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Making a positive difference
for energy consumers

2015 Network Innovation Competitions

Our gas and electricity networks need to become smarter and more efficient. Ofgem runs innovation competitions to fund projects that encourage new approaches that will help make the system smarter and save customers money. The Network Innovation Competitions (NICs) for electricity and gas help develop crucial knowledge and expertise to share across the industry. This year we will provide **£62.8m** of funding for **nine** projects which, when combined with the companies' contributions and external funding, will see a total of over **£100m** being invested in innovation.

RIIO NIC NETWORK INNOVATION COMPETITION

2015 Network Innovation Competitions

2015 is the third year the NICs have been run.

This year's projects cover an exciting range of areas across both distribution and transmission of gas and electricity. Each project tackles problems facing the networks now or in the future.

This year, some of the **projects explore issues such as:**

Creating a new type of smaller electricity pylon which offers environmental benefits and saves customers money.

Demonstrating the commercial feasibility of creating BioSNG from household waste and how this gas can be used as a fuel for transport and domestic heating.

Developing a new technique for managing the temperature of substations – increasing their operational capacity and lifespan.

What is the NIC?

The NIC is open to applications from GB distribution and transmission networks, including independent companies, offshore transmission owners and the national system operator. Network companies submit and deliver projects in partnership with the wider energy industry, such as energy suppliers, universities or technology providers.

How we've judged each project

Each successful project must meet specific criteria to ensure it brings benefits to customers. Two expert panels (one for electric and one for gas) advise us for each of the competitions. They help us decide which projects should be funded.

Our criteria are that a project must:

- Generate new knowledge that can be shared among all network operators.
- Be cost effective and provide value for money to customers.
- Accelerate the move to a low carbon energy sector and/or deliver environmental benefits, and potentially bring net financial benefits to customers now and in the future.

Each submission must also demonstrate that the project:

- Is innovative.
- Is robust and ready to implement.
- Involves appropriate partners and external funding.
- Is relevant and timely.

Stimulating innovation

The NICs are designed to stimulate innovation by network operators. This means the industry can better meet customers' changing needs and **move to a low carbon economy** by:

- Connecting new low carbon sources of gas or electricity.
- Meeting the needs of small-scale and intermittent generation.
- Using new sources of data and trialling new practices to improve network performance.
- Helping customers reduce their carbon footprint and cut bills by lowering their energy consumption.
- Addressing an increase in electric vehicles, heat pumps, smart domestic appliances and other low carbon technologies.
- Sharing learning from the project through the ENA 'Smarter Networks' Portal.
- Ensuring all customers can benefit from each project.

Read on for details on this year's projects.

RIIO NIC NETWORK INNOVATION COMPETITION

Electricity NIC projects details:

Project:
New Suite of Transmission Structures (NeSTS)

Company Name:
Scottish Hydro Electric Transmission PLC (SHE Transmission)

The Concept:
To create a new type of electricity pylon which is smaller, better for the environment and provides savings to customers.

NIC funding awarded:
£6.6m

Additional Company Contribution/External Funding:
£0.75m

Period of Project:
6.25 years

Potential NeSTS OHL support design – note that this model is one of several potential designs and is not final.

The project will aim to:

- Engage with a variety of stakeholders to create a suite of electric towers which are visually acceptable to the public.
- Demonstrate tower designs which meet the challenges of connecting renewable generation in remote locations.
- Reduce the cost of new overhead projects by 10%.

Electricity NIC projects details:

Project:
Offgrid Substation Environment for Acceleration of Innovative Technologies (OSEAIT)

Company Name:
National Grid Electricity Transmission PLC (NGET)

The Concept:
To convert an existing 400kV substation into a field trial centre where innovation projects can be tested under real world conditions.

NIC funding awarded:
£12m

Additional Company Contribution/ External Funding:
£13.9m

Period of Project:
4.75 years

The project will aim to:

- New methods and technologies under realistic network conditions.
- Create a safe environment for developing new procedures and training.
- Complete 14 specific innovative projects over its duration.

Electricity NIC projects details:

Project:
Celsius

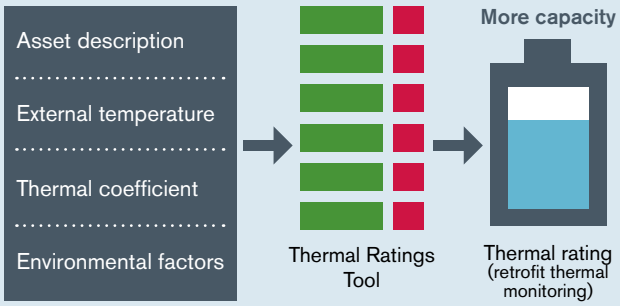
Company Name:
Electricity North West Ltd (ENWL)

The Concept:
To develop a new way of managing the temperature of substations – increasing their operational capacity and lifespan.

NIC funding awarded:
£4.7m

Additional Company Contribution/ External Funding:
£0.5m from ENWL with additional funding of £0.2m from project partners.

Period of Project:
4.25 years



The project will aim to:

- Develop an understanding of the relationship between increased transformer load and temperature.
- Create a tool which measures a transformer's internal operating temperature.
- Enable network operators to add capacity to the network at a fraction of the cost of traditional reinforcement.

Electricity NIC projects details:

Project:
Future Intelligent Transmission Network Substation (FITNESS)

Company Name:
Scottish Power Transmission PLC (SPT)

The Concept:
To create GB's first live digital substation.

NIC funding awarded:
£8.3m

Additional Company Contribution/ External Funding:
£0.9m from SPT with additional funding of £1.5m from project partners.

Period of Project:
4 Years

The project will aim to:

- Utilise new digital technology to improve substation design standards.
- Reduce system outage times; improving the service provided and reducing the associated costs by 4-5%.
- Increase the speed of substation deployment while reducing building/ modernisation costs.

Electricity NIC Projects details:

Project:
Angle-DC

Company Name:
Scottish Power Manweb PLC (SPMW)

The Concept:
To increase network capacity through converting an existing Alternating Current (AC) circuit between the mainland and Anglesey to Direct Current (DC).

NIC funding awarded:
£13.1m

Additional Company Contribution/ External Funding:
£1.5m

Period of Project:
4 years

The project will aim to:

- Give the DNO full power control of the link between Anglesey and the mainland.
- Increase network capacity and reduce losses.
- Generate new learning which can be applied within future DC projects.

Gas NIC Projects details:

Project:
Customer Low Cost Connections (CLoCC)

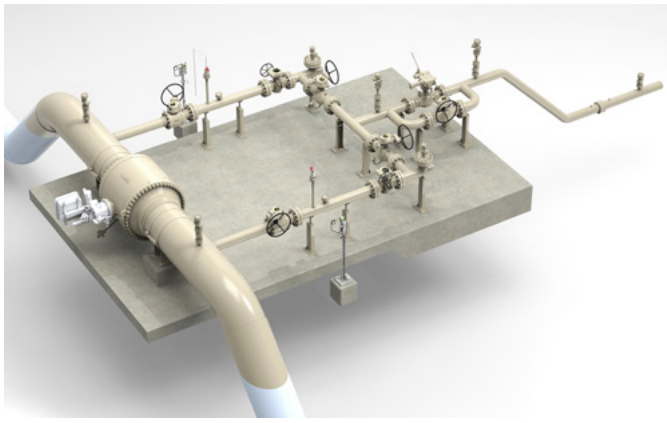
Company Name
National Grid Gas Plc (Transmission System)

The Concept:
To minimise the cost and time of connections with a particular focus on unconventional gas connections.

NIC funding awarded:
£4.8m

Additional Company Contribution/ External Funding:
£0.5m

Period of Project:
2.75 years



The project will aim to:

- Halve the connection costs and times for customers wishing to connect new types of low carbon gas to the transmission network.
- Reduce the usage of liquefied natural gas (LNG) and help improve the security of supply through enabling the connection of unconventional gas sources.
- Create learning which can be applied to the gas distribution network.

Gas NIC Projects details:

Project:
City CNG

Company Name:
Northern Gas Networks

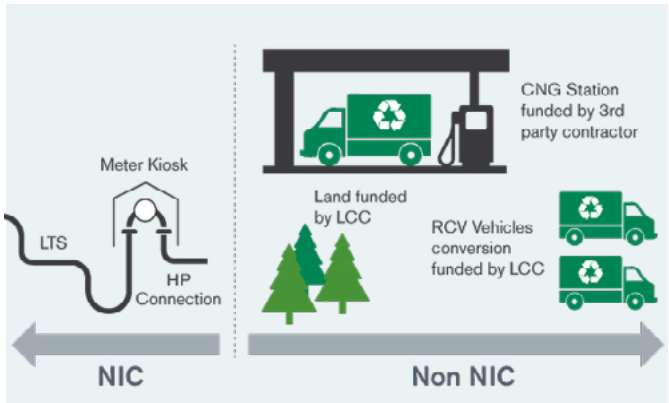
The Concept:
To design and build the UK's first scalable city based Compressed Natural Gas (CNG) fuelling station.

NIC funding awarded:
£0.7m*

Additional Company Contribution/External Funding:
tbc*

Period of Project:
4 years

* This project has been awarded partial NIC funding of £700k instead of a requested £1.1m. Northern Gas Networks may choose not to progress this project on these terms. We are working with them and a decision is expected in early 2016.



The project will aim to:

- Provide a 'build it and they will come' proof of concept for the viability of a city-based CNG fuelling station.
- Create a novel charging arrangement whereby the cost of connection is spread out over ten years rather than paid up front.
- Create learning that helps to facilitate the connection of more low carbon gas to the network.

Gas NIC Projects details:

Project:
Commercial BioSNG Demonstration Plant (Distribution Networks) (NGG DN)

Company Name:
National Grid Gas Distribution

The Concept:
To develop a commercially viable plant that converts household waste into synthetic biogas (BioSNG).

NIC funding awarded:
£5.4m

Additional Company Contribution/ External Funding:
£0.6m from NGG DN with an additional grant of £17m from the Department for Transport.

Period of Project:
4 years

The project will aim to:

- Build on the existing learning and knowledge generated by NGG DN's Pilot BioSNG Project funded by the NIC in 2013.
- Deliver financial savings to customers through lowering the cost of gas and removing the need to invest in electric heating systems.
- Demonstrate the environmental benefits of using unconventional low carbon gas as a fuel for domestic heating and transportation.

Gas NIC Projects details:

Project:
Real-time Networks

Company Name:
SGN

The Concept:
To create a new method of modelling energy within the GB gas network

NIC funding awarded:
£7.1m

Additional Company Contribution/ External Funding:
£0.81m

Period of Project:
3 years

The project will aim to:

- Produce an updated modelling tool with a novel 'cloud' arrangement which measures the energy within the system in real time.
- Reduce network investment.
- Deliver environmental benefits such as reduced network leakages and the removal of the need for expensive enrichment methods for unconventional gas.

The Electricity NIC Expert Panel

- Dr Robin Bidwell CBE (Chair)
- Jo Armstrong
- Alan Bryce
- Sharon Darcy
- Prof. Nicholas Jenkins

The Gas NIC Expert Panel

- Miriam Greenwood OBE DL (Chair)
- Ron Chapman
- Trisha McAuley OBE
- Prof. David Newbery
- Sean Sutcliffe

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