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Unlocking network capability: the gas network and its role in the UK's energy future

So far, the Future of Gas series has examined the opportunities for gas as part of the energy mix to 2050 and its role in solving the energy trilemma. The final chapter, Unlocking network capability, looks at why the gas network is essential for enabling the UK's future energy ambition.

Today's gas network is sophisticated, resilient and versatile. We want to make it even more flexible because the way we use the gas network in future will be different from how we use it today. So, how could the gas network evolve to meet a wide range of future needs?

Gas is a critical source of energy, and for the last 25 years, most consumers have chosen gas for heating, cooking and hot water. How do we decarbonise gas to help meet our carbon reduction targets? How do we plan for population growth and demographic shifts? And what is the role of policy makers, investors, innovators and customers in this new future?

We see a role for Government in establishing a joined up policy framework with a coherent UK-wide energy strategy. If we want to address the needs of the energy trilemma by 2050 we must to act now. Unlocking network capability addresses the challenges facing the UK's gas networks and identifies 'no regrets' options to help unlock the UK's energy capability.

Have your say

We are passionate about the gas network, and recognise the need for industry to work together to deliver the future of energy in the UK. The picture below shows how the gas network could evolve to meet customer needs and we set out some areas and questions that we would like to engage further with you on. You'll have some of your own, so please share them with us:

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How can we use the gas network to decarbonise heat and transport

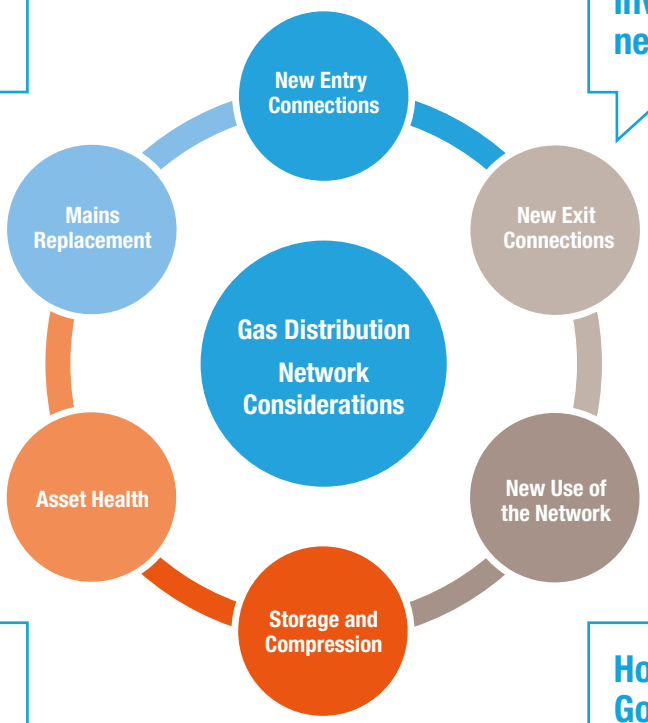
- Underpinned by safety legislation
- Reduced GHG emissions from the network
- Reduces operational costs of repair and customer interruptions
- Enables hydrogen capability
- Option to accelerate to reduce emissions quicker

- For future entry and exit connections
- Continue current plan to give the Network opportunity to flex to future options

How could the future be funded and the investment/innovation needed to get there

- CNG fuel sector for HGV's and buses
- Network of CNG filling stations
- LTS CNG connections
- Gas Turbine for generation
- Network extensions to fuel poor

- Heat networks
- Post Smart services
- Hydrogen deployment



- Reinforcement to connect new sources of gas (Biogas and BioSNG and shale)
- CV monitoring investment

- Needed for hydrogen conversion
- Opens the networks up for more bio-methane or shale

How can we minimise the impact of decarbonisation on customers

How can we help support Government policy that sets out a national and local approach

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Customer

- As the gas networks transition to deliver low carbon energy, how do we manage the specific customer and stakeholder requirements and expectations of the energy network?
- Could the development of innovative and flexible appliances be a game changer in the transition of the gas networks to deliver low carbon energy?
- How do we address the issue of fuel poverty as we transition to low carbon heating?

AD & BioSNG

- What is the best way to facilitate production of renewable gas to heat homes and reduce transport emissions?

Hydrogen & CCS

- What are the opportunities and constraints for hydrogen blending in the existing network?
- How could we adapt the network for 100% conversion to hydrogen?

Transport

- How do we create a network of gas transport infrastructure?

Heat networks

- How does the gas network best interact with heat networks?

The gas network

- What is the best way to design the network to cope with new sources of gas and gas demand?
- How do we develop the right pricing structure and safety regulations?

How are we making the gas network of today the gas network of the future?

Testing hydrogen on a 'live' network

HyDeploy

In 2017, we hope to be starting a three-year trail with Keele University to determine the extent to which hydrogen could deliver cost-effective, non-disruptive carbon savings to customers. This will be the first practical test of hydrogen on a live gas network in the UK since the transition from town gas.

The university's private gas network comprises a network and appliances typical of UK gas distribution systems, and domestic and commercial users including combined heat and power. Testing hydrogen in this situation will enable a more ambitious trial than would otherwise be achievable.

Building a BioSNG plant

Swindon BioSNG plant

National Grid is building a plant to produce renewable, low carbon methane (BioSNG), by gasification of residual household waste. Capable of heating 1600 homes or fuelling 75 HGVs, it will also help industry better understand the contractual, commercial and engineering issues related to production, fuel off-take and waste feedstock supply.

The idea is to encourage the roll-out of a large number of BioSNG plants across the UK; help address renewable targets; and develop a UK-owned technology that could generate exports. It could also inform policy and investment decisions; attract waste supply companies and fuel off-takes to enter into long term contracts; and entice banks and equity funders to finance BioSNG projects.

A state-of-the-art CNG filling station

Leyland CNG

In March 2016, CNG Fuels in partnership with National Grid unveiled a new state-of-the-art filling station in Lancashire capable of fueling over 500 HGVs per day with CNG directly from the high-pressure LTS.

It also supplies 100 per cent renewable biomethane (Bio-CNG) and is an important part of the UK's rapidly growing CNG refueling infrastructure. Made at anaerobic digestion plants from waste, the biomethane is delivered to the filling station through the National Grid pipeline system.

For more information about how to get involved please contact us at futureofgas@nationalgrid.com