ofgem Promoting choice and value for all gas and electricity customers

Creating Britain's low carbon future. **Today.**

LCN Fund
Low Carbon Networks

To deliver Britain's ambitious plans for a low carbon energy sector, energy networks must be transformed. They must be smarter, more innovative, more flexible, more responsive to customers' changing needs and more cost effective.

The £500m Low Carbon Networks Fund (LCN Fund) is providing vital backing for a series of leading-edge projects aimed at developing crucial knowledge and expertise which can be shared across the industry – helping to improve performance while curbing costs.

Last year four projects shared £63m from the LCN Fund. In 2011, its second year, the fund is backing a further six ground breaking initiatives with a total of almost £57m.

See inside for details.

LCN Fund
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The Low Carbon Networks Fund (LCN) Fund was set up by Ofgem to run from 2010 to 2015.

It encourages electricity network companies to test and anticipate how the networks will need to change now, so we're ready for the challenges of a low-carbon future.

Over five years, the LCN Fund will help finance projects designed to develop the expertise needed to ensure networks can meet the challenges of moving towards a low carbon economy. Winning projects have also attracted investment from third parties and are partnering with local councils, universities, electricity aggregators and multi-national technology firms.

The LCN Fund will help networks address key low carbon challenges, such as:

- incentivising customers to manage their energy demand
- connecting new sources of renewable generation efficiently and in a timely manner
- enabling electric vehicles, heat pumps, and other low carbon technologies to connect more efficiently
- understanding the role networks and customers need to play in order to manage the transition to the low carbon economy.

How much is it worth?

Up to £500 million in total, over the five year period.

The First Tier, up to £16 million a year, is spread across all distribution network operators (DNOs) to spend against set criteria.

The Second Tier, up to £64 million a year, is provided to projects that win an annual competition.

A discretionary reward totalling up to £100 million over the five year period, can be awarded by Ofgem for successful project completion and exceptional projects.

2011 Second Tier funds:

Like last year, an independent panel of experts advised Ofgem to help us reach our decision on which projects should win funding.

Six bids were submitted and all six were considered good enough to receive funding.

As in 2010, all bids were judged against the extent to which the solution being trialled would:

- accelerate the development of a low carbon energy sector
- impact on the operation of the distribution network
- deliver financial benefits for present and/or future consumers
- develop new skills and knowledge that can be shared across the industry.

Bidders also had to show that their project:

- is relevant and timely
- demonstrates a robust methodology and readiness
- involves funding and skills from other partners.

This year the LCN Fund again attracted a portfolio of high quality projects. All the bids demonstrated a relevance to the challenges facing the industry and an ambitious approach to tackling them. Also, they all included partnerships across a range of organisations, spanning energy and technology companies, universities and local authorities.

The projects aim to:

- tackle real and immediate issues facing the industry
- share the information and expertise built up through the trials across the industry
- produce solutions to ensure the best value from future investment.

Submissions looked to explore:

- how to meet the challenges facing the networks from increasing use of low carbon technologies
- how to increase the capacity of existing networks
- consumers' response to tariff incentives
- how results can lead to a more efficient approach to future investment.

Low-carbon networks: the future

Network operators face a number of challenges as they look to facilitate the transition to the low carbon economy. They will increasingly have to deal with two way flows on the network from photo voltaic solar panel in homes and other distributed generation. The decarbonisation of heat and transport may place far greater loads on the network and the roll out of smart meters will encourage customers to change how they use energy through time of use tariffs.

Ofgem has already introduced a new regulatory framework for the energy network sector: RIIO (Revenue= Incentives+Innovation+Outputs). The aim is to ensure that networks not only respond quickly and efficiently to changing customer demands but also work with those customers to help anticipate such changes.

The knowledge accumulated from the trials funded by the LCN Fund will help network companies build up their understanding of how and where future investment will most be needed.

The LCN Fund is only open to projects in the electricity distribution sector. However, the RIIO framework will bring a similar approach to innovation for the gas distribution and electricity and gas transmission sectors.

The Winning Projects

Capacity to Customers

Flexible Plug and Play

Flexible Networks for a Low Carbon Future

FALCON (Flexible Approaches for Low Carbon Optimised Networks)

BRISTOL (Buildings, Renewables and Integrated Storage, with Tariffs to Overcome network Limitations)

New Thames Valley Vision: From data to decisions

Capacity to Customers

The company: Electricity North West Limited

The area: North West England

Amount awarded: £9.1m (total project cost, £10.7m)

Period of project: January 2012 to December 2014

Key partners: IGE UK Ltd (GE), Parsons Brinckerhoff Ltd (PB), Flexitricity, EnerNoc, RWE npower, NGET, University of Strathclyde, University of Manchester, Tyndall Centre for Climate Change, Association of Greater Manchester Authorities.

The project will aim to:

- increase the capability of the existing high voltage (HV) network. It will make available capacity which is currently set aside for use when problems develop elsewhere on the network (ie from network failure or planned maintenance)
- approach 1200 industrial customers to sign up to contracts which allow Electricity North West to interrupt supplies, in return for payments or reduced connection costs
- find ways which could fundamentally change the way networks are designed in the future. This could lead to a reduction in the amount of investment to develop an electricity network to be capable of meeting the needs of a low carbon economy.

Flexible Plug and Play

The company: UK Power Networks

The key concept: Giving generators more flexibility and choice over network access

The area: Cambridge

Amount awarded: £6.7m (total project cost, £8.8m)

Period of project: January 2012 to December 2014

Key partners: Cable & Wireless Worldwide, Smarter Grid Solutions, Imperial College London, University of Cambridge.

The project will aim to:

- deploy 'smart' technologies and communication equipment across a 700km^2 of the Extra High Voltage (EHV) network in Cambridgeshire, to enable faster, cheaper connection of wind farms
- provide new commercial arrangements which will give generators more choice and flexibility and will test ways of managing the network more actively
- increase flexibility to help networks learn how to operate in a way better suited to the needs of low carbon generation such as wind farms
- develop a model which could be used by all distribution network operators to accommodate low carbon generation more efficiently
- provide short term benefits for network operators across the industry.

Flexible Networks for a Low Carbon Future

The company: Scottish Power Energy Networks

The key concept: Obtaining more value from existing network assets

The area: Three separate locations - Wrexham, St Andrews and Whitchurch

Amount awarded: £3.6m (total project cost, £6.4m)

Period of project: January 2012 to December 2014

Key partners: University of Strathclyde, TNEI, Nortech, BRE.

The project will aim to:

- explore a variety of different techniques to deliver extra capacity on the HV network at three separate locations:
- use real time data from monitoring equipment to show Scottish Power Energy Networks how, at that moment in time, they can operate their network most efficiently
- provide practical information on design and network operation which could provide immediate benefits for other network operators.

FALCON (Flexible Approaches for Low Carbon Optimised Networks)

The company: Western Power Distribution

The key concept: Development of an investment model for designing 'smart' high voltage networks

The area: Milton Keynes

Amount awarded: £12.4m (total project cost, £14.9m)

Period of project: November 2011 to September 2015

Key partners: Logica, Aston University, Cranfield University, Cisco Systems, University of Bath.

The project will aim to:

- develop a new investment model for the HV network based on information from trialling innovative new 'smart grid' solutions
- allow networks to identify where 'smart' technology can be used most economically to provide customer benefits
- combine a range of technical measures and innovative commercial arrangements for both generators and consumers
- develop new insights into network investment which will be available to the rest of the industry.

BRISTOL (Buildings, Renewables and Integrated Storage, with Tariffs to Overcome network Limitations)

The company: Western Power Distribution

The key concept: Enabling photo voltaic solar to connect to the low voltage network more efficiently through using an in home battery and variable tariffs

The area: Bristol

Amount awarded: £2.2m (total project cost, £2.5m)

Period of project: December 2011 to January 2015

Key partners: University of Bath, RWE npower, Siemens, Bristol City Council.

The project will aim to:

- solve the network problems which arise when a number of customers in a local area connect PV solar panels to their house
- investigate how a battery installed in the home can help customers to manage their energy usage and save money on their bills
- test how consumers respond when offered different electricity tariffs throughout the day
- explore the benefits of supplying electricity by direct current (DC), rather than the traditional alternating current (AC).

New Thames Valley Vision: From data to decisions

The company: Southern Electric Power Distribution

The key concept: Development of low voltage networks

The area: Bracknell

Amount awarded: £22.8m (total project cost, £29.9m)

Period of project: January 2012 to March 2017

Key partners: GE, Honeywell, University of Reading, KEMA, EA Technology, Bracknell Forest Council.

The project will aim to:

- develop new ways of understanding how domestic and commercial customers will use electricity in the future, allowing the industry to forecast demand more accurately
- provide analysis to help anticipate where low carbon technologies are likely to connect to the network
- hold demand response trials coupled with the use of low voltage storage devices, to look at ways of managing network constraints
- help network companies understand the implications of the growing use of low carbon technologies on network planning
- illustrate the benefits of developing better communications between network operators and commercial customers.

The Expert Panel

- Dr Robin Bidwell (Chair)
- Professor Nick Jenkins
- Sean Sutcliffe
- Sharon Darcy
- Professor David Newbery

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