Thermoelectric materials convert waste heat into useful electric power. This could have a substantial impact on UK and global energy consumption because more than half of primary energy is ultimately wasted as heat. So far, thermoelectric generators (TEGs) have been restricted to niche applications but the market for thermoelectric energy harvesters could be as large as $1bn within a decade. Potential applications for TEGs include scavenging heat from car exhausts, producing combined heat and power units for use in remote, off-grid locations, and replacing batteries in wearable microelectronic devices. A major limitation has been to develop cheap, efficient TEGs that do not rely on toxic materials such as lead or scarce resources such as tellurium.

Dr Jan-Willem Bos has received EPSRC grant funding to develop a viable, non-toxic alternative to lead telluride TEGs, using ‘Heusler alloys’. These combine abundant elements such as titanium, nickel and tin, have good thermal and mechanical stability and strength and are easy to process. However, optimizing the thermal conductivity of Heusler alloys has traditionally been problematic so Dr Bos will research new means of controlling the thermal conductivity of Heusler alloys in order to build a TEG prototype of comparable performance to existing lead telluride devices. Working also with the University of Glasgow and Royal Holloway University London he will use world-leading electron microscopy, neutron scattering facilities and theoretical modelling to probe the atomic-scale structure and dynamics of the new materials in order to optimize the synthesis parameters and then use this technical know-how in collaboration with an industrial partner European Thermodynamics Ltd. to build prototype TEG modules.

Dr Bos described the work as having “substantial potential for impact, with notable prospects for making a contribution to lowering the UK’s carbon footprint as well as providing excellent opportunities for knowledge transfer to a vibrant new industry and for high-quality training”.

For more information on this project, visit: http://gow.epsrc.ac.uk/NGBOViewPerson.aspx?PersonId=165362

If you are interested in new TEGs, please contact Dr Bos at J.W.G.Bos@hw.ac.uk or Energy Academy Theme leader in energy materials and storage, Dr Nick Bennett at N.Bennett@hw.ac.uk or contact the Energy Academy by e-mail at Energy@hw.ac.uk
24th November 2015
Holiday Inn – Birmingham

This is a FREE one-day workshop to bring together the whole supply chain to understand the barriers and opportunities to driving this technology in the UK

Who Should Attend
Bringing together the supply chain to assess the opportunities and challenges in driving a microalga-derived aviation fuel technology. This workshop is aimed at industry and academics who are:

- Microalgae cultivators
- Airplane and engine manufacturers
- Chemists
- Fuel companies

Confirmed Participants
Boeing, Airbus, Department for Transport, Thomson Airways (TUI Group), AlgaeLink, Sustainable Aviation, AlgaePARC, Green Fuel Research, MicroA AS, Avespa, Innovate UK

https://www.biofuels2015.co.uk/
Royal Society of Edinburgh BP Hutton Prize in Energy Innovation

This prize is funded by the BP Trust, and carries a prize of £10,000. It is made on a biennial basis by the Council of the Royal Society of Edinburgh, to an individual early career researcher based in Scotland, who has shown “a significant individual contribution to energy innovation through research and knowledge exchange”. [https://www.royalsoced.org.uk/640_TheRSEBPHuttonPrizeinEnergyInnovation.html]

The winner of the 2015 RSE BP Hutton Prize in Energy Innovation is Dr Cairong Jiang, Research Fellow at the University of St. Andrews. Dr Jiang was nominated by Professor Mercedes Maroto-Valer, Head of Heriot Watt’s Energy Academy for her work on solid state electrochemistry in direct carbon fuel cells (DCFCs) and development of a practical system to convert the chemical energy of the solid carbon into electricity. More on this story on the Royal Society web-site [https://www.royalsoced.org.uk/] and @royalsoced

Dr Jiang was also the winner of the 2015 Heriot-Watt Scottish Energy News Researcher of the Year award in the category of energy and fossil fuels. The award was given to Dr Jiang last May by Fergus Ewing, Minister for Business Energy and Tourism.

In 2016, Heriot-Watt will be inviting nominations for recognition of the work of Scotland’s early-career researchers at the 2016 Researcher of the Year Awards. For more information contact Energy@hw.ac.uk or call 0131 451 3881

If you are interested in sponsoring an award, we are interested in talking to you so please contact Patrick McCarthy at energy@hw.ac.uk.

Please keep an eye on the Newsletter for more information on the awards.

Interested in STEM Education?
Go4SET Programme

Go4SET [http://www.etrust.org.uk/go4set], links teams of year six (8/9 (England) and S2 (Scotland)) pupils with employers and universities to offer a 10 week Science, Technology, Engineering and Mathematics (STEM) Project.

Engineering and Technology. Support from Industry and business is sought for this initiative and can help to make an important contribution to the future of STEM through inspiring pupils to become involved at this key stage in their education. Work-related learning within an industry and enterprise context is at the core of the Go4SET experience.

EDT’s Go4SET project is typically 10 weeks and offers young people age 12-14 the opportunity to develop skills, inform subject choice and change perceptions about STEM, raising awareness of how studying these subjects can lead to a rewarding career.

Heriot-Watt University hosts several of the key events around the Go4SET programme and Dougie Watson at Go4SET is looking for volunteers to take part. Chris Larkins, Environmental and Energy Manager at Heriot-Watt is a previous mentor on the Programme. Chris told the Energy Academy that participation “requires perhaps 4 days’ time and involves hosting a visit for a project group of a few 12-14 year olds plus visits to the participating school between November and March”. If you want to know more about how it works, please contact Chris at c.larkins@hw.ac.uk for more insights into what’s required

If you are a Heriot-Watt researcher and are interested in taking part, please contact Dougie Watson at D.Watson@etrust.org.uk. If you are one of the Newsletter’s other readers, take a look at the web-site and sign-up. What have you to lose?

The International Conference on Ocean Energy (ICOE) is a global marine energy event focused on the industrial development of renewable marine energy.

The 6th ICOE will be held in Scotland for the first time at the Edinburgh International Conference Centre from the 23rd to the 25th February 2016.

The Programme includes:
- Knowledge Sharing: Learning from other industries
- Research into environmental impact
- On and off-grid solutions: Integrating and adapting marine generation in a constrained grid environment
- State of the Art: Tidal Technology Showcase
- Cabling and Connection
And many other topics


Dr Cairong Jiang receiving the 2015 Heriot-Watt Scottish News Researcher of the Year award for excellence in energy and fossil fuels. From left to right, Mark Whittet, SEN, Cairong Jiang, Fergus Ewing MSP and Professor Mercedes Maroto-Valer
**Newton Fund : China–UK research and innovation bridges**

Innovate UK, the Research Councils UK (RCUK) and the Ministry of Science and Technology (MoST) for the People’s Republic of China are to invest up to £16 million in collaborative research and development projects that propose new commercial solutions to critical challenges impacting the socio-economic growth and development of China in relation to energy, healthcare, urbanization and agri-food. The UK investment has been made possible through the Department for Business, Innovation and Skills-managed Newton Fund.

**Find out more and register:** https://interact.innovateuk.org/competition-display-page/-/asset_publisher/RqEt2AKmEBhi/content/china%20-%20Research-and-innovation-bridges-competition?elqTrackId=a874a9569eeb3663c68d60a8700913f&elq=c7bc3f1468ab445f85b6da1d9961a8f&elq=Campagnid=15&elqaid=136&elqat=1

**Competition opens:** 16th November 2015; **Registration Closes:** 23rd March 2016

**Competition Closes:** 30th March 2016

**Find a partner:** [http://china-uk-newtonfund.meeting-mojo.com/](http://china-uk-newtonfund.meeting-mojo.com/)

The aim of the competition is to bring together companies (small to medium-sized companies and/or larger businesses), research organizations, academics and other collaborators from China and the UK for the joint research and development of new solutions to key socio-economic challenges, in the form of innovative products, processes or services. The principal market a project must consider is China. UK project costs to range in size from £800,000 to £1 million.

**Register to find out more:** Webinar: November 17th at 15:30
[https://connect.innovateuk.org/web/technologystrategyboard/events-view/-/events/29810227](https://connect.innovateuk.org/web/technologystrategyboard/events-view/-/events/29810227)

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**Energy Catalyst Brokerage Event**

**COSLA Conference Centre – Edinburgh**

**28th January 2016**

Round 4 of the Energy Catalyst opens 26th November 2015. In collaboration with Innovate UK and the KTN, the Energy Academy is holding another brokerage event where there will be an opportunity to learn about Round 4 of the Energy Catalyst initiative. Indicative funding from Innovate UK, the EPSRC and DfID is likely to be similar to that made available under Round 3 of the initiative.

Heriot-Watt is looking to build links with SMEs and other researchers across all areas of energy research. If you are interested in working with Heriot-Watt Energy Academy and think Energy Catalyst could be for you, please contact Patrick McCarthy by e-mail to Energy@hw.ac.uk

**Who Should attend?**

The event will be of interest to SMEs, universities and service providers working to reduce emissions, improve the security of supply and reduce energy costs.

**Registration and Directions to the COSLA Centre**

At this time, please send an expression of interest to Energy@hw.ac.uk. For more information on the event itself, please contact Natasha Sim natasha.sim@ktn-uk.org. For directions to the COSLA conference centre see [http://www.cosla.gov.uk/conference-centre/easy-get](http://www.cosla.gov.uk/conference-centre/easy-get)

See also: [https://connect.innovateuk.org/web/energy-catalyst/events-view/-/events/29785802](https://connect.innovateuk.org/web/energy-catalyst/events-view/-/events/29785802)