Project Union

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The National Transmission System (NTS)

The role of gas:

- 23m gas customers across the UK
- 85% households using gas for heat
- 881 TWh of energy is delivered by NTS

UK gas demand:

- 39% Power Generation
- 38% Domestic Use
- 23% Industrial & Commercial

Map key:
- Compressor station
- Beach Reception Terminal
- LNG Importation Terminal
- Interconnector

- 7,600km high-pressure pipe
- 94 bar maximum pressure on the network
- 24 compressor stations
- 504 above-ground installations
- 8 connected distribution networks
Project Union will connect, enable net zero and empower a UK hydrogen economy, repurposing existing transmission pipelines to create a hydrogen ‘backbone’ for the UK by the early 2030s.

- Repurpose 1,500-2,000km of the NTS through a phased approach in line with Government’s cluster prioritisation and green hydrogen development
- Connect cross GB supply, demand and strategic storage sites, enabling growth of a UK hydrogen economy
- Use existing infrastructure to deliver a low carbon future, reducing environmental impact of new construction
- Enable early and affordable market growth of a low carbon hydrogen economy to achieve net zero

Checklist of aims:

1. Repurpose 1,500-2,000km of the NTS through a phased approach in line with Government’s cluster prioritisation and green hydrogen development.
2. Connect cross GB supply, demand and strategic storage sites, enabling growth of a UK hydrogen economy.
3. Use existing infrastructure to deliver a low carbon future, reducing environmental impact of new construction.
4. Enable early and affordable market growth of a low carbon hydrogen economy to achieve net zero.

This map is for illustrative purposes only.
Project Union: the benefits

Project Union will contribute to Energy Security.
Enabling transport of, and fair access to, indigenous supplies around the UK and opens up export opportunities by connecting to the European Hydrogen Backbone.

- **Decarbonisation of industry & power**
  Fair access to green and blue hydrogen enabling businesses to decarbonise. Access to transmission enables green hydrogen production to scale.

- **Energy storage and resilience**
  System resilience to move and store sufficient volumes across the country.

- **Connectivity and efficiency**
  Connect production and storage with demand, enabling system efficiency through shared infrastructure.

- **Market coupling**
  Connect isolated production sites enabling competition, reducing costs and improving security of supply.

- **Levelling up and job creation**
  Project Union drives approx. £300m GVA and supports 3100 jobs at peak construction.

- **Global leader in green innovation**
  Attract global investors by getting best value from national infrastructure and enabling rapid scale up.

- **Flexibility and optionality**
  Flexibility in power generation, storage and consumption. Optionality in future hydrogen decisions whilst maintaining gas networks' delivery.

- **Consumer-centric**
  Innovative, cost-effective consumer focused energy solutions, e.g., the pilot hydrogen town brings scalability & phasing.
Project Union: Feasibility key deliverables

Regulatory funding under the NZASP mechanism has been approved to the value of £5.626m*. Over a 12-month period commencing early 2023, the programme will deliver the following outputs:

### Phasing Strategy and Priority
- Phasing strategy – order and timing
- Economic assessment
- Real Options Analysis identifying key decision points
- Supply and Demand Scenarios

### Pre-Front End Engineering and Design (pre-FEED) activities
- Planning and consenting strategy
- Appraised set of routing options
- Asset data collection requirements
- Constructability assessment
- Cost Estimates
- Engineering policy review

### Hydrogen market enabling activities
- Evidence gathering for policy decisions
- Regulatory and market framework options
- Supply chain review
- Customer and stakeholder engagement

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*Phasing Strategy and Priority for each section of the hydrogen backbone. This will be determined through engagement with existing and emerging stakeholders across production, storage and demand sectors, network modelling, alignment with policy objectives and by evaluation of greatest value to the consumer.

Pre-Front End Engineering and Design (pre-FEED) activities, examining the viability of repurposing existing methane infrastructure assets and options to provide a complete hydrogen backbone connecting strategic supply locations.

Hydrogen market enabling activities, including development of options for the design of regulatory and commercial frameworks for hydrogen infrastructure and ongoing customer and stakeholder engagement.

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*18/19 price base
Project Union: high level plan

FEEDs are staggered following pre-FEED to allow phases construction by the early 2030’s. Example for illustration only.
Government policy indicates a clear signal for hydrogen, and it is essential that this is supported with the development of transportation infrastructure to allow a resilient, liquid, competitive UK wide market to develop.

Given the length of time required to plan for and deliver critical national infrastructure, if the UK is to achieve its Net Zero targets by 2050, there is a clear need to act now and at pace.

Project Union proposes to create an operational hydrogen backbone for the UK by repurposing 1,500 to 2,000km of existing assets, representing ~25% of the UK’s current methane transmission network by the early 2030s.

We will create the evidence base to support government and regulatory policy decision making. Over the next 12 months, we will deliver:

- Phasing strategy and priority pipeline routes
- Pre-Front End Engineering and Design (pre-FEED) for the full UK hydrogen backbone
- Hydrogen market enabling activities

*18/19 price base*
A high-pressure hydrogen test facility using decommissioned transmission assets, to demonstrate the National Transmission System (NTS) can transport hydrogen safely and reliably.

Four key hydrogen concentrations are being tested:

- 2% hydrogen gas
- 5% hydrogen gas
- 20% hydrogen gas
- 100% hydrogen gas
A global-first, world-class facility

Project Union drives approx. £300m GVA and supports 3100 jobs at peak construction.
Thank you

You can find out more and get in touch:

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