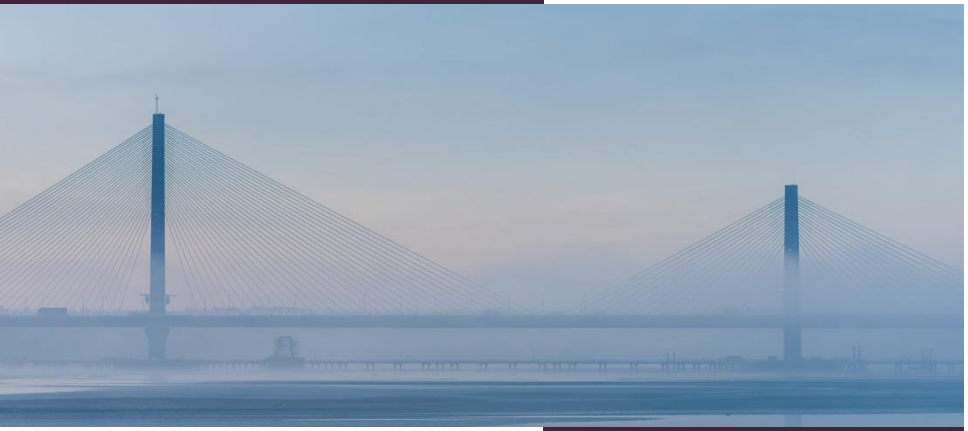

HyNet
Delivering Clean Growth for the North West

May 2018

Andy Lewis
Future Role of Gas Innovation Manager

Cadent
Your Gas Network

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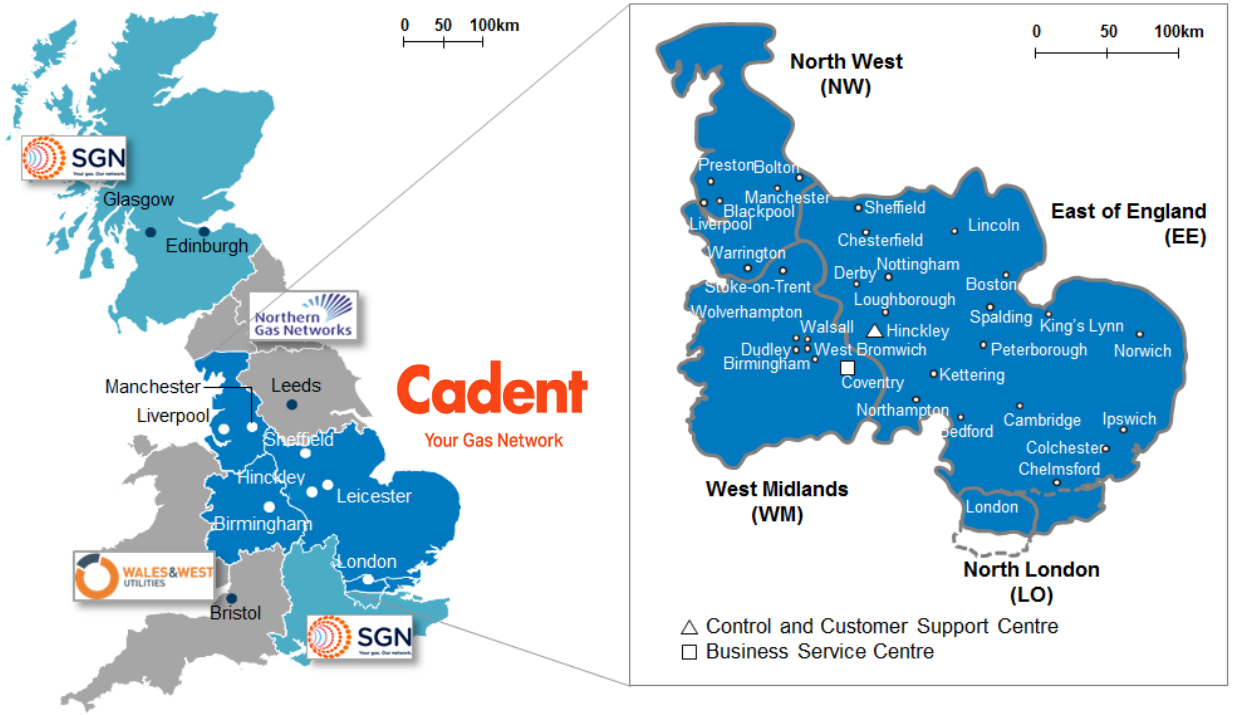
Cadent: Largest gas distribution company in the UK

Innovating for the future



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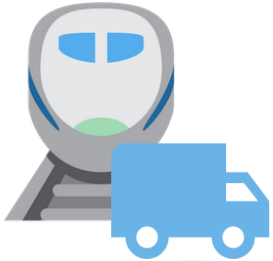
Decarbonising heat and transport

Challenges and opportunities

85%
of UK homes on gas

Nearly a quarter
of UK emissions from industry



2040
Diesel phase out

In 2020s
2 CCUS clusters operating with at scale deployment in 2030s (CGS)

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Carbon Capture, Usage and Storage (CCUS)

Critical technology

"The Government should not plan to meet the 2050 target without CCS. The Government should set out plans in 2018 that kick-start a UK CCS industry in the 2020s."

CCC: An Independent Assessment of the UK's Clean Growth Strategy (January 2018)

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HyNet North West: An integrated project

Hydrogen and Carbon Capture, Usage and Storage

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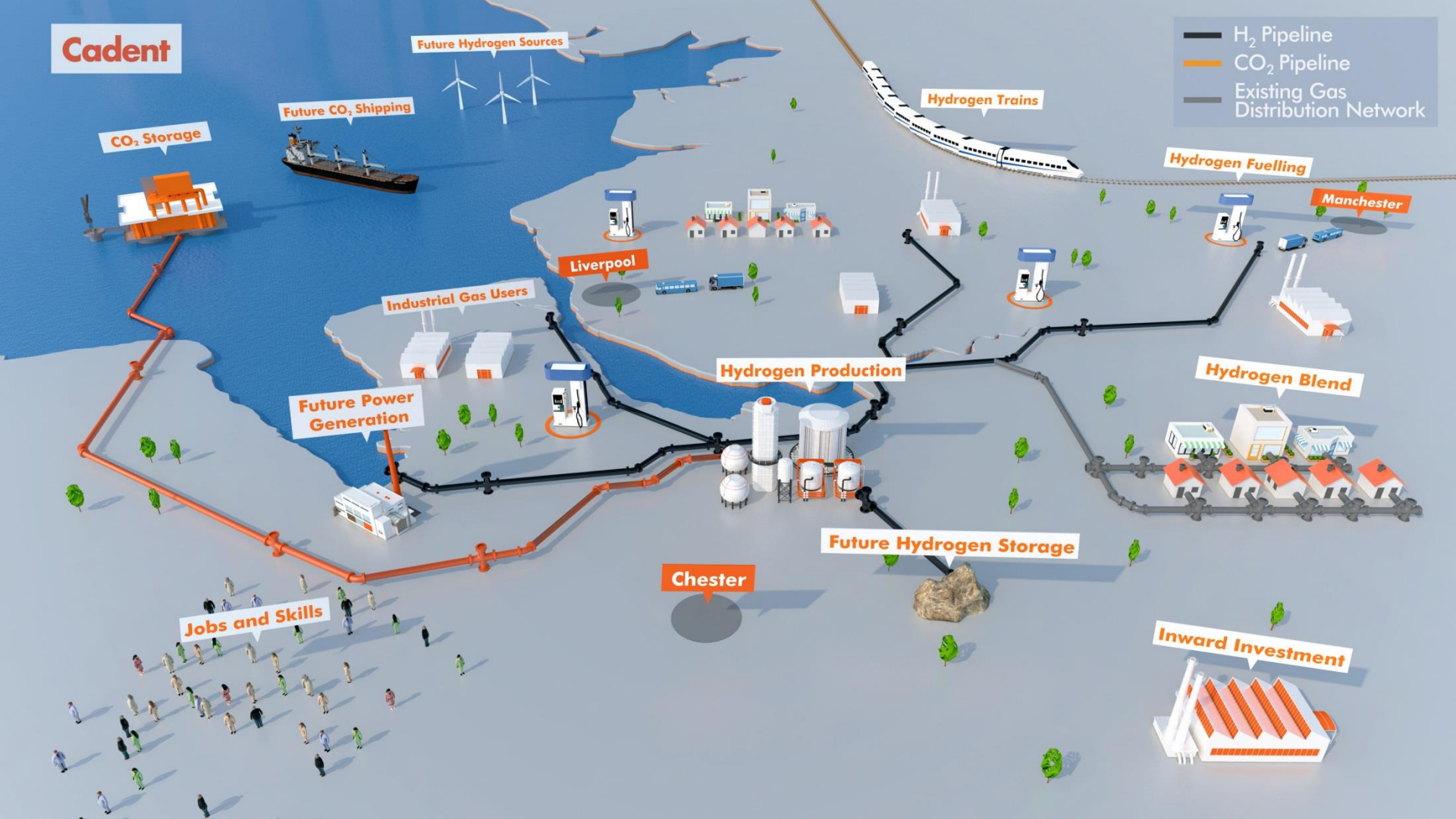
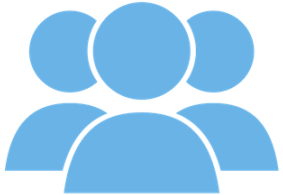
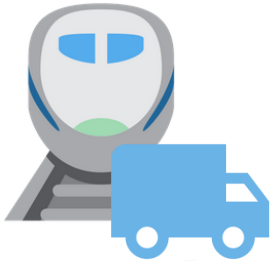

Cadent
Future Hydrogen Sources
Future CO_2 Shipping
CO_2 Storage
Hydrogen Trains
H_2 Pipeline
CO_2 Pipeline
Existing Gas Distribution Network
Hydrogen Fuelling
Manchester
Liverpool
Industrial Gas Users
Hydrogen Production
Hydrogen Blend
Future Power Generation
Future Hydrogen Storage
Chester
Jobs and Skills
Inward Investment

A North West hydrogen cluster
A major opportunity for new industrial growth

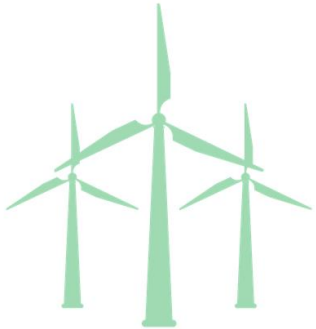


Blend for customers with minimal disruption

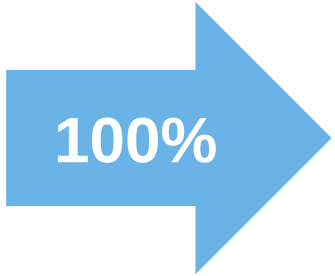
100% to industry for major emissions reductions



Low carbon transport when infrastructure in place



Use in power generation to produce low carbon energy



Move towards 100% hydrogen in distribution network

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HyNet North West

A credible option for UK's first CCUS

£

'No regrets'

2020s

CO_2

Extendable and replicable

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The North West

An ideal location

- **Industrial heritage**, committed to bold innovation.
- **High industry concentration** of energy-intensive sites .
- **Existing infrastructure.**
- **Strong skills base** for further development into a centre of expertise.
- **Unique geology** provides an unparalleled opportunity.

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HyNet North West

Liverpool Bay (ENI): Low cost and practical option

- Liverpool Bay can be **operating by 2025**
- Estimated storage capacity of 130 million tonnes.*
- Extension to Humberside, **operating by c.2030 –** further 1bn tonnes.
- **Uses existing infrastructure** due for decommissioning within this time frame.

© Cadent Gas Ltd 2017

HyNet North West: The benefits

© Cadent Gas Ltd 2017

Economy

Security and growth

- **GVA** to the NW is estimated at 17Bn to 2050, annual average of £528 million
- **Annual Average job creation** in the NW is estimated at 5,976 with peak at 11,522 jobs
- **Attracts** inward investment.
- **Stimulates** investment in other renewable energy.
- **Exportable** skills base for hydrogen and CCUS technologies.

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Environment

CO_2 savings and cleaner air

- **Avoids 1.1 million tonnes** of carbon dioxide emissions.
- **Provides 5-6 TWh** per annum of heat in Phase 1.
- **Hydrogen infrastructure** can facilitate vehicle fuelling hubs for cleaner air.

© Cadent Gas Ltd 2017

HyNet North West: Industry, Homes and Transport

© Cadent Gas Ltd 2017

Industry

Material reduction in carbon dioxide emissions

Supply hydrogen to 10-15 major industrial gas users.

Hydrogen via a dedicated pipeline.

75% of over 1 million tonnes CO_2 emissions saved with HyNet are from industry.

© Cadent Gas Ltd 2017

Industry

A North West cluster

- **Consistent demand** from cluster of large industrial gas users in small geography.
- **Existing sources** of hydrogen production and skills.
- **Exemplar programme**.

The most cost-effective region for a project of this kind.

© Cadent Gas Ltd 2017

Domestic customers

A practical solution

- Blend of hydrogen (up to 20% vol.)/natural gas to around two million homes/businesses.
- Starts the process of decarbonising heat.
- Widespread use of a blend could save around 6m tonnes of CO_2 emissions annually.
- No disruption for customers .
- Hydrogen acceptability.

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Transport

Building the network

- Hydrogen infrastructure can facilitate transport fuelling hubs throughout the region.
- Lower harmful emissions from buses, HGVs.
- Potential for rail network.

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HyNet North West:
Next steps

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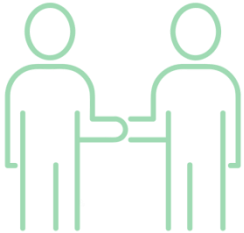
Regional collaboration

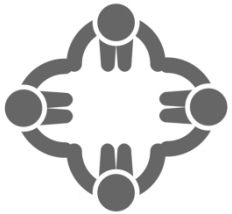
Building relationships

To make HyNet a reality we are working with our partners to:-



Build key partnerships for delivery.

Form a project consortium



Collaborate with North West energy alliances

Share information with regional and central government stakeholders

Policy support and routes to funding

Key decisions

- **£0.9 Billion** infrastructure investment
- **50% of cost** of abatement of other major hydrogen projects
- **CCUS Delivery Plan** by end-2018 supported by work of the task force.
- **Avoid / postpone oil & gas field decommissioning costs** (c.£200-500m)
- **Potential to fit under RIIO** price control mechanism for 2021-2028

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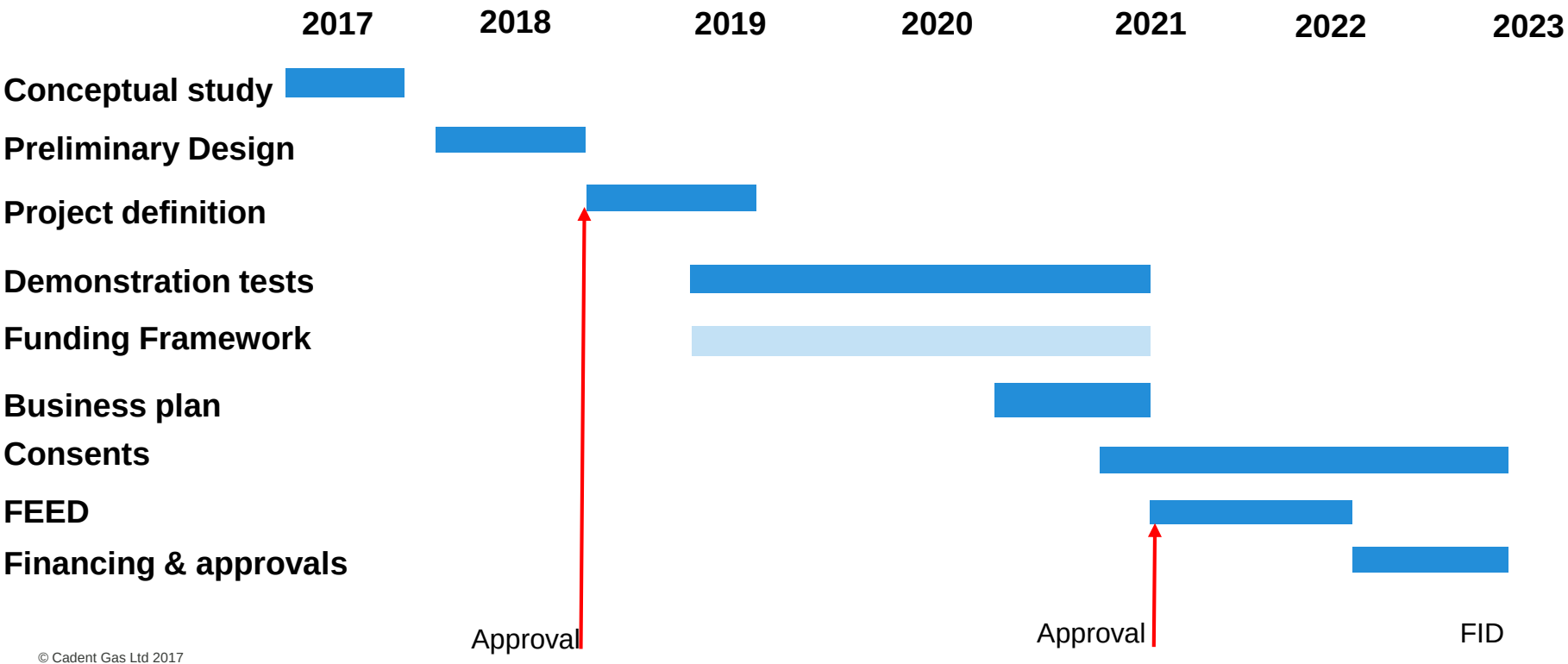
Timeline



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HyNet North West

A low cost, deliverable project

Turns *'ambition into action'* (Clean Growth Strategy)

- *Clean growth*
- *First CCUS infrastructure*
- *Material carbon dioxide emissions savings*

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