

Welcome to our new SEES Research Engineers

Welcome to our 3rd intake of Research Engineers! 9 new REs recently attended their EngD Induction programme – see below for details.

It has been an excellent year for the SEES IDC. The programme has been renewed and refreshed after a 'greenfielding' event earlier in the year attended by graduates, REs, industrial and academic supervisors and members of our Advisory Board. In a major review of its IDC portfolio EPSRC have commended our Centre rating it as one that was "thought of most highly", with specific plaudits for **industrial engagement** and impact, along with our RE Feedback Forum.



Induction

A focus for this year is to consider the impact that your EngD work is leaving on sponsor companies/sectors and to broader policy. This will have benefit for sponsors, REs and the IDC.

Dates for your diaries: **26 and 27 June** for the 2012 Conference. The Centre for Environmental Strategy (which hosts the IDC) will be celebrating its 20th Anniversary at the same time so it will be an even more impressive event this year!

New Starters



Adam Luqmani will be working with InterfaceFLOR on 'A competitive solution for significant carbon footprint reduction across

InterfaceFLOR's European assets.' Adam studied his MEng in Architectural and Civil Engineering at the University of Bath and completed his placement at Edenvale Young Associates.



Craig Brown will be working with Bosch Thermotechnology Ltd on a project called 'Intelligent Heat Solutions: Concepts and Strategies for Product Development.' Craig studied his MEng in Chemical Engineering at the University of Birmingham and spent part of his degree at the National University of Singapore.



Emily Gould's project with Schneider Electric will be on 'Charging Infrastructures for Electric Vehicles – Identifying and Developing Business

Within Target Sectors.' Emily studied for a BA in Business and International Finance at Oxford Brookes University and has an MSc in Corporate Environmental Management from the University of Surrey.



Jamal Miah will be working with Nestlé UK Ltd on a project called 'Delivering an integrated strategy for a sustainable, low carbon

food production facility'. Jamal studied his MEng in Chemical Engineering at the University of Leeds. In 2010 Jamal received an Internship for Yantai Wanhua Polyurethane Co in China.



Douglas Morton sponsored by Sony Broadcast and Professional Europe will work on 'The design, development and build

of five 'green' outside broadcast vehicles driven by the concept of Design for the Environment.' Douglas studied his BSc in Product Innovation at the University of Hull.

Azadeh Fahimi will be working with



Thames Water 'Mitigating Risk Associated with the Management of Trunk Mains Networks.' Azadeh obtained her Bachelors in Mining Engineering from

the University of Tehran and has a MSc in Water and Environmental Engineering from the University of Surrey.



Michael Rustell sponsored by HR Wallingford Ltd is 'Knowledge extraction and development of a decision support system

for conceptual design of sustainable liquid natural gas terminals under risk and uncertainty.' Michael studied his BSc and MSc in Civil Engineering at the University of Plymouth. He has worked as a Design and Advertising Manager for RST Developments and as a Structural Engineer for the Royal Navy.



Jade-Ashlee Cox will be working with Surrey County Council on a project to develop 'A systems approach to delivering a World Class

Waste Solution Materials innovation.' Jade has a BSc in Physical Geography from the University of Durham along with an MSc in Environmental Technology from Imperial College London.

Rosanna Kleemann's project with Thames Water is 'Sustainable Phosphorus Recovery in Waste Treatment Plants.'



Rosanna studied her BEng in Civil, Structural and Environmental Engineering at Trinity College Dublin and her MSc in Water and

Environmental Engineering at the University of Surrey.

EPSRC

Engineering and Physical Sciences
Research Council

Featured RE – Stafford Lloyd

Sponsor company: Rolls-Royce

Project title: Evaluation of the life cycle environmental impacts of products and their integration into a bespoke decision support framework

My project began in October 2007, co-sponsored by Rolls-Royce with their Defence Aerospace business based in Bristol. Rolls-Royce is a global power systems company who manufacture and provide services for gas turbine engines for use on a wide range of civil and military aircraft, as well as diversified energy and marine applications and other businesses. The company had developed a tool for producing product based environmental assessments, based on a simplified version of life cycle assessment, to be used within the design process. My task was to figure out how the environmental information provided by the tool should be used to influence design decisions.



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Design for Environment (DfE) or Ecodesign are terms usually used to describe activities that focus on the environmental impacts of a product in design. Through a review of the literature, and how other businesses approach DfE, I came to the conclusion that the most successful approaches apply a methodology relevant to the decision-making context of a business or industry. The nature of Rolls-Royce's products presented some unique constraints. Over the life cycle, the 'in-use' phase contributes a very large proportion of the overall environmental impact. Despite there being significant environmental impacts from other phases of the life cycle, the company struggled to get traction to address these within the design process. Rolls-Royce also required the environmental information to be presented in a format that the business could understand within standard decision-making processes.

Rolls-Royce frequently use risk management processes to evaluate whether or not a design will meet requirements. To integrate environmental considerations into design decisions I have developed a framework that translates environmental information into an assessment of business risk. The risk based approach is not only consistent with existing decision-making processes, but also demonstrates how non-use phase

environmental impacts can affect the business, and are important to address in design.

To develop and test the framework I co-ordinated focus groups, consisting of senior managers and environmental specialists within Rolls-Royce, to develop a business position on pertinent environmental hazards. These hazards have formed the basis of case studies to prove that the framework works, using design data from several of Rolls-Royce's products, including one of its newest Trent engines (pictured). Applying the framework within the business has produced some really interesting insights, in particular how using risk allows environmental information to be used in design trade-off decisions; for example balancing the performance benefits of using a scarce material with the risks this poses to the business. I intend on presenting my findings at an Ecodesign conference in Kyoto, Japan, later this year.

I'm now coming towards the end of my EngD and it has been a fantastic experience. A personal highlight for me was the advanced leadership module in the Brecon Beacons (pictured). It's great that Research Engineers get the opportunity to take part in such a diverse range of modules and events, as well as engaging in timely, cutting edge research in industry.



Brecon Beacons

Conferences



Berkeley University, California

This year the International Society of Industrial Ecology (ISIE) conference was held at Berkeley University, California from June 7th to 10th. It was attended by three of our RE's, Paul Jensen, Dave Cobbledick and Emma Keller who were all presenting some of their research work. Both Paul and Dave presented in the Eco-Industrial Development and Industrial Symbiosis session on the first day. Paul spoke about diversity and its role in the facilitation of industrial symbiosis and Dave took to the floor to talk about data and knowledge management for industrial symbiosis development. Both presentations were really well received and the speakers were asked some interesting and challenging questions by fellow researchers and experts in the area. But with only 12 minutes to speak and 3 minutes for questions there wasn't much time for in depth discussion and so conversations continued on afterwards in the sunny courtyard of the Berkeley campus. Emma presented on the second day on greenhouse gases in environmental certification schemes, in the session on footprint analysis, reporting and communication. It was Emma's first presentation at a conference, but the audience were engaging and keen to hear about the depth behind environmental labels everyone is familiar with.

The conference was intense, with up to 15 presentations a day to watch as well as a keynote panel session to kick the day off and a themed dinner on University grounds to bring it to a close. The diversity of the talks and range of experts present to listen to and network with however, made the four days fly by and the jet lag seem a distant memory. The three were then able to relax a little after the conference and spent the weekend in San Francisco, where they spent time eating burgers (American

style), hiring bikes and cycling over the Golden Gate bridge towards the Redwood forest and experiencing the liberal and obscure range of bars that make up the city's nightlife. All in all, it's pretty certain that the messages they put across and the lessons they learnt, definitely were enough to offset the flights; all in the name of industrial ecology!



Michael Rustell (Yr 1) attended a 3 day workshop for the European Group for Intelligent Computing in Engineering held at the University of Twente in

Holland. The workshop was aimed at novel applications of artificial intelligence in civil engineering and Michael wrote a paper with Dr. Y Rafiq (University of Plymouth) on the development of a software module that transforms conceptual building designs created through artificial intelligence into interactive 3D models that afford the designer a better understanding of a chosen solution. Other topics included novel uses of genetic algorithms to logistical planning and the use of a pattern recognition algorithm for the detection and recording of potholes in road networks.



Steve Brown (Yr 1) attended the Waterwise Water Efficiency Conference 2011 in March. The one day conference presented a range of work which has been undertaken

on water efficiency programmes and metering projects in the UK. The speakers were representing regulatory bodies, water companies and Local Authorities. The conference provided an excellent arena for interested parties to share knowledge and experience of water efficiency programmes.

Steve also attended the Westminster Energy, Environment Transport Forum Keynote seminar: The future of the water industry-expectations for the White Paper in July. The conference focussed on the content of the eagerly awaited Water White Paper, which is due out in December 2011. The overarching objective of this conference was for DEFRA to obtain a steer from the water sector as to where the focus of the White Paper should be placed.

In summary, Steve's interpretation of the event was that the White Paper should be a road map for the sector and not overly prescriptive. The paper should encourage and demand innovation for the challenges that lie ahead, such as climate change and increased sector competition. There appeared to be a significant emphasis on customer engagement. It was also noted (by one or two speakers) that hosepipes bans should be considered as part of drought management strategy as opposed to a failing of the water company. The audience felt that the paper was/is a timely publication and followed other important publications such as the Cave Review, Pitt review and others

Conference funding

All Surrey REs are now entitled to claim up to £2,000 over the course of their projects to cover attendance at conferences. Further information is available in your programme handbook. If you have attended a conference please let Lisa know so that we can feature it in future issues of the newsletter.

Research Engineer News

David Williams (Yr 4) has had a paper accepted for the CIBSE Technical Symposium this year. The Symposium is being held on the 6th and 7th of September at DeMontford University. His paper title is 'Projecting building energy demand using probabilistic weather conditions accounting for climate change.'

Congratulations to **Nick Mills** (Yr 1) and Vicky who married on 11th August. Vicky and Nick had a great day and a lot of partying was done by all guests. They then spent 10 days on the Caribbean island of St Lucia spending a lot of time in the sea and drinking the local cocktails. They also toured the rain-forest on zip lines and went to the only drive in volcano in the world, which stinks!



Brunel RE **Peter Macfie** has been awarded The Vice-Chancellor's Prizes for Doctoral Research for his research on prototyping a control centre optimisation tool at National Grid. He was presented the prize at his Graduation ceremony in July.

Congratulations to **Emma Keller** (Yr2) for her place as a new board member of the International Society for Industrial Ecology's Student Chapter.

Richard Hall (Yr4) has published a paper in collaboration with Oxford Brookes University called 'Transpired solar collectors for ventilation air heating'. To access the paper please visit the [ICE Virtual Library](#).

Gail Atkinson (Yr2) is undertaking her EngD, at the Forestry Commission's research agency Forest Research (FR), based at Alice Holt Forest near Farnham. Her work is on the social and environmental benefits of land regeneration, turning brownfield sites into greenspace. Gail hosted an MSc internship (summer 2011) for Francis Ashwood who looked at barriers to using environmentally sensitive soil amendments in land regeneration. SEES Director Chris France & MSc Director Jonathan Chenoweth visited Gail and Francis (with Kieron Doick (FR Supervisor)) in May for an update on both research projects. During their visit they took time to see the Straits, a long-term monitoring plot at Alice Holt which measures many parameters including some fascinating measurements of the carbon sequestration of the forest. A highlight of the visit was climbing the 30m monitoring tower to see canopy level equipment and to look down over Alice Holt Forest. Further information on the research projects discussed is available from Gail (gail.atkinson@forestry.gsi.gov.uk)



David Williams (Yr4) on the birth of his baby girl. Holly Olivia Williams was born on the 19th of April 2011. Holly's big brother Isaac, who is now two, has just about got used to the idea that Holly is a permanent feature!



EngD Social - Somerton July 2011

At the end of July a group of the RES spent a couple of days in Somerton, Oxfordshire, camping in Chris France's garden! The group visited nearby Hook Norton brewery where they were taken through the process of transforming their local water supply into an award winning tipple. This was followed by a BBQ and camp fire in the evening. On the following day the EngDs stretched their legs with a walk in the Oxfordshire countryside. EngD Stafford Lloyd fell foul of local nature getting a large moth stuck in his ear. Numerous methods to extract the moth were attempted, with the long tubing method pictured found to be the most effective. The moth was eventually recovered and Stafford was able to continue his evening by the camp fire.



If you have any suggestions for any social events please contact Lisa Casson or your Feedback Forum representative.



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