Innovation drives change, enables the energy transition and delivers value to our customers.

National Innovation Allowance (NIA)

The NIA provides a fund for small-scale, low technology readiness level (TRL) projects from early research through to demonstration. The funding is accessible throughout the RIIO-T2 period and has three key drivers.

NIA drivers

Research and development: Encouraging operational and technological innovation.

Collaboration and dissemination: Working with external partners to solve problems and share new learnings.

Customers and strategy: Focusing on solutions that deliver benefits to our customers.

Highlights

1. A further 40 NIA projects have been approved with 33 projects moved through contract to delivery or closure.
2. A total of 120 projects have now been progressed through RIIO-T2.
3. 70 NIA projects have successfully completed in the RIIO-T2 period.

Read more: Innovation strategy 2025 →

NIA projects

Asset design for a hydrogen network
This project considered typical National Transmission System (NTS) pipelines, Above Ground Installations (AGIs) and compressor station assets and assessed how they should be designed for hydrogen transmission, in line with hydrogen-specific current codes and standards. This project enabled a comparison and identification of any additional aspects of design and infrastructure required on the NTS network when repurposing from natural gas to hydrogen or developing new hydrogen NTS assets. The project was successful in identifying the differences and the resultant costs and risks associated with the design, construction, operation, maintenance and decommissioning of assets for hydrogen, when compared with asset design for a natural gas network.

Blending management approach
This project aims to investigate how the activities carried out by the transmission system operator may need updating to accommodate blends of hydrogen.

The project assesses the modelling software currently used for running the network and planning maintenance, and investigates the technical feasibility and resource implications associated with deploying software to upgrade or replace the existing methods.

HyNTS 100% H2 metering system
Meters are used for process measurement – to understand flows across the network and measure the gas used to power our compressors – and for fiscal measurement of flows on and off the network. Accurate metering is key to ensuring shippers are billed correctly and the system performs efficiently.

This project involved the design and construction of a dedicated hydrogen metering skid at the FutureGrid Phase 1 facility, to test a range of metering technologies suitable for measuring 100% hydrogen flows, at representative transmission pressures.

Strategic Innovation Fund (SIF)

The SIF provides funding for larger scale demonstration projects and enables their development through several separate project phases – Discovery, Alpha and Beta. This funding is determined by annual challenges that focus on encouraging cross-industry collaboration.

Highlights

1. Successful applications and delivery of two Round 4 discovery projects exploring innovative AI tools to manage digital decommissioning of large-scale equipment and repurposing of existing decommissioned pipe elements for alternative uses, including electrical energy, heat, fuels, water and data.
2. Successful applications supporting four Round 3 Alpha projects covering a range of topics including offshore energy hubs, liquid organic hydrogen carriers, hydrogen storage in depleted onshore hydrocarbon fields and the decarbonisation of the marine sector.
3. Successful applications and ongoing delivery supporting two Round 2 Beta projects developing a digital twin of the whole Welsh energy transmission and distribution system and a digital twin and data-sharing platform to enhance climate resilience and investment planning.

SIF: Round 4 discovery projects

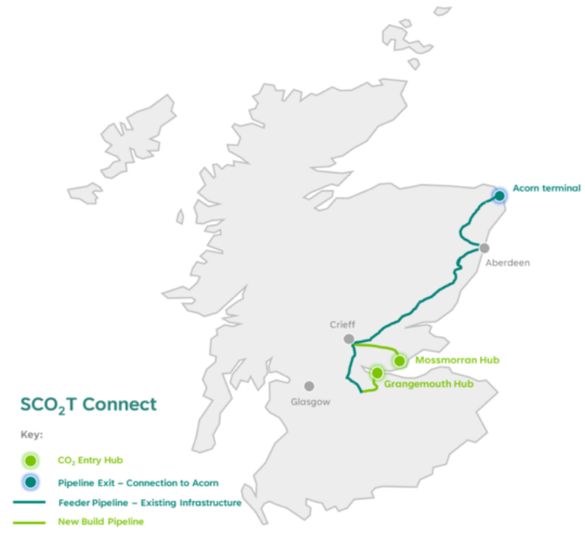
Digital decommissioning of large-scale equipment
As the gas transmission network responds to a changing energy system, including the transition to net zero and changes in supply and demand, we are required to decommission our large site-based assets in certain locations. Decommissioning is a multifaceted endeavour that goes beyond the conclusion of an asset's lifespan and encompasses a complex deconstruction process. This project will implement an innovative AI tool to help National Gas manage decommissioning and drive benefits such as increasing the accuracy of cost estimation, reducing carbon emissions, identifying re-use potential and lowering the overall time taken to decommission.

Alt Pipe
As the owner of the National Transmission System (NTS), National Gas is committed to responsibly managing our redundant assets in a manner that contributes to a sustainable, lower-carbon future by decommissioning them responsibly, refurbishing for re-use where viable, or changing their purpose where possible. This project will identify decommissioned elements of redundant pipework on the transmission system which are unlikely to be used for refurbishment or part of any wider repurposing of the core network, and explore the potential for repurposing these for alternative uses including the storage or transmission of electrical energy, heat, fuels, water and data.

HyNTS FutureGrid programme
FutureGrid is a world-class test facility with the sole purpose of demonstrating the ability to transition our National Transmission System (NTS) to decarbonised energy. At the forefront of all the work we do, it focuses on how we can repurpose existing assets that have been in natural gas service for many years, at the lowest cost to UK consumers. To date, the programme has built the Phase 1 test facility, demonstrating the ability of a wide range of our assets to be operated with hydrogen at blends including 2%, 5%, 20% and 100% hydrogen. These outputs have fed into the critical evidence case submitted to the Health and Safety Executive (HSE). The facility provides a platform for testing hydrogen and exploring other opportunities such as Carbon Capture, Utilisation and Storage (CCUS), of which we have several projects under consideration for demonstration on the facility. Beyond this, we are also exploring the opportunity for third parties to use the facility for additional testing, which provides commercial opportunities and a return of revenue to UK consumers. The Phase 1 facility acts as a vital platform to generate key safety evidence for the NTS, at the lowest possible cost to UK consumers, by providing an efficient platform that can be developed to suit further testing needs.

HyNTS deblending for transport
One such project is the HyNTS deblending for transport project, which focuses on demonstrating a future new industry where hydrogen refuelling stations are directly connected to the gas network. This will enable them to benefit from a secure supply of low-cost, high-purity hydrogen, helping to promote the hydrogen transport sector and serve the large-scale needs of rail, bus, heavy haulage, marine and aviation sectors. Demonstrating this opportunity is vital to enabling hydrogen refuelling infrastructure and should be started now to align with the industrial cluster and Project Union activities. Construction of the deblending facilities is underway, with a hydrogen refuelling station and hydrogen vehicles already live on site for trials. Demonstration of the deblending activities is due to commence at the start of 2026, with continued stakeholder engagement and the production of a commercial requirements and strategy document ongoing throughout 2025 and into 2026.

SCO_2T Connect
The SCO_2T Connect project will be a crucial component in enabling the Scottish cluster to decarbonise via Carbon Capture, Utilisation and Storage (CCUS). It will combine 170 miles of repurposed assets with 35 miles of new-build pipeline, to develop Scotland's first onshore carbon dioxide transportation network. Pre-Front-End-Engineering-Design (FEED) activities were completed in 2024, and through UIOLI funding, a FEED readiness project was completed in 2025. The activities for this included design, procurement and regulatory aspects. Funding for FEED studies is expected to come in the latter part of 2025. To support the SCO_2T Connect team, several of our projects are feeding into the design of the repurposed pipeline and the safety case for transporting gaseous phase carbon dioxide in our assets. The carbon transportation technical demonstration phase 1 project carried out an all-encompassing study looking at topics including benchmarking, how carbon dioxide reacts with our NTS materials, fatigue, water ingress and corrosion. The outputs from this project and wider SCO_2T Connect work shaped the follow-up projects. A carbon dryness project investigated how to keep our pipelines and assets dry and looked at the importance of maintaining the specification of carbon dioxide. Looking ahead, two projects (carbon dioxide repurposing procedure project and carbon integrity management project), aim to identify the evidence gaps associated with repurposing our pipelines to transport carbon dioxide and provide guidance on how to safely repurpose and continue to maintain a carbon dioxide network in future.



Innovation in motion continued

Project Union

Project Union aims to create a hydrogen transmission network for the UK, facilitating the transport of 100% hydrogen, and ensuring a core hydrogen network is developed. Through a combination of repurposed existing assets and new infrastructure, a hydrogen network of up to 1,500 miles could be created by the mid-2030s. This would initially link strategic hydrogen production sites, including the industrial clusters and provide the option to expand beyond this initial hydrogen transmission network to connect additional customers. It would do so by connecting and integrating hydrogen supply, demand and storage, enabling effective market growth and efficient scaling up.

To enable a thriving hydrogen economy, we need to ensure that we build confidence in the resilience of physical supply and connectivity to developing markets. Project Union can fulfil this role by creating a cost-effective, reliable and efficient hydrogen transportation system.

In 2024, the feasibility phase of Project Union was completed, which took a whole backbone approach to delivery. Pre-FEED activities were undertaken for the whole hydrogen network, enabling the broadest evidence base to inform decisions on future phasing. The following was produced:

- Phasing strategy which delivered an assessment to determine the prioritisation and timing for delivery of each section of the hydrogen network while ensuring security of supply on the remaining natural gas network. This will continue to be assessed.
- Pre-FEED activities which delivered an appraised set of routing options, a constructability assessment and a planning and consenting strategy based on enhanced cost estimates and asset data for a full hydrogen network.
- Hydrogen market enabling activities, including a supply chain assessment and ongoing customer and stakeholder assessment.

The next step for Project Union is to deliver the Front-End-Engineering-Design (FEED) work which will provide the technical evidence required to fully develop pipeline routing options and will be delivered on a regional basis. In addition, for a hydrogen transmission network to be operational, a wider suite of activities must be carried out. This includes ensuring relevant systems are adapted, commercial frameworks are in place and customer and stakeholder needs are understood. This next phase of Project Union is proposed to be funded under the Net Zero Pre-construction Work and Small Net Zero Projects (NZASP) re-opener mechanism, assessed by Ofgem. The funding will be provided on a regional basis with the East Coast region, connecting the Humber and Teesside, being the first phase for delivery.