



Power electronics – enabling a resilient energy system

**TARGETED CALL FOR
KNOWLEDGE TRANSFER PARTNERSHIPS
FEBRUARY 2013**

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Summary

The Technology Strategy Board, Welsh Government and the Engineering and Physical Sciences Research Council (EPSRC) are to invest jointly up to £1m to establish new Knowledge Transfer Partnerships (KTPs) in the area of power electronics. We are looking to support a cohort of up to 12 KTPs UK-wide for this thematic KTP competition, with up to three of these coming from companies based in Wales.

Power electronics is considered key to enabling a resilient energy system for a future UK energy mix which will include a larger percentage of renewables, connectivity to a European supergrid, community energy systems, and electric vehicle charging.

This targeted call for KTPs aims to stimulate and support supply chain innovation in power electronics and the energy sector. It is part of a £5.4m programme and is running in parallel with a £4.4m Technology Strategy Board investment in power electronics. Typical annual project costs could be in the region of £60k with a third of this being contributed by the company, in the case of an SME.

This targeted call will encourage knowledge-sharing across projects, and will facilitate effective links to the UK research base, including the developing EPSRC National Centre for Power Electronics. This will give the businesses involved access to knowledge and expertise held by a range of academic groups with different perspectives on the high-level challenges facing the industry.

KTP applicants can link their projects to the Technology Strategy Board technical feasibility or collaborative R&D competition strands where appropriate. Those organisations applying to both competitions must make sure that their proposals can stand alone and are not dependent on both applications being successful.

NB: This document provides information on the targeted call for KTPs only. Those wishing to apply for feasibility studies or collaborative R&D projects should visit www.innovateuk.org and look under Competitions.

This call for KTPs will provide new opportunities for open innovation and knowledge exchange across supply chains and sectors, and will help businesses to integrate sustainable innovation into their organisations. Through this call we aim to bring new innovation capacity and capability to UK businesses by promoting the commercialisation of knowledge, technology and expertise. This KTP thematic call is in direct response to the challenges set out in the 2011 BIS report: *Power electronics – a strategy for success*.

We will part fund KTPs. The targeted call opens on **4 February 2013** and the deadline for applications is **19 June 2013**. A briefing/brokering event for potential applicants will be held in Birmingham on **13 February 2013**.

Background and challenge

Power electronics provides a way of controlling all areas of our energy system – from gigawatts (GW) at a national level, to kilowatts (kW) at a community level – and is a necessary and important component for delivering future resilient energy systems. Information and communication technologies between key parts of the system are also essential to enable this control to happen, as well as technology development in new materials, manufacturing, monitoring and a number of other technologies. The challenges of delivering a UK energy system fit for the future requires a collaborative, systems approach with design in mind at an early stage, to produce 'right first time' solutions.

EPSRC are currently working on establishing a centre of excellence which focuses on underpinning scientific and engineering challenges for power electronics across

all sectors – specifically drawing on the capability of the UK-wide academic research base in:

- power electronics devices, integrated drives, converters and component integration.
- reliability and health management
- packaging and integration
- thermal management
- design and manufacture.

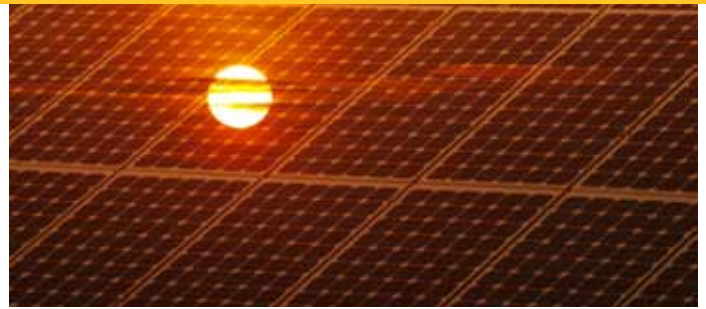
Against this background of UK expertise, a target of more than 15% of energy will come from renewable sources by 2020 and greenhouse gas emissions will be reduced by 80% by 2050, presenting significant challenges to the continued security, stability and quality of our energy supply.* This call for KTPs offers businesses the opportunity to work in partnership with the UK-wide academic research base (higher/further education sector or research and technology organisations).

As part of its strategy, *Science for Wales* – addressing the areas of low carbon, energy and the environment – the Welsh Government's 'Energy & Environment' team is looking to support KTP projects that involve businesses based in Wales.

To enhance the cross-sector and collaborative nature of this competition, there will be a Collaboration Nation event in 2014. Its aim will be to position the UK as a leader in power electronics for future energy systems and to link projects and people to the wider investment community through channels such as private investment, the Low Carbon Networks Fund and Horizon 2020.

We want to support high quality KTPs that will promote knowledge transfer to help UK businesses realise tangible benefits both in the UK and globally and help solve challenges in the energy sector using power electronics.

* Source: UK Energy in Brief 2011, Department of Energy and Climate Change (DECC), www.decc.gov.uk.



These will

- involve businesses already engaged in the power electronics sector but are in need of further support to grow faster, understand the challenges of the energy sector and accelerate development of their innovation capability
- involve businesses already engaged in the energy sector but are looking to the power electronics sector to provide new technology solutions and innovations to help solve their problems in delivering a resilient energy system of the future
- involve business interested in entering the power electronics and/or energy sectors but which currently lack the capability or capacity to innovate.

Scope

We will support businesses looking to bring forward innovative projects that links power electronics to resilient energy systems. We are looking for proposals that can address one or more of the following challenges:

- development of power electronics devices, components, converters and systems that ensure distribution networks are able to accommodate increasing levels of embedded generation and emerging technologies – such as energy storage and electric vehicle charging networks and other low carbon technologies
- innovative materials, device, component and monitoring technologies that can help improve system performance and manage reliability by reducing costs, losses, and the need for maintenance of systems that are required to operate in a range of extreme environments
- systems approaches to reduce costs, enable simpler systems through standardisation – including development of appropriate ICT embedded systems, control systems and early stage design

- devices, components, products and processes that can be transferred from other markets and can meet the challenges of the energy sector e.g. transport, aerospace, manufacturing and the built environment
- development of megawatt-scale (MW) power electronics devices, components, converters and systems for the conversion of variable voltage inputs into fixed voltage for connection to the grid from new renewable generation plants – including aggregated community scale renewables. i.e. virtual power plants utilising a number of renewable options such as wind turbines, photovoltaic systems, tidal generators and other low carbon technologies
- development of MW-scale converters in Flexible AC Transmission Systems (FACTS) to support the existing AC grid.
- high voltage DC systems using GW-scale power electronics converters to boost voltages for transmission over long distances – for application in offshore wind and the European supergrid.

KTP projects can last between six and 36 months. We expect the KTP projects in this targeted call to last for typically 24 months, although shorter or longer time frames will be considered on their merit. The Technology Strategy Board may adopt a portfolio approach to the selection of cohort members to achieve an appropriate spread of specific topic areas highlighted above.

Funding

We will fund part of the cost of running the KTP project. The level of grant that the KTP can receive depends upon the size of the company. The grant is paid through the academic partner and the level also depends on whether the academic partner uses a full economic cost model. KTP is open to all UK companies and the UK-wide knowledge base.

We will support knowledge sharing between the resulting KTPs by:

- holding knowledge-sharing events (such as Collaboration Nation) while the KTP projects are running, enabling the cohort to meet and discuss matters of wider interest, such as generic challenges and breakthroughs
- setting up a dedicated group on the **_connect** site including <https://connect.innovateuk.org/web/power-electronics> for the partners to communicate and share information
- working to promote the success of the individual KTPs and of the whole cohort
- bringing the cohort together with other relevant Technology Strategy Board funded projects.

Please note that only companies residing in Wales will be eligible for Welsh Government support.

As an example, a small or medium-sized enterprise might contribute around a third of the project costs with the remainder of the costs being paid as grant. Currently average annual project costs are around £60k. Larger companies generally receive a lower level of funding.

Your regional KTP adviser will be able to provide more details on funding levels.



What is KTP

KTP is Europe's leading programme helping businesses to improve their competitiveness, productivity and performance through the better use of the knowledge, technology and skills that are available within the UK knowledge base. The programme is UK-wide, headed by the Technology Strategy Board, and supported by 12 other public sector funding organisations.

A KTP involves the formation of a partnership between a business, an academic institution (or knowledge base partner) and a recently qualified person, known as the associate. The aim of the

partnership is to facilitate the transfer of knowledge and embedding of new capability within the business.

Through collaboration, these partnerships can:

- access highly qualified people to spearhead new projects
- access experts who can help take their organisation forward
- develop innovative solutions to help their organisation grow
- develop the capacity and capability to innovate more effectively beyond the KTP project.

Application process

To take part in this targeted call a business should contact one of our KTP advisers. The KTP advisers provide advice on eligibility and timescales, and work with all the potential KTP partners to develop the joint proposals.

The application process involves:

Stage 1: Expression of interest (EOI)

Stage 2: Approved EOIs invited to submit a grant proposal and application form

Stage 3: Our Partnership Approvals Group (PAG) makes a funding recommendation

Stage 4: For this targeted call there is also a further assessment involving the Technology Strategy Board technologists, Welsh Government and EPSRC.

Both the EOI and application must be agreed by a KTP adviser before submission by the academic partner for consideration by the Partnership Approvals Group.

KTP proposals in response to this targeted call must be submitted by noon **19 June 2013**.

If you have a proposal that is not within the scope of this targeted call or is not selected as part of this cohort, you may still be eligible for a KTP grant. The scheme runs throughout the year and supports projects in many fields. Contact your local KTP adviser for more information.

Further information

For more information about KTP eligibility or suitability of projects for this targeted call please contact your regional KTP adviser. Adviser contact details are available on the KTP website at www.ktponline.org.uk

For details of the *Power electronics – enabling a resilient energy system CR&D and feasibility* competition visit www.innovateuk.org and look under Competitions.

You can visit www.ktponline.org.uk to find your local adviser or office.

For further support call: 0300 321 4357 or Email: KTP_companies@tsb.gov.uk

Publicity

As part of the application process all applicants are asked to submit a public description of the project. This should adequately describe the project but not disclose any information that may impact on intellectual property, is confidential or commercially sensitive. The titles of successful projects, names of organisations, amounts awarded and the public description will be published once the award is confirmed as final. Information about unsuccessful project applications will remain confidential and will not be made public. E-mail pressoffice@tsb.gov.uk with any queries.

The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve quality of life.

The Knowledge Transfer Partnerships Programme is part of the Government's Solutions for Business portfolio.

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Key dates

Targeted call opens	04 February 2013
Optional briefing/ brokering event	13 February 2013
Deadline for applications	19 June 2013 noon
Partnership Approvals Group (PAG) meeting	11 July 2013
Funding outcomes/cohort membership announced	August 2013