



Wales & West Utilities  
Innovation Report 2020/21



# Innovating for today and tomorrow

## I'm proud to introduce our 2020-21 Innovation Report.

Our final report on our innovation work in GD1, it not only showcases our exciting projects from the last 12 months, but also looks back at our delivery since 2013.

In the last eight years, we've started 417 innovation projects, 109 were funded using the Network Innovation Allowance. These have delivered more than £15m of benefits. From mains cutters, which help our engineers upgrade gas pipes in a way that keeps disruption and time off gas to a minimum and are now standard tools across the sector, to the Freedom Project, the first test of hybrid heating systems in customers' homes, our projects have been industry leading.

In 2020-21, we've continued to prepare for the future through research projects and trials in real customers' homes. We've renewed our focus on hydrogen, working with partners in industry and government on projects including the development of an Industrial Cluster in south Wales. And

looking to the future, we've begun work on identifying villages in our network that could become a pioneering Hydrogen Village, meeting the government's aspirations as set out in the 10 Point Plan.

And we've continued to work on hybrids, building on feedback received from customers as part of the Freedom Project. We're leading HyCompact, which combines a green gas boiler and an air source heat pump into a single, compact hybrid system that can fit in the space of a gas boiler. Customer feedback has been positive, with seven in 10 welcoming the prospect of hybrid heating, while reminding us that comfort and reliability are their 'must haves'.

Feedback of this kind will help inform our customer-focused net zero strategy going forward. Recognising the importance of the gas network in a future whole energy system, we've also taken part in projects to better forecast flexible generation gas demand, supporting renewable energy and helping to keep the lights on.

But it's not just net zero that's benefiting from innovation. Innovation is helping our engineers manage and maintain the gas network more effectively and efficiently: new ways of repairing high-pressure pipelines will help us avoid costly network interventions and keep costs and disruption to customers to a minimum.

Learnings from these projects are being shared with other networks – not least through Gas Goes Green – which is helping marshal the efforts of the UK's gas networks to decarbonise home heating.

As we move into GD2 we remain focused on innovation. Our Business Plan for 2021-2026 is our most ambitious plan ever, built on the views of more than 25,000 people across Wales and south west England. They told us to focus on preparing for the future and supporting the most vulnerable, so our innovation activity will be aligned to those aims: transforming our network to deliver net zero and identifying new ways to identify and support the most

vulnerable, including StreetScore, making sure streetworks are as safe as they can be.

It is an understatement to say that the world has changed considerably since 2013 and the start of GD1. In the energy sector, we have a challenging transition to net zero to navigate, while all of us have been affected by the once-in-a-generation Coronavirus pandemic. From digitalisation and new technologies, to new vaccines and treatments, innovation is driving the response to these challenges, and its power and importance has never been clearer.

I hope you find this report of interest, and as always – at a critical point for the energy sector – if you want to talk about working with us, get in touch:

[innovation@wwutilities.co.uk](mailto:innovation@wwutilities.co.uk)

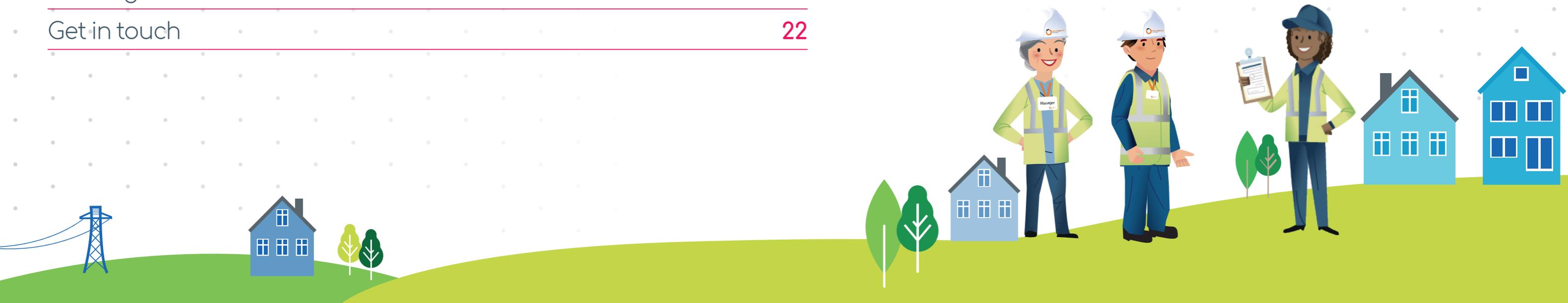


Graham Edwards  
Chief Executive



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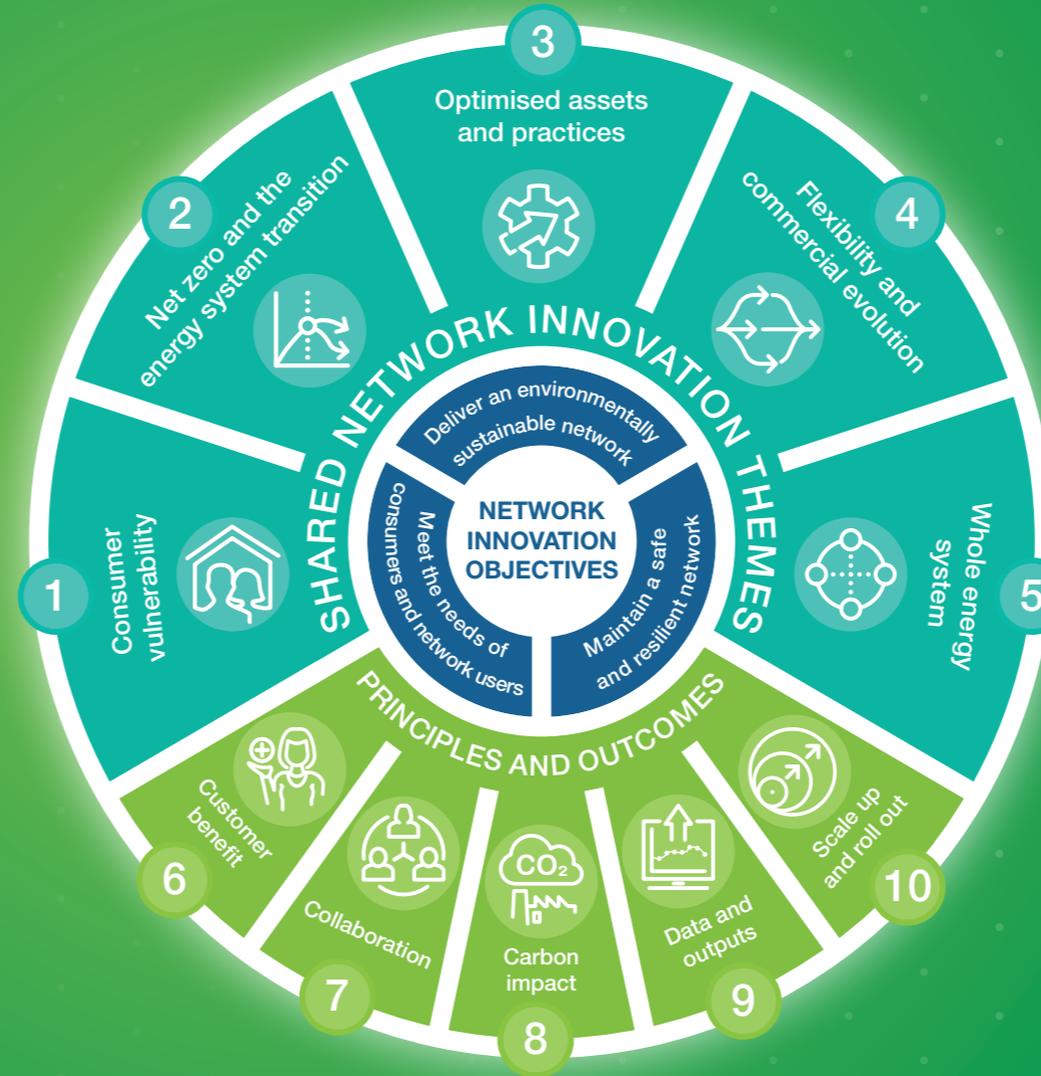
# Our strategy

We have identified our strategic aims to 2050, which reflect what customers want and value from networks and are aligned to the ENA's Gas Network Innovation Strategy. This has helped determine our innovation focus areas for the 2020s.

This strategy sets out how we want to work with you, the innovators, to continue developing new solutions that can help us deliver safe, resilient networks that facilitate the net zero transition and meet the needs of our customers.

Together, we can build on strong foundations set down in RIIO-1, pioneering through business-funded innovation and Ofgem's proposed allowances to deliver to the Principles and Outcomes set out in our strategy.

Join us on our ambitious journey through RIIO-2 to develop and deliver innovation to meet our decarbonisation challenges and get involved in helping us refresh our strategy this autumn.



# Shared network innovation themes



3 projects

12 projects

13 projects

1 project

6 projects



## Tackling consumer vulnerability:

Supporting the needs of customers in vulnerable circumstances and making sure everyone can experience the benefits of energy transition.

## Moving to net zero emissions:

Facilitating the UK's transition to net zero greenhouse gas emissions before 2050.

## Optimising assets and practices:

Developing and implementing industry leading best practice techniques to deliver our essential works affordably and safely, while minimising inconvenience to customers.

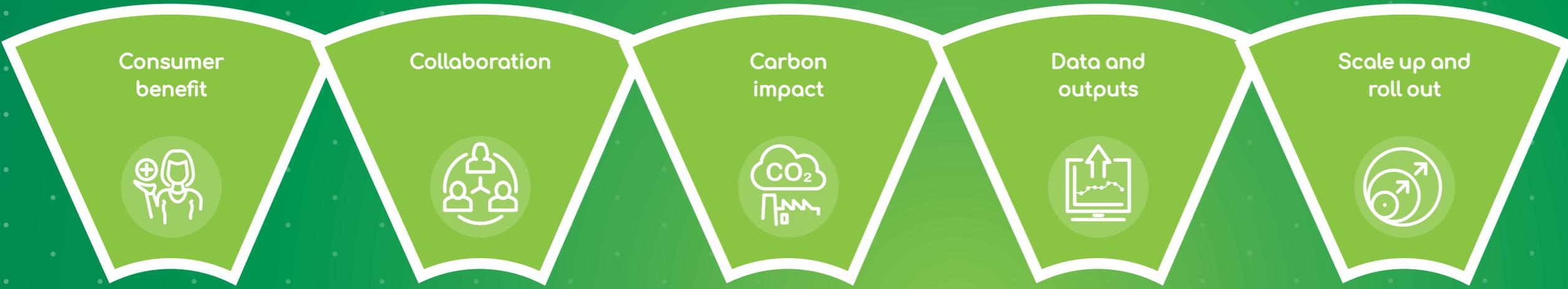
## Flexibility and commercial evolution:

Developing innovative solutions to increasing the flexibility, transparency and efficiency of the energy system, enabling information to be more open and networks to be more responsive to change.

## Supporting a whole system approach:

Enabling joined-up and efficient approaches across multiple aspects of the energy system around planning, forecasting, design, construction, operation, maintenance and data.

# Principles and outcomes



**1,775 hours**

More than 1,775 hours of customer time off gas has been avoided through innovation, and more than 10,000 hours since 2013.

**71%**

More than 71% of our portfolio was in collaboration with one or more network, and more than two thirds since 2013.

**120 tCO<sub>2</sub>e**

Over 120 tonnes of carbon dioxide equivalent emissions have been avoided through innovation, and over 400 tonnes since 2013.

**238**

238 ideas were received from stakeholders, and 1,365 ideas since 2013.

**£15m**

We met our target of delivering £15m benefits since 2013 and this is included in our base costs for RIIO-2.

# Our innovation portfolio

Working more efficiently and connecting green gas

2013/14

2013/14

2014/15

2015/16

2016/17

2017/18

2018/19

2019/20

Year 1



## Team

Our innovation team came together in 2013, to build a foundation to meet today's challenges and get ready for tomorrow's. We created networks within the business and developed relationships externally with our supply chain, fellow networks and the EIC.

## Green gas

In this year, we led the GDNs on our 'Unconventional gases within the onshore gas networks' project to remove barriers, simplify processes and improve access for new technologies that help introduce new and renewable sources of gas.

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## Self-funded innovation

We delivered our self-funded innovation project to develop 500-metre pipe coil trailers. This equipment has enabled significant efficiencies in our mains replacement programme, supporting insertion as best practice, reducing excavation and reducing wastage. These are now used by all the GDNs, driving improved performance for all gas customers.



2014/15

Improving the customer experience and paving the way for hydrogen

- 2013/14
- 2014/15
- 2015/16
- 2016/17
- 2017/18
- 2018/19
- 2019/20

Year 2



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**£1m benefit** We commissioned our award-winning Ductile Iron Window Cutter project. To date, this project has delivered more than £1 million of cost avoidance benefit and has been implemented across the UK by all GDNs. The cutters will deliver enduring efficiencies which have been included in our base costs for GD2, while reducing disruption from our work for our customers.

## Hydrogen future

We collaborated with Northern Gas Networks on the H21 Leeds City Gate project, the first of an extensive programme of industry-leading projects that are paving the way to a hydrogen future.

**Open innovation** As part of its Open Innovation Programme, Welsh Assembly Government supported our innovation delivery. This relationship continues to go from strength to strength.

2015/16

Putting customers first and learning valuable lessons

- 2013/14
- 2014/15
- 2015/16
- 2016/17
- 2017/18
- 2018/19
- 2019/20

Year 3



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## Energy futures

We started work on our Bridgend Future Modelling project, which clearly articulated key facts about future energy solutions and gave us a fuller understanding of future customer impact. This was the first of a long series of projects to create a vision of what a future energy network might look like, all paving the way for our Freedom demonstrator.

## Fail fast

We trialled our Iron Main Condition Assessment System project prototype, but the demonstration failed to successfully prove the system, only meeting one of the four success criteria. The fail-fast principle adopted here was a valuable lesson learnt and it has been taken forward to protect our portfolio in future years.

2016/17

A hybrid pathway for the future of energy

Year 4

# Hybrid demonstrator

Our Freedom Project began. This £5.2m demonstration project was an industry-first, cross-sector collaboration investigating a whole energy system approach. Pursued in collaboration with electricity network Western Power Distribution, the project saw the installation of 75 smart-controlled hybrid heating systems in homes across Bridgend. The project introduced hybrids as a viable source of low-cost and low-carbon domestic heat alongside hydrogen and other green gasses.

- 2013/14
- 2014/15
- 2015/16
- 2016/17
- 2017/18
- 2018/19
- 2019/20



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# Future modelling

Our Flexible Energy Simulator project began, which sought to deliver a simple, flexible energy simulator that can be used to assess different energy supply scenarios and support evidence-based public and future investment policy for energy networks and other utilities. This simulator developed into our 2050 Energy Pathfinder, which today has been used to model pathways to decarbonisation in the UK.

2017/18

Rolling out effectively and collaborating

2013/14

2014/15

2015/16

2016/17

2017/18

2018/19

2019/20

Year 5



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# Above & Beyond

Our Above and Beyond project began. We led this cross-industry, pioneering project, which set out to establish a standard, network-wide framework for drone use that could revolutionise the way we monitor and maintain our assets. If rolled out across all 14 energy networks, this method of drone surveillance could result in savings of £1.4 million when compared to traditional methods.

## Roll out and scale up

We celebrated the successful roll-out of several projects in this year, highlighting the significant value delivered via our business-as-usual innovation portfolio. Some 21% of the portfolio had been implemented as best practice in the business, delivering cost savings, reducing our environmental impact and improving safety, reliability and customer service.

2018/19

## Regional modelling and building a smart network

- 2013/14
- 2014/15
- 2015/16
- 2016/17
- 2017/18
- 2018/19
- 2019/20

Year 6



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## Optimisation

Our UK-first OptiNet project

commenced in collaboration with Cadent Gas. This demonstration project is investigating a range of solutions to optimise networks, including introduction of smarter pressure control to maximise existing demand in distribution networks and also compression into the high pressure system, helping us bring more green gas on to the network and support the transition to a cleaner energy system.



## Green City Vision

Our Green City Vision started in collaboration with UK Power Networks and Scottish & Southern Electricity Networks. This pioneering, cross-vector study assessed low-cost, technically feasible solutions to produce a low-carbon city or large town. It was the first time whole systems had been simulated together and was the first time our 2050 Energy Pathfinder model had been used in tandem with the National Grid Future Energy Scenarios.

2019/20

Long-term decarbonisation solutions

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100 innovations

This year saw us reach some significant milestones. By year 7 of RIIO-1, we had fully embedded more than 100 innovations across the business, delivering a significant amount of value for our customers. These projects were the successes of more than 1,000 ideas received from our colleagues, supply chain and through the important relationships we've formed with our fellow networks.

2013/14

2014/15

2015/16

2016/17

2017/18

2018/19

2019/20

Year 7

Our first all digital report



Future energy scenarios

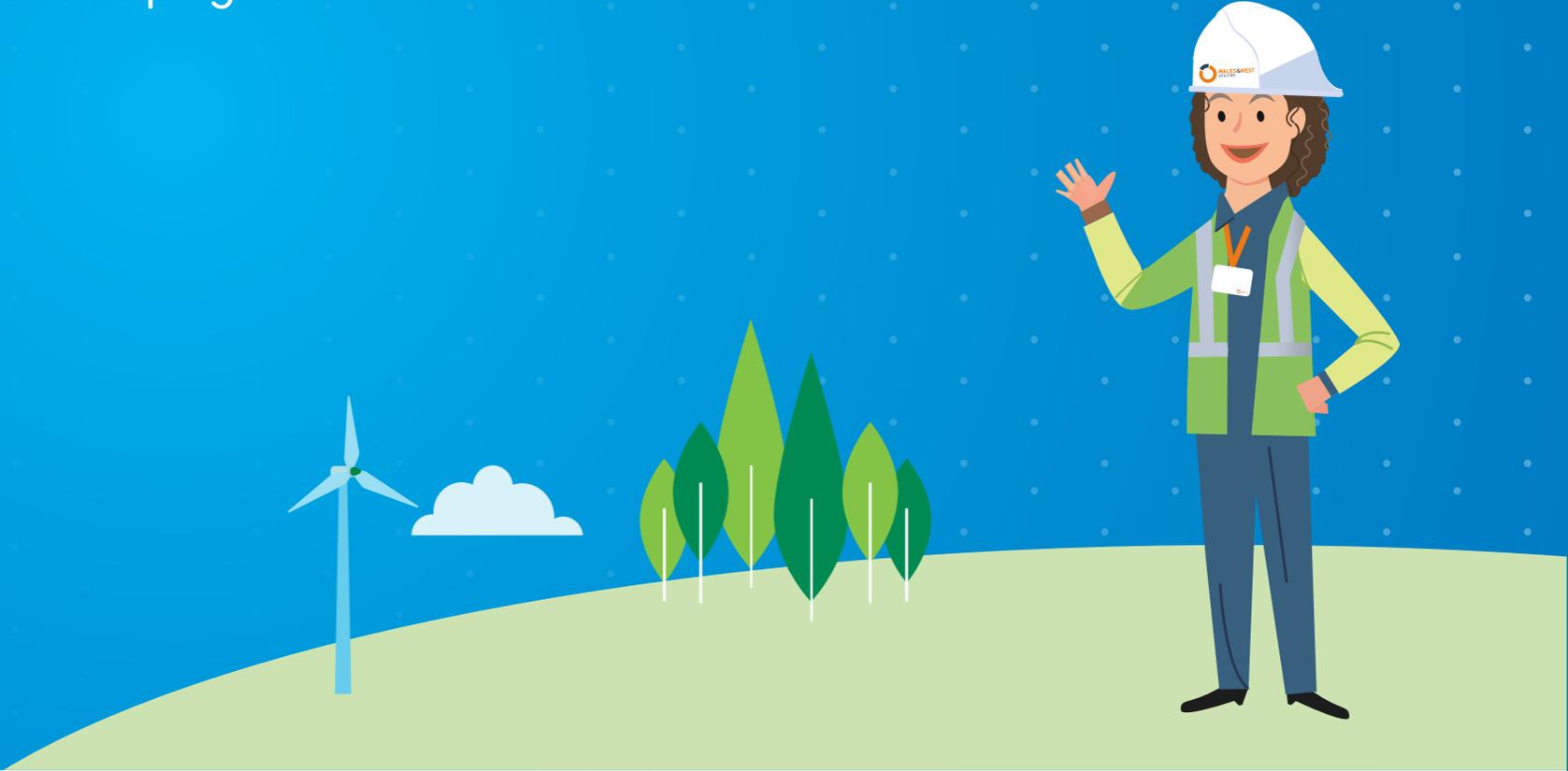
Our Regional Future Energy Scenarios (FES) project started. This project's innovative approach to developing regional future energy scenarios for gas networks was the first of its kind. It mapped every locality in our region to find long-term solutions for heat, power and transport, enabling closer alignment between regional gas and electricity network planning that will be essential in any future 'whole-system' approach.

# Case studies

Since 2013, we've delivered 109 Network Innovation Allowance-funded innovation projects. Whether designing the future of energy, helping us work more effectively, or improving the customer experience, we are proud of the projects we have delivered.

This year, our projects have included making streetworks safer for the most vulnerable, continuing work to design a sustainable future energy system, and helping us to decarbonise our fleet.

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# Securing safer streetworks

Innovation is allowing us to explore how best to support the needs of those in vulnerable circumstances and take a more inclusive approach. Our Ramp Up project (NIA\_WWU\_063) has given us valuable insight into the effect our essential works can have on the public, particularly those in vulnerable circumstances.

With Northern Gas Networks, SGN and Steer Energy, we worked with stakeholders such as those on the Priority Services Register (PSR) to assess and develop technology and new ways of working to overcome challenges faced day-to-day by the vulnerable public.



## 2 Approach



Between June 2020 and February 2021, we conducted in-depth interviews and surveys with people on their challenges when encountering streetworks in everyday life. The aim was to gather views and ideas from people with lived experience of challenges when journeying through streetworks.

Following this, we identified 11 key pain areas where issues have the most significant impact and worked to develop an assessment tool, develop new approaches for communication and redesign how items with the most impact should look.

Finally, we developed 22 paper-based concepts, ranging from an Impact Assessment Tool to simple solutions to improve signage, barrier visibility and footway ramp design. These will be further developed in a second phase of the StreetScore project in RIIO-2.



**"We understand that these works have to take place, but what to them may appear to be a small thing can be a huge obstacle if you're in a wheelchair or even a mum with a pushchair.**

**A bad experience with streetworks could be enough to put a wheelchair user off going out at all.**

**I really would encourage them to try and imagine what this is like for anyone less mobile".**

## 1 Need



PSR groups and the wider public frequently experience inconvenience or challenges travelling around streetworks. While they understand these

works need to be done, if there are avoidable obstructions or unclear signage, public tolerance of them quickly diminishes. The challenge is to identify who is affected by the works and how, and to tailor our services according to their needs.



**71% of participants living with disabilities mentioned that when their regular journeys were affected by streetworks, they would stay home and not travel.**

## 3 Benefits



The project produced many solutions, highlighted the need for a nationwide joined-up approach and identified a range of local, network-specific changes that would be low cost and easy to introduce.

It has also identified more than 20 options that have strong potential for improving streetworks to address the challenges raised, including Sight Line, Portable Ramps, Pre-Comms and Signals for portable traffic lights that could be deployed by all GDNs.

Ultimately, the project will further improve streetworks design, complementing the traditional health and safety considerations with an informed customer stakeholder view that creates a positive experience for vulnerable customers and the wider public.



Consumer vulnerability

1 DBS System

2 Ramp Up

3 StreetScore

# CASE STUDY

## Hydrogen Storage for Zero Carbon Fleet Transport

# Greening the fleet

In 2019, domestic transport was the largest emitting sector of greenhouse gas (GHG) emissions, producing 27% of the UK's total. Of this, Light Commercial Vehicles (LCV) and Heavy Goods Vehicles (HGV) accounted for more than 8%, some 38.7 million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>e).

Alongside Northern Gas Networks and low emissions transport experts Cenex, we're looking to identify what refuelling infrastructure would be needed to switch our fleets to hydrogen-powered vehicles, with a view to achieving zero emissions fleets by 2035.

### 1 Need



We operate wide ranges of vehicles, mainly LCVs and HGVs that account for 75% of our fleet's emissions. Most have high on-board energy demands as the engine is used when stationary to power specialised equipment and tools in remote locations.

This study will help us understand whether hydrogen could meet our fleet's fuel demand, particularly where battery-powered electric vehicles, which have a lower payload, may not be suitable.

### 2 Approach



First, we needed to determine each GDN's fleet composition and operational constraints, work out which vehicles produce the most emissions and calculate the current fleet's energy requirements.

Cenex analysed refuelling data for 1,455 diesel-powered vehicles across both GDNs and calculated the energy use required to perform their duties. It then translated this data into an effective operational range for various zero-emission vehicle types, focusing on hydrogen fuel cell electric vehicles.

Since this type of vehicle is not yet readily available, we used a combination of telematics and other operational data to produce a 'heat map' showing how many existing journeys can be made by an equivalent hydrogen vehicle. This 'heat map' will show where hydrogen refuelling stations would need to be and their specifications.

### 3 Benefits



The project will enable us to better understand the benefits of using hydrogen-powered vehicles across our networks and allow us to plan our next steps.

So far, the analysis has shown there is a clear opportunity for deploying zero-emission vehicles within both fleets. While many journeys could be made using battery-powered electric vehicles, more than 14% of those journeys would exceed the capability of even a large battery vehicle and

such vehicles may not be able to carry the payload our operatives require, so hydrogen would provide a suitable zero-emission alternative.

Final results will produce a suggested vehicle and hydrogen refuelling station specifications that will be applicable to the wider GDN fleets and represents the first step towards us trialling hydrogen vehicles in future.



### Net zero and the energy system transition

- |  |  |
|--|--|
| 1 H21 Field Trials Design              | 7 Hydrogen Deblending in the GB Gas Network        |
| 2 H21 Hydrogen Ready Services          | 8 Hydrogen Storage for Zero Carbon Fleet Transport |
| 3 H21 Initial Hydrogen Supply Strategy | 9 HySCALE  |
| 4 H2GO - Domestic Hydrogen Detector    | 10 HyTechnical                                     |
| 5 Higher chain alkane gases from AD    | 11 IGEM Gas Quality Standard Working Group         |
| 6 Hybrid-Hydrogen (HyHy)               | 12 Optinet   |



### Factfile

- Our First Call Operative vehicles operate at around 90% maximum possible payload and electric vehicles with large batteries would further reduce this, introducing operational and logistical constraints.
- The Wales & West Utilities fleet has an equivalent average daily hydrogen demand of 2,351 kg of hydrogen per day, 56% of which would service all large vans.

# CASE STUDY

## Permanent Leak Repair Clamps Phase 2

# Safely sealing in savings

This project builds on strong foundations set down in Phase 1 (NIA\_WWU\_040), which completed a global literature review and concluded a double-seal clamp provides the best engineering solution needed for the management and repair of leaking Local Transmission System (LTS) pipelines. Phase 2 is investigating market availability and costs, evaluating the benefit of them over current solutions. The project will see a novel permanent leak repair clamp installed on a six-inch LTS pipeline in Anglesey, north Wales.

### 3 Benefits



If we can successfully demonstrate installation of a permanent repair clamp on our north Wales pipeline, the need to cut out or divert the pipeline section containing the temporary repair clamp will be removed and avoid significant costs.

With a service life of up to 25 years, the MORSEAL permanent leak repair clamp solution could significantly reduce intervention costs – providing a cost-effective, safe and monitorable alternative to all UK Gas Distribution Networks.

### 1 Need



The current procedure for repairing damaged steel High Pressure pipeline is to apply a temporary repair using a leak clamp that must be revisited and the clamp replaced with a permanent repair within 12 months. This is both costly and inefficient, so we need to find an alternative.

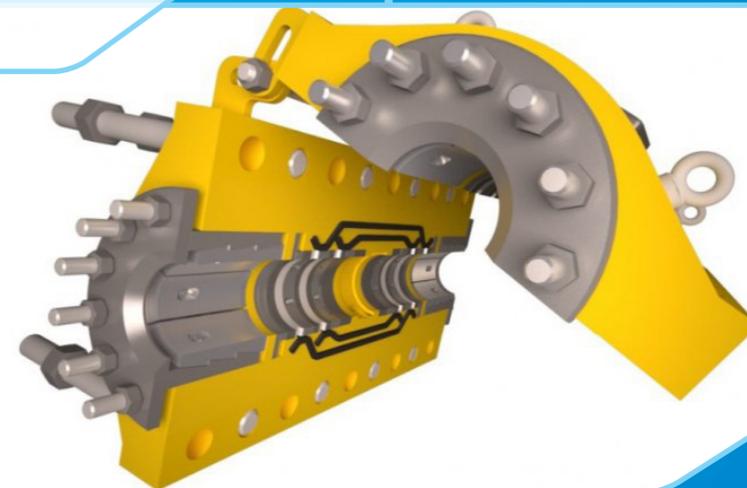
### 2 Approach



Working with partners IRM Systems and Pipelines Maintenance Centre (PMC), we engaged the market to identify potential vendors of permanent leak repair clamp solutions. Hydratight with their MORSEAL clamp were the successful vendor and, following the creation of new installation work procedures and a successful factory demonstration, plans to install this clamp on the Tryfil Mawr-Llangefni pipeline in Anglesey, north Wales are set for this summer.

### Factfile

- A diversion on a 6-inch pipeline can range from between £100,000 and £300,000 depending on size and complexity.
- MORSEAL pipe clamps are proven worldwide, used to repair a leaking subsea and topside pipelines. Our demonstration is the first of its kind on a GB Gas Distribution Network.
- At Wales & West Utilities, we operate 2,300km of LTS gas pipelines.



### Optimised assets and practices

- 1 Climate Change Impact Mapping
- 2 Cryogenic Pipeline Cracking Technology
- 3 Debris in Pipe
- 4 Risk-based Approach HP Filters & Pig Traps
- 5 Duraseal Repair Method
- 6 Eye in The Sky
- 7 Gas Venting Research
- 8 Integrated Calibration Solution
- 9 Odorant Monitoring
- 10 Permanent Leak Repair Clamps Phase 2
- 11 Pressure Control and Management
- 12 Project MOLE
- 13 Zero Emissions Odorant Pumping System

# HyCompact

Hybrid heating systems could play a pivotal role in the decarbonisation of heat but, until recently, the fact they all needed outside space for an external heat pump was regarded as a barrier to adoption.

Our Freedom Project gave us valuable insights into how hybrid heating would affect the broader energy system, while last year's HyHy project (NIA\_WWU\_060) showed how such systems would work in practice with hydrogen.

HyCompact now seeks to develop and demonstrate a lower-cost, single-unit solution that meets customer needs while still delivering on our decarbonisation targets.



Whole energy system

- 1 EPIC
- 2 HyCompact
- 3 Transport Pathways
- 4 Net Zero South Wales
- 5 Tools Of Engagement
- 6 Zero-2050: South Wales



## Factfile

- In the UK, domestic energy use is responsible for more than a quarter of national GHG emissions and 75% of household energy use is for space heating and hot water.
- The ENA/Navigant 'Pathways to Net Zero' report also highlights the importance of hybridisation with hydrogen and biomethane, with 22 million domestic hybrid systems in use by 2050 – single unit hybrids enable quick progress in this area.



## 1 Need



Project research shows more than seven in 10 consumers are interested in hybrid heating systems, but 80% said they would only switch if the installation was less disruptive than replacing their current boiler. HyCompact seeks to capitalise on recent advances in technology to deliver what customers want – a low-cost, integrated unit that is easy to install, more likely to be widely adopted and always offers the lowest carbon emissions.

## 2 Approach



Working with UK Power Networks, we are examining the potential for single-unit hybrid heating systems in seven homes, where the heat pump and gas boiler are contained within a wall-mounted boiler unit only slightly larger than a standard boiler.

This project will be a technical in-home demonstration of this type of heating system tested with the advanced controls further developed since Freedom. By integrating Passiv UK's grid-enabled smart controls with 'HyCompact' units, we will gather in-home performance data and

demonstrate aggregated domestic demand response simulations as well as unique efficiencies from simultaneous operation. A new whole-systems carbon optimisation control function allows the system to select the boiler or heat pump on carbon intensity, where the boiler can be used to avoid marginal emissions from flexible generation. This uses minimum heat pump efficiency thresholds linked to the day-ahead generation mix forecast to avoid upstreaming more emissions to the power sector than are saved in the building.

Having already gathered learning on the four units currently installed, we will be fully testing all seven units during winter 2021-22 'heating season' in phase 2 of the project, which will be completed in March 2022.

## 3 Benefits



HyCompact will deliver the data and practical experience we need to further refine the design and installation techniques for the kind of hybrid heating systems that offer the potential for a much higher deployment rate and lower cumulative emissions than other heat technology pathways. Importantly, these systems can be installed by gas engineers, which helps to tackle the skills challenge for installation of heat pumps. This could lead to greater customer acceptance and adoption, which will ultimately help the UK achieve its net zero targets.

The project will also help us identify the necessary next steps towards a commercial roll-out of smart, grid-aware, single-unit hybrid heating systems and the associated customer journey required for such a roll-out.

## CASE STUDY

### Flexible Generation Forecasting

# Flexible generation forecasting

Robust gas demand forecasts are a key requirement for gas system operators so they can develop efficient network operating strategies. Historically, gas demand has been fairly predictable, but due to more flexible gas generation plants coming online recently, forecasting is becoming harder.

This has been brought into sharper focus since current paths for decarbonising the energy system in the UK include increasing the share of intermittent renewable generation on the electricity network and any gaps in generation capacity need to be plugged by flexible gas generation plants.



#### 1 Need



GDNs need a better way of predicting this dynamic demand, but no model existed that could accurately and robustly forecast it. Since more of these sites are looking to connect, we need to develop such modelling capability so GDNs can continue to operate their networks efficiently.

#### 2 Approach



This was a collaborative project between Wales & West Utilities, Northern Gas Networks, SP Energy Networks and National Grid ESO, delivered by partners Delta-EE and Afry.

At the outset, it comprised desk-based research to build on existing knowledge and identify relevant data sets followed by workshops to ascertain how the modelling will be used and what functionality it needed.

The team then scoped, designed and built a new forecasting model, versions of which included sites relevant to each network to support a period of testing, validation and refinement. Finally, we ran a series of training sessions so operators have a clear understanding of how to use it.



Flexibility & commercial evolution

1 Flexible Generation Forecasting

#### 3 Benefits



The model developed accurately forecasts flexible gas generator operations, which will help GDNs better plan network operations in future.

Built around key drivers influencing power system needs and behaviours, the flexible generation forecasting model can be used to further explore how the operation of the network might be impacted by future renewable generation challenges. Exploring how these challenges will evolve in future will inform the need for and potential role of gas networks to support more renewable generation.

As a collaboratively built model, involving Electricity, Gas and ESO companies, it has widescale applications across the energy system.



#### Factfile

- Flexible gas generators are also referred to as gas peakers and are usually natural gas-fuelled reciprocating engines or turbines.
- The total number of connected power generation sites across the UK is 184, which equates to 2.8 GW of power output generated by the GDNs. With another 174 due to connect in the next 12-18 months, output will increase to 6 GW, enough to power 7.5 million homes.

# Green gas for a greener future

Clean hydrogen is one of the key pillars of the UK's £12 billion 10 Point Plan to push the country towards net zero emissions by 2050. As part of this plan, around £500 million is due to be invested to generate 5 GW of low-carbon hydrogen production capacity by 2030.

Wales & West Utilities is playing a leading role in transitioning the UK's gas network away from natural gas and is working with a range of partners to pave the way for hydrogen to be used to power industry, home heating, electricity generation and transport in future.



## Factfile

- The region to be covered by the South Wales Industrial Cluster is the second-biggest industrial emitter of carbon in the UK.
- The pathway to having a fully functioning zero carbon gas grid could save around £13 billion a year compared to one that relies on electricity alone.

## Why hydrogen

Because hydrogen produces no carbon, it is a green alternative to burning fossil fuels that meets the 2050 climate change targets. Since around a third of the UK's carbon emissions comes from homes using natural gas for heating and cooking, the role hydrogen could play in our net zero future is potentially huge.

## What we're doing

We are working with a range of partners in industry and government on several innovative projects aimed at transforming the gas grid away from natural gas to hydrogen. Among the most significant of these are:

### Regional Decarbonisation Pathways

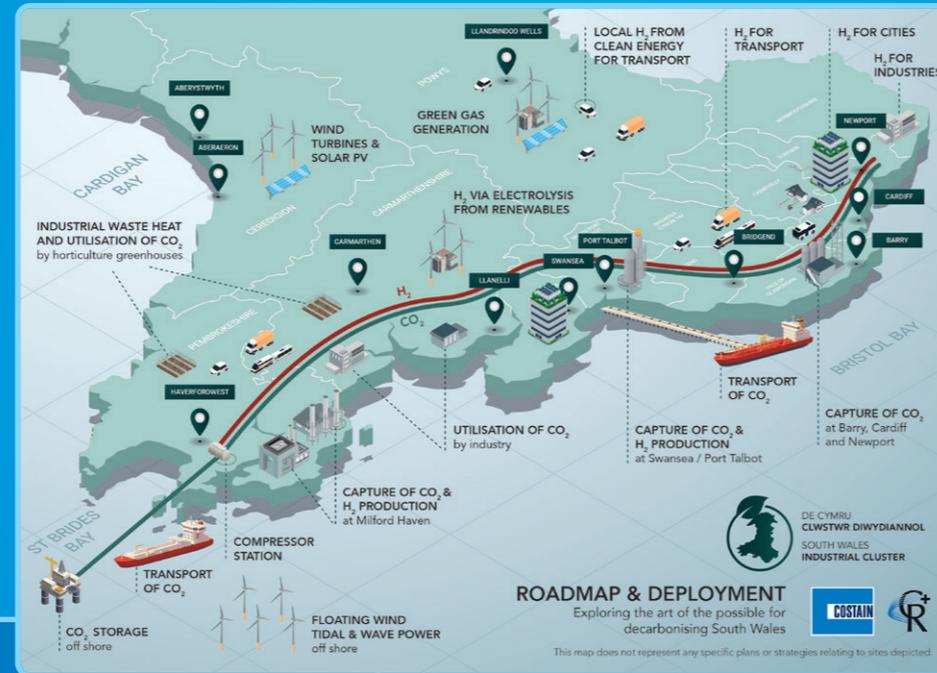
Born out of a call for innovation, this project with Costain and the Energy Systems Catapult aims to produce a plan to transition our network to hydrogen in the lowest-cost, least disruptive, most secure way. Using detailed regional and sub-regional analysis, the latest modelling and long-standing engineering expertise, the project will assess the energy system needs for our region, give us the tools we need to develop our investment strategy and set out the blueprint to achieving our net zero targets over five-year intervals until 2050.

### The South Wales Industrial Cluster

Recognising industry will be the catalyst for wider hydrogen adoption, we are a partner in two Innovate UK-funded projects to develop a 'hydrogen backbone' for south Wales. The South Wales Industrial Cluster programme will identify the main hydrogen production and demand centres across south Wales and Bristol and the size and route of the local transmission system needed to cope with the increase in hydrogen capacity in the region. As well as being designed to meet industrial demand, the programme will also support the connection of homes and transport hubs to the hydrogen network across the region.

### Hydrogen Village

Also part of the Government's 10 Point Plan is the Hydrogen Village project, which aims to demonstrate the feasibility of converting an entire large village to run on hydrogen instead of natural gas. Alongside other gas networks, we are currently identifying potential sites for the village, looking at a range of factors such as the suitability of the local networks, the availability of a secure local supply of hydrogen and the approach to community engagement required to deliver the trial.



The south Wales Industrial Cluster region

H2

Hydrogen

1

SGN: H100 Fife

2

Codent: HyDeploy

3

NGN: H21 Leeds Citygate

4

Hydrogen in the NTS

# Working with us



## Our process



## Our ambition

We've set our targets high. Up to 2026, we will continue investing in innovation and making sure customers get the best value for money. We'll track and share these benefits in line with the Innovation Measurement Framework, which we will set out in our next annual report in summer 2022.

Since 2013, our projects and partners have helped us hit our target of £15 million project benefit and this saving has been included in our base costs for GD2. We want to work with you to continue delivering real benefits for our customers.

We are committed to delivering long-term benefits through our future of energy projects and want to be net zero ready by 2035.

## Our process

We've built a strong but simple innovation operating model – our 'innovation process toolkit' – that uses a range of tools and techniques to produce clear project strategies and plans, engages stakeholders in our vision, encourages project success and supports roll-out of equipment, products, research findings and procedures.

Since 2013, we've implemented more than 100 projects, and have received more than 1,000 ideas. Our project partners have been there every step of the way, from ideation to business-as-usual, and have helped us share learning broadly. Seven of our RIIO-1 projects will carry over and be completed in RIIO-2, representing a value of up to £500k.

We are aligned to the recently published **Energy Networks Innovation Process (ENIP)** developed in collaboration with all energy networks. Together, we commit to keeping you engaged in an accessible and transparent innovation process, designed to ensure collaborative working and deliver benefits to our customers now and in the future.

# Working with us

## Open innovation

We are at the forefront of sharing our learning with other companies and interested bodies through network forums and dissemination events. In RIIO-2, we aim to increase our reach to work with more than 500 external organisations.

Collaboration doesn't just mean working on projects with our network partners. It means actively sharing learning from our projects and adopting best practice. We have formed and strengthened relationships through active participation at collaborative forums such as the Gas Innovation Governance Group (GIGG).

The Innovation Measurement Framework (IMF) now forms part of ENIP. This framework will make sure benefits are shared and will report on a range of innovation outcomes. These include collaboration and partnerships, the speed at which successful innovation is transitioned into business-as-usual and the benefits innovation has delivered for network customers. Keep an eye out for our dive into the IMF in our 2021/22 report.

## Looking ahead

Our Business Plan for 2021-2026 is our most ambitious plan ever, built on the views of more than 25,000 people across Wales and south west England. They told us to focus on preparing for the future and supporting the most vulnerable – so our innovation activity will be aligned to those aims: transforming our network to deliver net zero and identifying new ways to identify and support the most vulnerable.

To support the ever-expanding scope and scale of innovation within our sector, over the next five years we have access to a wealth of funding mechanisms, including the Network Innovation Allowance, Strategic Innovation Fund, Net Zero Use It Or Lose It fund, and the Vulnerability & Carbon Monoxide Allowance. Get in touch with us to explore how we can take your idea from concept to reality using these funding mechanisms to deliver a low-cost and low-carbon energy system, fit for the needs of all consumers.

# Get in touch

## See our challenges

Visit our webpage at [wwutilities.co.uk/innovation](https://www.walesandwestutilities.co.uk/innovation)

1. We are 100% aligned to the 2020 Gas Network Innovation Strategy which sets out five key industry innovation themes.
2. Here you can take a look at our calls for innovation and get in touch with your ideas.

## Come and meet us

Visit our [webpage](#) to see our whereabouts, you'll find us at many digital and physical conferences and events.

## See our joint successes

Visit our webpage and keep up to date by following us on Twitter

 [@WWUtilities](#) and  [LinkedIn](#).

## Get in touch to submit your ideas

1. Click on the buttons below to submit your ideas via our web portal:

[Submit project idea >](#)

[Submit product idea >](#)

2. [Sign up](#) to our mailing list [Let's connect >](#)

3. Email your ideas directly to [innovation@wwutilities.co.uk >](mailto:innovation@wwutilities.co.uk)

Wales & West House, Spooner Close, Celtic Springs, Coedkernew, Newport, NP10 8FZ

Contact the Innovation team at [innovation@wwutilities.co.uk](mailto:innovation@wwutilities.co.uk)

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