Innovation for today’s and tomorrow’s customers

Wales & West Utilities Innovation Report 2016/17
We put our customers first. It’s a core value of our business. They rely on the safe and reliable gas supply we provide, and expect us to work hard to keep the gas flowing today and prepare our gas network to play its part in a future affordable, secure and low carbon energy system.

In 2016/17, we’ve invested more than £1.8 million on 34 innovation projects, an increase of £0.8 million on last year. This report outlines our progress on these projects – supported by Network Innovation Allowance (NIA) funding. NIA funding has delivered very real successes, and as an industry we must do all we can to continue this.

For several years a significant amount of our innovation spending has been focused on the future role of gas, and I remain proud of our accomplishments in this space. Underpinned by research work delivered thanks to NIA funding in Bridgend and Cornwall, our unique energy simulator gives insight into the future energy landscape, helping local, devolved and national government make future energy policy decisions in a customer-focused and sustainable way. Meanwhile, operational improvements, like the latest in our developed pipe cutters and better, more efficient and effective ways of finding gas leaks, are helping us deliver outstanding service to our customers today.

This year has seen us continue our range of successful innovation partnerships. Not only are we working with other energy networks including electricity distribution network operators, businesses large and small, academia and the Energy Innovation Centre, we also continue to work closely with the Welsh Government as an innovation anchor company. Since 2013, we have participated in projects with more than 70 different partners.

While there’s no “one size fits all” answer to the energy trilemma – supported by our research and innovation projects, and underpinned by our unique energy simulator, our view of the future remains clear. Gas has an essential role in a future energy mix, to help to deliver an affordable, secure and low carbon energy system.

Graham Edwards
Our strategy

Our strategy is simple. We innovate to make sure we can deliver the highest possible levels of safety, reliability and service for today and tomorrow’s customers.

For today’s customers, our innovations have helped us deliver outstanding levels of customer service: reducing the disruption from our essential work while making us more efficient and cost-effective and our network more resilient.

And for tomorrow’s customers, our research projects and partnerships make sure we play our part in delivering reliable energy at affordable costs for customers, while helping the UK meet its decarbonisation targets.

With a small innovation team supported by a large delivery team (that’s all of us) our innovation is driven by our five business priorities which reflect the stakeholder outputs we deliver as well as making sure we meet the needs and expectations of all our customers and stakeholders today and in the future.

During 2016/17 we have continued to evolve our innovation portfolio while investing a further £1.8m on innovation activities using NIA funding that will help us to harness knowledge, expertise and potential to meet the challenges of the future.

These challenges can be summarised as:

- Delivering a smart, reliable, low cost and low carbon network to meet the future energy needs of our customers
- Supporting customer needs and expectations in a changing environment
- Effectively managing an ageing infrastructure to keep the gas flowing to our customers’ homes and businesses
- Continuing to review, develop and demonstrate technological advances to keep our colleagues and customers safe while delivering value for money.

Governance and delivery

During the year, a total of 148 new innovation project ideas were submitted to our team for review and evaluation. These ideas became 15 new projects using NIA funding as well as 14 projects which were supported by other means including self-funding to demonstrate the new equipment, materials and technologies in a real world environment. This demonstration is vital if benefits of innovation are to be realised.

Before being selected for development, we first review potential projects against our business priorities to make sure they’re worthwhile. We then consider their ease of implementation versus potential benefits for the customer. This is done by our Innovation Committee – as well as our Innovation Steering Group made up of several of our executives and senior managers. This group also reviews the quality and effectiveness of our ongoing innovation portfolio.

This thorough process and ongoing monitoring makes sure that every project we select for development has the potential to provide real benefits to our customers.

Collaboration is central to delivering our business innovation.
Why innovate?

The energy sector continues to be dynamic and constantly changing. Innovation, supported by incentives, is essential to meeting the challenges of the future. Our sector is undergoing rapid and significant change and we recognise the importance of challenging ourselves and others within our sector to find better ways of doing things. It is helping us support a sustainable integrated energy solution by providing a safe and reliable gas network that delivers best value and excellent service for our customers today and in the future.
Now is the time to innovate

We put our customers first, and target innovation to deliver value for money and real results for our customers. Our values have helped innovation thrive, with 62 NIA projects started since 2013/14.

We’ve invested £1.8 million across 34 innovation projects in 2016/17 with funding from the NIA scheme. Not all of our projects have been successful but we have learnt from each and this has helped us deliver for our customers in the long term. The incentive funding has allowed us to pursue a number of solutions to real problems including:

- In 2013/14 we pursued Iron Mains Condition Assessment tools in order to improve safety, and to plan our gas main replacement programme better.
- In 2014/15 we developed Ductile Iron Window Cutters which mean we can cut into old metal gas mains quicker during replacement programmes to keep disruption to customers and road users to a minimum.
- In 2015/16 we developed the Smart pressure sensor which gives our engineers a digital measurement of test and installation pressures to improve safety and deliver consistent reporting.

In 2016/17 too, NIA funding has helped us deliver for customers of today.

Drones!

**BACKGROUND**

They’ve taken film and photography to new heights, have been heralded as the next big thing in delivery services and now drones are set to help us survey our pipelines and network faster, easier and cheaper than ever before.

Surveying is a vital part of making sure our assets are properly protected and maintained. Until now, surveys have been carried out using ground-based methods like scaffolding or specialist cherry pickers. This can be costly and time consuming.

In March 2017, we finished our five-month project to assess and report on the suitability of using drone technology to do condition surveys on above ground pipes within visual line of sight – a flight distance of less than 500 metres from the pilot.

**KEY BENEFITS**

- We understand the strengths and weakness of drone surveys against traditional techniques – particularly on how the survey data is monitored, managed and acted upon.
- We demonstrated the benefits of drone surveys for areas that were difficult to access and collected survey data in difficult environments including an estuary and a railway bridge.

**NEXT STEPS**

- Asset inspection is a challenge for all infrastructure providers – so the outcomes of this project will be shared with other gas networks as a first step.
- Drone technology offers huge potential for both gas and electricity networks. We hope to collaborate to explore the use of drones to survey beyond visual line of sight, potentially to replace helicopter flights that look for contractors working in the vicinity of our pipes and help us make sure we keep our network safe and secure.
- Further consideration will be given to the comparative strengths and weakness of in-house training to fly drones versus an outsourced service framework.

Beyond visual line of sight

Now is the time to innovate

Projects

**RAPID STEEL PIPE CUTTER**

**KEY FACTS:**

- Finished – October 2016
- Collaboration – Wales & West Utilities only

**NEED**

- We want to use the most efficient methods of replacing our old metal gas mains.

**CHALLENGE**

To develop a hand-held tool that will safely, swiftly and successfully cut through steel pipes without damaging the newly inserted PE pipe to give improved value from our essential gas mains replacement work.

**IMPACT**

Reduction in the size and duration of our street works activities that affect our customers – minimising disruption and reducing cost. Like our successful 2015/16 Ductile Iron Window Cutters (now in use across our network, other UK gas networks and also being used abroad), Steel Cutters will help us include more pipes in live insertion projects.

**NEED**

We want to use the most efficient methods of replacing our old metal gas mains.
Projects

PORTABLE GAS READING EQUIPMENT (PRE)

**KEY FACTS:**
- Finishes – January 2018
- Collaboration – Wales & West Utilities only

**NEED**
We want to test innovative laser and fibre optic technology, and demonstrate its ability to locate gas leaks in underground utility ducts quickly and accurately – reducing excavation and repair cost.

**CHALLENGE**
To develop and field test software that allows us to create a video map to record our survey activities.

**IMPACT**
Development of a comprehensive digital platform providing improved quality and availability of our field survey records.

Driving OUTSTANDING SERVICE

PORTABLE GAS READING EQUIPMENT (PRE)

**KEY FACTS:**
- Finishes – January 2018
- Collaboration – Wales & West Utilities only

**NEED**
We want to test new technology to help us find the source of gas leaking into other utility ducts.

**CHALLENGE**
To test innovative laser and fibre optic technology, and demonstrate its ability to locate gas leaks in underground utility ducts quickly and accurately – reducing excavation and repair cost.

**IMPACT**
Reduction of the cost and duration of work needed to find the source of and stop gas leaking into utility ducts allowing us to fix the leak quicker, therefore reducing the volume of gas leakage. Minimising the impact of our work to find gas leaks on our customers.

Driving OUTSTANDING SERVICE

PORTABLE GAS READING EQUIPMENT (PRE)

**KEY FACTS:**
- Finishes – November 2017
- Collaboration – Wales & West Utilities only

**NEED**
We want to use advanced technology to find gas leaks on our network safely and quickly.

**CHALLENGE**
A series of trials of three different gas leak detection tools to understand if they are better than current equipment used to find gas leaks in a variety of applications.

**IMPACT**
Improvement of methods of gas detection, allowing our colleagues to find and fix leaks quicker, therefore reducing the volume of gas leakage and keeping the communities we serve safe.

Driving OUTSTANDING SERVICE

“Cutting into ductile iron mains has always been a challenge. It’s a real positive that the ductile iron mains cutter is now operational and embedded right across our business. With one in each of our operational areas – and many more on order, it’s not only making our job a little easier, it’s also making sure as many customers as possible can receive the benefits of live mains insertion – replacing their old metal gas pipes while keeping disruption and time off gas to a minimum.”

Demanding SAFETY always
Innovation for tomorrow’s customers

The future is now

With more than 80% of heat and power demand at peak times currently met by the gas network, we’re planning for the future – to make sure we continue to deliver reliable energy at affordable costs for customers, while helping the UK meet its decarbonisation targets.

We’re already playing a part in decarbonising heat, with 16 biomethane sites injecting enough green gas into the Wales & West Utilities network to meet the demand of 90,000 homes.

Freedom

BACKGROUND

We are proud to be playing a leading role supporting a shift change to a flexible, integrated energy network – with gas and electricity networks working closely together to support the decarbonisation of heat.

Testament to this is Freedom – a novel heating system that could help decarbonise heat.

It could provide an affordable, secure and low carbon solution. We want to start Hannah West Equity, remaining flexible and effective method of demand side response which reduces network reinforcement requirements.

Following approval of our customer engagement plan, we have selected the equipment to be used for the trials and completed pilot installations in four households in Bridgend, south Wales.

We have started to install a further 71 hybrid heating systems throughout the year.

We want to investigate a cost-effective and flexible method of energy storage based on biomethane.

The simulator provides leading industry insight into future energy scenarios.

The future is now

We’re already playing a part in decarbonising heat, with 16 biomethane sites injecting enough green gas into the Wales & West Utilities network to meet the demand of 90,000 homes.

A vision of the future is emerging. Our research has told us that the full electrification of heat comes at an excessive cost. We are committed to, alongside partners, delivering an energy future that addresses the UK energy trilemma – providing consumers with affordable, secure, and low carbon energy.

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- Freedom’s whole energy system approach provides flexible demand side response which reduces network reinforcement requirements.

NEXT STEPS

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- Customers will manage their heating requirements via a custom-made app that has been thoroughly tested for usability.
- Further develop network infrastructure models to analyse the impact that Freedom could have on the gas and electricity networks.

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Learning and sharing

PROJECT DELIVERY

In the past 12 months we have expanded our innovation team, (though it remains small) and focused on improving our project management and implementation processes. We are committed to embedding innovation, and have updated our processes to make sure this happens. Through our experience, we have learnt that positive project outcomes are linked to the speed in which they are formed, demonstrated and assessed.

We have produced an innovation management toolkit, adapted from Change Management Expert John Kotter’s processes to fit our needs. This uses a range of tools and techniques that produce clear procedures. It will help us to manage, successful projects and increase the reliability of our gas supply and help the environment.

The survey gathered valuable insight into the effectiveness of our processes, the impact of our projects and how well project progress information is communicated. We scored good or very good 78% of the time – a great set of results.

The highest scoring area was “projects that have been implemented are improving the reliability of our gas supply and help the environment” with 95% of respondents rating this good or very good. Also scoring 95% was “our innovation team members are easy to work with.”

The lowest score, with 45% of respondents rating it good or very good was “there are enough ideas being put forward”. Earlier we reported that we had received 148 ideas in the year and this survey score reflects the challenges we face of how and when to communicate both the good ideas and the ones that do not pass the evaluation process.

It is vital that we take the feedback from our colleagues to build on the successes and to ultimately support an effective transition for the innovation process as well as our projects to business as usual.

INSIGHT

Innovation plays an important role in helping us to design our future at Wales & West Utilities and getting colleagues involved in scoping, developing and testing new ideas is vital in embedding it as business as usual. To support this aim, in September 2016 we surveyed colleagues across our business and 47% gave us their feedback on what we could do to improve results, identify the barriers that get in the way of people providing high-quality innovative ideas, recommend what could be done to overcome the barriers and to discuss the concept, role, skills and behaviours needed for effective innovation champions across our sites and offices.

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The kick-off workshop facilitated by Wales & West Utilities was a well-organised and extremely positive session. A defined project strategy was set out, ensuring all stakeholders had a shared vision. This was imperative as it established what success would look like at the end of the project and beyond. Giving everyone the confidence of a well-managed, successful project. Implementing projects in this way fosters an innovative approach from all parties both in terms of process and product.

Louise Early, Crowcon

BENEFIT TRACKING

Since 2013, we have completed 47 NIA projects with a total investment of £4.8m. These projects span the recognised methods of research, development and demonstration and 27% of our project portfolio has matured to the technology readiness levels of 7 or 8 – a level 9 is described as a technology that has been proven.

Clearly, an important benefit of the NIA programme is the ability to share project benefits with others. A particular focus this year has been to assess other implemented projects to identify any benefits for our customers and colleagues. The results of this review highlighted that there are projects that we want to adopt and projects that we want to learn more about, but there are also projects that appear to have limited benefits for our network due to differences that exist, for example in our asset base or in the geography or demographics of our network area.

IMPLEMENTING PROJECTS FROM OTHERS

We have built stronger relationships with both gas and electricity networks over the past four years, and we continue to work together to implement projects that have been successfully rolled out by others and could deliver benefits for our customers too. Some examples of innovation projects that we have adopted from other networks are Cadent’s Fence Feet, SGN’s Osprey Pressure validators and NGN’s Stub end abandonment project.

We have completed a full review of all projects registered on the NIA project portal and identified 10 that have been rolled out by other UK gas networks that we want to adopt. We’ll be working closely with those networks to review projects such as SGN’s CISBOT, that allows a repair to the pipe joints using robotic technology, examine their value for money analysis and consider the benefits they could bring to our customers.

SGN’s CISBOT allows repairs to pipe joints robotically.
CO-ORDINATED RESEARCH

The gas networks are essential to providing affordable heat for customers. We have invested in research to shape understanding and build acceptance of the role and importance of gas networks in delivering the integrated, affordable, low carbon energy system that the UK economy and UK energy customers need. We are working closely with other utility networks to maximise project learning, considering a range of different technologies and implementing strategies to decarbonise gas now.

OUR SUCCESSES

We were proud that two of our projects have won awards. The Flexible Energy Simulator won the IEGEM Gold Medal award and the Reuse of Gasholder Sludge (NIA, WWU 016) won the Brownfield Briefing Award for the Best Use of a Combination of Remediation Techniques – for applying a range of technologies to overcome a significant technical challenge in its treatment.

During the year, we have done more to connect with the innovation community and in listening to their feedback we have refreshed our problem statements making them easier to follow. We have used our network of collaborators to reach out to more people and are building relationships to drive collaborative working.

We found Wales & West Utilities to be true ‘partners’ in the development of innovative solutions. They were able to support the fast-paced and ambitious nature of our project, and together we were able to get to the core issues and attack them in a focused manner.

Iain Chirnside, Steer Energy Solutions

We have 16 biomethane connections, with the capacity to power the equivalent 112,000 homes

We have 25 gas-fired power stations, of which 21 are flexible ‘peaking plants’

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Iain Chirnside, Steer Energy Solutions

Our project partners are always ready to rise to our challenges and make our innovation programme a success.

SHARING

We showcased 10 of our most successful projects at the 2016 Low Carbon Network Innovation Conference in Manchester. A team of 16 colleagues were among more than 1,300 delegates to share some of our best work at our exhibition stand, at the breakout sessions and within the showcase room, giving us an opportunity to view the latest tools, techniques, equipment and processes developed by other networks and businesses.

Sharing learning is one of the key aims of the innovation stimulus and we have devoted time and effort to make it a success. During the year, we organised our own stakeholder events and participated in multiple events such as the IEGEM annual conference, Utility Week Live and the NJUG conference to share with other network licensees and the industry exciting research findings and new technology to contribute to the overall success of the innovation programme. We also held the UK’s first Alternative Gas Workshop, speaking to people interested in getting involved in injecting green gases into our network, and getting their feedback on how we can work together better.
Looking ahead

Innovation is core to our business strategy. We rely on innovation to drive efficiency, while delivering against all our business priorities and output targets and we will continue to do this in the future. Our strategy will stay the same, innovating for customers today and tomorrow, with an innovation portfolio split between projects that develop solutions to solve today’s problems and those that plan for the UK energy system of the future.

There are a growing number of successful projects that have been developed across and beyond the industry that we want to adopt and see us be leading these projects working closely with other networks to implement their successful projects in our network where we can best fit.

For more information on our projects, including project progress and closure reports, please go to the learning portal at: www.smarternetworks.org

### Annual project summary

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