

**Technology Strategy Board**

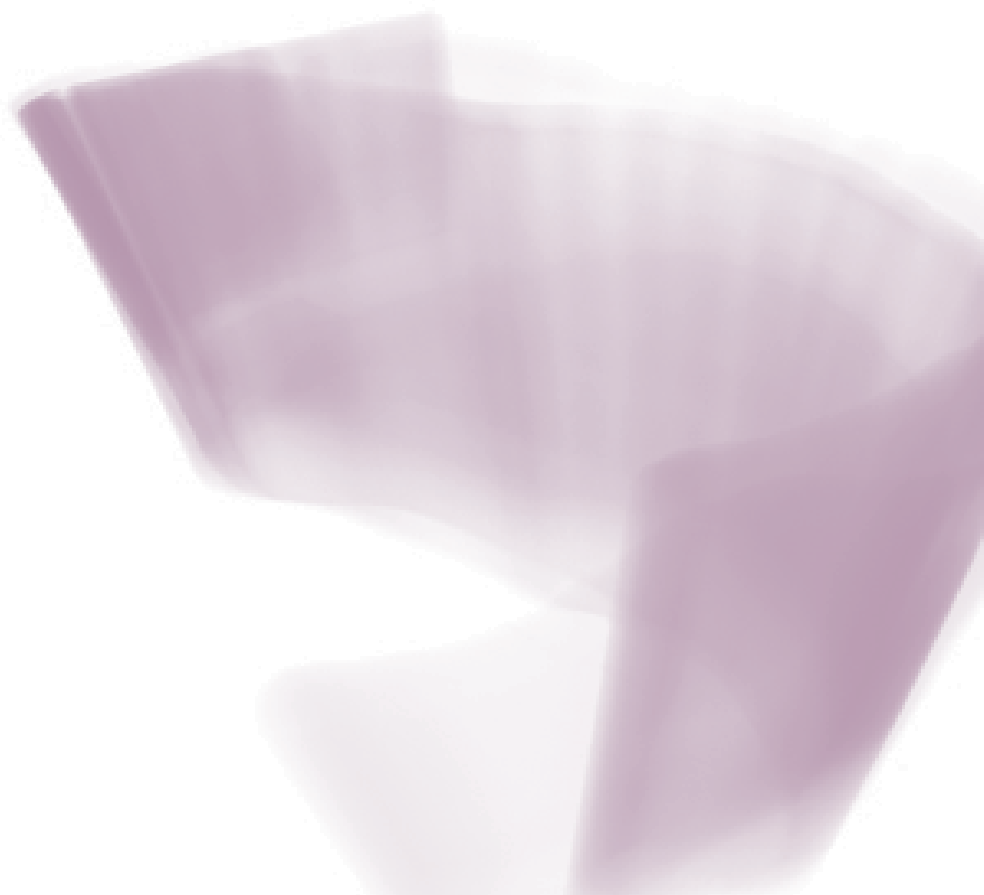
Driving Innovation



# Smart power distribution and demand

**COMPETITION FOR FEASIBILITY FUNDING**

**JANUARY 2012**



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## COMPETITION FOR FEASIBILITY FUNDING

### Summary

The Technology Strategy board is to invest up to £2.4m in feasibility studies to stimulate innovation in power distribution and in management of demand. Proposals are invited that demonstrate innovation in component design, software, implementation, integrated systems and novel business or operational models.

This competition is the first and exploratory phase in a new four-year programme. We aim to stimulate the rapid delivery of innovative technologies and disruptive business models that address the technical and socio-economic challenges posed by reduced generation of power through fossil fuels, increased generation through renewable sources and a predicted surge in demand from the electrification of heat supplies and from electric vehicles.

To support and secure the UK's role in delivering innovation for future power

systems, we will encourage and support collaborative working, technology transfer, and systems integration across the energy generation and supply, digital, built environment, transport, and creative sectors.

There are two strands to the competition. The first is for feasibility studies lasting up to four months where grants will not exceed £25k. The second is for feasibility studies lasting between six and 12 months where grants will not exceed £100k. Projects in both strands are open to companies of any size but must be led by a small or medium-sized enterprise (SME). Strand 1 projects may be collaborative or led by a single company. Strand 2 projects must be collaborative.

This is a single-stage competition. It opens on **9 January 2012** and the deadline for the receipt of applications is at noon on **22 February 2012**. A briefing day for potential applicants will be held on **18 January 2012**.

### Background

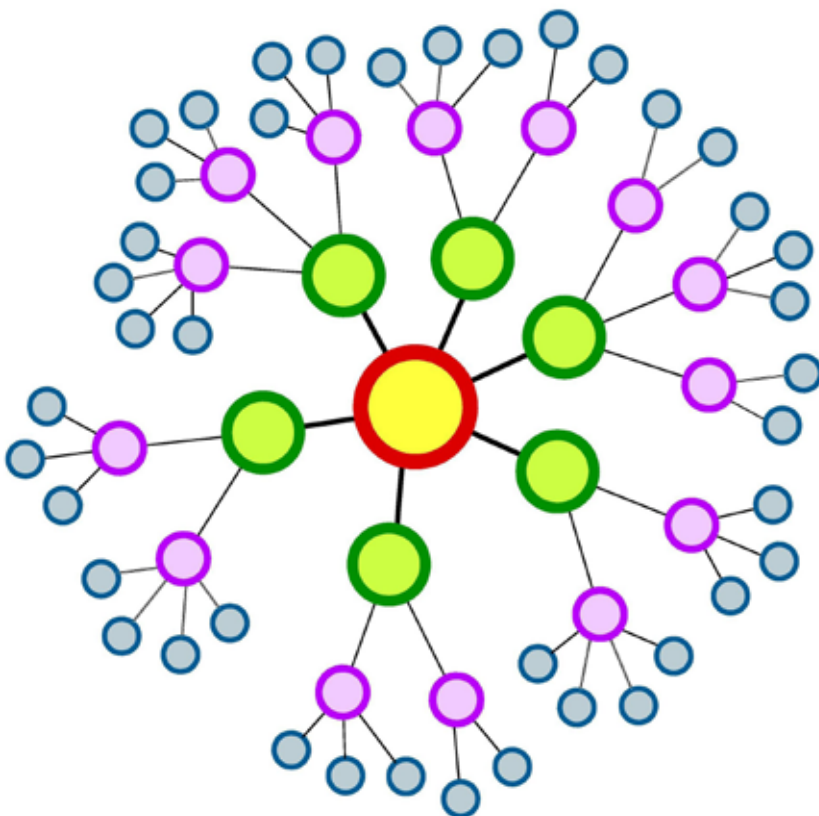
There will be a complex mix of technologies generating power by 2050. These will range from nuclear power stations through offshore wind farms to solar panels on people's houses. At the same time, demand for power will go up because of the electrification of heating systems and because electric vehicles will be incorporated into the system. The challenge for the power industry is to match demand with supply.

The market for goods in the field of energy networks could be worth an estimated £110bn globally in 2014 (Pike Research). It is estimated that reinforcements to the power network through increased automation of distribution and demand side participation – the ability of energy consumers to make decisions about the quantity and timing of their electricity supply – will save the UK £8bn by 2020.

The power sector will need to be almost entirely carbon-free by 2050, leading to increased reliance on renewable energy sources that are not continuously available.

Through this competition, the Technology Strategy Board aims to support business innovation across a broad range of technologies that support the power network functions of distribution automation (DA) and demand side participation (DSP), including novel concepts such as virtual power plants (VPPs).

All areas require advanced integration of information and communications technology; electronics, photonics and electrical systems; advanced materials; industrial mathematics; and nanoscale technologies. Novel demand-side, consumer-focused technologies and business models may also benefit from the participation of creative industries (cognitive design, social gaming), financial services (markets and trading) and socio-economic insights (behavioural change).





## Scope

Distribution automation technologies are already commercially available and widely used by utilities. There are opportunities to optimise the performance of components, systems and operating models in ways that can provide a better measurable return for utilities. Applications that address operations and efficiency, management of peak loads, predictive technologies and communications for equipment, and system restoration may offer the greatest potential.

### 1. Distribution Applications

The following distribution areas are in scope for this competition:

- applications to manage operational efficiency including those that reduce losses, improve voltage profiles, identify equipment that is not operating as well as it should, make the system easier for system operators to manage, and reduce labour costs
- applications to manage peak loads including those that coordinate with customer equipment to reduce loads and balance loads between available distribution sub-stations and feeders
- applications to predict equipment failure including those that are designed to anticipate problems on the distribution system before they occur. These applications include both real-time monitoring systems and techniques designed to estimate the probability of equipment failure
- applications to restore systems after failure including those that are designed to improve restoration of the grid and reduce service loss to customers in the event of equipment failure.

### 2. Demand side participation applications

The following demand side participation applications are in scope:

- residential sector applications including those that facilitate reduced costs of sensors, controls, displays, communications equipment, and energy-storage and power-quality devices. These applications can promote longer duty cycles; consumer engagement; self-healing networks; distributed intelligence; community energy generation and storage; dynamic demand response aggregation, such as offered by virtual power plants; and future energy balancing and trading platforms
- commercial and industrial sector applications including those that increase the scalability, monitoring and direct control of load management, interruptible demand and dynamic pricing programmes. These can include but are not limited to advanced controls, novel interfaces, communications equipment, energy generation and storage.

Advanced optimisation algorithms for monitoring and control of systems are within scope for both distribution automation and demand side participation applications.

#### Out of scope

The terms energy efficiency and demand side participation are used interchangeably. However, it is important to point out that DSP explicitly refers to all those activities that involve deliberate intervention in the marketplace so as to alter the consumer's load profile. Energy efficiency is used in an all-encompassing sense and includes any activity that would directly or indirectly lead to an increase in energy efficiency. To make this distinction precise, a model that encourages customers to install energy efficient lighting systems through a rebate programme would fall under DSP. On the other hand, customer purchases

of energy efficient lighting, as a reaction to the perceived need for conservation, is not demand side participation but classified as energy efficiency.

Reduction in consumer demand via energy efficiency is being addressed by several Technology Strategy Board innovation programmes, including the Low Impact Building and Low Carbon Vehicles innovation platforms, and is therefore out of scope for this competition. However, innovation in demand side participation and distributed energy has not been specifically addressed by our programmes. Only feasibility studies within these areas are therefore in scope.

### Funding allocation and project details

We have allocated up to £2.4m to fund feasibility studies that address the technical challenges and inspire and demonstrate new technologies in line with the scope described above. We are primarily looking to fund pre-commercial feasibility studies attracting up to 75% public funding.

This competition has two strands.

**Strand 1** – We will invest up to £400k in feasibility studies lasting up to four months. Projects can attract up to 75% public sector funding and the total public funding element will not exceed £25k for each project. Strand 1 is open to either single companies or to companies working in collaboration with other companies or academic institutions where a business need exists. Strand 1 is open to companies of any size, including SMEs, micro and large companies, however the project must be led by an SME.

We invite short-form proposals presenting concepts for future innovative technologies, and business and operational models which have the potential to make a substantial contribution to the cost-effective development of flexible, resilient, self-healing and secure future power networks.

**Strand 2** – We will invest up to £2m in collaborative feasibility studies lasting between six and 12 months. Projects can attract up to 75% public sector funding and the total public funding element will not exceed £100k for each project. Studies must be collaborative and led by an SME. Companies of any size are eligible as partners. Academics are eligible, but cannot lead a consortium.

Strand 2 is designed to look at more detailed feasibility studies offering opportunities to demonstrate innovation. They might feature novel individual technologies or demonstrate new integrated systems as well as operational and business models.

All proposals must explain how the work will help UK positioning within the global market and against other innovative leaders in the field. In particular, the proposals must show a capacity for scalability, reliability, securability, interoperability and sustainability.

Proposals should deliver a tangible outcome such as a component, system, process or business model. They should clearly show how the approach can reduce the costs of network reinforcement and upgrades associated with decarbonisation of power networks.

Successful applicants will be expected to present their findings at a future event, details of which will be available later.

We will consider proposals involving academia and research establishments provided they are led by an SME and have a clear potential route to market.

All applications will be assessed on individual merit in accordance with the normal Technology Strategy Board process.

Further details can be found in the *Guidance for Applicants* for this competition, available from our website (see [www.innovateuk.org](http://www.innovateuk.org) under Competitions) after you have registered for this competition.

## Key dates

Competition Opens	<b>09 January 2012</b>
Briefing day	<b>18 January 2012</b>
Registration deadline	<b>15 February 2012 noon</b>
Deadline for receipt of applications	<b>22 February 2012 noon</b>
Decision to applicants	<b>26 March 2012</b>

Looking for partners to work on your project? Go to **\_connect** ([www.innovateuk.org/connect](http://www.innovateuk.org/connect)) to find collaborators and networks. Visit the smart grid technologies group at [http://bit.ly/smart\\_connect](http://bit.ly/smart_connect) and the smart energy and future power systems group on LinkedIn at [http://linkd.in/smart\\_link](http://linkd.in/smart_link)

## Application Process

This single-stage competition will open on **9 January 2012**. The deadline for registration is at noon on **15 February 2012** and the deadline for completed applications is at noon on **22 February 2012**.

An optional briefing event will be held in Birmingham on **18 January 2012** to highlight the main features of the competition and explain the application process.

**Note: All deadlines are at noon.**

## More information

To apply for this competition you must first register with us. You can do this by going to the web page for this competition at [www.innovateuk.org](http://www.innovateuk.org) under Competitions. When you register you will get access to all the supporting information you need to read before you apply, including the *Guidance for Applicants* and the application form.

**Competition Helpline:**  
**0300 321 4357**

**Email:**  
[competitions@innovateuk.org](mailto:competitions@innovateuk.org)

## 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 (IP), 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](mailto: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.*

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