WALES & WEST UTILITIES

Delivering Innovation

2023/24

WALES&WEST UTILITIES

Welcome

At Wales & West Utilities we're proud of the work we do to accelerate the energy system transition through innovation, in line with the full breadth of our values and priorities as an organisation.

In this 2023/24 innovation report, you'll discover how our portfolio of projects is helping to meet ambitious net zero targets, deliver energy security, support our customers through the energy crisis and maintain a safe and reliable supply of energy across Wales and the south-west of England.

This report summarises our innovation activities throughout this last regulatory year and sets out our strategy, upcoming projects and priorities. It bridges the work that is already underway and the exciting new developments on the horizon. It also shows the partnerships we have developed with other organisations to maximise innovation in the UK and beyond, recognising that the only way to deliver at the scale and pace required is to work together.

The energy and policy landscapes move quickly, and there is still uncertainty around how our future energy system will look. We know we will have to change almost everything about how we produce, distribute, store and use energy – and we believe that the gas network has a critical role to play now and in the long term.

In the last year, we've been investing to address whole energy systems and energy resilience. Our HyVoltage project assesses the viability of introducing flexible 'vector conversion' sites with integrated smart links between the gas and electricity distribution networks. These smart sites would produce hydrogen for storage or the gas grid when electricity supply exceeds demand – making better use of wind and solar, and generate clean power when needed.

Crucially, we see hydrogen as as a robust solution for a range of energy system challenges – able to support decarbonisation in industry, storage, electricity generation, heat and heavy-duty transport. Our Next Gen Electrolysis project looks at how we can use wastewater, such as process or rainwater to produce green hydrogen. The unique electrolyser technology could reduce costs and operational barriers to green hydrogen production – essential for a cost-effective transition to net zero.

We continue to work collaboratively with other networks and partners to deliver evidence on the transition of network assets and customers to support low-carbon gases, including hydrogen. This aims to support our decision making and future policy direction. We are also leading an industry-wide project to consider interactions between biomethane and hydrogen, and how networks can be developed to maximise the role of all green gases.

We're also investing in domestic consumer research particularly for those in vulnerable situations, rural energy systems, hybrid heat, district heat and heat networks. We're looking at how we can maximise the use of gases from bio waste on our network, like biomethane and liquid waste biomass, through projects such as ALCHEM.

Our Pathfinder 2050 tool has helped 18 local authorities in Wales so far to develop their regional energy plans. This year, we want to keep investing in modelling and digitalisation, aiming to improve understanding of the future energy system and decarbonisation options.

As we look to the problem of decarbonisation of transport, in early 2024 we collaborated with First Hydrogen to trial a first-of-its-kind 3.5 tonne hydrogen van. Technology such as this is being explored to help us maintain the levels of service required for an emergency service provider without compromising on quality or range.

We already work with a variety of innovators, third-party organisations and other energy networks – and are always keen to connect and collaborate as we continue to build on the innovation knowledge and learning gained to help us to build towards a sustainable net zero future.

I'm excited to present this year's report and look forward to another year of innovation and delivery to come. If you have any ideas or questions for innovation at WWU, contact our Innovation Manager Sian Rowlands at: Sian.Rowlands@wwutilities.co.uk

– Graham Edwards, CEO

Contents

Introduction to innovation

This report summarises our innovation activities throughout this last regulatory year and sets out our strategy, upcoming projects and priorities. It also shows how you can work with us on our future innovation needs.

Over the past 12 months we've continued to accelerate our portfolio of innovation projects, spending £2.8m of innovation funding to support the energy system transition and vulnerable customers at pace, to meet the UK Government's ambitious 2050 net zero targets.

Even though there is uncertainty on the shape of our future energy system, there is a recognised critical role for the gas networks, which is supported by the British Energy Security Strategy, so we're investing in technology to address whole energy systems and energy resilience. Our projects showcase the vital role that hydrogen can play to decarbonise industry and commercial consumers, storage, heavy-duty transport, and assess cost-effective ways of inserting hydrogen into the gas distribution network.

Through our research and collaboration we are continuing to develop evidence on the feasibility of repurposing our networks to hydrogen, and supporting customers through the transition. This will contribute to the process for the UK and Welsh Governments to make key decisions on policy. This means we're investing in domestic consumer research, particularly for those in vulnerable situations, rural energy systems, hybrid heat, district heat and heat networks. We're also interested in expanding use of gases from bio waste in our network such as biomethane and liquid waste biomass.

WHAT OUR PARTNERS SAY

This was HydroStar's first time working with the gas networks and the company has gone from strength to strength thanks to these collaboration opportunities. Wales & West Utilities helped us navigate and access new funding streams, making the process easy. In the last year, we launched our partnership project, NextGen Electrolysis – Wastewater to Green Hydrogen. The project aims to improve the green hydrogen production process and reduce demands on water resources, by developing new electrolyser prototypes that can directly use impure water sources, like rainwater, final effluent and seawater. So far, the technology has successfully produced over 94% purity green hydrogen from multiple sources.

Hydrostar

Investing in data modelling and digitalisation is high on our list of priorities, as is finding ways to support local authority energy planning, especially through use of our energy system Pathfinder model. The imperative to reduce emissions from our transport fleet also saw us trialling our first hydrogen van, which will help us maintain service levels required for an emergency service provider without compromising on quality of service or range of consumers we can reach across our patch.

With partnerships an integral part of our innovation, we worked with 22 unique partners across the last 12 months including a variety of innovators and energy networks, and collaborated in over 60% of our projects with other energy networks.

We are keen to increase the number and volume of ideas we're reviewing, as we build on both our innovation portfolio, and levels of knowledge and learning that support the delivery of a sustainable, net zero future.

If you or your organisation has a great innovation idea that fits with our strategy, please get in touch with us.

DID YOU KNOW?

83

ideas currently under consideration

Project funding

We have several mechanisms available to support innovative activity: the Network Innovation Allowance (NIA), the Strategic Innovation Fund (SIF), and other regulated/non-regulated funding.

Network Innovation Allowance (NIA) is the building block of innovation funding that has helped us build a focused innovation team looking at the future of energy and decarbonisation of our network, creating a robust portfolio of projects, with a variety of Technology Readiness Levels (TRLs), often building on knowledge gained in earlier projects, or leading to further innovation in new areas. Strategic Innovation Funding (SIF) is a competitive funding mechanism designed to drive the innovation needed to transform gas and electricity networks for a low-carbon future, focused on rapid acceleration of innovation projects to demonstrator level.

Collaboration is key to innovation success with all networks sharing project learning whether projects are collaborative or not. NIA and SIF project summaries are published online so that knowledge and learning can be built upon, reducing unnecessary duplication, and ensuring value for consumers throughout the process.

We've invested £2.8m of innovation funding (£1.9m NIA) across 18 projects over the past 12 months and we're continuing to ramp up and accelerate to help the UK Government achieve its net zero 2050 targets.

Our projects have covered a wide range of topics, including:

- building evidence and learning to support Government decision making and policy
- researching how gas control systems would be impacted by any transition
- how we can support whole energy system transition with flexible energy conversion
- protecting vulnerable consumers with new types of alarm systems
- retrofitting homes for hydrogen
- assessing infrastructure for industrial demand
- looking at ways to reduce the cost of hydrogen production and co-location benefits to blend hydrogen onto the network.

Please visit our case studies for full details.

We also have access to funding for larger net zero projects through the Ofgem re-opener process and are always looking for other investment opportunities, such as DESNZ hydrogen funding, and other private investment partners.

Sharing our learning and outputs from innovation projects is an important part of our year. We're active members of groups such as the Energy Research Partnership and Institute of Gas Engineers & Managers (IGEM) and regularly attend events. Please reach out if you'd like to find out where we'll be next, and where you can meet us in person.

If we think your new idea is a good fit for us, we'll work with you to choose the best funding mechanism as we take your idea through our process >

DID YOU KNOW?

18 NIA projects kicked off

WHAT OUR PARTNERS SAY

As a start-up organisation, we're new to the innovation scene. We met with representatives from WWU at the SIF pitching sessions, who later guided us through the funding application process – and we were successful in our bid! We worked with WWU on delivering our Discovery Phase objectives for the ALCHEM – or Advanced Low Carbon Hydrogen Energy Management – project, which seeks to reduce the energy input required for electrolysis and increase its flexibility to ramp up and down to match the profile of renewable generation.

KI Hydrogen

Current projects

Over the following pages you will find all the exciting project work we have undertaken over the past 12 months. These are shown as a high-level list and through several in-depth case studies.

WHAT OUR PARTNERS SAY

Our work with WWU has been extensive over the years. Most recently the team has helped coordinate several large projects involving multiple partners, expertly managing relationships and funding opportunities. We've been working with WWU on the HyVoltage and Microgrids projects – both with the aim of increasing utilisation of renewables to enable a more efficient future energy system.

Frazer Nash

Systemic building blocks

Our systemic building blocks diagram shows how our network is positioned in the end to end gas distribution process that will take us to 2050.

Each project in this report is aligned to these building blocks, so we can easily see how our projects spread across our network and address the needs of our customers.

Click on any block to see our projects grouped in relevant themes.

Key :

- Natural gas
- Hydrogen
- Biomethane
- Any/all gases
- Electricity

- Upstream gas production and generation
- National gas system
- Distribution system

Customer :

- Industrial and commercial
- Domestic
- Transport

Electricity supply

Electrolysis

Imported hydrogen

LNG

Natural gas reformation

Natural gas

Hydrogen

Seasonal storage

Power generation

Biomethane production

National transmission system

Distribution system offtake

High-pressure gas network

Diurnal storage

Gas pressure reduction station

Intermediate, medium, low-pressure gas networks

Industrial and commercial

Domestic

Vulnerable customers

Appliances

Transport

Combustion

Alternative fuel generation

Fuel cell

Cross system

Safety

Regulation

Commercial

Data and digitalisation

Regional and local system planning

Meters and sensors

Skills and capabilities

Live project portfolio

Part 1-of-3

The following pages outline our live project portfolio, with case studies showing how each project aligns with a key theme, how partners have worked with us, how we've collaborated with other networks, and which funding mechanism was used.

DID YOU KNOW?

Total investment of

£2.8m

on all projects in 2023/24

which includes £1.9m of NIA

Cross system

Projects that support the transition across different parts of the system.

Project reference	Project name	Description	Partner	Link
NIA_NGN_414	Legislative and Regulatory Analysis	This project is assessing the commercial and regulatory impact of transitioning customers to hydrogen for trials and conversion projects.	Element Energy	
NIA_SGN0025	Interventions for Hydrogen by Asset Groups	This project is part of the DESNZ Hydrogen Programme and is evaluating all current network evidence and research, identifying any potential gaps, for specific asset groups, into a single document, helping to formulate future project roadmaps across the networks.	DNV	
NIA_NGGT0185	NSIB Skills & Competencies	This project looks to develop methodologies for skills training and the development of hydrogen competencies in the gas industry of the UK (both transmission and distribution).	EU Skills	
NGNG_NIA_346	ATEX Equipment & SR/25 Modification Assessment	This project is undertaking hazardous area (HA) assessment on a range of sample sites to determine variation in HA zoning following conversion to 100% hydrogen. It will also undertake surveys on a range of sample sites to determine suitability of existing electrical and instrumentation equipment and connections following conversion to 100% hydrogen.	Fingleton White	
NIA_WWU_2_15	Hydrogen Village Regulation Project	The project seeks to demonstrate hydrogen blending into a rural below 7Bar network using established industry processes. The solution would be applicable to a wide range of rural areas considering community energy projects or Smart Local Energy Systems.	Frontier Economics	
NGN_NIA_344	H21 Ignition Consequence Research	The project is investigating phenomena, the limitations of existing knowledge when it comes to natural gas as a fuel and how this might change with the introduction of hydrogen into domestic settings.	DNV	
NIA_WWU_02_18	European Hydrogen Distribution Insights	Performed a comprehensive evaluation of case study examples within gas distribution networks that will be used for hydrogen transportation and delivery. Analysed stakeholder engagement practices, emissions reduction benefits and policy support across key DSO projects.	Guidehouse	
NIA_WWU_02_38	Net Zero Infrastructure Planning – Risks & Opportunities	This project will follow on the back of Regional Decarbonisation Pathways to look at the current planning environment in the context of new gas (and electricity) infrastructure required to meet net zero. This will be done by reviewing the current DCO and CPO consenting process against case studies (SWIC hydrogen pipeline) to give recommendations to consenting dispensation.	Turley	
NIA_WWU_02_27	Gas Control System – Impact Assessment (Future requirements)	An impact assessment allowing the networks to have a better understanding of the future needs of our system operator function and data requirements for the energy system transition.	WIPRO	
NIA_WWU_02_44	Pathfinder Development	This project seeks to further develop the existing WWU Pathfinder model in order to enable housing stock owners to assess the carbon impact of their portfolio within the energy system (grid and generation), as well as the options for retrofit intervention at a property or properties.	LCP-Delta	
NIA_NGT0229	Network Policies and Procedures	The project will align the UK Gas Networks' policies, standards and procedures and develop a roadmap resulting in a hydrogen-ready document suite for each network.	QEM Solutions	
FI_0049	IGEM Downstream Hydrogen Standards Development	This will fund the delivery of three work packages to focus on evidence relevant to domestic and non-domestic hydrogen installations.	KIWA	

Diurnal storage

Assessing options for day-to-day energy storage in the gas system.

NIA_WWU_02_42	Hydrogen Storage Feasibility Study	This project looks to gain an understanding of the feasibility of utilising the existing grid structure for storing hydrogen for distribution through the network and optioneering ideas for future storage options.	NCC	

Live project portfolio

Part 2-of-3

If you have an idea that aligns with our key themes, please contact us >

Domestic customers

Supporting the energy system transition for domestic heat and other energy use in the home.

NIA_NGN_338	Street Score 2	A project to continue the understanding of the challenges for vulnerable customers travelling through street works and to develop a range of prototype solutions to minimise disruption to these customers.	Steer Energy	
NIA2_SGN0030	HyCompact Testing	A project to carry out a series of laboratory tests on the HyCompact unit and Passiv Systems control systems, to understand how gas usage may change in the future.	Kiwa	
NIA_WWU_2_12	EUSE - Ventilation Within Buildings	Investigate if the conversion from natural gas to hydrogen creates new issues with regards to the existing ventilation within properties.	Kiwa	
NIA_NGN_421	Domestic Hydrogen Sensor Research	A follow on project from GD1. Testing of a H2 alarm, to be used in homes.	Bohr	
FI_0036	Dispersion of Helium releases in domestic properties	This project will provide real data showing dispersion of gas in a range of real ‘as lived in’ properties ranging in size, shape, layout and age.	Kiwa	
NIA_CAD0095	HomeShield	HomeShield will have the capacity to detect a number of alarms and onwardly communicate those hazards to the occupier and a ‘key contact’ of the occupier leading to proactive action to make the situation safe. HomeShield is a ‘fit for all’, inclusive, battery or mains powered alarm.	UIS	

High-pressure gas network

Managing the transition of high-pressure gas network assets to carry decarbonised gases.

NIA_WWU_02_58	Biomethane and Hydrogen Interactions	This project will explore how biomethane can be managed and used in areas of the gas network which will be converted to 100% hydrogen.	ARUP	
NIA_WWU_02_49	Hydrogen Blending with LPG Feasibility Study	Follow on from LPG Village to understand if H2 can be blended into LPG.	Frazer-Nash / Frontier Economics	

Hydrogen

Understanding the impact of hydrogen production technologies and business models on the transition of our energy system.

SIF_WWU_2_3	NextGen Electrolysis Discovery	The project will look to reduce the cost of hydrogen production by tackling the real-world operational constraints of electrolytic production, specifically the need for high purity water, by utilising less pure/wastewater sources to reduce demand on pure mains water, passing cost savings to end consumers	HydroStar	
SIF_WWU_2_3A	NextGen Electrolysis - Wastewater to Green Hydrogen Alpha	Alpha Phase focused on experimental development of the innovative membraneless electrolyser and green noncorrosive electrolyte, enabling wastewater feedstock and matching to fluctuating renewables. This builds on Discovery feasibility studies, which confirmed technological viability whilst quantifying the benefits of removing water purification entirely	HydroStar	
NIA_NGN_425	Hydrogen Compatibility of Components: Phase 2 Further Analysis	The output of NIA_NGN_276 highlighted a range of materials that, through assessment of relevant literature, have been categorised as having a high potential for degradation in hydrogen, rendering the asset assembly unsuitable for use with hydrogen without further mitigation. The aim of this project is to undertake follow-up review of the outputs and results from the subsequent network assessments, including recommendations to undertake further evaluation of materials of construction, risk mitigation options and propose a testing plan for certain materials.	HSE SD	
NIA_WWU_02_60	Development of Microgrids	This project will look to identify the data required to establish the size of a microgrid, and the equipment to run it and the feasibility of owning, maintaining and operating the site by a local authority or third party.	Frazer Nash	
SIF_WWU_3_2	ALCHEM - (Advanced Low Carbon Hydrogen and Energy Management)	The ALCHEM (Advanced Low Carbon Hydrogen and Energy Management) project uses innovative biomass electrolysis technology, which uses liquid waste biomass to produce green hydrogen and green chemicals with no oxygen, using 75% less energy than conventional water electrolysis.	Ki-hydrogen	
NIA_ WWU_02_202	Green Hydrogen production impacts on water usage	This project seeks to model the amount of water required to produce the necessary amount of green hydrogen and the impact it could have on our future, with consideration of the effects of climate change and other water scarcity issues likely in this time.	HydroStar	

Live project portfolio

Part 3-of-3

If you have an idea that aligns with our key themes, please contact us >

Industrial and commercial

Supporting the energy system transition for major energy users, businesses and other organisations.

NIA_WWU_02_37	HyVoltage	This project will the assess the viability of introducing flexible vector conversion links between the gas and electricity distribution networks.	Frazer-Nash, Cornwall Insight, Imperial College, Bristol University	

Intermediate, medium, low-pressure gas networks

Managing the transition of intermediate, medium, low-pressure gas network assets to carry decarbonised gases.

NIA_NGN_301	Failure Modes and Permeation Testing of PE	A project to assess the impact of the change of characteristics of hydrogen from natural gas on the distribution networks for various scenarios.	Radius Plus	
NIA_WWU_2_11	LPG to Hydrogen Village: Feasibility and Concept Design	This project will study different methods of supplying hydrogen to customers in villages currently supplied by liquified petroleum gas (LPG). This includes transporting and storing hydrogen as a compressed or liquified gas, or using ammonia as a carrier of hydrogen.	Tutis Energy	
NIA_WWU_2_17	Lessons from the Past: What can we learn from past energy transitions in the gas industry	The project reviewed the challenges which faced the British gas industry from the point of nationalisation in 1949 through the many changes which were required for the industry to become more efficient and produce gas more cost effectively, so that it could compete with its main rival the electricity industry. Lessons learnt can be applied to the current hydrogen switching process.	WSP	
NIA_NGT0210	Lower Cost Excavation and Repair for Hydrogen Pipelines	This project considers the differences between excavating and repairing a high-pressure natural gas pipeline as we do today, with a hydrogen transmission pipeline in the future.	Jacobs	
NIA_WWU_02_40	Emissions Mitigations - Purging for a Hydrogen Future	This project seeks to explore options for elimination of natural gas emissions from current purging operations, and in the event of a large scale hydrogen conversion programme.	Steer Energy	

Seasonal storage

Assessing options for longer term energy storage in the gas system.

SIF_WWU_3_1	Hydrogen Storage in Aquifers	As the use of hydrogen increases, the requirement to match supply and demand will require storage at scales from linepack (MWh scale) through salt caverns (GWh scale) to geological structures (TWh scale). At present, most work on the largest stores addresses depleted gas fields. This idea recognises that the geological storage of hydrogen in aquifers may be a cheaper option for large scale storage than use of depleted gas fields, as modelling studies we have undertaken indicate that cushion gas requirements may be lower.	Progressive	

Transport

Developing options for the use of decarbonised gases in transport.

NIA_WWU_2_14	Hydrogen for Aviation across the Western Gateway	Details the strategic and technical evidence base for the potential role of hydrogen in aviation for utilisation across all Gas Distribution Networks, and future development opportunities within the aviation sector and wider aerospace supply chain.	ARUP	
NIA_WWU_02_19	Integrated Hydrogen Hubs	This research project will determine if hybrid hydrogen and district heating systems can support the decarbonisation of transport and heat at the lowest cost for customers	Guidehouse	
SIF_WWU_2_2	Integrated Hydrogen Transport Hubs Discovery	The Discovery phase of this project will look to review available data and technology and consider how integrated hydrogen hubs affect the economics of hydrogen production, and how their location can improve the overall efficiency of the electricity network and reduce the need for overbuilding hydrogen infrastructure. This project will also consider the technical requirements of operating electrolysers to support both transport and heating needs.	Guidehouse	

CASE STUDY:
Gas Control System

Gas Control System Impact Assessment

The gas control system impact assessment project is the first phase of a scope of works that will give gas networks a better understanding of what their system operator functions will need to look like in the event of a transition away from natural gas.

This project is the first step in ensuring systems are future proofed and ready to be upgraded as and when future energy sources are bought into the network.

Project breakdown

HOW: Gap identified; tendered for partner

WHO: Wales & West Utilities, NGN, and National Gas

PROJECT PARTNERS: WIPRO

FUNDING MECHANISM: Network Innovation Allowance

Need

Decarbonisation of the Gas Distribution Networks (GDNs) will mean transition from natural gas to an alternative green gas such as hydrogen. While there has been significant progress in recent years to accelerate the shift to green gases, there are still many obstacles to overcome before 100% hydrogen can be injected into the network.

Currently, the control systems used are not designed to manage significant change in asset configuration or multi-fuel systems, so to help with this transition, we need to identify any changes that may be needed to ensure control systems can meet the requirements of a future green gas network.

Approach

Project partner WIPRO carried out an initial phase of work to determine the impacts of a range of future energy scenarios on control room processes and hence systems and teams. The impact assessment included:

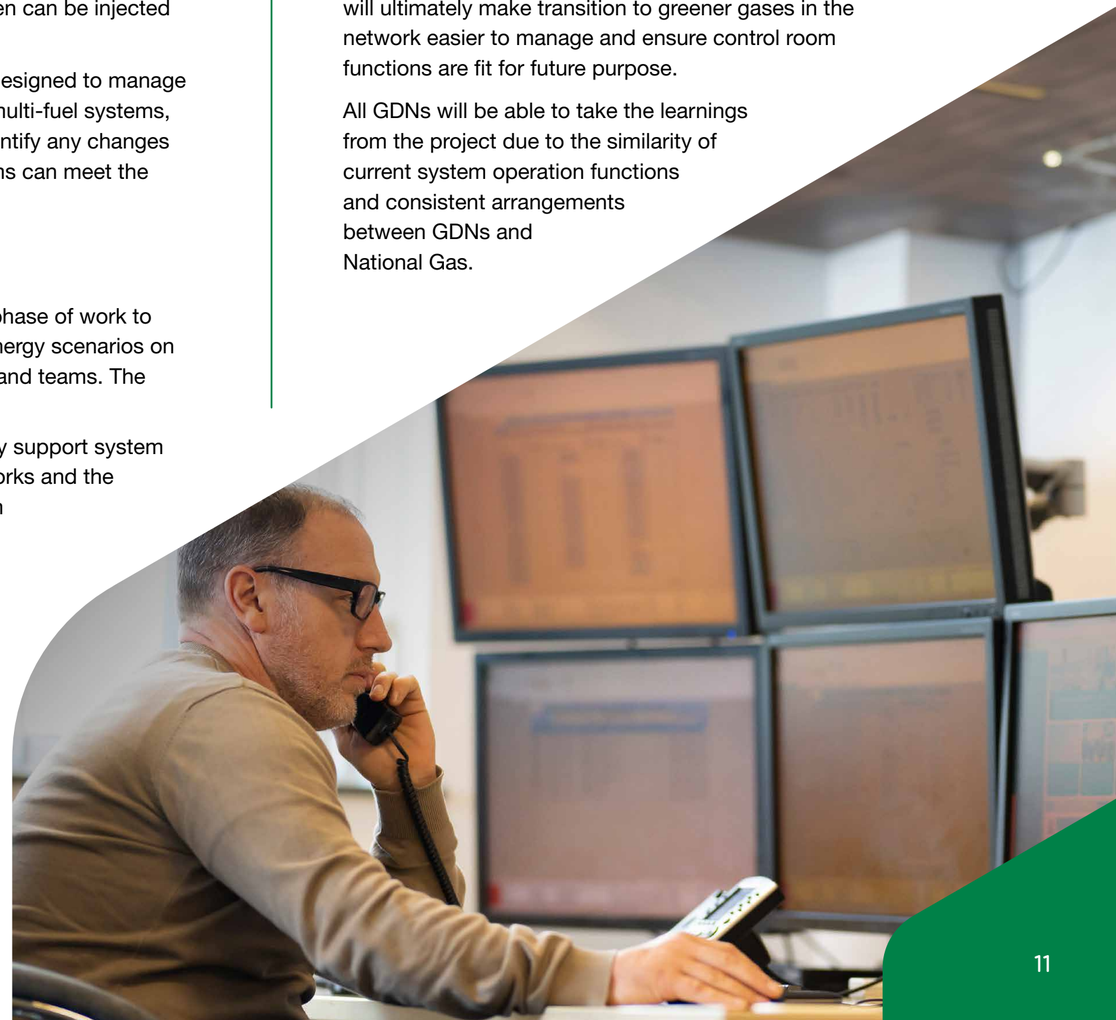
- Systems and related processes that directly support system operation activities in the distribution networks and the impact on the national transmission system
- Resource requirements that are directly impacted by any changes to those control room systems; for example, if additional configuration will be required
- Links to external systems.

Further work will be undertaken in phase two of the project, which will once again be a collaborative project between the GDNs.

Benefits

This project and the phases that will follow will give networks a better understanding of the future needs of the system operator function and what changes are needed as the energy mix in the UK shifts. This will ultimately make transition to greener gases in the network easier to manage and ensure control room functions are fit for future purpose.

All GDNs will be able to take the learnings from the project due to the similarity of current system operation functions and consistent arrangements between GDNs and National Gas.



HyVoltage

The whole energy systems HyVoltage project is assessing the viability of introducing flexible vector conversion links between the gas and electricity distribution networks. It seeks to demonstrate the potential benefits of co-located power-to-gas and gas-to-power systems by deploying Vector Conversion Sites (VCS) on the networks.

As well as outlining these benefits, the project will look at the barriers to implementation and develop a roadmap identifying the technical, commercial, policy and regulatory changes required to maximise the benefits.

Project breakdown

HOW: Gap identified; supplier proposal

WHO: Wales & West Utilities, with support from NGED

PROJECT PARTNERS: Frazer-Nash Economics, Cornwall Insight, Imperial College London, Bristol University

FUNDING MECHANISM: Network Innovation Allowance

Need

Exploiting existing gas network infrastructure could be crucial to meeting net zero targets, offering significant cost savings for networks and consumers regardless of whether the networks are used for distribution, storage or both.

To show how this could work in practice, this study aims to provide the evidence that sets in motion the policy and regulatory changes required to enable the use of flexible vector conversion technology that will allow the gas network to play the most beneficial role it can in the UK's journey to net zero.

Approach

This desktop study is being carried out in four distinct work packages:

1: Challenge definition – Frazer-Nash will look at previous relevant network innovation projects and other publicly available sources and complete a literature review. It will then assess potential technologies for the VCS subsystems and identify the barriers, enablers and benefits of VCS development.

2: Technical viability assessment – looking at VCS sizing and the most suitable gas pressure tiers and electricity voltages by conducting a workshop with stakeholders and analysing feasible voltage and pressure levels. The team will also assess locations on the network and the potential number required.

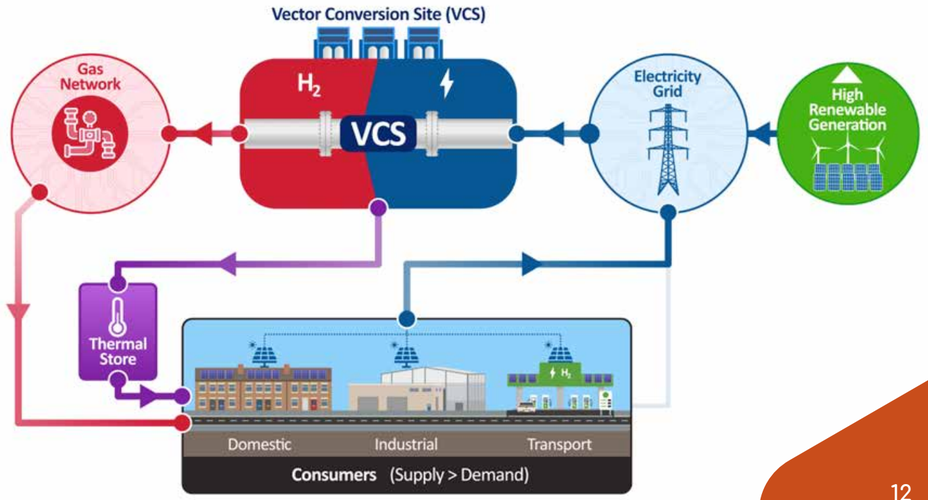
3: Commercial viability assessment – partner Cornwall Insight will define a business model that includes looking at how a new Vector Conversion Operator would work with electricity and gas suppliers and network operators. They will produce a cost/benefit analysis, assess potential policy and/or regulatory barriers and propose ways around them.

4: Outline design and technology roadmap – using the results of the above assessments, the team will set out use cases for VCS and define a 'first of a kind' model that could be demonstrated in future. They will also develop a roadmap to capture the technology, policy and regulatory changes needed for VCS to be successfully exploited.

Benefits

VCS could produce hydrogen for storage when electricity supply exceeds demand. This hydrogen could be stored directly within the network or distributed to the consumer, bypassing the high-pressure transmission system. It would also enable generation of electricity from the gas network during times of peak electricity demand.

Benefits include reducing overall energy system costs to the consumer by providing system flexibility and increasing energy security. If the project is successful, it will prove using the existing gas network infrastructure is crucial to the UK meeting net zero targets.



CASE STUDY:
HomeShield

HomeShield

With a wide array of alarms and alerts existing in people's homes at present, the sounds they emit can be confusing, especially to people in vulnerable situations. This project aims to improve safety by producing HomeShield, a simple-to-use device that detects multiple sounds, including alarms, and alerts the occupier – and their key contact if they are in vulnerable situations – so they can carry out checks and stay safe.

Project breakdown

HOW: Collaborative Call for Innovation

WHO: Wales & West Utilities, Cadent, NGN

PROJECT PARTNERS: Utility Innovation Solutions

FUNDING MECHANISM: Network Innovation Allowance

Need

Currently, households may have differing alarms that detect a number of hazards, such as fire, carbon monoxide and, in the future, hydrogen. These operate in isolation and can be confusing, especially to customers who may be in vulnerable situations. For example, an alarm may be just alerting the customer that the battery has run out and needs replacing. If the alarm is ignored, it could put customers in danger, while misinterpretation of an alarm can result in unnecessary engineer call-outs.

Approach

Working with multiple networks across the gas industry, innovator Utility Innovation Solutions is helping develop the device over a series of phases, up to and including building a proof of concept prototype. The stages include:

- Initial scoping session with charities – engaging with partners such as Royal Association for Deaf People, Disabled Living and Care & Repair Cymru to find out what would work well for them and their communities
- Workshop trials and interim report – conducting trials to confirm HomeShield addresses the issues and reviewing performance and progress
- Proof of Concept built – carrying out trials in homes of 10 prototype products and analysing performance
- Testing, lessons learnt, closure report – trialling the product among a select group and gathering feedback to inform future development, then producing a report and recommendations for Phase 2.

Following these initial stages, we will be gathering further feedback from the charities and conducting further trials to better understand the full scope of the device. We will then be building the proof of concept product based on that learning, carrying out further tests and producing a final report on the project that outlines next steps.

Benefits

Completion of the project and future adoption of the device could lead to the prevention of death, disability and injury and an increase in the general welfare of customers, especially those in vulnerable situations.

In addition, widespread use could lead to fewer false emergency call-outs and emergency vehicle trips, reducing fuel emissions and carbon footprint due to the resulting decrease in journeys.

The device will be future proofed, so any new alarms added to the home will be able to be incorporated into the system with ease.

CASE STUDY:
Cartrefi Hydrogen Homes

Cartrefi Hydrogen Homes

The gas we use to heat our homes is responsible for up to a quarter of the UK's carbon emissions, so changing the way we do it could play a huge role in helping the country hit its ambitious net zero targets. By retrofitting a hydrogen boiler and a cooker to an existing home in Blaenau Gwent, South Wales, this project aims to demonstrate the use of hydrogen as a low-carbon fuel for heating and cooking, where alternatives may not be suitable for certain housing stock.

Project breakdown

HOW: Awarded funding by Welsh Government

WHO: Wales & West Utilities

PROJECT PARTNERS: DNV, Linc Cymru, Kiwa, Melin Homes, IGEM

FUNDING MECHANISM: Optimised RetroFit and NZARD Use It or Lose It

Need

Hydrogen does not contain any carbon, so does not produce carbon dioxide on burning, only water and heat. Switching to hydrogen could allow people to continue heating and cooking with gas in their homes with minimal disruption to their everyday lives but in a cleaner, more environmentally friendly way. All homes used to test hydrogen have, until now, been new build homes, so this project addresses a gap by demonstrating the potential ease of large-scale future retrofit across the UK.

Approach

This project aims to be the first of its kind in the UK to retrofit hydrogen appliances – in this case, a boiler and a cooker – to an existing home. The Cartrefi Hydrogen Homes property will also be fitted with other energy efficiency measures to demonstrate a holistic approach to decarbonising heat and reducing energy demand.

For the purposes of this project, hydrogen will be supplied using bottles rather than through the existing pipelines so the property's natural gas supply is not affected during the trial. Modern sensors fitted in the property will detect any leaks and shut off supply automatically.

Benefits

This project will give us valuable insights into the process of converting UK homes to hydrogen from natural gas via retrofit, which would significantly reduce the country's carbon emissions and help achieve ambitious net zero targets.

It will also enable us to learn more about how customers interact with hydrogen appliances and to develop technical standards, skills and training for hydrogen appliance installation.

CASE STUDY:
North Wales Conceptual Plan

North Wales Conceptual Plan

The North Wales Conceptual Plan project aims to build on our Regional Decarbonisation Pathways (RDP) report by assessing the capability of Wales & West Utilities' existing infrastructure and the need for new infrastructure for transporting hydrogen from production to industrial demand in North Wales. It will investigate the methodology for industrial infill, analyse the potential for job retention and creation and carbon reduction and explore supply and demand scenarios in the area.

Project breakdown

HOW: Gap identified; tendered for partner

WHO: Wales & West Utilities

PROJECT PARTNERS: Apollo Engineering Consultants Limited

FUNDING MECHANISM: Use it or lose it

Need

New entities such as the Deeside Decarbonisation Forum (DDF) and existing public bodies such as Ambition North Wales (ANW) are creating links between supply and demand centres in the region and enabling cross-sector partnerships that will drive the development of hydrogen infrastructure and technology. But to truly deliver decarbonisation, more detailed assessment and planning is required on the opportunities in particular areas.

Wales & West Utilities wants to use the RDP project and Britain's Hydrogen Network Plan as an evidence base for the next phase of work in North Wales. This study looks at how hydrogen can be rolled out across the region and assesses the capability of existing infrastructure to transport hydrogen from production to demand and whether new infrastructure will be needed.

Approach

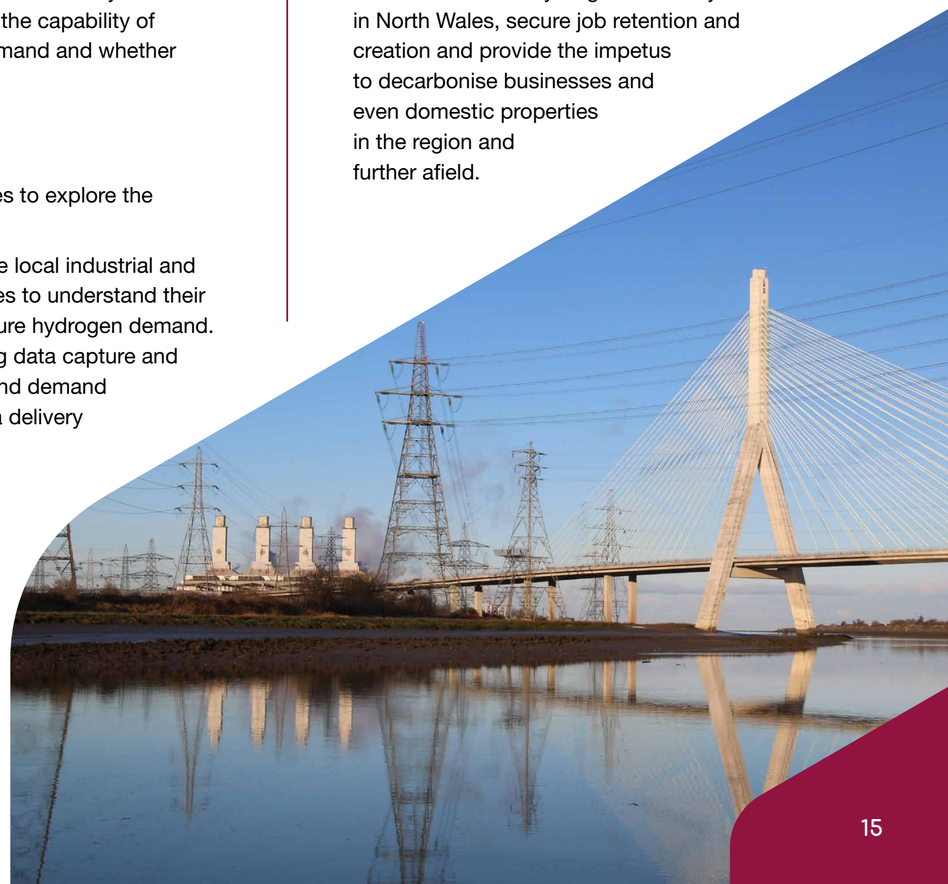
Project partner Apollo has divided the study into two distinct phases to explore the local and regional opportunity:

- Local: Industrial Infill Methodology – using data capture to engage local industrial and commercial customers on Deeside and Wrexham industrial estates to understand their decarbonisation aspirations with the aim of ascertaining likely future hydrogen demand. This is being carried out alongside Wales & West Utilities' ongoing data capture and interaction with customers. Output from this will include supply and demand feasibility, an assessment of potential barriers and the design of a delivery programme.
- Regional: North Wales Hydrogen Network Masterplan – mapping and quantifying short, medium and long-term hydrogen demand and storage requirements in North Wales according to four discreet scenarios that also account for a possible link to HyNet. This package will also look at local hydrogen production locations and storage requirements, propose options for a new-build hydrogen transmission system, assess existing pipeline infrastructure and future requirements and investigate job creation and retention. It will then produce a delivery programme and recommend the regulatory and commercial approach for delivering the proposed pipeline infrastructure.

Benefits

By better understanding the demand and our current capabilities to supply what's required, we can build a business case for more investment now and in the future that will allow industrial and commercial customers to decarbonise faster than is forecast currently.

Successful completion of this project could also kick-start the hydrogen economy in North Wales, secure job retention and creation and provide the impetus to decarbonise businesses and even domestic properties in the region and further afield.



CASE STUDY:
NextGen Electrolysis

NextGen Electrolysis – Wastewater to Green Hydrogen

Gas distribution networks are preparing their infrastructure so it can deliver green hydrogen to power industry and heat homes, but green hydrogen production is currently limited due to the water and energy requirements particular to the process. This project built on an initial study and aimed to assess whether less pure water can be used in the production process of green hydrogen.

Project breakdown

HOW: SIF proposal from supplier

WHO: Wales & West Utilities

PROJECT PARTNERS: HydroStar, National Grid Electricity Distribution, University of Exeter, Welsh Water

FUNDING MECHANISM: Strategic Innovation Fund

Need

Green hydrogen production is primarily achieved through polymer electrolyte membrane (PEM) electrolysis, which requires both carbon-free electricity, purified water and relatively expensive membranes made from rare metals. There are therefore considerable barriers to its efficient and cost-effective production, since it can only be made where the infrastructure to purify water to the required extent and sources of carbon-free electricity exist. Purifying water also requires lots of energy, so NextGen Electrolysis – Wastewater to Green Hydrogen is investigating using water that is less pure, such as that from rivers, taps, rain and manufacturing processes.

Approach

The project team investigated using innovative membraneless technology that removes rare metals from the device design and uses a green, non-corrosive electrolyte that can be adjusted to suit specific types of wastewaters. The innovative control system designed by HydroStar also allows an additional 10% of hydrogen to be produced from the same sized stacks when connected to solar power.

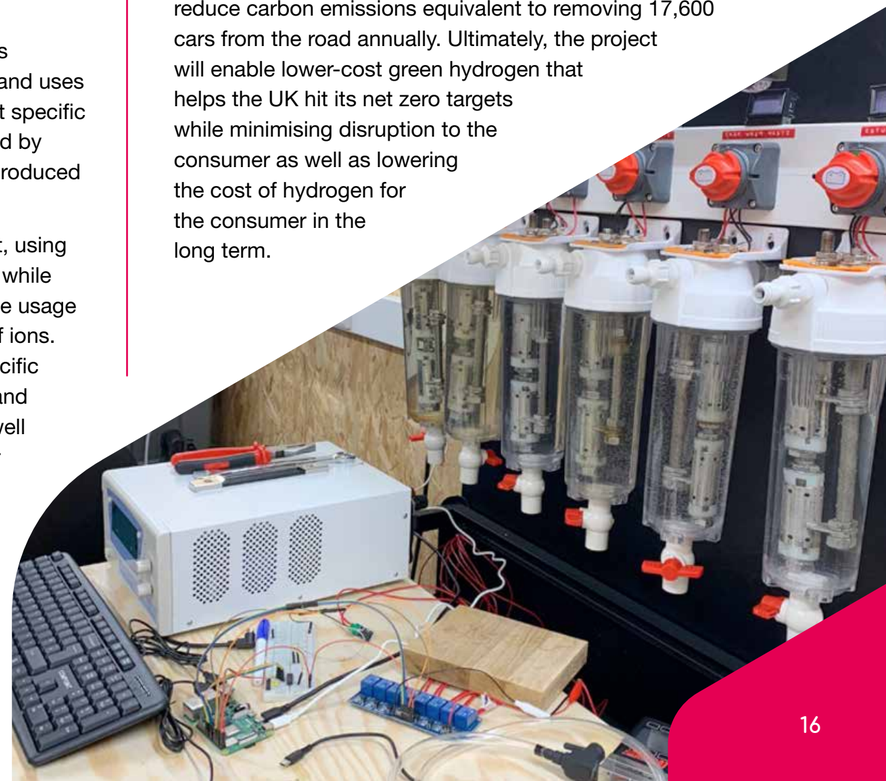
HydroStar looked at electrolyser and electrolyte development, using three 2KW electrolyser testing units and simulation software, while the University of Exeter worked with them to model electrolyte usage across a range of water types with different concentrations of ions. They also looked at the effects of injecting hydrogen into specific areas of our network and how that will affect our customers and producers. Welsh Water advised on wastewater sources as well as providing analysis of which of their sites could be used for co-location production purposes.

The completion of the ‘Alpha’ phase saw the NextGen electrolyser successfully produce hydrogen from nine different impure water sources (including seawater/ final effluent/rainwater) with at least 94% pure hydrogen being produced from all those tested.

Benefits

As well as addressing real-world manufacturing and operational constraints and reducing the cost for consumers, roll-out of this technology would also enable the production of green hydrogen in remote rural communities by co-locating with solar farms and wind turbines to help lower the requirements of large electrical grid connections. It will also facilitate distributed generation across the network, reducing capital and operating costs and taking away the need for expensive and resource-hungry transportation.

By removing the need for purification, the project could save around 4.5 swimming pools’ worth of water a day per gigawatt of hydrogen produced. Distributed generation would also reduce carbon emissions equivalent to removing 17,600 cars from the road annually. Ultimately, the project will enable lower-cost green hydrogen that helps the UK hit its net zero targets while minimising disruption to the consumer as well as lowering the cost of hydrogen for the consumer in the long term.



CASE STUDIES:

ALCHEM and Hydrogen Storage in Aquifers

We led on two SIF projects for Round 3 Discovery Phase and are working on next phases of funding.

To read more about how the SIF process works, please **click here**.

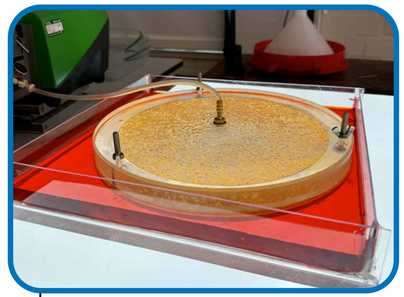
Hydrogen Storage in Aquifers

Project Partners: Progressive Energy, NGN

Challenge: Developing novel technical and market approaches to deliver an equitable and secure net zero power system.

Summary: As the use of hydrogen increases, the requirement to match supply and demand will require more storage. Currently, most work on storing hydrogen focuses on depleted gas fields, but porous geological aquifers may be a cheaper option while still offering operational equivalence.

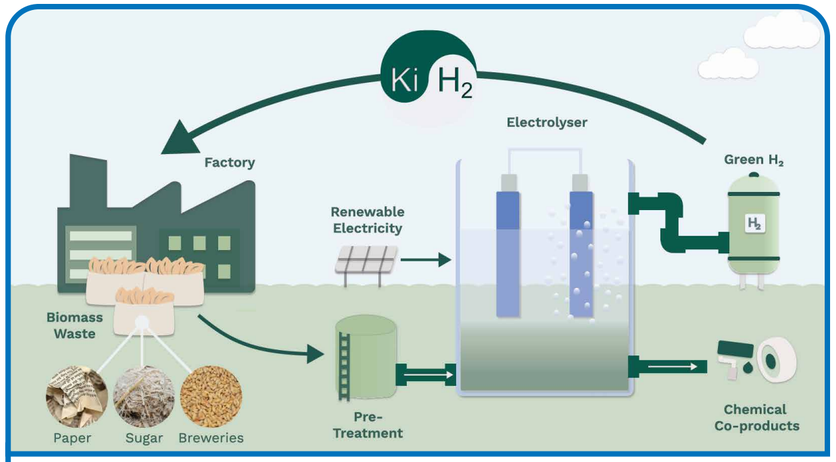
The first phase of this project will model the likely performance of aquifers and assess their potential 'cushion gas' requirements. It is thought aquifers may require less of this gas and thereby achieve a lower overall storage cost.



Anticlinal test rig: the cell is saturated with water, and then air is injected in the centre

Map of aquifer structures known as Bunter Closures

Fluvial Triassic sandstone (exposure at Runcorn Park)



ALCHEM (Advanced Low Carbon Hydrogen and Energy Management)

Project Partners: KI Hydrogen, Hynamics

Challenge: Novel technical and market approaches to deliver an equitable and secure net zero power system (optimising electrolyser deployment and operation to unlock whole system value).

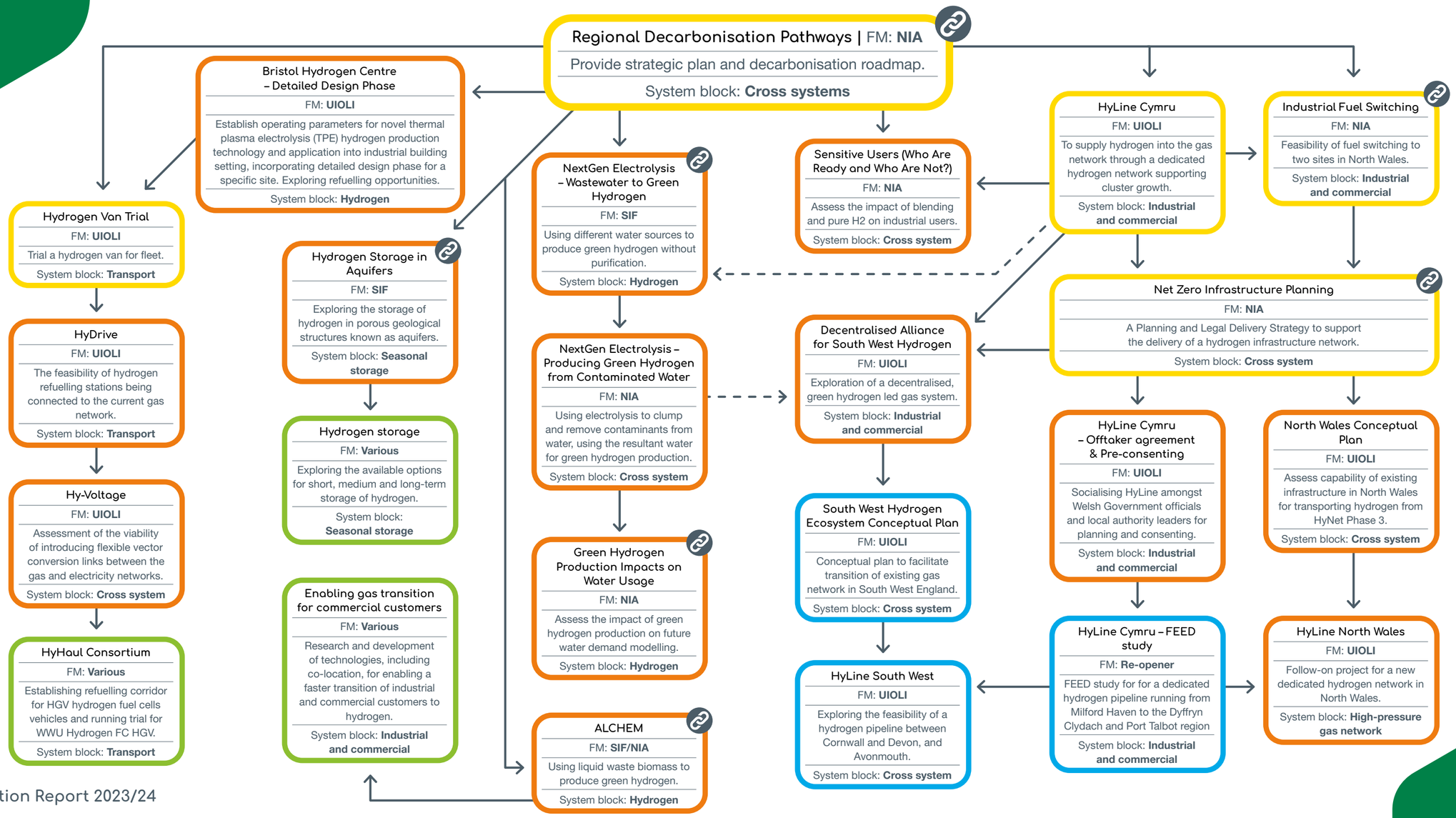
Summary: Due to high energy requirements, the cost of producing 'green' hydrogen through commercially available technology remains three times higher than for producing the 'grey' equivalent. Current green hydrogen production technology also struggles with ramping up and down when renewables are intermittent.

The ALCHEM project addresses both problems through its innovative biomass electrolysis technology, which uses liquid waste biomass to produce green hydrogen and green chemicals with no oxygen, using 75% less energy than conventional water electrolysis.

Building our portfolio

Industrial and commercial and transport

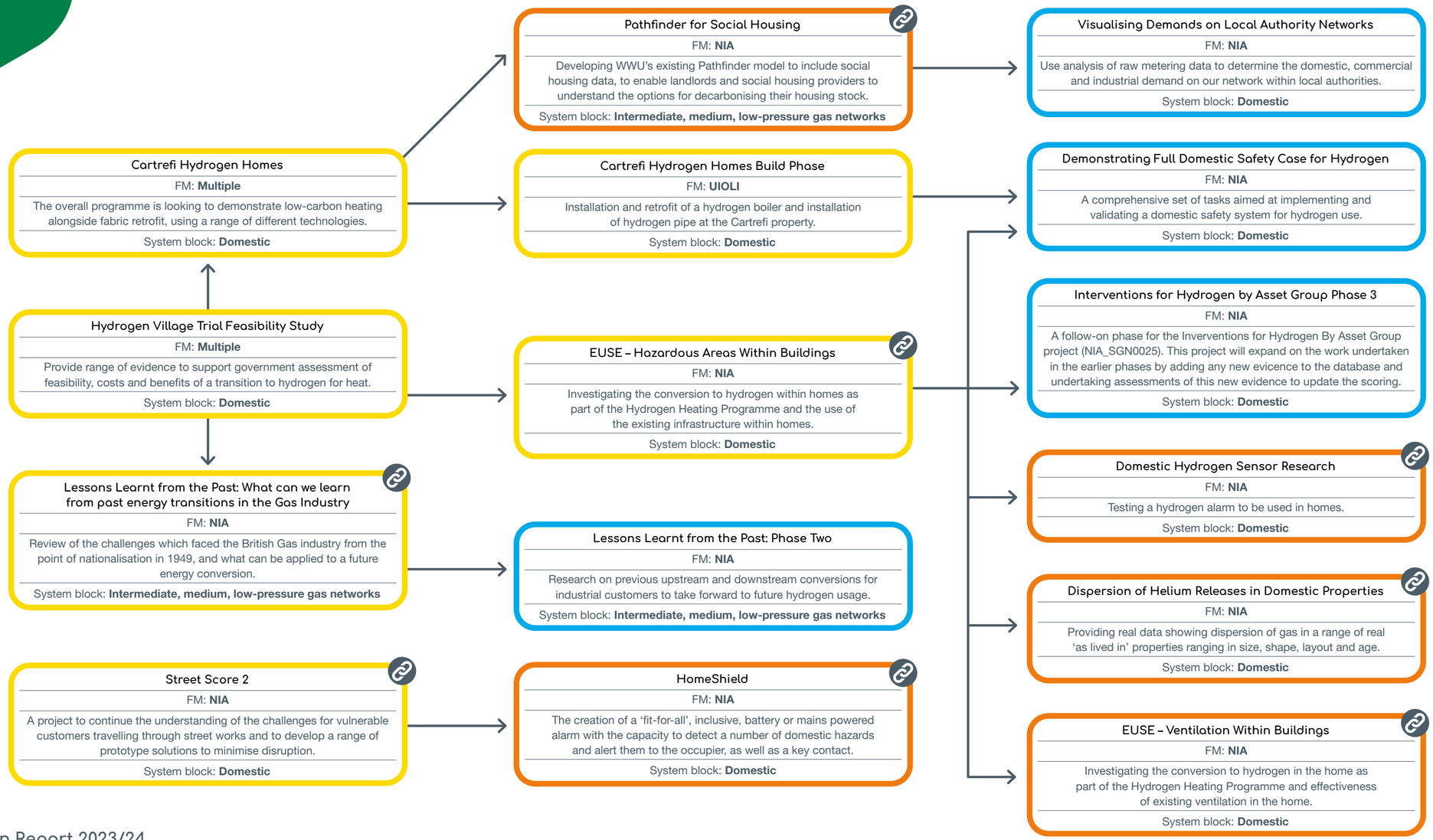
Here you can see how projects are building on previous project learning and the funding that enables this, as we explore energy system transition options for industrial and commercial customers.



Building our portfolio

Domestic

Here you can see how projects are building on previous project learning and the funding that enables this as we explore energy system transition options for domestic customers.



Future of innovation

Don't forget – if you have an idea that can further our ambition, be sure to **get in touch >**.

Planned projects

Part 1-of-4

Cross system

Projects that support the transition across different parts of the system.

Project name	Description
Transitioning and Repurposing Oil Pipelines for Hydrogen (TROPHy)	Aviation sector work is gaining traction, which in turn leads to the potential for widespread hydrogen demand, so options are being investigated to repurpose all types of existing transportation assets, including oil pipelines.
OptiFLOW	This project will explore the optimisation of green hydrogen production sources as they develop as a result of the initial 4.5GW of Celtic Sea leasing for FLOW.
NextGen Electrolysis - Producing Green Hydrogen from Contaminated Water	Electrolysis can also perform electrocoagulation and flotation, which can clump microplastics/heavy metals/other pollutants together and bring them to the water surface to aid in their removal. HydroStar believe this will clean the water enough to produce hydrogen from. Therefore this project targets contaminated or highly polluted water to produce hydrogen, which is complementary but very different from just using impure water. This enables onsite hydrogen production for businesses with high natural gas demands who wish to reduce their carbon footprint without the need for extensive water infrastructure, whilst reducing environmental damage or wastewater treatment costs.
WATTI: AI Digital Energy Assistant	The Watti project proposes the development and deployment of an AI-powered digital assistant designed to provide personalised, accessible, and actionable energy advice to consumers. It aims to address the urgent need for energy saving and efficiency practices and support consumers, especially those in vulnerable situations, in navigating the complexities of the energy market.
Situational Awareness	This project will research the latest developments in human machine interface (HMI) theory and human factors to ensure any new process and system design is done in a way that best supports the users of the system. In particular we want to mitigate the risks above noting the specific requirement to support situational awareness in a rapidly changing environment as we transition.
South West Hydrogen Ecosystem Conceptual Plan	WWU are looking to undertake a conceptual plan to facilitate the transition of the existing gas network in the South West of England. In its initial phase, this will take the regional outputs of WWU's Regional Decarbonisation Pathways project to produce a network plan for Bristol and the surrounding region.

Domestic customers

Supporting the energy system transition for domestic heat and other energy use in the home.

Visualising Demands on Local Authority Networks	WWU has access to large amount of raw data regarding meter extracts – with proper analysis this can give us an insight into the demand for commercial, domestic and industrial properties at a location. The data is raw and will need a large amount of analysis in GIS Pro or Mappoint in order for us to see where exactly meters and demands are located. This project seeks to use this analysis in order to determine the domestic, commercial and industrial demand on our network within local authorities.

DID YOU KNOW?

We worked with **22** unique partners in 2023/24

Planned projects

Part 2-of-4

Hydrogen

Understanding the impact of hydrogen production technologies and business models on the transition of our energy system.

Project name	Description
Lessons Learnt Phase 2	Following on from the extensive work carried out in Lessons Learnt phase one (NIA_WWU_2_17), we shared the document with various parties including government and regulators. Many stakeholders were interested in follow up work, requesting a deep dive into the upstream and downstream conversion, for industrial customers to take forward to future hydrogen usage.
Utonomy Smart Pressure Control at High Bickington	The Utonomy smart pressure control is part of the compressor solution to minimise the amount of time that the compressor must run – to be installed as part of an effective, efficient solution.
Demonstrating Full Domestic Safety System for Hydrogen	The project involves a comprehensive set of tasks aimed at implementing and validating a domestic safety system for hydrogen use, including excess flow valves.
H2 Ready Homes capture	Database required to capture information relating to individual properties to identify if they are hydrogen ready from a supply point of view and also from a boiler/gas safe perspective. Collaboration required with GDNs, IGT sites and Gas safe register or XOSERVE to capture all data.
NextGen Electrolysis Beta	The use of green hydrogen in the transition to a low carbon economy requires large amounts of R&D from the perspective of both producers and distributors. This project targets the resilience of energy systems and robustness of supply lines in gas distribution.
Role of Lined Rock Caverns to Support Hydrogen Sector and Implications for Network Planning	Assess the role that lined rock caverns (LRC) could play in supporting the developing hydrogen sector and to support the electricity network storage needs and to define the implications for gas and electricity network planning.
Project GaIN	This project seeks to undertake initial modelling to assess the impacts of rolling out higher efficiency gas appliances, such as thermally driven heat pumps and fuel cells, as an immediate means of reducing carbon emissions without impacting the electricity network.
Total Cost of Operation – Van: BEV and FCEV - Analysis and Comparison	Follow-on from Cenex study in 2021 to review how to make WWU's van fleet zero-emissions, and the role of fuel cell electric vehicles (FCEVs) and battery electric vehicles (BEVs)..
DASH – Decentralised Alliance for South West Hydrogen	Exploration of a radically decentralised green hydrogen driven gas network. This project seeks to explore viability of hydrogen production at sites with grid availability or constrained renewables, the role of biomethane within this arrangement and its sensitivity, technical challenges to be overcome, and links to storage in South East England.
Regional Planning Translator	As the work on local area energy planning increases, the need to be able to translate the outputs from each plan into tangable network forecasting andinfastructure building will be crucial. Using the data from the Wales LAEPs we would look to turn this into a visual network demand as well as identifying key locations in which the network will be required in future and for what purpose.
Application of Functional Blending Specification at Strategic Locations	Project to undertake conceptual design work on how the functional blending specification can be applied in three key areas of LTS development for hydrogen blending at offtake, blending into existing LTS, and blending into new LTS.
Determining future energy demand of B&R Team vans with full on-board power	Assessing our onboard power cability to inform our future power needs for alternative fuel.

Planned projects

Part 3-of-4

Hydrogen (continued)

Understanding the impact of hydrogen production technologies and business models on the transition of our energy system.

Project name	Description
Nuclear Enabled Hydrogen Supporting Transition (NEHST)	A baselining assessment, producing a report on the impact Nuclear Enabled Hydrogen production could have on both Hydrogen Rollout for Domestic heating and Industrial applications at a regional level within WWU's network.
Biofoundry Hydrogen Production	The technology utilises genetically optimized microbes to convert the chemical energy from organic compounds in wastewater into microbial metabolism, resulting in formation of green hydrogen.
Salt Cavern Hydrogen Storage Feasibility Project	Follow on project from Salt Cavern project. Refine and concentrate areas to focus on for a pre-feed and intial CBA.
Defining the role of storage for the distibution networks	A project to assess the role that gas distribution networks will play in storage in the energy system transition.
The Impact of District Heating on our Network	To understand what impact district heating will have upon our network.
Hydrogen Fuel Cell Operating Hub for Repex/Large Scale Projects	Explore long duration operation sites having a fuel cell to power all ancillary equipment.
HyLine North Wales feasibility study	A study to explore a hydrogen transmission pipeline from potential producers in North Wales.
ALCHEM ALPHA	The ALCHEM (Advanced Low Carbon Hydrogen and Energy Management) project uses innovative biomass electrolysis technology, which uses liquid waste biomass to produce green hydrogen and green chemicals with no oxygen, using 75% less energy than conventional water electrolysis.

Industrial and commercial

Supporting the energy system transition for major energy users, businesses and other organisations.

Aquifer Storage of Hydrogen Alpha	As the use of hydrogen increases, the requirement to match supply and demand will require storage at scales from linepack (MWh scale) through salt caverns (GWh scale) to geological structures (TWh scale). At present, most work on the largest stores addresses depleted gas fields. This idea recognises that the geological storage of hydrogen in aquifers may be a cheaper option for large scale storage than use of depleted gas fields, as modelling studies we have undertaken indicate that cushion gas requirements may be lower. The Alpha phase of the project will build on the findings from Discovery Phase.
NPT Net Zero Hub	Working with a number of partners we are looking to retrofit a commercial building in Neath Port Talbot (NPT) to use hydrogen and in turn complete some works to expand and adapt existing hydrogen production facility in Baglan, as part of the University of South Wales' building. Study required to assess how this would be done and produce short document to advise on commercial retrofit benefit and costs.
Repurposing the gas network for scalable heat pump deployment	Investigation into the feasibility of repurposing the gas network to provide sustainable energy to ground source heat pumps in domestic properties.
Bristol Hydrogen Centre Phase 1b	Conversion of our Bristol Depot to hydrogen.
Sensitive Users (Who are ready and who are not?)	How to asses the impact of blending and pure hydrogen on industrial users, tool creation and case study.
HyLine Phase 1, Feed Study	FEED study for for a dedicated hydrogen pipeline running from Milford Haven to the Dyffryn Clydach and Port Talbot region.
Investigate the opportunities of using hydrogen to move energy as an alternative to undergrounding electricity cables.	Investigate the opportunities of using hydrogen to move energy as an alternative to undergrounding electricity cables.

Planned projects

Part 4-of-4

Intermediate, medium, low-pressure gas networks

Managing the transition of intermediate, medium, low-pressure gas network assets to carry decarbonised gases.

Project name	Description
Hydrogen Rollout Assessment (Town Pilot)	The main focus of the project is to understand the main energy systems and supply chain requirement involved in the deployment of hydrogen for heating at scale.
Understanding future energy loads from Data Centres	Data centres are a growing centre of demand on energy networks. The scale and nature of demands have also had impact on capacity for other users in some areas. This project aims to understand the current status of data centre demands, future projected growth (including where this may be targetted), options for meeting demand from the gas and electricity systems, and net zero options for the sector.
HyRes Project in Rural Energy Systems – Build Phase	Build and install hydrogen blending injection unit.
Enfield Biomethane Blending Tee Trial	Trial of the first blending tee in the UK to blend biomethane with methane maintaining calorific value whilst reducing the propane needed thus reducing the carbon intensity of the gas.
Smart Pressure Control Phase 2	Phase two of the roll out.
Urban and Rural Energy System Transition Implications	Understanding the differences between urban and rural energy system transition implications.

Transport

Developing options for the use of decarbonised gases in transport.

Rural transport feasability study	Investigate decarbonistion of transport in rural areas.
Connecting Train Refuelers to our Network	Hydrogen is a useful solution to decarbonise heavy vehicles. Having completed study on road freight in HyDrive, this study will consider the likely demands and the feasibility of connecting train refuelers at depots to our network. This will involve a baseline study of current rail transport demands, projection of future demands and cost analysis of transforming a train depot so that it can facilitate hydrogen refuelling.

Out and about

Innovation Zero 2024

The team were in London attending the Innovation Zero conference for the first time this year, alongside delegates from all UK gas networks, demonstrating our collective commitment to reaching net zero. The brand new interactive whole systems model sat alongside our HyLine Cymru model, showcasing our vision for the future. The Shadow Secretary of State of Climate Change and Net Zero, Ed Miliband MP, was amongst the 12,000 attendees. We're looking forward to 2025.

Energy Innovation Summit 2023

Our Net Zero and Innovation team headed up to Liverpool to the Energy Innovation Summit. The summit was a chance to engage with the 1,110 attendees and demonstrate the ongoing work we're doing to decarbonise the gas network. Our HyLine Cymru model also made the journey, helping stand visitors visualise how the proposed 130km hydrogen pipeline could deliver low-carbon hydrogen to industrial customers across South Wales. The team were on hand to offer deep dive insights into our projects and share valuable learnings from our broad portfolio. The project managers for the HyLine, Ventilation and Hazardous Areas Within Buildings, Lessons Learnt from the Past, and Hydrogen for Aviation projects had the opportunity to disseminate their respective projects' learnings. We will once again be returning to Liverpool on the 29th and 30th October for the Energy Innovation Summit 2024.

Innovation Basecamp

The Energy Innovation Basecamp saw innovators from across the UK gather to hear the challenges faced by our energy networks and understand how their ideas and technology could help overcome these barriers. We worked with the other energy networks, industry experts, and other stakeholders to produce problem statements pertaining to these barriers so that innovators could address these specifically. The event also saw the launch of the SIF round four challenges which can be found **here**. In July, members of the innovation team attended pitching sessions, where suppliers detailed how they could solve the problems raised at the Basecamp event.

Energy Research Partnership (ERP) presentation

ERP is a public-private partnership seeking to guide and accelerate innovation in the energy sector through enhancing dialogue and collaboration between policymakers, academics and industry. In 2023 we presented our innovation activity and vision to an ERP meeting, seeking feedback and ideas for new projects. We continue to be active members of the Partnership.

Lochem trip

Five WWU colleagues took a trip to the Netherlands to see a domestic hydrogen trial in action. Twelve houses in Lochem, which sits around 90 minutes from Amsterdam, have been converted from natural gas to hydrogen as part of the three-year trial. The team gained valuable insight from customers, local politicians and technicians, on the role hydrogen is playing in the Netherlands to reach net zero targets.

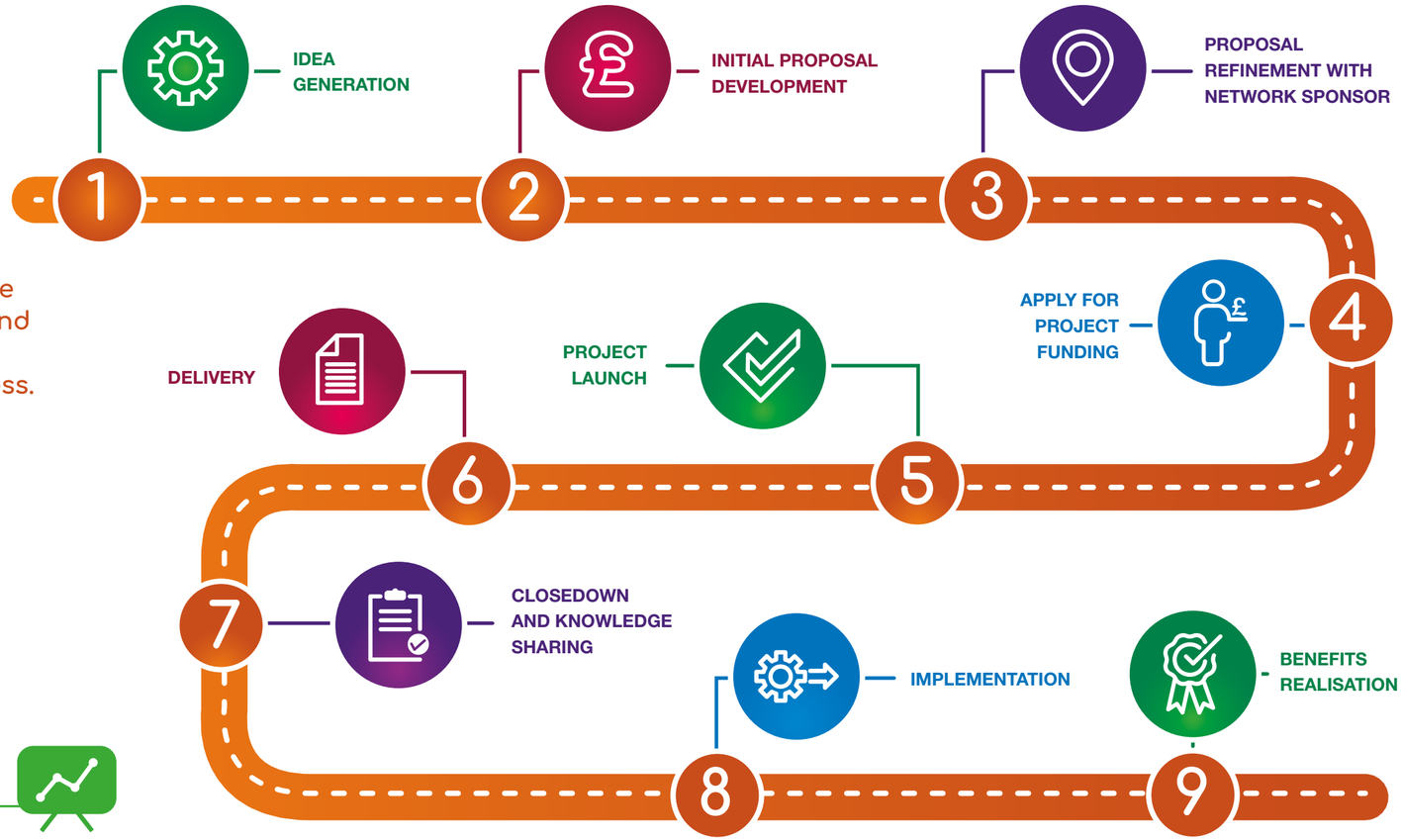
Hyline Cymru Feasibility launch

Wales & West Utilities were proud to be sponsored by MS for Carmarthen West and South Pembrokeshire, Sam Kurtz, for an event at the Senedd disseminating the HyLine Cymru project. The event was well attended, with members from the Climate Committee and delegates from industry attending to hear about the proposals to build the 130km pipeline from Pembroke to Port Talbot.

Innovation process

Why not follow the example set by our innovation project partners on the previous pages? Here's our handy guide to working with us as we respond to the challenges of the future. You can also view the Energy Networks Innovation Process Document **here**, which complements the WWU process.

1. **Idea generation** – review this report, particularly the strategic areas of interest, to make sure your idea aligns with one of our priorities and the themes and focus areas that we need to address.
2. **Initial proposal development** – review funding opportunities and eligibility criteria to see which innovation funding might best fit your idea.
3. **Proposal refinement with network sponsor** – you can either **contact us** directly or you can direct your idea through one of the national routes (**SNP**, **UKRI**, **KTN**) where other networks can also assess the ideas (networks can agree to collaborate at this stage).
4. **Apply for project funding** – after working out the best funding route, the next step is to apply for project funding with us.
5. **Project launch** – successful proposals will have a kick-off meeting and both NIA and SIF projects will be registered on the Smarter Networks portal.
6. **Delivery** – work with us (and any other network sponsors) to deliver the project, recording information and learning.
7. **Closedown and knowledge sharing** – project wrap stage, validating outcomes against objectives, sharing information, learning and results with all stakeholders.
8. **Implementation** – help us implement the project into business-as-usual operation.
9. **Benefits realisation** – benefits will be tracked by the network.



DID YOU KNOW?

61%

NIA projects kicked off in 2023/24 were collaborative

WHAT OUR PARTNERS SAY

We've worked with WWU for many years across a portfolio of projects and have established a streamlined process through our great working relationship. We're pleased to have collaborated with them on the Purging for a Hydrogen Future project, alongside Northern Gas Networks, as well as on a project involving testing of PE pipework – the outcomes of which will support WWU's ongoing work to launch Wales' first hydrogen demonstrator home, as well as informing many other projects in future.

Steer

Get in touch – we're easy to work with

Over the past 12 months we have been busy investing money in projects to decarbonise the network and ensure consumers in vulnerable situations are not left behind, but the work doesn't stop there; we still have a long way to go and we want your help to get there.

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 to receive calls for innovation and project updates:

Let's connect >

3. Email your ideas directly to

innovation@wwutilities.co.uk >

- We post problem statements and ideas on **Find a Tender** and advise how you can submit an idea to us.
- Don't forget to read our **innovation strategy** and **business plan** to make sure your idea aligns to our priority areas.
- We also talk at events held throughout the year, including the annual **Energy Innovation Summit (EIS)** and **innovation zero**.
- National routes include **The Smarter Networks Portal**, which is the window into network innovation for regulatory-funded projects where you can see details on current projects, find partners and propose ideas for all network companies to review and consider.
- The **UK Research and Innovation (UKRI) website** contains details of UKRI's key funding programmes and includes a 'funding finder' tool where you can search for current funding opportunities across UKRI, research councils and Innovate UK.
- The **Knowledge Transfer Network (KTN)** is part of **Innovate UK** and exists to connect innovators with new partners who will work with you to refine your idea and direct you to appropriate funding opportunities.

WHAT OUR PARTNERS SAY

As a collective of 18,500 designers, advisors and experts working across 140 countries, we're delighted to be collaborating with WWU on their journey to develop a more sustainable energy system and built environment. Having successfully secured a tender with the team, we will be working with them on the Biomethane and Hydrogen interactions project with all GDNs across GB. We look forward to nurturing and expanding our partnership with WWU and the GDNs.

ARUP

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