE Research Engineer Dan Williams and supervisor Dr. Yinshan Tang from the Informatics Research centre. Their work developed a methodology which will enable the energy consumption and greenhouse gas emissions of electronic software distributions to be calculated.

Dan is sponsored on his EngD by Microsoft and further details on his work can be found at: www.reading.ac.uk/tsbe/tsbe-profile-dan-williams_1.aspx

The article is published in: Environ. Sci. Technol., 2012, 46 (2), pp 1087-1095

BIM Research will help save carbon

BIM (Building Information Modelling) is a buzz word in construction at the moment. Researchers from the Design Innovation Research and TSBE Centres have joined forces to investigate how BIM can contribute to the sustainability of projects. The work is supported by Bentleys, Crossrail, Excitech and Capita Symonds.

Look out for more details in the next newsletter



Solar, Clean & Green

In December last year, the University had two solar PV systems installed on campus by SSE, one of the TSBE Centre's research partners.

Together the systems have a capacity of just under 50kW. SSE met the cost of the systems in return for the feed-in tariff payments generated. The electricity generated is sufficient to power the Carrington building's heat pump system and provide six-weeks of lighting in the Facilities Management Directorate building (or more importantly to make about half a million cups of tea*)

Both systems are performing well with combined energy production of over 19MWh to the end of May, saving over 11 tonnes of greenhouse gas emissions.

TSBE researcher Peter Burgess is looking into low cost weather corrected performance monitoring methods for PV systems, sponsored by SSE and Solarcentury. The performance of the new University systems together with data from the University's weather station now forms part of the evidence base for this work. The installation of the solar panels is part of a wider Clean & Green programme to cut the University's carbon footprint 35% from the 2008/9 level by 2016. As a leader in climate change research, it is important for the University to show that it is living its values.

By Peter Burgess. Read more at: www.reading.ac.uk/news-and-events/PR426925.aspx

Designing for Heat and Humidity

Building facades are now being recognised as not just static and inert elements that seal off a building from the outside; or just aesthetic elements (as the name implies) that exist purely to give a building an architectural expression.

Facades can act as 'skins' that wrap around a building and interact dynamically with the external environment; with proper engineering, the facade will moderate the environment to produce an acceptable internal one with less energy consumed.

Buro Happold realised there is a lack of research and proven passive facade technology for providing thermal comfort in hot-humid climates. The issue in this climate is that the high humidity makes high temperatures much less bearable. Air conditioning and dehumidifiers are generally used to make indoor conditions more comfortable, but these are energy intensive.

Bridget Ogwezi, sponsored by Buro Happold, is researching how the building skin can present an opportunity for exploiting the hygroscopic properties of materials to reduce indoor relative humidity. She will carry out tests natural materials like wood and cellulose based fabrics to see how they can be engineered specifically to increase the surface area available for moisture absorption to take place and thereby make a definite impact on the comfort conditions of the building users. The result of this will be an integral or retrofitted facade element that complements other passive measures in naturally ventilated building in hot-humid climates to improve thermal comfort.

The project 'Hygroscope' demonstrates the hygroscopic nature of wood and is a precedent for exploiting it as an adaptive facade element to control humidity.



This is an intervention

Improving the energy performance of non-domestic buildings can play an important role in meeting UK energy targets. Researcher Michelle Agha-Hossein is working with Halcrow to investigate whether/how interventions can be employed to save energy without compromising occupants' satisfaction, well-being and productivity.

An intervention could be any introduced change to the working environment, from a simple sticker reminding employees to turn off lights, to more advanced energy saving technologies. Michelle's research looks at two very different types of intervention: the first (and main) technical intervention was to provide a newly refurbished work environment, while the second is to introduce behavioural interventions such as interactive posters to the building which will encourage employees to save energy at their workplace.

The newly refurbished case study building, in stark contrast to the old building, is mechanically air-conditioned, completely controlled by a building management system (BMS), and fitted with technologies such as PIR and daylight sensors. The occupants were allowed no control over their environment in the new building. The results of this research so far have showed that the base-load electricity consumption, in m², in the new building was 65% less than the old building. However, the new building's CO₂ emissions rate in 2011 was 3 times higher than the design target. Michelle is working on reducing this gap with the second behavioural intervention.

Find out more about Michelle's research by emailing her at m.aghahossein@pgr.reading.ac.uk.



Curtailing curtailment

Many electricity markets are decarbonising by investing heavily in wind. Northern Ireland is a prime example, planning to grow its wind capacity fivefold, aiming to provide 40% of its electricity through renewable energy by 2020, a mere 8 years from now. For such a small island electricity system, this presents some serious challenges, one of which is a growing problem of curtailing wind generation.

It is currently not possible for all the power plants in Northern Ireland to be switched off, even if there is enough instantaneous wind to meet demand. The system operator requires at least three power plant units to be running at all times, in order to ensure that if one trips unexpectedly, the others can increase their output. This system security limitation presents a barrier to renewable integration,

as wind generation will have to be limited, or curtailed, when it exceeds these levels.

Research Engineer Marek Kubik, together with industry sponsor AES, is looking into ways of altering the operation of AES's conventional generation in order to reduce the frequency and severity of wind curtailment in Northern Ireland, and help the Irish system meet its ambitious goals. Initial findings show that some significant reductions to curtailment could be made by utilising the fuel flexibility of Kilroot Power Station, located near Belfast, to reduce its minimum generation contribution and free up demand to be met by wind.

Find out more about Marek's research at mlkubik.tumblr.com or by emailing him at marek.kubik@aes.com.



Green walls keep cool at Chelsea

Just back from the Chelsea Flower Show where her research on the effect of plants in urban environments was showcased, Royal Horticultural Society and University of Reading research scientist, Dr. Tijana Blanusa is looking forward to supervising a project with the TSBE Centre next year. The EngD research project, sponsored by RHS will focus on the role of green walls in the urban environment and will seek to understand the barriers to their uptake.

'Plants can do surprising and amazing things'

Dr Tijana Blanusa

Further details on Dr. Blanusa's work can be found at: www.reading.ac.uk/biologicalsciences/t-blanusa.aspx

Visit to NREL

Researchers Peter Burgess, Marek Kubik and Daniel Saker presented their research at the 2012 World Renewable Energy Forum, held in Denver, Colorado. The conference included an opportunity to visit the National Renewable Energy Laboratory (NREL) facilities at South Table and the National Wind Technology Centre. This enabled the TSBE researchers to connect with international research taking place there.

Read more at www.ases.org/conference