Local Energy Challenge Fund
Open to New Applications

“The newest strand of CARES, the Local Energy Challenge Fund, has been created to demonstrate the value and benefit of local low carbon energy economies. For information on the Local Energy Challenge Fund and how to apply and for more information, copy the following url into your browser:
http://www.localenergyscotland.org/funding-resources/funding/local-energy-challenge-fund/challenge-fund-how-to-apply/

The Local Energy Challenge Fund is a two phase scheme. Phase 1 will support applications through support of up to £25,000 to develop the project proposal, complete early feasibility and prepare for Phase 2.

Support will be available from Local Energy Scotland throughout both phases. Intervention levels of up to 100% are available. Phase 1 applications will be assessed by the Local Energy Challenge Fund Panel and must be submitted by May 25th. Phase one offers will be made to successful projects at the beginning of July 2015.

Applications should relate to “large-scale local low carbon demonstrator projects which show a local energy economy approach linking local energy generation to local energy use. This could include projects looking to develop innovative distribution and storage solutions, and with an overall aim to create more local value and benefit.”

If you are looking for a partner as part of your consortium for Round 2 of the LEC, contact energy@hw.ac.uk to discuss your idea and what expertise you think we can offer. Alternatively the Energy Academy may be able to help you find a commercial partner if you are an academic working in the areas covered by the call.
Fledge Funding
3 more awards for collaborative research

Developing intelligent power monitoring capabilities through embedded intelligence – More information: D.Flynn and H.Lewis@hw.ac.uk

An Energy Living Laboratory simulating a residential living space. More information: S.R.Payne@hw.ac.uk

What happens when we inject CO2 into wellbore Cement-Rock Systems – More information: E.Charalampidou@hw.ac.uk

The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

ORIGIN: Call for papers

ORIGIN is an FP7 European project developing sophisticated intelligence for the management of energy in a community, focused on the concepts of aligning energy demand with the availability of renewable-based supply. ORIGIN has two conferences planned to share knowledge and discuss emerging technologies in optimization of community renewables.

Turin: 24th September 2015
Findhorn: 4th June 2015

The organizers would welcome papers for the Turin Conference in the following areas:

Energy system optimisation
Electricity networks
Heat networks
Human engagement in optimisation
Storage
Tariff structure and economics

Interested? See also: http://origin-concept.eu/ or contact Lucy (l.k.bryden@hw.ac.uk)

‘Commercialisation of Energy Storage in Europe’

As members of the Scottish Hydrogen and Fuel Cell Association, the Energy Academy has received notice about a report from the FCH JU on the ‘Commercialisation of Energy Storage in Europe’ from CEO Nigel Holmes. Nigel’s summary of the report is that both Power-to-Power (P2P) storage and conversion to other carriers have the potential to play an important role in providing flexibility to the power system. They will make it possible to ensure that large amounts of renewable energy are not wasted, but are rather used to reduce the amount of required non-RES generation and de-carbonise heating, transportation and the gas grid. However, in order for storage technologies to develop, regulators need to create a level playing field on which storage can compete with other flexibility options.


Are you Interested in visiting FlowWave TT?

If you are a Heriot-Watt student or researcher and you want to see the FlowWave TT facility on April 16th, send an e-mail to energy@hw.ac.uk. Places are available courtesy of Thrive For Business and the Energy Academy. More information: http://www.thriveforbusiness.co.uk/networking-event/site-visit-flowave-tt

IMPEE Summer Studentships Available

The Institute of Mechanical, Process and Energy Engineering (IMPEE) at Heriot-Watt University http://www.hw.ac.uk/schools/engineering-physical-sciences/institutes/mechanical-process-energy-engineering/research.htm is a dynamic, multidisciplinary research Institute focused on promoting excellence across: Biomedical Engineering, Digital Engineering, Energy Harvesting and Conversion, and Multiphase Flow. It is headed by Professor Mercedes Maroto-Valer FRSE.

IMPEE has extensive laboratory and workshop facilities and its staff are actively engaged in a range of high-profile research initiatives. Of interest to the Energy Academy are IMPEE’s activities in the integration of energy micro-technologies into macro-systems. This includes innovations in smart materials, smart devices with the exploitation of their applications in smart vehicles, smart buildings, smart cities, smart grids up to a complete smart infrastructure. We develop the science and engineering of extracting, converting and conserving energy from novel sources in novel ways. Sources of energy include clean fossil fuels (carbon capture and storage), renewable from solar, and wind to more exotic such as bacteria and biomass, including also newer thermo-electric conversion process. Storage of energy through electrochemical and solar thermal routes and combining the energy efficiency schemes are also explored through front line research efforts

IMPEE will sponsor up to 4 students over the summer months to support the research of its members. The bursary will pay an undergraduate student (£250 per week, for 8 - 10 weeks) and cover the HWU standard registration fee for visiting researchers (£70). All other costs (visa, consumables etc) must be met by the project supervisor. All projects must be completed before the end of August. The allocation of these bursaries will be judged by a panel and will be based on the quality of the student applicant and the expected research outputs. A maximum of 1 project (student)/ supervisor can be submitted in this call; the deadline for submission of the application form below is the 15th April and awards will be announced by the 22nd April.

If you are a company interested in beginning a relationship with the University, a Summer Studentship might be suitable. Contact: M.Maroto-Valer@hw.ac.uk or energy@hw.ac.uk
Government commits £60m of funding to Midlands universities for enhancing energy R&D

£60 million has been committed by UK Government for a new energy research project called the Energy Research Accelerator (ERA). This will be a multimillion research hub which will build on the expertise of six leading midlands universities, Birmingham, Nottingham and Warwick, Loughborough, Aston and Leicester and the British Geological Survey and the surrounding industrial base. The Energy Research Accelerator will build upon the power of advanced manufacturing, multi-disciplinary research and industry expertise within the Midlands Region and the leadership of the MS Group of Universities by supporting the strong regional industrial base to harness the potential of cities in the region, as well as by bringing together leading academics in energy research with a proven track record of successfully working at the interface of academia, policy and industry. More information: http://www.birmingham.ac.uk/news/latest/2015/03/18-energy-research-funding.aspx and http://birminghamenergyinstitute.org/2015/03/23/energy-research-moves-into-a-new-era/

NCUB publishes preliminary assessment of Easy Access IP

“Easy Access IP is an approach to knowledge exchange between universities and business under which research institutions offer a free licence to a specific technology, using a simple, non-negotiable, one-page agreement. In return for the licence, the recipient must commit to using the technology to create value for society and the economy, and to acknowledge the role of the Institution as the originator of the intellectual property (IP). By the end of 2014, Easy Access IP had been adopted by 24 Universities and research organisations both in the UK and abroad. The primary aim of the scheme was to increase the interactions between Universities and business by removing the perceived barriers that they may be difficult to deal with or over-value their IP.”

The National Centre for Universities and Business (NCUB) has recently published IP Pragmatics’ preliminary assessment of the Easy Access IP initiative. One albeit selective hereinafter reported finding was that Easy Access IP set out a challenge to industry – if the low level of engagement is due to the difficulty of dealing with Universities, then removal of these barriers should lead to increased engagement from companies. According to the report, this does not appear to have happened to a significant extent, so the report argues “perhaps this demonstrates that the costs and risks of development, the difficulties of reaching potential partners, or a lack of commercial potential may be more important constraints to wider uptake of University intellectual property.” To read the report visit http://www.ncub.co.uk/reports/easyaccessip.html. If you are a company and have strong views on working with universities, let the Energy Academy know by writing to us at energy.hw.ac.uk

Adventures in Energy

The EPSRC Adventures in Energy Call is targeted at cross-cutting, interdisciplinary proposals focused on novel energy technology development. Proposals may consist of a single research project or a suite of small-scale feasibility studies based around a common theme. Collaborative projects are encouraged.

The call closes at 16:00 on Thursday 21 May 2015. Up to £4 million is available for this call; proposals should not exceed £500 thousand in value at 80% full Economic Cost (fEC).

Potential applicants to this call must register their intent by submitting an Expression of Interest via the form at the bottom of the page by 23:59 on Tuesday 07 April 2015, including the names and affiliations of the PI and any Co-Is, the topic(s) of the research, and the approximate value of the funds to be requested.

To be eligible for this call, applicants should hold or have recently held (grant end date on or after 01 January 2014) at least one EPSRC research grant. However, investigators on any current or completed EPSRC grants funded wholly or largely by the EPSRC Energy Theme during the period 2011-14 are not eligible for this call - More information: http://www.epsrc.ac.uk/funding/calls/adventuresinenergy/

Research Methods for Solar PV: Materials and Techniques

Tuesday 14 April 2015, University of Leeds, Great Woodhouse, University House, Cromer Terrace, Leeds, LS2 9JT

This one day course is designed for early stage researchers and PhD students in photovoltaics - and those wishing to update their skills and to meet others in the field. Our theme this year is Materials and Techniques for PV. More information: https://store.lboro.ac.uk/browse/product.asp?compid=1&modid=2&catid=53

Upcoming Smart Grid Workshop | Microgrids | 30 April 2015

An Energy Living Laboratory

The Laboratory is the idea of Heriot-Watt researchers Drs Sarah Payne, Ryan Woolrych, Andrew Peacock, and Joel Chaney. They conceived of the need for an environment that can be manipulated and regulated to conduct controlled experiments in order to validate modelled environments and understand user experiences. It is designed as a space in which academic researchers from engineering, computer science, physics, and psychology can work together alongside companies to develop, for example, climate sensors and desirable methods of control. It will explore people’s attitudes and behaviours under various thermal conditions depending on if they are cognizant of, for example, the availability or non-availability of renewable generation, carbon intensity of the grid electricity supply, and frequency of electricity supply. The occupants’ acceptance, evaluation, and use of various control methods under these different circumstances will be determined. Over time, it is anticipated that the Laboratory will be expanded by adding additional functionality to allow studies on acoustic and lighting comfort.

As well as acting as a facility for accelerating development of innovation arising from the University itself, there will be opportunities for industry to collaborate with the research team by using the Laboratory to test new technologies and systems aimed at reduced energy usage.

With real life application at the heart of the design, the laboratory can be set up to mimic the appearance of a residential living space or working environment allowing simulation of occupant experiences as if they were at home or work.

If you want to work with the Living Laboratory please contact S.R.Payne@hw.ac.uk or any of the team by writing to energy@hw.ac.uk

This week’s Contributors.

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Developing Solid-State, Power Electronics for Real-Time Control

“Power Electronics is the application of solid-state electronics for the control and conversion of electric power. It is that of an enabling technology that influences the performance of, and provides the competitive advantage for, much more expensive devices or systems.” The application and development of Power Electronics is considered to be a £135 billion direct global market, growing at a rate of 10% per annum. The need to apply power electronics crosses a myriad of industrial sectors, ranging from aviation, space, subsea and energy,

At Heriot-Watt, Drs. David Flynn and Helen Lewis have begun a feasibility study to assess solutions for intelligent power electronics that can be adaptive in near to real time to the requirements of the application. They aim to scope and develop an intelligent power monitoring capability through embedded intelligence that uses integrated circuits to measure input power parameters (ex. voltage, current, cos phi etc.) for both 2 and 3-phase inverters.

The work was supported by a grant from the Energy Academy under the latest Fledge funding initiative for projects designed to stimulate collaboration across the University and with the commercial sector. The objective is to create an evidence based roadmap for the future development of intelligence power electronics at Heriot-Watt.

If you are an SME or large company interested in Power Electronics, Prognostics and Condition Monitoring and are looking for a research partner, or simply want to know more, please contact David Flynn by e-mail (D.Flynn@hw.ac.uk) or call 44 131 451 3942. David leads the Prognostics and Health Management Group within the university Department of Electrical, Electronic and Computer Engineering and is Deputy Director of the Microsystems Engineering Centre and is Deputy Director of the EPSRC funded Centre for Doctoral Training in Embedded Intelligence.
Opportunities in Building Integrated Photovoltaics

BIPV refers to photovoltaic systems that generate electricity and function as part of the building. Products such as windows, walls, facades and roofs can be designed as BIPV (e.g., solar tiles) and architects can use these products to provide both function and aesthetic style. Interested? The Knowledge Transfer Network in partnership with SUPERGEN – SuperSolar is running a workshop in London on April 29th. More information: http://www.eventbrite.co.uk/e/opportunities-in-building-integrated-photovoltaics-tickets-15998827925?aff=es2&utm_source=http%3a%2f%2fnews.ktn-

Biotechnology YES and Environment YES – Call Open for 2015

Are you an early career researcher? YES is an innovative competition which aims to raise awareness of the commercialisation of scientific ideas among the research community. YES has been running for 20 years this year and has a track record of inspiring postgraduates to take their careers somewhere they may not have previously imagined.

A team of 4 or 5 members work together to devise a business plan for a company based on hypothetical science. Places are provided FREE of charge to most researchers. The Energy Academy’s Patrick McCarthy has coached winning Scottish ‘YES’ teams since 2005. If you are interested in Environment YES, let me know. I’d be happy to work with you. For more information, contact Patrick on 44 131 451 3881 or see www.environmentyes.org

The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

Engineering solutions for production of chemicals and fuels from alternative resources

Prof Franco Berruti, Director of ICFAR, Western University, Ontario, will visit Heriot-Watt University between 28 April-1 May 2015 as part of a project on "Biochar for Carbon Capture".

He is an accomplished and internationally recognized researcher with research interests in the general area of chemical reaction and reactor engineering for multi-phase systems and in particular gas-solid fluidized bed reaction and reactor technologies as applied to a number of processes involving both catalytic and non-catalytic solid particles.

His work includes the development of hydrodynamic and chemical simulators of chemical processes of industrial interest, thermal cracking processes (cooking reactions, pyrolysis and ultrapyrolysis of various carbonaceous feedstocks: biomass, heavy oils and bitumens and plastic wastes).

If you want to meet Prof Berruti please contact Professor Raffaella Ocone by e-mail to R.Ocone@hw.ac.uk

Are you a student interested in conferences? Conference - Grants for Students

The Energy Storage Research Network, in collaboration with the Energy Superstore, http://energysuperstore.org/ will fund a number of opportunities to help PhD students registered at UK universities to attend the events listed below.

America Square Conference Centre, London, Thursday 4th June
will look at energy storage in the national grid through a one-day IET seminar. The programme will focus on how storage plays a role in current network operations, what the technical issues and practicalities are plus current standards and the challenges and opportunities of the new RIIO regime. The event will also seek to address 'what is next' for our infrastructure and the crucial implementation of new techniques and technology. The ESRN and the Energy Superstore will support up to four students registered at UK universities, to a maximum of £250 each. To apply, please submit proof of student status and a brief explanation of your research interests to Dr Jacqueline Edge (energysuperstore@imperial.ac.uk) by Friday 22nd May 2015.

OSES 2015 is the international meeting place for experts, industry leaders and stakeholders in offshore energy and energy storage. The ESRN and the Energy Superstore will support up to ten students registered at UK universities, to a maximum of £400 each. To apply, please submit your abstract to Dr Jacqueline Edge (energysuperstore@imperial.ac.uk) by Friday 22nd May 2015.

The ECS Conference on Electrochemical Energy Conversion & Storage with SOFC-XIV; Glasgow 26th – 31st July. The conference is an international conference devoted to Solid Oxide Fuel Cells, Batteries and Low Temperature Fuel Cells. The ESRN and the Energy Superstore will support up to ten students registered at UK universities, to a maximum of £120 each. To apply, please submit proof of student status and a brief explanation of your research interests to Dr Jacqueline Edge (energysuperstore@imperial.ac.uk) by Monday 1st June 2015.

The EPSRC Programme Grant on “Energy Materials: Computational Solutions” is hosting its second one-day open meeting, covering experimental and computational work on recent developments and new materials for solar cells, lithium batteries, solid oxide fuel cells and thermoelectric devices. The ESRN and the Energy Superstore will support up to ten students registered at UK universities, to a maximum of £120 each. To apply, please submit proof of student status and a brief explanation of your research interests to Dr Jacqueline Edge (energysuperstore@imperial.ac.uk) by Friday 17th July 2015.
Local Energy Challenge Fund Workshops
Dates Announced

Two dates have been set aside by Local Energy Scotland to learn about the new call for the Local Energy Challenge Fund. The workshops are free and designed to help you find out more about the fund. There will also be updates from the successful Round 1 projects (six projects, total of £20M funding) and how to apply for Round 2. Workshop dates are as follows:

**Monday 27th April**, 10:00-12:30, Best Western Queens Hotel, Perth. Link to register: [https://www.eventbrite.co.uk/e/local-energy-challenge-fund-info-event-perth-tickets-16561722558](https://www.eventbrite.co.uk/e/local-energy-challenge-fund-info-event-perth-tickets-16561722558)

**Tuesday 28th April**, 10:00-12:30, ECCI, Edinburgh. Link to register: [https://www.eventbrite.co.uk/e/local-energy-challenge-fund-info-event-edinburgh-tickets-16561844924](https://www.eventbrite.co.uk/e/local-energy-challenge-fund-info-event-edinburgh-tickets-16561844924)

Both of these events will be an opportunity to meet with other interested groups and to consider how best to shape your project application. This event will help those who are thinking of applying to the Local Energy Challenge Fund and want to find out more details, and will cover:
- Background to the fund and key priorities
- What’s involved in applying
- Timescales and next steps

To apply, download an application form from: [www.localenergyscotland.org/challenge](http://www.localenergyscotland.org/challenge)

For any queries regarding the Challenge Fund or the workshops please contact challenge@localenergyscotland.org

If you intend to apply and are looking to partner, contact energy@hw.ac.uk

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**Scottish Solar: Blue Skies Ahead?**

13 May 2015
5.00pm - 8.00pm
Followed by a drinks & networking reception
Burness Paull LLP
50 Lothian Road, Edinburgh EH3 9WJ
£30 + VAT for non-members
ecoConnect Members attend at a 50%-100% discount

- What practical steps are needed to support the Scottish solar industry – who will be its champions, what policy initiatives are needed?
- How will a **collaborative approach** across the renewables sector to maximise the uptake of solar – eg. with onshore wind – be encouraged
- What lessons can be learnt from experiences elsewhere in the UK?
- Is the building sector sufficiently engaged or will installation costs & familiarity with traditional solar approaches be a barrier to take-up?
- Is there sufficient support for innovation – at both R&D & commercialisation phases

Register: [https://www.eventbrite.co.uk/e/exploring-new-home-energy-control-system-interfaces-for-an-aging-population-tickets-16280222584?ref=enivte001&invite=NzcxNDQxNi9Bb3JkQnUxVHJvY29ja0BjYy51ay8w&utm_source=eb_email&utm_medium=email&utm_campaign=invi temodernv2&ref=enivte001&utm_term=attend](https://www.eventbrite.co.uk/e/exploring-new-home-energy-control-system-interfaces-for-an-aging-population-tickets-16280222584?ref=enivte001&invite=NzcxNDQxNi9Bb3JkQnUxVHJvY29ja0BjYy51ay8w&utm_source=eb_email&utm_medium=email&utm_campaign=invi temodernv2&ref=enivte001&utm_term=attend)

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**Exploring New Home Energy Control System Interfaces for an Aging Population**

**Thursday, 23 April 2015 from 09:00 to 13:30 (BST) The Lighthouse, 11 Mitchell Lane, G1 3NU Glasgow**

The University of Strathclyde is holding a knowledge exchange event centred on exploring new interfaces for home energy control systems for an aging population.

The event will provide an overview of the outputs and opportunities arising from the EPSRC funded project APAtSCHE (Aging Population Attitudes to Sensor Controlled Home Energy)—which investigated the technical and social issues surrounding developing and deploying home automation technologies in social housing inhabited by senior citizens—and include participative activities to inform prototypes of home energy control systems. The event will also include presentations by eminent speakers on policy, technology, and society.

For more information, please contact: Jennifer MacKenzie Institute for Energy and Environment Department of Electronic and Electrical Engineering, University of Strathclyde Tel: +44 (0)141 548 2268 Email: jennifer.mackenzie@strath.ac.uk
Power Take-Off Systems for Wave Energy - R&D Services Call

Wave Energy Scotland Ltd (WES) has issued an invitation to tender for wave energy technology development projects in areas that have been prioritised as requiring the most development and/or having the most impact on the future cost of energy.

See: http://www.publiccontractsscotland.gov.uk/search/show/search_view.aspx?ID=MAR203890

This competition will award technology development contracts for Projects that will:
- Provide a step change in the capital cost and/or efficiency/performance over current technology;
- Deliver a highly reliable PTO via high quality engineering and technology risk management;
- Fit into the overall cost of energy

and which may also:
- Deliver a PTO that can be easily integrated into different wave energy converters (WECs) and WEC device families and
- Develop a PTO that could stimulate a new form of Wave Energy convertor being developed.

The competition will have 4 Stages with Applicants able to apply for one or more Stages.

To register your interest in this notice and obtain any additional information please visit the Public Contracts Scotland Web Site at http://www.publiccontractsscotland.gov.uk/Search/Search_Switch.aspx?ID=341683.

The Application Deadline is 12 noon on 15th May 2015

Total quantity or scope
Up to 100% funding, via a contract for research and development services, is available under this call for:
- Programme Stage 1: Concept characterisation and feasibility studies – up to 0.1m GBP per Project for up to 6 months
- Programme Stage 2: Concept optimisation/proof of concept (including small scale physical testing) – up to 0.5m GBP per Project for up to 12 months
- Programme Stage 3: Engineering development and small-medium prototypes – up to 2.5m GBP per Project for up to 24 months
- Programme Stage 4: Engineering definition and medium-large stage prototypes – up to 4.0m GBP per Project for up to 24 months

If you are interested in this Call, you should record your interest at:

https://www.publiccontractsscotland.gov.uk/Access/Login.aspx?ReturnUrl=%2fnotice%2fnotice_register.aspx%3fid%3dMAR203890&id=MAR203890

Full details can be found in the Call Guidance Document.
CPV: 73100000, 76000000, 31100000, 43328100.
Clean Electricity from Geothermal Energy

The problem of what to do with oil and gas wells at the end of their life-cycle is one that increasingly requires attention. With significant ‘sunk’ costs and no method of reinstatement, wellbores are abandoned after use and fall into disrepair leaving a potential environmental headache.

Current estimates suggest approximately 2.5 million wells sit abandoned in the US, with a global count in the tens of millions. These figures will continue to rise as the wells drilled over the last 20 years reach the end of viable production.

Developing a novel approach, a study by Neil Wight and Dr Nick Bennett at the Institute of Mechanical, Process and Energy Engineering at Heriot-Watt University has identified a potential opportunity from these abandoned wells. This allows them to take on a second life; producing clean electricity using the wellbore structure for its geothermal potential. Crucially this approach operates in a self-contained manner, independent of the surrounding environment and has no requirement for naturally occurring geothermal fluid. Analysing data for 2,500 land wells in Texas, the team evaluated geothermal gradient and the potential for their approach to produce electricity effectively in combination with abandoned wells across various well depths. Net power outputs of between 109 kW and 630 kW were found for systems capable of continuous operation.

Although originally focused on abandoned wells, the approach offers interesting potential for the production of geothermal energy in areas considered to have low geothermal potential in the traditional sense.

Drilling wellbores specifically for the production of energy in this way using existing technical knowhow, equipment and methods from the oil and gas industry – a sector which is a speciality in Scotland – could allow generation to take place in areas with no previous drilling for hydrocarbons or an available resource of wellbores.
Contd from Page 1 **Clean Electricity from Geothermal Energy**

Additionally, up-coming drilling programs could be modified to provide a wellbore offering maximum potential for electricity production at end of life; something of particular use for operators developing wells with short life cycles or those drilling exploration wells. While initially applied to Texas, the average geothermal gradient in the UK is 26 °C per km with local gradients of up to 35 °C per km; meaning the development of such an approach in Scotland could be both possible and practical.

If this approach to geothermal energy sounds interesting, please do get in touch with either Neil (nmw30@hw.ac.uk) or Nick (n.bennett@hw.ac.uk) who will be happy to discuss further, including the straight-forward step of adapting this model for testing and identifying suitable sites in Scotland.

To learn more about the work of Nick Bennett go to http://www.hw.ac.uk/schools/engineering-physical-sciences/staff-directory/nick-bennett.htm

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**Thrive for Energy Club**

Date: Friday 24th April  
Venue: The Scotsman Hotel, Edinburgh  
Start Time: 8am  
Finish Time: 10am  
VIP Speakers:

Brenda Park, Senior Consultant - Solar, AMEC Foster Wheeler  
Mike Hogg, BDM, Clearfleau

Click here for full details of the meeting:  
http://www.thriveforbusiness.co.uk/networking-event/clearfleau-amec-foster-wheeler

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The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.
The first Chemistry in Energy conference, organised by the Energy Sector of the Royal Society of Chemistry, is being hosted by Heriot-Watt University next July and will bring together scientists and technologists with an interest in the application of chemistry in the energy industry.

The event will cover all aspects of energy-related research, where chemistry and the chemical sciences play a key or underpinning role in solving the UK’s combined energy challenges of carbon emissions, energy costs and security of supply. The scope of the conference will be broad and will include all energy forms and technologies.

For more information: http://www.sccs.org.uk/events/1st-chemistry-in-energy-conference

To register: http://www.maggichurchouseevents.co.uk/cec/index.htm

Local organizer: Mercedes Maroto-Valer (M.Maroto-Valer@hw.ac.uk)

Meet the Energy Academy at All Energy 2015

All Energy http://www.all-energy.co.uk/ is considered the largest renewables event in the UK and takes place at the SECC in the renewables hub of Glasgow for the first time on Wednesday 6 and Thursday 7 May 2015.

Heriot-Watt will once again be exhibiting at All Energy. Registration is free and is now open https://www.livebuzzreg.co.uk/2015/alle15/?ga=1.187512360.1638166610.1397049479

To meet with the Energy Academy team, either send an e-mail to energy@hw.ac.uk and arrange to meet us at the Heriot-Watt University stand or if you have registered use the MyEvent facility https://www.all-energy.co.uk/en/MyEvent/Website-Sign-Up-login-form/?RetUrl=xSfsSxMyEventsSfsSxWebsite-Sign-Up-view-profilexSfsSx to book a meeting. We look forward to seeing you there!

Meet the Energy Academy at All Energy 2015
Experimental Geochemistry Investigation of CO₂ Induced Damage of Wellbore Cement-Rock Systems

Carbon Capture and Storage (CCS) has a key role to play in curbing CO₂ emissions from thermal-power generation and industrial processes alongside renewables, energy efficiency, nuclear and other mitigation options. However, there are still challenges that need to be overcome before CO₂ storage can be deployed to substantially reduce carbon emissions.

The idea behind subsurface storage is that CO₂ could be injected into deep (> 800m) suitable geological formations entering the host rock pore space initially occupied by fluids. It’s thought that its fate depends on specific circumstances: for example, injected CO₂ could migrate upwards as a separate phase, due to buoyancy and get physically trapped; alternatively, it could fully dissolved in the in-situ fluids within the rock, leading to changes in pH, redox states and density. These changes could lead to fluid motion, or to in situ precipitations of solid carbon-bearing minerals, along complex process pathways.

When CO₂ is injected into storage sites, it may affect the wellbore cement integrity by altering (weakening) the cement properties, which could potentially lead to CO₂ leakage along the wellbore track. Furthermore, it may be possible that CO₂ injections may develop local stress changes, due to the adding chemical loads to the pre-existing thermo-mechanical loading of the reservoir. This could create new fractures or re-activate pre-existing faults that might be distant from the injection well either within the reservoir or in the overlying sealing cap rocks. Potential CO₂ seepage through fractures, faults and wells could then be a critical issue affecting the long-term security of the store.

Through Fledge Funding from Heriot-Watt’s Energy Academy, Dr Elli-Maria Charalampidou, Dr Susana Garcia, Dr Helen Lewis and Professor Mercedes Maroto-Valer will investigate the impact of CO₂-induced geochemical reactions on wellbore integrity and the mechanical integrity of cement-carbonate rock systems by looking at the chemical reactions between CO₂ and carbonate-rock cement assemblies and the emerging deformation processes on such assemblies in simulated reservoir conditions. In order to achieve this, two research groups have been brought together by the Energy Academy (EGIS-IPE and EPS-IMPEE) to bring to bear expertise from across Heriot-Watt University.

The research team will develop an experimental system that mimics conditions underground and in bore holes. This will allow the identification of the deformation processes that develop in the carbonate rock and cement assemblies due to the chemical, thermal and mechanical (isotropic) loading. Environmental Scanning Electron Microscopy (ESEM) of high-resolution digital images, covering cross-sections of interest (e.g. rock-cement interfaces), will be used to understand the mineral changes and the deformation features at the micro-scale (grain-pore deformation and micro-fracture creation) in the tested rock-cement assemblies.

The research team will also compare the rock-cement assembly pore networks before and after laboratory deformation using digital image analysis techniques and the use of in-house software based on stochastic modelling aiming also at calculating porosity changes in regions of interest.

If you are interested in subsurface carbon capture and storage or want to understand more about this work, contact Dr Elli-Maria Charalampidou (E.Charalampidou@hw.ac.uk), Dr. Susana Garcia (S.Garcia@hw.ac.uk), Helen Lewis (H.Lewis@hw.ac.uk) or Professor Mercedes Maroto-Valer (M.Maroto-Valer@hw.ac.uk).
Biofouling Solutions for Marine Renewables Knowledge Network Development

The UK government has set the objective of delivering at least 15% of electricity from renewable sources by 2020. Governmental projections of electricity generation from these sources have created significant interest in Orkney as a leading region for large scale deployment of wave and tidal energy converting devices.

Orkney has a well-developed infrastructure supporting the marine energy industry. This has recently been enhanced with the construction of additional piers and harbour structures designed to facilitate the growth of the marine energy sector.

A major concern to industries working in the marine environment is biofouling - the settlement and growth of organisms on submerged structures. The hydrodynamic and mechanical consequences of biofouling organisms on moving structures, e.g. marine turbines, include increases to surface weight and roughness thereby impacting drag, and survivability of devices; decreasing efficiency of energy generation; contributing to or accelerating corrosion of marine metals that could affect subsea connectors.

With support from the Energy Academy and working with the European Marine Energy Centre on Orkney, Dr Jo porter and Dr Andrew Want are looking at factors that influence the behavior of key fouling organisms with the aim of drawing up recommendations to inform maintenance schedules for marine devices. They also want to build a network of partners associated with marine energy test centres crossing the boundary between biofouling analysis and device maintenance. Such a network would provide an opportunity for scientists to work closely together with test site personnel and developers to gather data, to share knowledge and to formulate expertise on specific aspects of biofouling that are relevant to the marine renewables.

If successful it’s hoped that the work will suggest how best to undertake seasonal biofouling monitoring programmes at the EMEC test site and systematically document biofouling at harbour areas.

More information? Contact J.S.Porter@hw.ac.uk or telephone 0131 451 3148
Do You Want to Access European Funding?
New Scottish Enterprise EU Funding Portal Launched!

Designed as a single, go-to source of information on EU funding programmes, the recently-launched Scottish EU Funding Portal is a free online resource for organisations interested in EU funding and transnational project collaboration. “Developed in response to demand from Scottish stakeholders, the Portal aims to establish a single source of information on EU funding programmes for which Scotland is eligible. “

The Portal is a partnership project between Scotland Europa, Scottish Government, East of Scotland European Consortium and West of Scotland European Forum. Providing information to registered users about EU Programme opportunities, the Portal will guide users to contacts and organisations who can support the development of an EU project. Partnerships will be fostered and forged through the Partner Search area, whilst providing a resource to explore the types of EU projects Scottish companies are currently - or have previously been - involved in. There will be an area in which to share news, publications and details of events which users think will be of interest to a wider audience.


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Measuring and Collecting Wave and Tidal Data

Accurate data sets are regarded as invaluable to engineers & scientists involved in offshore / coastal research and design. Tidal predictions are affected by both local topography and environmental conditions. Models cannot predict ‘accurately’, extremes and return times, if not validated for complex topographic regions ‘remote’ from a primary tidal measurement site ‘port’.

At the International Centre for Island Technology (ICIT) on Orkney, with support from the Energy Academy, Dr. Robert Harris is working with Stromness-based Aquatera Ltd to develop a prototype buoy capable of measuring accurately, wave height and period and tide amplitude and phase that can be used in areas that are ‘remote’ or ‘uncertain’ with respect to their specific topographical variations and indeed which may also be susceptible to localised environmental (low / high pressure) differences.

The buoy which has been designed for coastal waters will be unique and able to measure accurately wave height and period and tide amplitude and phase simultaneously. The initial design will allow for one month remote operational capability with a design scope for 3-4 month operation prior to physical data download. Other key design features of the instrument include low cost of construction, ease of deployment and flexible compliant mooring.

The instrument will provide a low cost option to wave and tide data recording, the ease of installation, remote recording and design providing for greater opportunities for cross discipline research, i.e. engineering / environmental / biological. The unique data sets it is designed to collect will allow for greater insight into predictions of extreme wave / tide conditions towards associated research in: coastal structures, benthic / shoreline marine organisms, shore protection etc. Applications such as: coastal defence design, harbour design, breakwater design and compliant moored marine structures (particularly with mooring stiffness characteristics proportional to the water depth) are perceived.

Once built, it will be tested in the water in July / Aug 2015 with the aim, if proven, to seek further funding to develop the unit towards possible commercial production albeit on a small scale. More? contact R.Harris@hw.ac.uk or call 01856 850605.

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The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.
System Effects of Wind Forecast Error on Wind Generation of Electricity

Wind generation of electricity presents specific problems to the operation of electricity networks because of its intermittent nature and because its output cannot be guaranteed ahead of dispatch. Network operators rely on wind generation forecasts to estimate its future contribution to demand matching. However, these forecasts contain errors which increase in magnitude with prediction horizon, disrupting network balancing with attendant environmental and economic effects.

With support from the Energy Academy, Heriot-Watt’s Dr. Andrew Peacock, Dr. Edward Owens and Dr. Manju Dissanayake are developing new software that can be used to build a dataset from publically accessible on-line data sources that can then be interrogated by developers and researchers to explore the effects of forecast error on network balancing.

The analysis undertaken by the Group will bridge the gap between statistical treatment of forecast errors of wind generation and its impact on electricity network balancing to allow the creation of an applied forecast error that may be economic and/or environmental in nature.

Once collated, it is hoped that this information will be maintained and expanded and made available to registered users via a web service based interface.

The Heriot-Watt research group is gaining international traction in the field of community scale demand response and its relevance to future energy systems that contain substantial quantities of renewable generation. The Group seeks to engage across a broad stakeholder spectrum of stakeholders from policy makers to electricity network evolution to community participation in energy transitions.

More information? Contact A.D.Peacock@hw.ac.uk or telephone 0131 451 8310 or to learn more about the work of the Research Group, contact E.H.Owens@hw.ac.uk or telephone 0131 451 3743.
Microgrids – Workshop

Power Networks Demonstration Centre, University of Strathclyde, 62 Napier Road, Wardpark, Cumbernauld, G68 0EF
30th April 09:30 – 13:30

Who should attend: Companies with Smart Grid capabilities (ICT, sensors, monitoring, data analysis) or those with a general interest in microgrids.

Microgrids have global applicability and Scotland is one of the unique places where testing and implementation of new innovations is happening.

The workshop will examine the rise of microgrids as an innovative concept for secure and efficient electrical energy provision in campuses, business parks, cities, communities and islands.

The event will highlight how the Power Networks Demonstration Centre (PNDC) can act as a focal point for accelerating developments in this area, as well as collaborative working opportunities with Scottish companies. It will also explore the international context and landscape of microgrids and business growth opportunities.

Speakers include:

- Dr Andrew Roscoe, University of Strathclyde
- David Rutherford, PNDC
- Laura Campbell, Local Energy Scotland
- Rachael Taljaard and Stuart Duncan, Smarter Grid Solutions

This workshop is part of the Scottish Enterprise Smart Grid Supply Chain Events Programme. A buffet lunch will be provided on the day.


This week’s Contributors.

Patrick McCarthy (P.McCarthy@hw.ac.uk)
Jo Porter (J.S.Porter@hw.ac.uk)
Robert Harris (R.E.Harris@hw.ac.uk)
Andrew Peacock (A.D.Peacock@hw.ac.uk)
Mark Whittet (Mark@ScottishEnergyNews.com)
Mercedes Maroto-Valer (M.Maroto-Valer@hw.ac.uk)

Heriot-Watt Energy Academy is sponsoring Cleantech Innovate Scotland in Glasgow 2015. It follows a successful showcase in London at the Institute of Mechanical Engineers on February 12th when 36 clean-tech and renewable energy companies pitched for investment. More information and to register http://www.ecoconnect.org.uk/
Sustainable Energy Systems for Future Human Space Missions (SEnSe)

The European Astronaut Centre (EAC) is part of the European Space Agency (ESA) and is actively developing its research capabilities and working towards developing a test bed facility for technologies that are important for future manned space missions. These include technologies relating to water processing, waste management, automation, robotics and systems architecture. A primary focus is energy generation and energy storage for the lunar environment.

Lunar missions involving humans require essential resources to sustain life. This includes ~5 kg/day/person of metabolic consumables (oxygen, food and drinking water) and ~20 kg/day/person of clean water. A four-year mission to Mars would then require 28 tons of water for each person! Hence, technologies that can recycle food and human waste back into consumables would be indispensable. Energy is paramount to drive the processes that deliver these essential resources, and the longer the missions are, the more difficult it becomes to maintain energy supply.

A manned space mission involving the creation of a lunar base is currently under consideration. Development of accurate models are required to simulate the generation, storage and use of energy on the base, before such a project can be undertaken. A sustainable space-craft/base framework has the versatility to include both traditional – photovoltaic (PV) and thermoelectric generators (TEGs) – and disruptive energy-generation technologies, such as fuel cells (FCs). For PV and TEGs, testing under extreme conditions is needed, as well as estimation of the impact of these conditions on the effectiveness of solar harvesting. Water purification for human consumption will require a power-hungry technology where PV is key.

Heriot-Watt (Drs Nick Bennett and John Andresen are working with the EAC to investigate recycling of organic residues and used water within a Microbial Fuel Cell (MFC) within 24-48 hours where reusable water and CO2 for food crops is produced. This will include novel experimental testing of device performance at HWU, by replication of harsh lunar conditions. In particular will be performance/degradation testing of PV and Thermoelectric Generators as a function of exposure to lunar temperature cycles.

More information: N.Bennett@hw.ac.uk
The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

KTP Innovation Showcase
Technology & Innovation Centre, 99 George Street, Glasgow 28th May, 2015
4:30 – 8:00 pm

In 2015 the KTP programme celebrates its 40th anniversary and the Innovation Showcase will provide a unique opportunity for the KTP community in Scotland to come together and celebrate. At the Showcase we will be welcoming attendees from the diverse range of businesses and organisations that KTP has helped over the years as well as all our key stakeholders from the academic and public sectors.

The event will begin at 4:30pm with a networking reception where delegates will be able to view posters designed by The Showcase will include contributions from the business and academic communities as well as past and present KTP associates. The event will also see the premiere of a new KTP Scotland video which highlights the impact the programme is having all over Scotland.

Register:
http://www.eventbrite.co.uk/e/ktp-innovation-showcase-tickets-16479981067

Offshore Oil and Gas Environmental Monitoring in Colombia

Professor Hamish Mair (School of Life Sciences) chaired a workshop in Bogota, Colombia on 23rd April at the invitation of the Colombian Ministry of the Environment and ACP (Asociación Colombiana de Petróleo). Over 60 participants were involved representing the oil companies with current offshore exploration interests (Ecopetrol, Shell, Repsol, Petrobras, Anadarko), consultancy and service companies, and the main government ministries and agencies. The aim of the workshop was to develop Terms of Reference for the environmental licensing of seismic and exploratory well drilling activities offshore.

An overview of the history and current situation of environmental licensing in the North Sea was given as a basis for looking at best practice for similar developments offshore in Colombia. Professor Mair and colleagues had previously been involved in three other workshops in Colombia related to offshore environmental sampling and monitoring for hydrocarbon activities at the request of Ecopetrol and the government’s ANH (Agencia Nacional de Hidrocarburos). Colombia has an important, long-established onshore oil and gas production sector but it has only recently started investigating its offshore hydrocarbon resource potential (Caribbean and Pacific coastal waters).

Professor Mair also visited the British Embassy in Bogota to update officials in the UK-Colombia Trade mission within the Embassy since they are interested in promoting potential for UK companies to become more involved in the offshore developments. In addition to the technical workshop topics, there is scope for joint collaboration in other energy sectors such as renewable technologies of solar, wind and geothermal. The UK-Colombian government scheme of the Newton-Caldas Funding programme is being investigated for research collaboration potential in the energy sector as well as in various aspects of Colombia’s water and agricultural resources.

If you are interested in building relationships with Colombia in offshore developments or in renewable energy, particularly through the Newton Fund, please send a note to j.mair@hw.ac.uk. For more information on the Newton Fund, visit: https://www.gov.uk/government/publications/newton-fund-building-science-and-innovation-capacity-in-developing-countries/newton-fund-building-science-and-innovation-capacity-in-developing-countries

A report involving Heriot-Watt’s International Centre for Island Technology (ICIT) Orkney Campus estimates that Nova Scotia could generate energy from tidal power equivalent to 2% of Canada’s energy requirements and generate billions of dollars in gross domestic product. The report, ‘Value Proposition for Tidal Energy Development in Nova Scotia, Atlantic Canada and Canada’ was sponsored by the Ocean Energy Research Association in Nova Scotia, and produced by ICIT and can be downloaded at http://www.oera.ca/marine-renewable-energy/tidal-research-projects/other-tidal-research/value-proposition-for-tidal-energy-development/
Heriot-Watt at All Energy

Find Heriot-Watt in the Highlands and Islands and Orkney Pavilion ORK10

Wednesday 6th May
Community Energy - Seminar Theatre Exhibition Floor EX4

12:40 Harnessing Community Energies – ORIGIN Andrew Peacock, Heriot Watt

Thursday 7th May 2015
Grid 3 Technology - Conference Room 3

15:30-17:00 Chair: David Corne, Professor of Computer Science, The Energy Academy, Heriot-Watt University

- Knowing the FACTS – Dr Fahd Hashiesh, Technology Manager, ABB Ltd
- Accelerating renewable connections – Euan Norris, Project Manager, SP Energy Networks
- A solution to save the developer community time and cost with connection at 33kV and 132kV – John Rimell, Principal Business Consultant, British Power International
- VISOR – increasing stability and capacity on the transmission network – Priyanka Mohapatra, Senior Project Manager, Scottish Power Energy Networks
- Impact of electrolyser on the distribution network – Steven Adams, Project Manager, Scottish and Southern Energy Power Distribution
- My Electric Avenue: trialling demand control with electric vehicles (EV) - James Cross, Consultant, EA Technology
- Q&A and discussion

Poster Presentations
Poster Site 1, close to the Offshore Wind Theatre (EX1)

- The valuation of energy storage on UK’s Power Market
  Laila El Ghandour, Heriot Watt University

EU Energy Focus Bulletin

“The EU Energy Focus service is a free, Government-funded service to support European funding for energy-related projects.”

More information: Tel 0845 6000 430
Web: www.euenergyfocus.co.uk

Highlights

Fuel Cell and Hydrogen Call for Proposals. Launch of 2015 Call for Proposals will be published on the FCH JU website http://www.fch.europa.eu/ when they are available.

Webinar on 2015 Call for Proposals – 10th June 2015 Register: http://fch2juwebinar2015.eventbrite.com/

2015 Horizon 2020 Energy Calls for Proposals – deadlines in May and June 2015

The 2015 Call for Proposals for Low Carbon Energy, Smart Grids and Smart Cities closes on Tuesday 5th May. After this, there is only one remaining 2015 Horizon 2020 Energy deadline, on Thursday 4th June. This remaining deadline covers research, demonstration and market uptake projects for buildings, heating and cooling, industry and products and finance for sustainable energy. The Call budget is 82M€.

Download at: https://www.dropbox.com/s/0nawljl
ni1r94m/EU%20Energy%20Focus%20Bulletin%20April%2015.pdf?dl=0
Small farm-scale biogas from food waste in cold climates; an opportunity for micro-biological energy storage

In the warm areas of the developing world small scale anaerobic digestion (AD) systems are growing in popularity. For example in India today it is estimated that over 12 million plants are in operation. They can simultaneously help in dealing with waste, while providing a renewable decentralised source of gas for cooking, gas lighting, heating or generating electricity, as well as producing fertiliser as a by-product. However, in cooler western climates, effective smaller scale AD units are not available, while larger units are well out of the budget range of most farmers; there is however a considerable amount of waste available.

A hybrid-biogas technology has potential to be an important part of the solution to these challenges: combining waste streams and heat storage with microbial processes to generate a gas in a cost efficient way, which can stored provide energy on demand. Yet in rural areas, where organic waste is in plentiful supply, biogas technology in the UK remains under deployed as a result of technological challenges. For example due to UK temperatures being far below the optimal for biogas production, well established commercial small scale tropical systems do not function well. The result is longer digestion periods, which results in much greater digester volumes required, resulting in higher capital costs.

For instance, the new food waste regulations exempt up to 18% of the Scottish population and a significant number of rural businesses from food waste collections. They collectively generate somewhere in the region of 200,000tpa food waste at different parts of the food chain, and this could potentially yield 240GWh equivalent in biogas as well as digestate for organic/sustainable local food production. Admixing of farm wastes is also possible in rural areas.

On the other hand, there are global challenges around energy supply and waste management. For example, on Scottish Island communities there are grid capacity issues, where there are in some cases restrictions or long lead times with adding generation capacity to the national grid. There are also issues of energy poverty in rural communities, who often are forced to pay higher costs for their heating, for example due to lack of connectivity to the national gas network.

Furthermore, energy autarky has been presented as a framework for implementing sustainable regional development. This is the situation in which the energy services for supplying local consumption, local production and export are provided by local/regional energy resources. One key challenge to effectively moving forward with this vision is improving temporary energy storage.

A hybrid-biogas technology has potential to be an important part of the solution to these challenges: combining waste streams and heat storage with microbial processes to generate a gas in a cost efficient way, which can stored provide energy on demand. Yet in rural areas, where organic waste is in plentiful supply, biogas technology in the UK remains under deployed as a result of technological challenges. For example due to UK temperatures being far below the optimal for biogas production, well established commercial small scale tropical systems do not function well. The result is longer digestion periods, which results in much greater digester volumes required, resulting in higher capital costs.

Drs Joel Chaney, Edward Owens and John Andresen are modelling the effectiveness of different hybrid strategies to maintain the temperature of a biogas plant and thereby lower the cost of operation. These strategies might include different insulation, taking advantage of wind to generate heat and produce agitation through mechanical energy; the integration of solar heating and the use of phase change materials in order to maintain a constant optimum temperature for the bacteria; as well as waste-heat harvesting from other available sources , for example extracting and using heat from composting or from waste water.

They will also look at the possibility of using such a hybrid-biogas system as a means to temporarily store, while making use of, excess renewable energy generation in the form of heat. There is then the possibility to extract a portion of this at a later time without upsetting the stability of the microbial system, and there is the added possibility of then using the biogas generated to meet energy demand, when this cannot be met by other renewable sources.

More information: E.H.Owens@hw.ac.uk
Local Energy Challenge Fund

We are counting down the days until the second round of the Scottish Government’s Local Energy Challenge Fund closes to new applications and we want to make sure you don’t miss the opportunity to apply. The Challenge Fund is part of the Scottish Government’s flagship Community and Renewable Energy Scheme (CARES) delivered by Local Energy Scotland. Phase one is all about developing your idea into a phase two project which could draw in funding of £500k - £6m. The fund seeks to support large-scale local low carbon demonstrator projects which show a local energy economy approach linking local energy generation to local energy.

**Straightforward and simple application process**

- Open to a wide range of organisations
- Phase one is about outlining your vision for the project and identifying areas where support is required
- Download the application and guidance notes from www.localenergyscotland.org/challenge
- Register a note of interest with challenge@localenergyscotland.org
- Submit your application by 4pm on the 25th May 2015

**Support available**

- Phase 1 support of up to £25,000 to successful applicants for development and feasibility activity
- Phase 2 funding of between £500,000 - £6,000,000 from April 2016 over two years (subject to the Scottish Government spending review)
- Advice and support throughout the whole process from Local Energy Scotland
- Please email and queries about the process to challenge@localenergyscotland.org. The last date for submitting questions on round 2 is the 18th May 2015

**Available on the challenge fund website:**

- Updated FAQs
- Case studies and details of current round phase 1 and phase 2 funded projects
- Presentations from Challenge Fund events
- A page set up to help projects find partners to work with
- Guidance notes on the application forms and dealing with state aid
- Visit www.localenergyscotland.org/challenge

See how you can work with Heriot-Watt on page 2 of this Newsletter
SAMSUNG Global Research Outreach funding opportunity

Samsung has opened applications for the 2015 Global Research Outreach (GRO) programme, with up to $100k/year available for research in themes including next generation batteries, wireless transmission and fast charging. The Deadline is 31st May 2015. Further details are below.

If you have an interest in applying, please contact the SAMSUNG GRO team directly at http://www.sait.samsung.co.kr/saithome/Page.do?method=main&pagePath=01_about&pageName=gro_process

This is an annual call for innovative research proposals, open to world leading universities to foster collaborative research relationships. - Applicants must be a university professor or researcher but conditions apply – please speak to your RES contact.

More information at: https://www.dropbox.com/s/827om6kddj507j2015%20GRO%20Leaflet.pdf?dl=0

ETP Energy Industry Doctorate Programme Now open for 2015

The ETP has launched a call for applications from ETP member universities for the 2015 Energy Industry Doctorate Programme. The Energy Academy has learned that opportunities in this call will be very competitive. The programme requires industry (or equivalent) partners who will help to define new projects relevant to their business aims and be prepared to make a financial contribution.

To date over 90 high quality PhD studentships have been awarded on a competitive basis since 2011, with evaluation based on academic quality, potential for industrial impact and extent of cross-ETP collaboration. Eligible projects can focus on energy technologies across a range of areas including wind, marine, solar, bio-energy, power & grids, energy conversion and storage, energy utilisation in buildings, carbon capture and storage, oil & gas and cross-cutting energy economics, policy & law. Proposals on a low carbon energy technology not included above will be considered on a case by case basis. Submit your application by June 15th.

To download an application form visit: http://www.etp-scotland.ac.uk/ETPforIndustry/IndustryDoctorates.aspx

Local Energy Challenge Fund

The presentations from the Local Energy Challenge Fund workshops run by Local Energy Scotland in Perth and Edinburgh earlier this month are now available on the LES website. http://www.localenergyscotland.org/funding-resources/funding/local-energy-challenge-fund/information-event-presentations/

You can find all of the guidance notes, application forms and FAQs on the LES website at www.localenergyscotland.org.uk/challenge

The areas in which Heriot-Watt can help if you are considering an application to this or similar initiatives include:

- electricity supply and energy efficiency measures in supporting sustainable urbanisation;
- balancing energy supply and demand with energy storage
- development of solutions to meet demands of local users through methods that allow real-time predictions to minimise the variability and uncertainty of energy supply and demand;
- the development of smart user interfaces, which allow the optimisation of cost of energy;
- modelling the cost-effectiveness of energy efficiency vs onsite generation vs off-site generation for reducing impact of high fuel bills for fuel poor homes.
- development and better utilisation of appropriate community and large scale power infrastructure;
- reduction of carbon footprint of building stock;
- housing economics, housing policy, urban economics, econometrics and behavioural economics
- development and integration of hybrid energy systems

Interested in working with Heriot-Watt: Contact Dr Patrick McCarthy E: Energy@hw.ac.uk; p.mccarthy@hw.ac.uk; Tel: 0131 451 3881; 07989536218

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Large-Scale Removal of Atmospheric CO2 through Biomass Chemical Looping Combustion

Friday May 15th at 11:00 am
David Brewster Building Room 1.13
Heriot-Watt University
Dr. Kevin Whitty
University of Utah

Dr Whitty is a member of The Institute For Clean And Secure Energy (http://www.icse.utah.edu/) at the University of Utah that specialises in large-scale testing of new fuel technologies.

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- development and integration of hybrid energy systems

Interested in working with Heriot-Watt: Contact Dr Patrick McCarthy E: Energy@hw.ac.uk; p.mccarthy@hw.ac.uk; Tel: 0131 451 3881; 07989536218
Call for papers - electrochemical energy storage - IEEE

If you are interested in submitting a paper for the IEEE Transactions on Sustainable Energy (http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?reload=true&punumber=5165391 -- IF 3.8) Dr Dave Howey is interested in hearing from you
david.howey@eng.ox.ac.uk

Focused on integration of electrochemical energy storage (e.g. batteries, supercaps) into sustainable energy systems such as power grids and transport systems. The call for papers is here:
http://www.ieee-pes.org/images/pdf/calls-for-transactions/CFP_Special%

Deadline end May 2015

Environment YES

We ARE looking for two early-career researchers to join a team led by Dr Junjie Shen and Mandy Hughes who will join them to take on the challenges of the NERC-sponsored Environment YES competition. You don’t have long to commit as the deadline for applications is May 29th

Environment YES http://www.nottingham.ac.uk/environmentyes/index.aspx and http://www.nerc.ac.uk/funding/available/postgrad/advanced/yes/ is aimed at individuals who are in the early stages of their research career, for example PhD students or those in their first or second post-doctoral research appointment (we may have to make a case for Master’s students). You should be working in the environmental sciences and in particular that part that falls in the NERC remit of terrestrial, marine, freshwater, science-based archaeology, atmospheric and polar sciences.

If you want to take part, please, please get in touch with Junjie by e-mail to Shen, Junjie js315@hw.ac.uk

If YOU are reading this and you are not a Heriot-Watt student or researcher but are interested in taking part, contact us at energy@hw.ac.uk as teams can be drawn from across boundaries.

We look forward to hearing from you.

A New Look for the Energy Academy

The Energy Academy has a new website and you can see it by visiting
http://www.energy.hw.ac.uk/

The website allows readers to join our Energy Academy mailing list and to receive updates from the Energy Academy through this Newsletter or by e-mail.
You can also unsubscribe from the mailing list although we hope you won’t.

You can also follow us on Twitter at energy@hw.ac.uk directly from the site

If you are looking to study on an energy or energy-related course at Heriot-Watt, the new website will point directly to programmes of study that we offer. For more information on this or to request a synopsis of training and study opportunities at Heriot-Watt, send your address to p.mccarthy@hw.ac.uk

EU Funding for Energy 2015

Financing energy projects in Asia, Africa and Europe

Berlin, 27th – 28th August 2015

To register for the conference, visit:
http://www.euroakad.eu/veranstaltungen/buchungen0.html?tx_eurover_pi3[meeting]=1484

Scottish Energy Minister to present awards to winners at 2015 Heriot-Watt Scottish Energy News Researcher of the Year Competition

The winners have now been selected for the Heriot-Watt Scottish Energy News Researcher of the Year Awards and next week we will be featuring a special Newsletter dedicated to the winners, the awards and the awards ceremony

It’s not too late to come along. The ceremony will be held in the offices of the Green Investment Bank, Atria One, Level 7, 144 Morrison Street, Edinburgh EH3 8EX and starts with a buffet lunch at 1pm with the awards being presented at 2pm by the Minister for Energy, Finance and Tourism.

Join colleagues from academia, the energy industry, SMEs, MSPs and the support sector by dropping a line to energy@hw.ac.uk by close of business on May 13th

We look forward to seeing you.
This week's Contributors.

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Stephen Mark Williams  
(stephenmark.williams@strath.ac.uk)

Iain McEwan  
(I.Mcewan@hw.ac.uk)

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Science and Technology Park of BNT Polytechnic Seeks partners for Collaboration under H2020

The Science and Technology Park of BNT Polytechnic is a research intensive technical university based in Belarus. For more information download a presentation from:

https://www.dropbox.com/s/iuspf07gkb30ojp/S%26TParkPolytechnic_HORIZON2020_Energy.pdf?dl=0

The university has written to the Energy Academy to invite us to consider collaborating with them in three areas and has forwarded their project proposals for consideration.

The calls relate to:

EE-16-2015 Organisational innovation to increase energy efficiency in industry  
Deadline: 04-06-2015

EE-17-2015 Driving energy innovation through large buyer groups  
Deadline: 04-06-2015

EE-13-2015 Technology for district heating and cooling  
Deadline: 04-06-2015

If you are interested in working with the Science and Technology Park of BNT Polytechnic please download more information on each proposal at

https://www.dropbox.com/s/hrdaleh7w1g9320/HORIZON2020_EnergyCalls_proposal.pdf?dl=0

To contact the University, write to:

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Minister for Energy fetes Young Energy Researchers at Edinburgh Awards Ceremony

Speaking at the Heriot-Watt Scottish Energy News Researcher of the Year Awards for 2015, Fergus Ewing, Minister for Business, Energy and Tourism acknowledged the contribution of collaborative R&D to the Scottish energy industry. Talking to the audience of business people and academics, the Minister emphasized the importance of collaboration and partnership between the Scottish Government, academic research, innovation and enterprise and economic development, and the work of young Scottish engineers and scientists saying

“You are very important to the future of Scotland’s energy industries, not least because your research may be taken up to further help develop Scotland economy and energy sector – and this work – and the Heriot Watt Scottish Energy News Researchers of the Year Awards – may also help your to develop your own careers, whether in industry or in academia.”

“Heriot Watt’s Energy Academy – and its Institute of Petroleum Studies – are two of the most successful examples of driving forward the energy agenda in Scotland. Indeed, with a student population of 11,000 people, 1,700 academic staff and an annual turnover of £120 million a year, Heriot Watt University is itself a powerful economic engine for Scotland.

Professor Mercedes Maroto-Valer, Director of the Energy Academy, told the audience that “the Energy Academy provides a framework for world-class energy study and research – a ‘gateway to the industrial world’. “The awards also reflect the entire academic spectrum of the work of the Energy Academy, ranging from technical and engineering, to social and political aspects of energy policy – all issues which also impact on the ‘energy trilemma’ (affordability and security of energy supply, as well as the low-carbon and environmental issues) – with which we constantly grapple.”
The winner of the award for entrepreneurship is David Townsend of Town Rock Energy. Until 2013, he was still an undergraduate at the University of St. Andrew’s but has since received the accolades of the 2013 Scottish Institute for Enterprise Young Innovators Challenge in the category of Renewable Energy, the Scottish Enterprise Young Edge winner, 2014 and the Entrepreneurial Spark Entrepreneur of the Year for 2015.

David established Scotland’s first geothermal energy company. It applies well-established hydrocarbon exploration techniques combined with thermal modelling to high grade areas for hot water production from geothermal aquifers. He is also working to facilitate mine-water geothermal district heating schemes that will deliver very low carbon heat at an affordable rate to energy users in Scotland’s central belt. David is also a core member of the Geothermal Energy Expert Working Group tasked with advising the Scottish Government on means of assisting the private sector in developing geothermal energy in Scotland.

Energy and Fossil Fuels

The winner of the Heriot-Watt Researcher of the Year awards in the category, Energy and Fossil Fuels is Dr. Cairong Jiang.

Cairong has been working in the laboratory of Professor John Irvine at the University of St Andrews for 6 years. It is hoped that direct carbon fuel cells, may become a highly efficient means of converting carbon from waste, biomass or coal to electricity producing an exhaust stream that is well-suited to CO2 sequestration and, hence could underpin a new, clean carbon economy.

Dr Jiang has developed a practical system to convert the chemical energy of carbon from coal or biochar into electricity at high efficiency. She has looked at the potential of energy conversion from other carbon sources, for example, coal, beer carbon (industrial waste) and biomass thus demonstrating the potential of the use of coal, waste and renewable carbon sources as materials for high-performance, low-temperature fuel cells for the generation of electricity.

In 2012, her work was published in Energy and Environmental Science and has already been cited extensively. The research team has also filed a US patent application describing a direct carbon electrochemical cell and the University itself has received research grants of more than 1.5 M EU. The DCFC technology that she has been developing is widely considered to have the potential to convert coal to electricity at 80% efficiency and so could halve CO2 emissions from a given amount of coal.

The winner of the Heriot-Watt Scottish Energy News Researcher of the Year award for 2015 in the category of Energy and Fossil Fuels is Dr. Cairong Jiang from the University of St. Andrews.
Energy and the Environment

In the category of energy and the environment, we are pleased to recognise Mark Crouch, Senior Sustainability Professional and the Glasgow-based energy and carbon management consultancy company, Jacobs. Mark works on a broad range of research and consultancy projects, including renewables, energy storage and low carbon construction. He has a particular interest in hydrogen, hydropower and sustainable transport.

Recently, he and Jacobs carried out a series of reviews of each of the 7 cities in Scotland for the Scottish Cities Alliance (SCA), a Scottish Government supported organisation seeking to support the city economies while developing an understanding of the risks and opportunities posed by climate change and a shift to the low carbon agenda. The scope of this project focussed on those economic risks and opportunities including employment opportunities, job creation and skills development for each city and it looked across Scotland to identify other specific collaborative opportunities. The measures were wide ranging and covered both climate change mitigation and adaptation approaches, along with consideration of how cities might maximise benefits gained through proactive engagement with the variety of current national economic and sustainability initiatives.

Energy and the Marine Environment

The winner of the Heriot-Watt Scottish Energy News Researcher of the Year award has made a major contribution to environmental sustainability through his extensive work on the microbial response to the Deepwater Horizon disaster that occurred in the Gulf of Mexico in 2010.

Since oil and gas activities commenced in the North Sea and surrounding regions of the NE Atlantic about 50 years ago, pollution of crude oil and many of its refined petrochemical products has been a significant concern to the natural biota and economies that depend on these waters. Oil entering the water is ultimately removed by the activities of natural communities of oil degrading bacteria but little is known about these organisms and how they respond to oil spills.

Heriot-Watt’s Dr Tony Gutierrez is an expert in studying the microbiology, biogeochemical processes and associated abiotic factors occurring in deep ocean basins where natural oil seeps and contamination from the Oil & Gas industry are a predominant feature. He is the UK’s expert on the microbial response to the Deepwater Horizon oil spill, regarded as the worst maritime oil disaster in the history of the oil and gas industry in the United States.

His current research programme developed since taking up his appointment as Associate Professor at Heriot-Watt University, is targeted at acquiring knowledge and expertise on the resilience of natural systems in the ocean to recover from major perturbations in the ocean, such as oil spills, and to develop strategies to mitigate against future oil-related marine damage.

His ambition is to place Scotland at the forefront of knowledge and expertise in oil-response contingency, particularly for high risk and challenging environments, such as the deep sea and the Arctic, where oil exploration is expanding rapidly.

The Energy Academy would like to thank the Green Investment Bank and in particular Gregor Paterson Jones and Gavin Templeton for their support of the initiative and Mark Whittet, Editor of Scottish Energy News for his ceaseless promotion of the competition and good will towards the Energy Academy and the renewable energy sector in Scotland.
Energy Materials and Storage

The winner in this category is Dr. Jin Xuan from Heriot-Watt University.

His vision is to build international multidisciplinary networks for hybrid low carbon energy innovation and to connect the Scottish and overseas industrial sectors in order to promote renewable energy in Scotland. He also continues to conduct fundamental research in CO2 utilization and participates in the Huawei Tech fuel cell flagship project to develop fuel cell-powered mobile phones.

In 2011 he was the recipient of the Hong Kong Young Scientist Award given by the Hong Kong Institution of Science. In the same year he received an award for outstanding postgraduate research from the University of Hong Kong and one year later received the Shanghai Pujiang Talent Award. In 2013 he was honoured by the American Chemical Society with the ENVR Certificate of Merit Award.

He has already published 1 book, 3 book chapters and over 60 papers (a number of which have been included in the list of 'Top 25 Hottest Articles' and 'Most Accessed Articles'). With a strong understanding of the process of commercialization he has 8 patents relating to fuel cell technologies, waste-water treatment and heat exchange and catalysis.

In 2014, he moved his academic career to U.K., taking his current position in Heriot-Watt University as Assistant Professor. He has already secured three research grants as Principal Investigator including one from industry to develop portable fuel cell power sources. His other grants include; one from the Global Innovation Initiative (funded by U.S. Department of States, totaling $900,000 USD) for an international low-carbon energy partnership with Yale University, Shell, Lu’an and Chinese Academy of Sciences; and another from Scottish Funding Council for the Scotland-Hong Kong Strategic Research Collaboration Program.

At the age of 30 he is now leading an independent research team at Heriot-Watt.

In addition he is Specialty Associate Editor of Frontiers in Environmental Science, Guest Editor of Micro and Nanosystems, and reviewer for a number of energy journals such as Electrochemistry Communications, Electrochimica Acta & International Journal of Hydrogen Energy.

Energy Infrastructure and Society

The winner in this category is a young scientist from the University of Strathclyde, Dr. Jennifer Roberts. Her work addresses the key challenges facing modern energy development and the links to policy. It is in the area of risk assessment, perception and communication and concerns the adoption of new low carbon technologies. It informs how the necessary transition to an environmentally sound and low-carbon energy system can be implemented in a way that is acceptable to society. Jen was unwell and her award was accepted by Dr. Ragne Low, University of Edinburgh.
Fuel cells have long been recognized as one of the key enabling technologies for a secure, low-carbon energy future in view of their advantages including fuel flexibility, high efficiency and low emissions. Cost and durability are currently two major barriers for the large-scale market penetration of this technology. To overcome both the barriers, significant advancements are required in catalyst materials and device structural designs. The geometric structures of most concern in a fuel cell device are the 3D structure of gas channels and the porous structure within electrodes, which can strongly affect the cell output and life span by affecting reactive surface area, species transport and water management.

At Heriot-Watt we have developed a mathematical modelling framework to predict fuel cell transport and reactions, and studied the structure-performance relationships to develop the optimal electrode structure with functionally graded porosity to double the power density of existing technologies.

Model-based deliberate designs are difficult to realize with standard manufacturing methods. For certain components like the electrode catalyst layer, it is even impossible to control its structural parameters using traditional techniques, in which the relation between macroscopic parameters (process / catalyst parameters) and microscopic morphological parameters are generally unknown! At Heriot-Watt, we have used 3D printing to overcome these challenges and to develop what may be the first 3D-printed PEM high efficiency fuel cells.

If you are interested in fuel cell technology and the work of this group contact: H.Wang@hw.ac.uk; J.Xuan@hw.ac.uk and W.Shu@hw.ac.uk

**ETP Energy Industry Doctorates Programme**

The link to the new ETP Industry Doctorates Programme is:

http://www.etr-scotland.ac.uk/ETPforIndustry/IndustryDoctorates.aspx

Deadline: June 15th 2015
PhD Studentship University of Surrey

A three-year, fully funded PhD studentship has become available in the Department of Chemistry at the University of Surrey, to start on the 1st October 2015. Full details are available at [https://jobs.surrey.ac.uk/Vacancy.aspx?ref=024015](https://jobs.surrey.ac.uk/Vacancy.aspx?ref=024015).

The project will be supervised by Dr Qiong Cai and Professor Robert Slade. Informal enquiries and applications should be sent to Dr Qiong Cai (q.cai@surrey.ac.uk). The closing date for applications is Tuesday, 16th June.

How can Scotland make the most of its energy efficiency policies? Insights from recent research

Scotland has set an ambitious target to reduce energy demand by 12% by 2020. Achieving this target will require improving the energy efficiency of households, businesses and the public sector, with the potential to deliver wide economic, social and environmental benefits.

Presented by the University of Strathclyde's Centre for Energy Policy, ClimateXChange and the Scottish Government, this event will consider the best options available for improving Scotland’s energy efficiency, whilst also maximizing the benefits for Scotland and its people.

Confirmed speakers include: Mike Danson, Heriot-Watt University. *The ageing population and smart metering: A field study to householders attitudes and behaviours towards energy use.*

To register: [https://www.eventbrite.co.uk/e/how-can-scotland-make-the-most-of-its-energy-efficiency-policy-tickets-16767766842](https://www.eventbrite.co.uk/e/how-can-scotland-make-the-most-of-its-energy-efficiency-policy-tickets-16767766842)

The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

Low-cost, efficient electrical energy storage, to balance new patterns of electricity supply (e.g. from intermittent renewables such as solar and wind) is desirable for enabling a low-carbon energy system.

Researchers at Imperial College Grantham Institute and Energy Futures Lab want your help in identifying the most important electricity storage technologies (in terms of their potential future contribution to a low-carbon electricity system) for balancing intermittent renewables, both on a grid (discharge ~8h, unit size unconstrained), and off-grid (charge/discharge ~3h, unit size < ~15kWh), scale. They will use this information to conduct a more detailed study into the possible role of these technologies in a future energy system. [https://jfe.qualtrics.com/form/SV_6DMw2si3j0deZw1](https://jfe.qualtrics.com/form/SV_6DMw2si3j0deZw1)

More information: sheridan.few10@imperial.ac.uk.

EMEC ETV Competition

There are only two weeks left to apply to EMEC’s competition offering free Environmental Technology Verification (ETV). Open to all companies worldwide, EMEC is seeking proposals from developers of innovative energy or water treatment technologies that have environmental added-value.

Energy technologies:

- Production of heat and power from renewable sources of energy (e.g. biomass, geothermal, wave, tidal and wind);
- Reuse of energy from waste (e.g. 3rd generation biofuels and combustion technologies);
- Energy efficiency technologies (e.g. micro-turbines, hydrogen and fuel cells, heat pumps, CHP, logistics).

Water treatment & monitoring technologies:

- Monitoring of water quality for microbial and chemical contaminants (e.g. test kits, probes, analyzers);
- Treatment of drinking water for microbial and chemical contaminants (e.g. filtration, chemical disinfection, advanced oxidation);
- Treatment of wastewater for microbial and chemical contaminants (e.g. separation techniques, biological treatment, electromechanical methods, small-scale treatment systems for sparsely populated areas).

The deadline for submitting an application for Stage 1 of the competition is midnight 5 June 2015. For further information on the competition, visit: [http://www.emec.org.uk/services/etv/etv-competition/](http://www.emec.org.uk/services/etv/etv-competition/)
Energy Security in Scotland

On May 20th, the Energy Academy’s Dr Edward Owens was invited as an expert witness to the Scottish Parliament’s Committee for Economy, Energy and Tourism.

The event was convened by Murdo Fraser MSP and ‘Eddie’ was part of a round table discussion between the invited experts and MSPs.

Talking on the subject of “energy security” in Scotland Dr Owens focused on the problems associated with replacing thermal generation plant with intermittent generation sources, mostly in the form of onshore wind. He told the Committee that a reliance on importing fossil and nuclear energy may have a very positive effect upon Scotland’s headline greenhouse gas emissions, but in reality we will simply be exporting those emissions to England.

He also pointed out that high penetration of intermittent renewables into the grid generation mix has created an urgent need to invest in large scale energy storage systems and to reconsider the traditional approach to retailing electricity.

In March, the Energy Academy was the guest of Joan McAlpine MSP where experts from across the University including Dr. Owens talked about the opportunities for energy storage in Scotland.


Young Professional Green Energy Awards 2015

Soon to be Dr Dorothy Hardy of the Heriot-Watt Energy Academy has been nominated for an artist award in the Scottish Renewables Young Professional Green Energy Awards 2015 in the ‘Artist’ category. Dorothy’s work ‘Nesting Solar’ is a unique artwork that describes how photovoltaic cells can look good at the same time as generating electricity. Humour does not have to be left out of the equation! The twisted string of solar cells at the centre of the piece is disguised amongst pieces of broken solar cells, which are a by-product of the manufacture of photovoltaic panels. The piece demonstrates that photovoltaic materials can be used artistically, not just in standard panels that contain straight rows of solar cells. This is vital in ensuring that renewable energy is seen as a desirable addition to architecture and the landscape.

The artwork contains monocristalline silicon photovoltaic cells (Sunways AG) laminated between sheets of glass, with low-iron glass used at the front (Newcaslte Optical). The bird’s feet are made from tabbing strip (Jordan Brookes) that is used to make electrical connections between solar cells. The red of the bird’s eye is achieved with fluorescent dye (BASF), with solar shading film (MDP) used to create the beak. The whole artwork demonstrates the exciting possibilities for artistic use of solar cells within glazing.

Dorothy worked in renewable energy for less than 6 years before taking a career break, then completing a PhD on improvement of the aesthetics of photovoltaics in architectural glass.
The Energy Academy Welcomes ‘Common Purpose’ to the Centre for Innovation in Carbon Capture and Storage

Common Purpose is an international leadership development organization. On the 21st and 22nd May, Common Purpose brought a delegation from Glasgow to Heriot-Watt where we engaged them on the theme of Building the Future and what is new and what is emerging at Heriot-Watt in terms of new sectors and new technologies. Whilst here, the delegates met with Professor Rory Duncan, Professor Will Shu, Reader in Microengineering, Institute of Biological Chemistry, Biophysics and Bioengineering (IB3); Dr Jin Xuan, Assistant Professor in Energy Technology and Dr Huizhi Wang, Assistant Professor, both, Centre for Innovation in Carbon Capture and Storage. Here they learned about our work on the 3D structure of gas channels and the porous structure within fuel cell electrodes to try to increase both cell output and life span. They also had fun learning about the process of 3D-printing (shown below) and what it can be used for, in particular in relation to organ generation from stem cells.

This week’s Contributors.

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Inga Burton (I.Burton@hw.ac.uk)

The Energy Academy says goodbye to Lisa Farrell (shown above at the Researcher of the Year Awards (far right)). Lisa is leaving us to work for Route Monkey, the award-winning innovative software provider. The Company specializes in the optimization of assets via intelligent algorithms and unique software applications. Lisa was instrumental in introducing Route Monkey to the Energy Academy and in particular, to the work of Professor David Corne who is helping the Company develop a novel, scalable, online vehicle-routing system for fleet market and a software system for handling a wide range of non-standard fleet-related logistics tasks incorporating recent developments in multi-criterion and scalable optimization. We will miss her.
Dr. Gutierrez has worked extensively to understand the microbial response to the Deepwater Horizon disaster that occurred in the Gulf of Mexico in 2010—a historic spill recognized as the worst maritime oil disaster in the history of the oil and gas industry in the United States. He is an expert in studying marine microbial processes related to oil spills and in deep ocean basins, and is the UK’s expert on the microbial response to the Deepwater Horizon oil spill. His current research programme is aimed at understanding the resilience of natural systems in the ocean and how oceans can recover from major perturbations, such as oil spills. In 2013 he established a Microbial Observatory in the Faroe-Shetland Channel—the first of its kind in waters of the North-East Atlantic—to monitor oil-degrading microbial communities and to assess their response to oil pollution. His ambition is to place Scotland at the forefront of knowledge and expertise in oil-response contingency, particularly for high risk and challenging environments, such as the deep sea and Arctic, where oil exploration is expanding rapidly. He leads in independent research group and collaborates with other groups in Europe, the USA and Australia. With colleagues working on Human Health and Food & Nutrition in the School of Life Sciences at Heriot-Watt he is part of a Horizon-2020 EU grant, named MARISURF, worth €4.8m to exploit oil-degrading bacteria to satisfy an increasing consumer demand for natural and ‘environmentally-friendly’ ingredients, as well as changing government legislation requiring a shift toward industrial use of renewable and less toxic compounds.

Tony is the recent winner of the Heriot-Watt Scottish Energy News Researcher of the Year for 2015 for his work on Energy and the Marine Environment (pictured above) and if you are interested in what he is doing, contact him at Tony.Gutierrez@hw.ac.uk
**Venturefest Scotland 2015**

A summit for innovation, Glasgow, Wednesday 9th September

The Venturefest Network draws local innovation eco-systems together through a number of local events around the country, working closely with Innovate UK (Technology Strategy Board), the Knowledge Transfer Network and other national partners to strengthen connectivity between these innovators, investors and entrepreneurs.

http://venturefestscotland.co.uk/what-is-the-venturefest-network/

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**Get funding to improve design in your business**

The Scottish Enterprise ‘By Design’ grant can contribute between £2,000 and £5,000 to help SMEs design new products, processes or services or to help improve the design of existing products, processes or services.

The grant can be used by VAT registered companies in Scotland (except Highlands and Islands) looking to develop new products or services who can articulate the benefits of the project in question and who can contribute at least 25% of the cost SMEs cannot apply for this grant if they are already receiving or have received other funding from Scottish Enterprise or another public-sector body or are a Scottish Enterprise account managed company or Business Gateway Growth Pipeline company.

The Scottish Enterprise web-site http://www.scottishenterprise.com/services/develop-new-products-and-services/innovation-by-design/overview?seta sets out a whole raft of things that the grant can and cannot be used for and applicants must first complete a pre-qualification questionnaire to check eligibility.

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*The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.*

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**Fuel Cells and Hydrogen H2020 Calls for Funding**


The event gave an overview of the currently open topics in its Multi-Annual Work Plan. The event also had specific presentations on the transport pillar topics, the energy pillar topics and cross-cutting topics. The final presentations focus on the ‘rules for participation, call conditions and proposal submission and evaluation’ and an ‘introduction to Industry Grouping and Research Grouping’.


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**Energy Catalyst**

There is another round of Energy Catalyst (Round 3) to accelerate innovation in the energy sector from concept to pre-commercial readiness by providing investment and support at the time, in the way and at the scale innovators need it. Funding of up to £10million is available for the third round, opening 30 April 2015.

Once again, the Catalyst will support projects that contribute to all elements of the energy trilemma and funding will be available for three stages of technology development: Early-stage award: Technical feasibility; Mid-stage awards: Technology development; and Late-stage awards: Pre-commercial technology validation.

https://interact.innovateuk.org/competition-display-page-/asset_publisher/RqEt2AKmEBhi/content/energy-catalyst-early-stage-award-technical-feasibility-round-3

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**Technology Inspired Innovation**

This new Innovate UK Call provides up to £150,000 for feasibility studies to stimulate innovation across four enabling technology areas that underpin future UK growth: including advanced materials; and electronics, sensors.

Projects are open to companies of any size, but must be led by a small or micro company, working in collaboration with one or more business or research partners. Small or micro businesses could receive up to 70% of their eligible project costs, medium-sized businesses 60% and large businesses 50%.

https://interact.innovateuk.org/competition-display-page-/asset_publisher/RqEt2AKmEBhi/content/technology-inspired-innovation-may-2015-advanced-materials
CO2 Conversion to Liquid Fuels


The partnership will undertake new research into increasing the efficiency of CO2 conversion to liquid fuels. Emission-to-liquid-fuel (ETL) conversion is a promising technology to reduce carbon emission as it directly consumes CO2 as a reactant and at the same time produces useful fuel liquids (such as methanol, ethanol and gasoline) that are compatible with the current energy infrastructure. However, the ETL process is still not widely implemented due to the associated issues of high cost, low efficiency and low sustainability.

The Heriot-Watt partnership aims to tackle these challenges by developing new types of more active catalyst materials for hydrogenation of CO2 that boost both reaction rates and catalytic selectivity (Yale). The reaction is also strongly influenced by the thermal management at device level. Accumulation of heat produced from the reaction has the effect of lowering CO2 conversion, promoting side reactions such as the reverse water gas shift reaction, and causing catalyst sintering and degradation. Consequently, the partners will look at reactor design using micro-fabrication technology and the impact of material-reactor interactions on catalytic conversion (Heriot-Watt).

The three partners have an ambition to initiate an International Synergetic Innovation Center for ETL Technology. The developing plan includes sharing facilities, cost sharing, knowledge exchange and supervision of PhD studentships and an arrangement on IPRs developed.

The Innovation Center will act as a catalyst to bid for major research funds and participation in academic and industrial collaborations. Exchange students/staff from China will be arranged for 6-12 month visits to UK and US partner universities. Annual symposium on ETL are planned to be held in the USA. The academic team will work closely with the industrial partners (Shell, Lu’an and others) to encourage international academic-industrial knowledge transfer. It is hoped that based on the new findings and technologies delivered by the project, pilot/industrial scale profitable ETL systems can be built by industrial partners to promote the global low-carbon energy infrastructure.

On Friday June 19th, you are invited to meet with the Heriot-Watt team involved in the project and to discuss how you can benefit from and contribute to the work that links the world’s leading CO2 solution providers (the UK and USA) with the world’s largest market for CO2 reduction (China).

To register or find out more e-mail: [energy@hw.ac.uk](mailto:energy@hw.ac.uk)
International search for innovations to eradicate water ingress

The Energy Innovation Centre (EIC) is seeking expressions of interest from third party suppliers who may have a solution to preventing water ingress into pits containing below ground utility assets such as regulators, valves, instrumentation and pipework.

Identified by one UK gas distribution network (GDN), the problem of water ingress is occurring in pits that are constructed with either concrete or fibreglass. These materials in many cases have been found to be ineffective at preventing water ingress which results in regular flooding and requires engineers to pump out the pits in order to perform routine maintenance and emergency tasks. This can necessitate additional time for maintenance and emergency activities, and increase the risk to operatives and potential asset failure. The GDN is looking for a permanent repair technique, method or modifications that will completely eradicate the water ingress issue.

To register initial interest and request an Expression of Interest (EOI) form, please call the Energy Innovation Centre on 0151 348 8040 and quote the reference number GDN-15-01. The deadline for registering initial interest is 5pm on Wednesday 17th June 2015.

More information: http://www.energyinnovationcentre.com/2015/05/eic-launches-international-search-for-innovations-to-eradicate-water-ingress/

Collaborators Sought for £6M Network Innovation Competition Bid

The Energy Innovation Centre (EIC), has a DNO industry partner that is currently seeking collaborators who are interested in joining a project that will trial different cooling methods on secondary substation assets such as transformers and cabling.

The electricity NIC is an annual funding competition run by energy industry regulator, Ofgem, whereby electricity transmission companies compete for funding for the best innovation projects. Up to £27m per annum is made available for projects that can help the networks balance the priorities of security of supply, cost and environmental sustainability.

More information: http://www.energyinnovationcentre.com/2015/05/collaborators-sought-for-6m-network-innovation-competition-bid/

Vendors or partners interested in participating in the NIC bid should register their initial interest with the Energy Innovation Centre by Friday 5th June by calling 0151 348 8040 and quoting reference DNO-15-01.
Heriot-Watt Launches the Centre for Energy Economics and Research Policy

The Centre for Energy Economics Research and Policy (CEERP) is a newly formed group that is a result of collaboration and partnership between Heriot-Watt University and BP plc. The Centre will be based within the Institute of Petroleum Engineering (IPE), which is recognized internationally as a leading centre of excellence in petroleum engineering and petroleum geosciences teaching, training and research with strong links to industry worldwide.

For the 9th consecutive year Heriot-Watt University has collaborated with BP plc in the preparation of the data for their Statistical Review of World Energy. Researchers within CEERP provided detailed statistical and analytical support for this year’s Review. The Review, a highly esteemed document consulted by energy experts, the energy industry, academics and journalists from around the world, tells the story – and history – of world energy through the numbers behind the energy market headlines. The Review is available in print and online at http://www.bp.com/statisticalreview.

The 2015 edition of the Review will be launched on Wednesday 10 June at BP headquarters in London. The Review will see its Scottish launch on Thursday 2 July in the Hawthornden Lecture Theatre (National Gallery) in Edinburgh, which will be attended by BP’s Chief Economist, Spencer Dale.


- What changes to global oil production and consumption drove the sharp fall in oil prices in 2014?
- How did slower economic growth in China and other emerging markets impact energy consumption?
- How has continuing strong growth in US shale oil and gas production altered its importance as an energy producer?
- In the run-up to the UN climate change conference in Paris, where are CO₂ emissions rising and falling?
- Did the US remain the world’s leader in renewable energy use?

For answers to these questions and much more, join BP chief executive Bob Dudley and Spencer Dale, Group chief economist, for the live webcast marking the launch of the 2015 BP Statistical Review of World Energy at 10am (BST) on Wednesday 10 June.
PhD Studies at Heriot-Watt University

Heriot-Watt currently has opportunities to study for PhD at ICIT on Orkney


Managing ocean space for sustainable growth http://www.hw.ac.uk/schools/life-sciences/research/icit/research/managing-ocean-space-for-sustainable-growth.htm Supervisor: s.kerr@hw.ac.uk

Orkney Tidal Dynamics http://www.hw.ac.uk/schools/life-sciences/research/icit/research/orkney-tidal-dynamics.htm Supervisor: d.k.woolf@hw.ac.uk

In each case, interested applicants should contact the project supervisor in the first instance and in the case of Dr Kerr’s project include a brief statement of interest highlighting how your experience is relevant to the proposal, and an up-to-date CV.

The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

Heriot-Watt and Cleantech Innovate, Glasgow 2015

The joint winners of the Energy Academy’s prize awarded at Cleantech Innovate, Glasgow 2015 http://www.cleantechinnovate.com/agenda/ were Green Space Live (@Greenspacelive) https://greenspacelive.com/web/gsl/index#PublicProjectsPlace: and Impact Solutions (@ImpactSol) http://www.impact-solutions.co.uk/ The winners each receive executive training and the support of the University’s School of Management and Languages.

GreenspaceLive Ltd is an energy engineering, consulting and software services company specialising in innovative energy systems and building simulation http://greenspacelive.com/site/about-greenspacelive/

Impact Solutions is a spin-out developing cutting edge plastic recycling technology to create value through sourcing, separation, and re-use of plastic waste streams

The School’s Corporate and Executive Development programmes provide fresh perspectives on key management issues and help explore the ways in which they can be applied within organizations. In making the awards, Energy Academy Business Development Director Patrick McCarthy said “It was a hard job and we’ve chosen the winners because I believe that the School can provide a real impact on the management team in each company and because we already carry out complementary work in the fields of research in which each company works.”

For full details of the courses offered, visit http://www.hw.ac.uk/schools/management-languages/corporate-executive-development.htm

Edinburgh-based Scottish hydropower company, Water Engine Technologies http://www.cleantechinnovate.com/presenting-companies/silver-hydro/ were the recipient of the €20,000 Climate CIC Award. The company previously known as Silver Hydro Ltd has also worked with Heriot-Watt through the University’s Company-led Engineering Design Challenge initiative to develop its low-head micro-hydro technology. SMEs interested in this initiative that provides a team of Heriot-Watt engineers for 24-weeks to undertake design and manufacturing challenges should write to I.McEwan@hw.ac.uk or energy@hw.ac.uk (closing date 15th August)
Support Heriot-Watt’s Environment YES Ambassadors

Environment YES Environment YES is an innovative scheme aimed at increasing entrepreneurial awareness in the environmental science community. YES is run as a competition where teams of early-career researchers attend a three-day workshop where they are given training and guidance on innovation and how to commercialize their research and to become an entrepreneur.

At the end of the three-day workshops, teams present and pitch their ideas for an imaginary environmental start-up company in competition with each other. The winning teams from each workshop are invited to a final where they compete for a prize of £2,500 and an opportunity to attend the 2016 Rice Business Plan Competition in Houston, Texas.

Patrick McCarthy has been promoting YES in Scotland since 2005 and has mentored successful YES teams year-on-year. Whilst teams can register and turn up on the day, many teams will prepare a business idea in advance and use the three-days of training to polish their presentation and ideas based on what they learn at the workshop. If you are interested in principle in helping Patrick help the Heriot-Watt team prepare for the Competition, please send an e-mail to js315@hw.ac.uk saying how you might help. The type of help required may be as simple as “what would you do etc etc” or “who can I talk to about...” or might just be a contact in a particular company or location but could go a long way to helping the team address the problems of “What and Why”, “When and How” and “Where and Who” that they will need to address in presenting a winning presentation.

The team is Jonathan Morton, Amanda Hughes, Freda Mwasha, Junjie Shen, Yang Chen and John Tobin bring together a diverse range of skills and ideas including materials chemistry and applied photonics, energy engineering.

The team has already met to discuss the nature of the project and we’ll be following their progress through the Energy Academy Newsletter from time to time. Well done guys.
Meet the KTN Knowledge Transfer Manager at Heriot-Watt on June 19th

The Sensors & Instrumentation Group of the Knowledge Transfer Network was established to build on over 10 years of support for UK sensing innovation from the Sensors & Instrumentation KTN through to the Sensors & Instrumentation Knowledge Centre.

The Group looks at sensing in its entirety, from the principles of measurement and novel sensor technologies through to instrumentation, deployment and data analysis. The group brings together a community of over 4000 individual members from SME technology companies, large company and public sector end-users, academics, entrepreneurs, support organizations including design, engineering, manufacturing, finance and intellectual property sectors, and policy makers.

Dr Felicity Carlyle is the Knowledge Transfer Manager with responsibility for sensor “applications across a range of sectors including energy.” She wants to “both broaden the market for established players in the sensor industry, and to look at routes through which emerging technologies could be brought to market.” Felicity will be visiting Heriot Watt on Friday 19th June and would like to meet with researchers and KE practitioners from across Scotland’s universities who are researching or doing r&d in this field in order to get a better idea of what research is going on so that the KTN can better inform UK businesses of the competencies within this sector and also to build links to support calls for research funding as and when opportunities become available.

To meet with Felicity, e-mail energy@hw.ac.uk. To join the KTN Sensors and Instrumentation Group visit https://connect.innovateuk.org/web/sensors-and-instrumentation

Energy Technology Partnership (ETP) Knowledge Exchange Networks

The ETP KEN has up to £100,000 for SME-driven collaborative projects that can be carried out across all of Scotland’s 12 universities for projects in renewable energy and oil and gas. Support is available to Scottish SMEs, and to non-Scottish SMEs who have, or want to establish, a base in Scotland. If you are not an SME, you may still be eligible for support of some kind. The type of support varies from markets research to bigger projects requiring up to 15 man-days of effort, over a three-month period, delivered by a Research Fellow, backed-up by a senior Academic; access to test and demonstration facilities, numerical modelling and simulation; prototyping and model building with up to £10k available to cover costs.

If you are an SME and have an idea contact the Energy Academy (energy@hw.ac.uk) who will introduce you to one of the ETP’s business development managers in the first instance. To find out more about the work of the ETP download the presentation at https://www.dropbox.com/s/8h2eeqmvmoxgg2/ETP%20Overview%20-%20condensed.pdf?dl=0