



nationalgrid

Future of Gas

- reflections to date

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Future Of Gas Programme: Our objectives



Understand customer & stakeholder views to set out what the future holds for gas



Understand the potential future impacts on our network and the gas market



Develop policy recommendations to support government and regulators

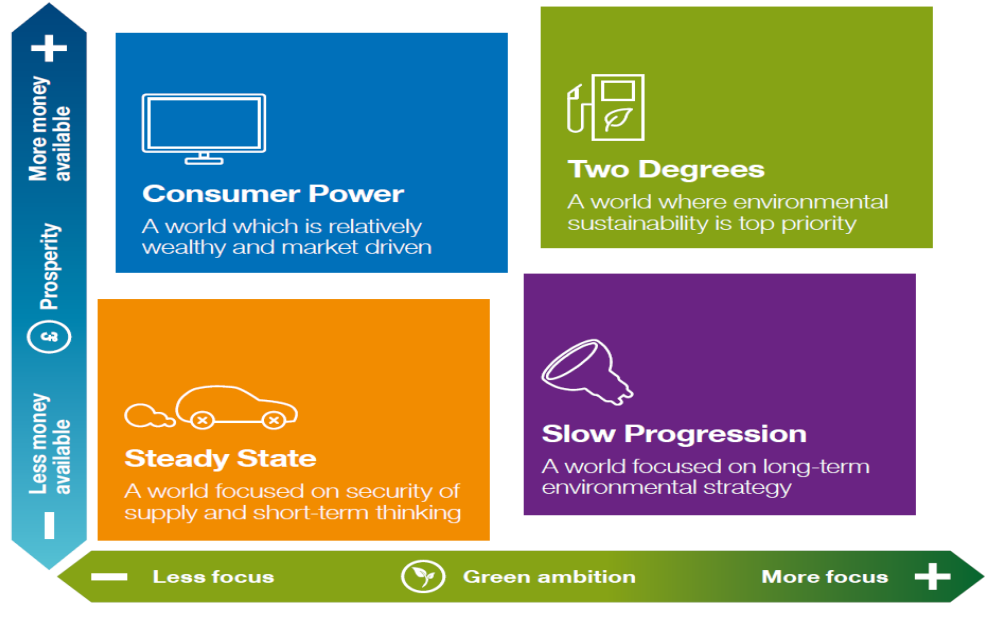


Consider innovative solutions to future challenges

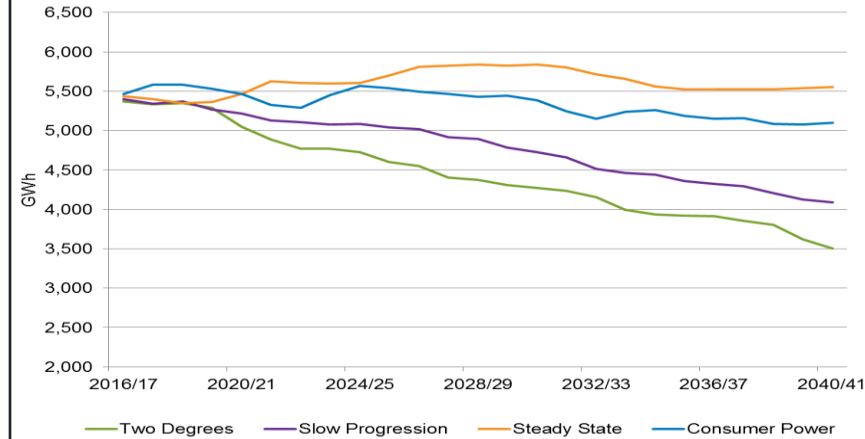
Our internal work: Future Energy Scenarios 2017 nationalgrid

Testing the potential impacts on our network

Four core scenarios



Future gas demand for a 1-in-20 peak day



In all scenarios and sensitivities there is an enduring need for gas

Source: National Grid Future Energy Scenarios 2017

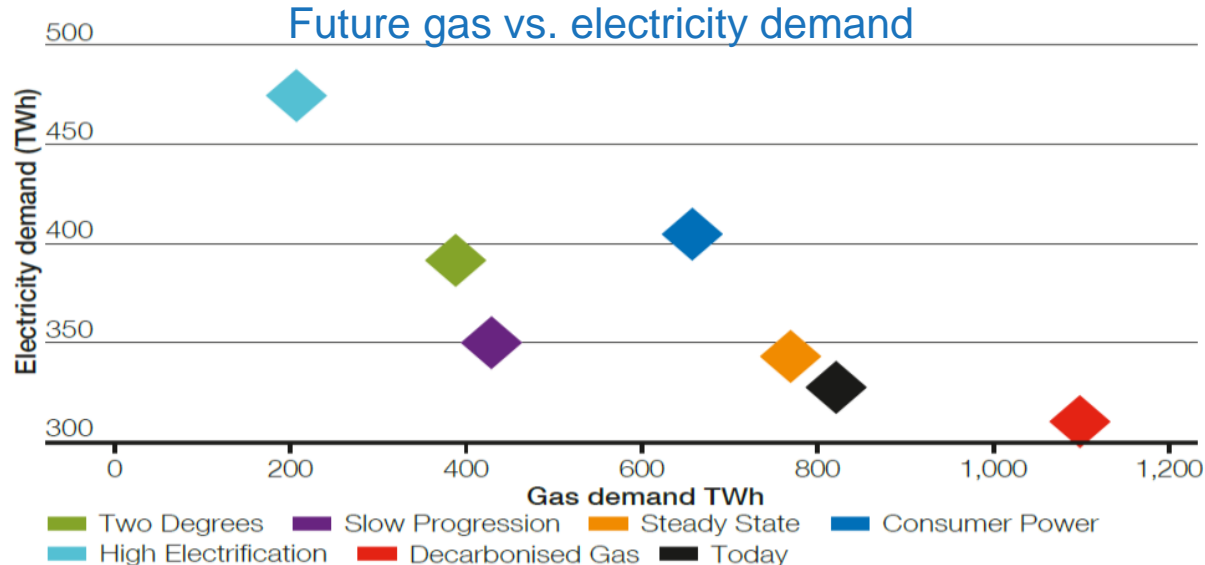
Future Energy Scenarios 2017: Sensitivities

High Electrification

What would happen if society decided we should pursue a more electric future, with more renewable electricity, to help us reduce our dependency on fossil fuels?

Decarbonised Gas

What would happen if heat was decarbonised through an alternative approach to heat pumps, which still enabled the 2050 carbon reduction target to be met?



External work: Academic and industry reports

Electricity for heat is more expensive and more disruptive than decarbonised gas

KPMG
July 2016

Keeping options open provides flexibility to explore different solutions

Ernst & Young
May 2017

Hydrogen makes use of existing infrastructure

Addleshaw Goddard
May 2017

Gas networks could have a much longer life transporting and distributing hydrogen

OIES
January 2017

Decarbonisation of heat is arguably the biggest challenge facing UK energy policy over the next few decades

Ofgem
November 2016

UK customers are familiar with gas... heat pumps are unfamiliar with high cost and space requirements.

If the gas network were decommissioned, the substantial capacity to transport and store large volumes of energy in the gas system would need to be replaced by another source.

Carbon Connect
September 2017

Imperial College
July 2017

Decarbonised gas networks could play a significant role in the future energy system and contribute significantly to decarbonisation

Our external learning:

Themes coming from customers and stakeholders

There is **considerable uncertainty** on decarbonisation policy and approach

Making the **best use of existing assets** (rather than building new ones) will minimise the disruption caused.

Innovation will be essential to achieve decarbonisation – particularly in CCS

No one single technology or solution will achieve decarbonisation in an affordable way. The combination that will emerge remains uncertain.



We need to ensure that ongoing network and market framework development keep as many credible future scenarios **open for as long as possible**.

Gas will increasingly play a **key role across the whole energy system**: delivering flexible power generation to support low carbon generation and supplying energy for heat and transport

Optimising use of existing infrastructure and supply chains will likely be **more affordable than full electrification of heat / transport**.

So what does the future hold for gas?

What we now believe...

1 Gas has an important long term role but as the pathways are uncertain, now is not the time to shut down optionality

2 Gas supports the wider UK economy as it represents good value for consumers and supports industrial processes

3 We need to decarbonise heat but nothing substantial will change for heat in the short term

4 Decarbonising transport with gas is happening today so could be an early priority

5 Supply sources are going to change; we need to consider the market rules to ensure GB remains attractive

6 System operability is going to become more and more challenging, making gas and electricity interactions more important

7 Whilst energy storage is growing in importance, the gas system itself remains a critical store

8 Innovation in gas is imperative: Government, regulators and industry need to work together to investigate and facilitate different technologies, in particular CCS

9 Hydrogen will play a role in the energy future, but how big a role remains uncertain