nationalgrid

Gas Distribution

Network Innovation Allowance

Annual Summary 2015/16

Welcome

This is the third Innovation Annual Summary for National Grid Gas Distribution under the Network Innovation Allowance (NIA). This is our third year under RIIO and the NIA framework has seen us continue to progress our portfolio of 61 projects and realise real value for our stakeholders. I'm pleased to say that we've made good progress over the last year, completing 30 projects from our portfolio. We will continue to track the benefits of these projects over the coming year.

This year we have made the most of the opportunities to innovate presented by the NIA, with an expenditure of £9.35 million. The increase compared to last year is because many projects in our portfolio have moved from proof-of-concept developments to large-scale field trials.

Our focus for this year has been on integrating our innovation projects into the business. Highlights included the commissioning of the first CNG refuelling station in the UK connected to our Local Transmission System and the first-ever flow of biomethane through a Reinforced Thermo Plastic pipe at 19 bar. These two projects are great examples of how innovation is resulting in real value for our customers today.

We continue to put customers at the centre of our innovation strategy and reducing the impact of our work on them remains the driver for many of our projects. Since our update last year, we have completed four further proof-of-concept trials within the PRISM (Pipe Replacement In Situ Manufacturing) programme.

We have also developed three TORS robots to carry out service connections remotely and hosted a successful demonstration of this technology in December 2015. We now have a good understanding of the full technical solution for both of these No Dig technologies and the business is committed to delivering the remaining programme of works, which will result in live field trials in early 2017.

Developing our understanding of the Future of Gas and our role in the 2050 energy mix has been an important area of focus for us in the past year. Alongside delivering a number of associated NIA projects, we were also successfully awarded funding for the next stage of development of our BioSNG Plant in Swindon.

The funding from Ofgem and the Department for Transport will enable us to test the commercial feasibility of generating renewable gas from black-bag waste sourced from Swindon Borough Council. This gas will then be injected into the local distribution network and be used to fuel the HGVs of a local road haulier. Alongside the work being done within the innovation team, we have also released four publications; Delivering for our Customers,

"We continue to put customers at the centre of our innovation strategy"

Supply of Renewable Gas, Domestic Heat and Transport. These publications have been well received and are available on our Future of Gas website.

Looking forward to 2016/17, we are embarking on a time of significant change within our business. Many of our big strategic projects are reaching live field trials and we look forward to implementing the successful outcomes of these projects into the business from early 2017 onwards.

Chris Train
Director
National Grid Gas Distribution

Our innovation strategy

Our strategy focuses on six value areas, which reflect the RIIO Outputs and our Gas Distribution Ambition. These areas have been split into two categories: For Today and For Tomorrow.

Our stakeholder commitments

These strategic value areas are underpinned by our five stakeholder commitments. They are to:

- Keep people safe.
- Be reliable.
- Safeguard future generations.
- Provide value for money.
- Deliver a quality service to all.

For Today

Customer experience

Reduce the size and duration of our replacement and remediation activities. Continually improve our customer and stakeholder experience through proactive communication.

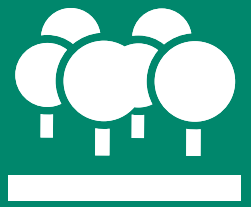
Cost efficiency

Continually reduce the cost of running our network by optimising the way we work, improving the efficiency of assets and the cost-effectiveness of investment decisions.

Life extension

Extend the life of our assets through increased monitoring and new remediation techniques. Increase our network reliability, thereby reducing disruption of service.

Safety and environment



Continually improve our safety standards for our customers and employees. Reduce our impact on the environment through energy demand and waste reduction and, wherever possible, have a positive impact on the environment in which we work.

For Tomorrow

Unconventional supplies

Open up the use of our network to alternative energy sources. Increase diversity and security of supply through the identification of renewable gas sources.

Future network

Facilitate the integration of our network into the wider energy chain to ensure least-cost energy provision for our customers. Understand the future energy needs of our customers.

The story of 2015/16

NIA projects

Over the past year, we have continued to deliver projects across our six strategic value areas. 84% of spend has been on projects in the For Today value areas, which aligns with the approach that we defined at the start of the year. Having these value areas ensures a spread of innovation projects across all our activities. Examples are shown on the following pages.

These projects have already started to benefit customers. During 2015/16 a number of our NIA projects were successfully implemented, including the first CNG refuelling station in Great Britain to be connected to the Local Transmission System. In September 2015 we became the first gas operator in Great Britain to test and commission Reinforced Thermo Plastic pipe that will operate at a pressure of 19 bar.

These projects have cultivated a culture of innovation within National Grid and have triggered a number of business-funded projects. For example, the CNG refuelling station project has led us to buy our first CNG-fuelled vacuum truck.

Future of Gas and the NIC

In 2015-16, we committed time and resources to improve our understanding of the future energy market and how this might impact on Gas Distribution Networks (GDNs).

We became the first gas operator in Britain to use Thermo Plastic pipe that operates at 19 bar pressure, while our CNG refuelling project led to our first CNG-fuelled vacuum truck

Projects in the future network value area, such as Distributed Sources of Gas, look at the effects of introducing new sources of gas into networks. In addition, a joint-funded report 2050 Energy Scenarios commissioned by all of the GDNs has given us a comprehensive insight into what the UK gas networks' role may be in the 2050 energy system.

This year we won funding through the Network Innovation Competition (NIC) and the Department for Transport to build a commercial BioSNG Demonstration Plant, which means we can expand the trials at our BioSNG pilot plant into a larger commercial scale plant. This project will demonstrate how gas derived from recycling black-bag waste can be injected into the local distribution network and used for refuelling heavy goods vehicles. Click here to see how we are getting on with last year's NIC project and find out more about this year's project.

We have also released a number of publications to articulate the Future of Gas story:

- **Supply of Renewable Gas**
- **Domestic Heat**
- **Transport**
- **Delivering for our Customers**

Learn more about these projects at our Future of Gas website
www2.nationalgrid.com/uk/industry-information/future- of-energy/gas/

NIA activity

This is the third year of the Network Innovation Allowance (NIA). The past 12 months have seen us continue to deliver a portfolio of 61 projects spread across our six value areas:

Projects per value area

Customer experience	15
Cost efficiency	19
Life extension	10
Safety and environment	5
Unconventional supplies	4
Future network	8
Total projects	**61**

£9.35m
was spent on NIA projects during 2015/16 financial year

21
projects were carried out collaboratively with other gas distribution network operators

30
projects were completed by the end of the 2015/16 financial year

Customer experience

Digging holes during our mains replacement projects is a cause of significant disruption to customers. That's why we're looking at innovations that will reduce excavations to an absolute minimum and increase customer satisfaction. This is being achieved through the use of No Dig technology.

PRISM (Pipe Replacement In Situ Manufacturing)

PRISM is a mains replacement technique for creating a new, fully structural plastic pipe by spraying a liquid polymer into an old cast iron pipe. The polymer cures and sets, in effect using the old main as a mould to create the new plastic main. It has the potential to dramatically reduce the number of holes we need to dig and is especially useful where circumstances make excavation difficult.

Since our update last year, we have completed two above-ground trials of PRISM and we have identified all of the technical elements that make up the end-to-end solution.

Blown Air Extrusion (BAE)

BAE works on a similar principle. It uses the old service pipe (the pipe connecting the customer to the gas mains) as a mould to create a new pipe. However, it differs from PRISM in that a vortex of air is used to distribute the polymer inside the pipe instead of a spray-head.

PRISM and BAE can be used independently or as an integrated solution for service and mains replacement. As the projects progress, we're continually assessing their commercial viability with a detailed cost/benefit analysis. We expect both methods to be trialled in a live environment in 2017.

PRISM is a technique for spraying a liquid polymer inside the old cast iron main to create a new fully structural plastic main

Service connections by robot (TORS)

TORS is a remotely-controlled robot. It can perform service connections from inside the pipe that would otherwise need holes to be dug outside each property in the street. TORS stands for Tier One Replacement System, with Tier One being another name for our low-pressure system.

Since last year three TORS robots have been developed with project partners Synthotech. One remotely connects customers onto 6in diameter gas mains, and the other two connect onto 4in diameter gas mains. All have had successful trials in controlled environments. Full end-to-end trials are planned to take place in operational environments, and the robots are expected to be deployed by autumn 2017.

Cost efficiency

Sealback mains replacement system

Sealback is a system which allows mains replacement to be carried out in live gas conditions. Polyethylene (PE) pipe with a Sealback fitting is directed into place inside the old main, a bag is inflated to form a seal, and sealant is then pumped into the gap between the old and new pipes, preventing gas leaks.

The Sealback product has been improved during this project as a result of feedback from users. The new version uses an inflatable bag instead of a nose cone, and has an integrated camera and an improved sealant delivery system. The inflatable bag means it can be used with different diameters of pipe and with tapering sections; something that wasn't possible with the earlier version. Sealback reduces excavation, reinstatement and traffic management costs, and improves customer satisfaction. Field trials are being carried out before implementation, which is expected to start in January 2017.

The improved Sealback design uses an inflatable bag instead of a nose cone

Reinforced Thermo Plastic pipe (RTP) is being trialled as a cheaper option

Plastic pipe as an alternative to steel for connecting to our networks

The Raynham Farm project is the first time we have used Reinforced Thermo Plastic pipe (RTP) instead of steel pipe to make a high-pressure (19 bar) connection to the distribution system.

Plastic is cheaper and quicker to lay than steel and we have demonstrated a significant reduction in time taken to connect new biomethane plants to the gas distribution system. This is welcome news for the increasing number of biomethane suppliers looking to connect up to our network.

The Raynham Farm project has led to further work to develop a Reinforced Thermo Plastic (RTP) Specification. This will enable suppliers to use RTP safely up to 19 bar, and reduce the cost of connecting to the grid. At the 2016 EIC Innovation Awards this project won the award for Best Innovation Implemented or Adopted by a Utility Contractor.

KOBUS service pipe puller

Borrowed from the water industry, KOBUS is another technology that does away with the need for excavations when replacing service pipes. KOBUS allows the old pipe to be withdrawn while pulling the new plastic pipe into place, meaning there's no need for costly excavation and reinstatement.

Thirty trials have now been carried out and we are currently fine-tuning the process and technology before implementing it into the business.

Safety and environment

Network Outperformance Measure (NOM) Risk Trading

In collaboration with other GDNs, we've developed NOM Risk Trading, an innovative methodology that uses the principles of currency trading to prioritise asset replacement. This desktop analysis quantitatively assesses the risk and critical role of our assets to ensure our asset investment is targeted in the most cost-effective way.

The project's innovative 'event tree' analysis tools have been refined and are now close to being finalised. This project will change the way we manage asset risk on our networks.

This CNG station in Leyland, Lancashire started flowing gas in February this year

Leyland CNG filling station

Working in partnership with CNG Services Ltd, we've commissioned the first-ever Compressed Natural Gas filling station connected to our Local Transmission System (LTS).

This CNG station in Leyland, Lancashire started flowing gas in February this year. It is supplied via our high-pressure network and compresses the gas before it is used to refuel trucks. Using a pipeline to transport gas reduces the number of fuel tankers on the roads, cutting pollution from traffic emissions, increasing road safety and reducing transport costs.

Moreover, because Leyland CNG filling station is connected to our high-pressure gas network, it is expected to be around 50% more efficient than other lower-pressure CNG stations connected to medium-pressure 2 bar systems. The station is currently undergoing an independent 12-month review to determine how efficiently it performs. The 'well to wheel' study should demonstrate the cost and emission benefits of using CNG over liquid fossil fuels. The project will provide a blueprint for a network of CNG stations across the UK.

Read more about this project
nationalgridconnecting.com/pump-action/

Safe removal of WEKO seals

WEKO seals, made from rubber and secured by two spring-loaded rings, form a seal between two adjacent sections of large diameter pipe.

When they need replacing, an engineer has to crawl inside the pipe to remove the seal. Although the engineer wears breathing apparatus, it is a difficult and potentially dangerous operation.

In this innovative project, we are looking to develop a method of removing the seals using a series of cradles, wheels and hydraulic jacks. This means that the seals can be removed remotely. Trials have been successfully completed on a 100m stretch of 36in main. Further development and trials are planned.

Future network

Distributed sources of gas

We are leading a collaborative project with Wales & West Utilities and Southern Gas Networks to investigate the effects of, and potential obstacles to, introducing new sources of gas such as biomethane, shale and coal bed methane into the distribution network.

The more open we are to using different sources of gas in our network, the greater the opportunity for decarbonising our sources of heat and ensuring security of supply.

The project has used findings from the experience of different countries to predict the effect on our network in a multitude of different scenarios. These findings will help us to develop a long-term strategy for introducing these new gas sources into our network.

Virtual reality simulators allow safe training outside of live gas conditions

Virtual reality simulators for training

We are exploring the use of virtual reality simulators to give less-experienced engineers the opportunity to handle complex procedures before starting on-site training in live conditions. This will reduce risk and give operatives the information they need in a more engaging format. If successful, we hope to reduce the time spent in the classroom and improve access to information about complex procedures. Trials of virtual reality products with bespoke software are taking place in our North West network.

2050 Energy Scenarios

In collaboration with the other networks and the Energy Networks Association, we have commissioned the 2050 Energy Scenarios report. This report details four energy scenarios and articulates the role that the UK gas networks could play in the 2050 energy system. The report concludes that continuing to use the gas network offers cost savings versus alternative technologies for decarbonising heat.

Read more about this project

Life extension

Developing a specification for PE repair systems

We have developed a specification for temporary and permanent repairs of polyethylene (PE) pipe. This will serve as an alternative to expensive cut-out and replacement work and give field force teams a consistent approach towards dealing with PE pipeline failures. As part of this project, we have assessed various temporary and permanent repair methods. The next stage of the project will test the proposed methods.

Jointing techniques for PE pipelines up to 10 bar

During the project to develop a PE repair specification (see above), we found the most common point at which PE pipelines fail is where two lengths of pipe are fused together. On that basis, we've been identifying methods of joining pipes that improve performance and lessen the risk of joint failure. Nine possible solutions out of 27 new jointing methods have been recommended and we're carrying out further research to narrow these nine options down to the most reliable jointing methods.

Repairing risers that supply gas to multi-occupancy buildings is a difficult challenge

Connections to multi-occupancy buildings

Carrying out remediation and repairs in multi-occupancy buildings (MOBs) such as blocks of flats and high-rises is a difficult task. Over the past year we have carried out an extensive MOBs policy review, which identified a number of opportunities for innovation and cost reduction.

To make sure best practice methods are used consistently in MOBs, we have developed a specification for internally lining vertical pipes (known as risers). The specification has been approved by Southern Gas Networks, Northern Gas Networks and Wales & West Utilities.

Following the development of the specification we have carried out trials of a system for lining risers with polymer using a vortex of air (similar to BAE, page 6). Once evenly distributed, the polymer sets inside the wall of the riser, forming a semi-structural pipe and sealing gas leaks. The outputs of these trials will feed into a final specification that will be presented to the Technical Standards Forum with the aim of making it a gas industry standard.

Watch the video here

Significant new learning: engagement

Feedback from customers can be a powerful stimulus for change and innovation. However, for this feedback to be meaningful, we have to approach customers in the right way and engage them with what we're doing. One project that taught us this is:

Smart CO detectors

This trial is monitoring smart carbon monoxide (CO) detectors installed in 600 homes throughout Great Britain. It's due to be completed this summer and has significantly advanced the process of monitoring CO levels and the testing and maintenance of detectors.

The success of the project has been in large part due to well-managed customer engagement, based on a well-thought-out plan. This included the cooperation of the Fire Service in installing CO monitors in universities and social housing. The networks funded the project and worked in partnership with Smart Compliance, who provided the CO detectors, and the Energy Innovation Centre.

Unconventional supplies

Siloxane impact and analyser

In partnership with other networks, we're investigating the potential effects of siloxanes on customers. Siloxanes, an umbrella term for compounds that contain silicon, occur when biomethane is burned. With the increasing number of biomethane plants being connected to gas networks, the potential impact on customers needs to be understood.

We now have 22 biomethane sites connected onto our network, with around 50 connections across all the networks in Great Britain. Controlled experiments are being carried out into appliance performance, with a siloxane analyser being used to record data and establish whether safe levels of siloxane are likely to be exceeded.

Significant new learning: implementation

To successfully introduce innovation into an organisation, you need to identify all the teams and stakeholders who'll be affected and assess the impact the innovation will have on them. This is particularly important in larger organisations, when a smooth transition from innovation to business-as-usual is critical. Projects that taught us this are:

Fence Feet

Fence Feet is a product that was trialled collaboratively with our strategic partners, Balfour Beatty. It is a new kind of support for fencing around works that takes up 300mm less space inside the working area and doesn't protrude into the public highway or pavement, making it much less of a trip hazard. Built-in handles also make it easier for operatives to lift and handle. By engaging with teams early, we were able to work around their individual timelines and processes to ensure we could deliver training in a timely manner to everyone who needed it.

Implementing Fence Feet confirmed the benefits of early engagement

Fence Feet was available to hire by all repair teams from July 2016. Equipment rental company Speedy is impressed with the product and has now made it available for its customers to order via their service.

Fence Feet won the Best Safety Innovation at the 2016 EIC Energy Innovation Awards.

SENSIT

SENSIT is a hand-held device that uses soundwaves to detect buried plastic pipes. Until it was introduced, the only way of locating plastic pipes was by checking records and then digging down on to the pipe to confirm its exact location.

Early on in the project we engaged with all teams that were going to be impacted by the implementation of SENSIT. During the trials we gathered feedback from the operatives who will be the main users. Their feedback allowed us to tailor the final product and to plan a successful implementation. Plans are now in place to deliver 10 devices to networks throughout August 2016.

SENSIT uses soundwaves to detect buried plastic pipe

Significant new learning: project stage gates

During a trial of new processes or tools, circumstances can change or an alternative technology can come to light which provides a better solution. We have to be brave and clear-sighted enough to know when to challenge the benefits of a project, even if this results in ending a trial early or a change of tack. The projects that taught us this are:

MEG fogger trial

This trial assessed an improved system for injecting Mono Ethylene Glycol (MEG) into parts of our network where there are still cast-iron pipes. MEG swells the lead yarn in the joints between the pipes, which dries out over time to prevent gas leaks.

As the project developed, it became clear that the original scope was no longer aligned to the changing business needs. This analysis, carried out during a project stage gate review, led to a significant change in direction. The lessons learned have enabled us to develop a more comprehensive MEG strategy internally and have resulted in a more targeted approach towards improving the MEG saturation of our networks.

The MEG fogger trial was re-scoped to develop a more targeted, technical solution

The stage gate process ensures projects are ready to move to the next level

The stage gate process

Not all innovation projects will result in successful technology outputs. As technology development moves through the technology readiness levels, we gain a better understanding of technical and commercial feasibility. In order to manage this evolution in our understanding, we use a stage gate process to control the progress of projects from one technical readiness level to another. This allows us to review the viability of the project and the benefit to the customer as the project moves through its lifecycle.

For example, as the PRISM and BAE programmes have progressed, many technical challenges have been faced. Our approach to overcoming these challenges has been improved by using the stage gate process to act as a control.

Collaborative innovation

We showcased some of our most successful projects at the 2015 Low Carbon Network Innovation (LCNI) conference in Liverpool, and have continued to work collaboratively with other gas distribution networks through the Energy Innovation Centre on a range of projects.

LCNI

The LCNI conference in Liverpool saw National Grid exhibit some of its leading innovations, including TORS, PRISM, SENSIT and Fence Feet

Bringing the industry together

We have partnered with the Energy Innovation Centre, a not-for-profit organisation which acts as a gateway between small and medium enterprises and network operators.

At the same time the Smarter Networks web portal, developed by another partner, the Energy Networks Association, has provided a focused channel of communication for the industry.

Over the past year, we have shared successful project outcomes and lessons learned with the other gas distribution networks through the Gas Innovation Governance Group. Some examples of innovation project outcomes that have been transferred between the networks:

• Fence Feet: SGN has started to roll-out the Fence Feet product into their own networks.
• Self-Amalgamating Tape: Our Emergency Response and Repair teams are now using this product (identified by SGN) to repair MOBs risers in London.
• Low Carbon Gas Preheating: The research in this Northern Gas Network's NIC project is contributing to our own Preheat Strategy and has led us to trial a Proheat system on our network.

Futurewave phase 3

Futurewave is a collaborative project led by National Grid with Northern Gas Networks, Scottish and Southern Energy Power Distribution, Scottish Power Energy Networks and Wales & West Utilities.

The project has created a multi-channel digital platform that connects customers, community organisers, innovative suppliers, energy distributors and investors via a single digital hub. The platform's focus of 'connectivity' aims to give stakeholders a new way to engage, closing the gaps in the energy market between customers and solutions, technology and markets, and capital and projects.

Phases 1 and 2 developed the vision for how it would work and identified the specific products and services involved. Phase 3 will prepare the project for go-live. The outcome will be a self-sufficient business that connects customers, suppliers and investors to the energy market via a website.

Non-NIA innovation

The projects funded by the NIA and NIC have encouraged a culture of innovation within National Grid. Engineers are identifying problems that need solving and are often coming up with their own solutions, which are then being trialled and implemented.

Small Purge Kit

The Small Purge Kit (SPK) is a compact, lightweight lower-cost solution for air-to-gas and gas-to-air purging activities in industrial and commercial gas meter installations. It replaces bulky, expensive equipment and covers 90% of the workload. SPK saves time and improves consistency of operations and safety on site.

The SPK is a lighter, cheaper and less time-consuming tool

Promising greater efficiency during excavations, Suck it and See is a pump and camera combined

Suck it and See

Suck it and See is an integrated water pump and camera system developed by Synthotech. Currently we use a camera to identify the location of the water in a main or service, then use a water pump to remove it. This new solution reduces the size and number of excavations required and uses a unique closed-loop system to recycle the gas back into the main or service. We have trialled this solution on the network and are looking to make further developments with Synthotech.

Geberit Mapress fittings

We have trialled a range of Geberit Mapress fittings which provide a more cost-efficient and flexible solution to repairing risers. The value of these fittings was demonstrated at Cleethorpes Pier, when a riser was replaced as part of the pier's general refurbishment programme. Major cost savings were made, and we are now seeking approval for these fittings to become standard for repairing risers.

Some more innovations are:

- **A new style of rock drill that was developed in order to reduce the potential for injury. A trial of the new rock drill is underway in the East of England network with the aim of reducing incidents by 70% and rock drill failures by 80%.**
- **A new pressure point fitting that allows a new service to be tested as soon as it's been installed, without waiting for a first call operative to attend.**
- **A new emergency control valve (ECV) kit for use by first call operatives who are the first on the scene to respond to a gas leak report. At the moment, the ECV has to be replaced by a repair team on a second visit. The new kit enables an immediate repair to be done, increasing safety and saving a significant amount per visit. Development work on this is now being taken forward under an NIA agreement in collaboration with manufacturer Pipetech and SGN.**

Future of Gas: BioSNG plant

Building on the outputs of our first NIC project (BioSNG Pilot Plant), in 2015/16 National Grid Gas Distribution was successful in being awarded further funding from the NIC (£5.4 million) and the DfT (£11 million) for a much larger BioSNG plant which will cost £23 million, to demonstrate the technology under commercial conditions.

The BioSNG Pilot Plant project is now more than two years through its three-year programme, and production of BioSNG has been successfully demonstrated. The remainder of the programme will seek to optimise BioSNG production from waste, and will provide valuable information to support the development of the commercial demonstration plant.

The four partners in the new project are Advanced Plasma Power, who will provide the gasification technology and supervise the project, Progressive Energy, CNG Services and Wales & West Utilities. The project to construct the demonstration plant in Swindon started at the beginning of 2016.

Planning and environmental permitting has been gained, and ordering of equipment is about to start. The plant is due to be completed by the end of 2017. Refuse-derived fuel will be supplied under contract from Swindon Borough Council, and renewable gas will be sold to a local road haulier who will use the renewable gas to fuel HGVs. Gas will also be injected into the local (Wales & West Utilities) medium-pressure grid to supply remote CNG fuelling stations.

The new plant has also been awarded £11 million of funding by the Department for Transport's Advanced Biofuels Competition. It will produce 1 million kg (22 GWhth) of renewable gas for transport in 2018.

If government and industry subsequently develop full-scale BioSNG production plants, the technology has the potential to deliver up to 100 TWh per annum of renewable gas.

Read more about this project
gogreengas.com

The BioSNG demonstration plant is a £23 million three-year project

Our innovation portfolio

The following two pages contain the full list of projects that were registered within 2015/16. For further information on these projects, and to read the project progress reports, please either click the link next to the specific project, or visit the Energy Networks Association Smarter Networks Portal at www.smarternetworks.org

Completed projects

Ref number	Project name	i
National Grid Gas Distribution Led Projects		
NIA_NGGD0006	Sealback II	>
NIA_NGGD0021	Alternative Riser Pipe Jointing Method – Pyplok	>
NIA_NGGD0043	MEG Fogger Trial Phase 3	>
NIA_NGGD0047	Jointing Techniques for PE Gas Pipelines up to 10 bar	>
NIA_NGGD0044	KOBUS Gas Pipe Puller	>
NIA_NGGD0065	Blown Air Extrusion (BAE)	>
NIA_NGGD0048	Examination of the Relationship Between Leakage and Operating Pressure in MP Systems	>
NIA_NGGD0046	Tier One Replacement System Stage 4.2	>
NIA_NGGD0045	Fence Feet Improvements	>
NIA_NGGD0054	PRISM Phase 2	>
NIA_NGGD0052	Demand Allocation Phase 2	>
NIA_NGGD0050	WEKO Seal Removal	>
NIA_NGGD0064	Mobile Virtual Reality Modelling	>
National Grid Gas Distribution Led Collaborative Projects		
NIA_NGGD0007	Development of DANINT FWAVC software for New Gas Chromatograph	>
NIA_NGGD0019	Pipeline Failure Rate Determination Due To Inland Natural Landsliding	>
NIA_NGGD0033	Multi-Occupancy Building CIP (HTC Serline)	>

Ref number	Project name	i
National Grid Gas Distribution Led Collaborative Projects (continued)		
NIA_NGGD0022	Study of Crater Formation Threshold During Gas Leakage on High-pressure Pipes	>
NIA_NGGD0035	Multi-Occupancy Building Cured In Place Lining (Nu Flow)	>
NIA_NGGD0055	Development of Gas Industry Specification for Polymeric Pipe Lining Systems for Multi-Occupancy Buildings	>
National Grid Gas Transmission Led Collaborative Projects		
NIA_NGGT0047	Resource and Asset Reuse Toolkit	>
Northern Gas Networks Led Collaborative Projects		
NIA_NGN_090	Project Futurewave	>
Southern Gas Networks Led Collaborative Projects		
NIA_SGN0006	Optomole (stage 1)	>
NIA_SGN0023	Cured In-Place Pipe (CIPP) (stage 2)	>
Wales & West Utilites Led Collaborative Projects		
NIA_WWU_009	Investment Prioritisation in Distribution Systems	>
NIA_WWU_025	Futurewave Phase 2 (Digital Prototype)	>

CONTINUED ON NEXT PAGE »

Our innovation portfolio continued

Live projects

Ref number	Project name	i
National Grid Gas Distribution Led Projects		
NIA_NGGD0067	Blown Air Extrusion (BAE) Fully Structural Solution – Proof of Concept	>
NIA_NGGD0076	Concrete Removal System for Multi-Occupancy Buildings (MOBs)	>
NIA_SGN0086	Cured In-Place Pipe (CIPP) (Stage 3)	>
NIA_NGGD0063	Leyland CNG Filling Station	>
NIA_NGGD0058	MEG Fogger Trial Phase 4a	>
NIA_NGGD0073	Multi-Occupancy Building Cured In-Place Lining (NuFlow) trial	>
NIA_NGGD0077	PRISM (Pipe Replacement In Situ Manufacturing) – Above Ground Trial	>
NIA_NGGD0075	Repair Sleeve for Gas Pipe Systems in Multi-Occupancy Buildings (MOBs)	>
NIA_NGGD0066	Sealback II (Testing)	>
NIA_NGGD0061	SENSIT Acoustic Pipe Locator	>
NIA_NGGD0057	ServiBoost	>
NIA_NGGD0062	Tier One Replacement System Stage 5	>
NIA_NGGD0069	Top Tee Siphon Adaptor (TTSA)	>
NIA_NGGD0074	Wall Anchors for Gas Pipe Systems in Multi-Occupancy Buildings (MOBs)	>

Ref number	Project name	i
National Grid Gas Distribution Led Collaborative Projects		
NIA_NGGD0072	Project Futurewave – Phase 3 (Pilot)	>
NIA_NGGD0056	Network Outperformance Measure Risk Trading Methodology	>
NIA_NGGD0059	Impact of Distributed Gas Sources on the GB Gas Network	>
NIA_NGGD0068	Network Outperformance Measure Risk Trading Methodology Stage 2	>
Northern Gas Networks Led Collaborative Projects		
NIA_NGN_142	Project Concur	>
Southern Gas Networks Led Collaborative Projects		
NIA_SGN0086	Cured In-Place Pipe (CIPP) (Stage 3)	>
NIA_SGN0094	Energy Map and Plan	>

If you have any more queries, please contact:

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