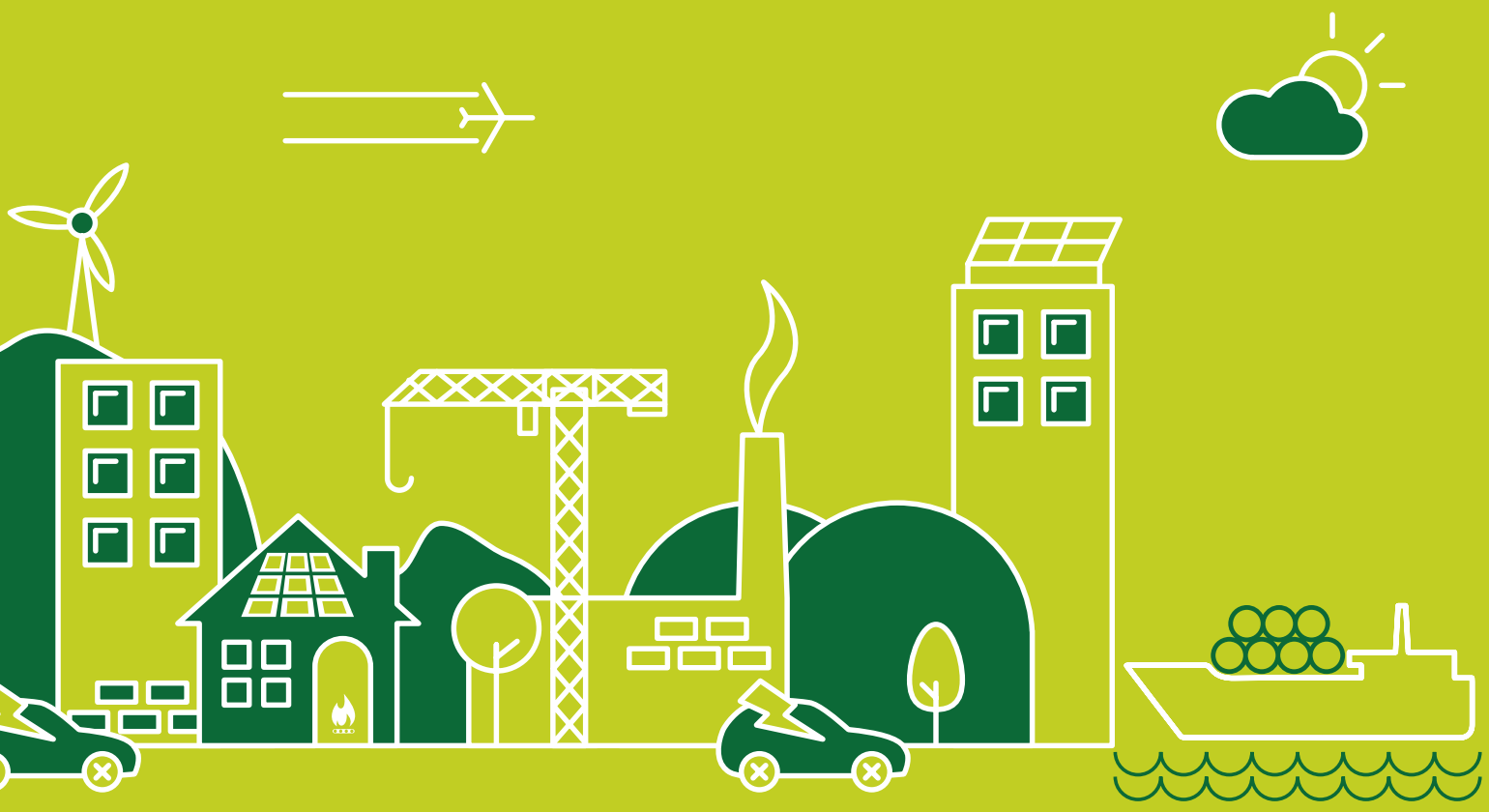
July 2017

nationalgrid

The Future of Gas

Progress Report



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01 Foreword

by Nicola Pitts
Head of Market Change – Gas

In November 2016, we launched our Future of Gas (FOG) engagement programme to develop insights on the future role of gas and the gas transmission system in GB. By combining the wealth of information that already exists on this topic with our gas transmission expertise and input from our customers and stakeholders, we believe National Grid is well-placed to facilitate this debate and to provide an overall view of the critical role gas will play in decarbonising the UK energy markets.

As our first report set out, gas delivers the greatest share of the UK's energy today for households, businesses, industry and power generation. GB is still seeing around 60,000 new domestic gas connections every year[1]; and across the EU, gas demand levels rose in 2015, and again in 2016[2].

We have spent the last few months engaging with a wide range of stakeholders; debating the future role that gas can and should play in the UK's energy mix and starting to consider how the use of GB's national gas transmission system (NTS) should adapt to support it. The purpose of this report is to provide an update on our progress, including some insight into the discussions we have had and the messages we have been hearing from stakeholders. We will also set out our planned next steps to continue collectively refining a vision for the future of gas and the NTS. Some common themes have come out of our discussions with stakeholders, which we explore later in this report.

The overarching message we are hearing is that gas has an important role to play in delivering the most cost-effective decarbonised UK future, but the current lack of certainty surrounding its future is making it difficult for the energy industry to commit to much needed investment in innovation. Stakeholders are in agreement that there is no one single solution, technology or fuel that can decarbonise the UK's entire energy system. It is likely that a combination of solutions, including both electricity and gas options, will be most cost-effective and best meet the needs of consumers in different areas. There is a common view that a whole system national policy framework is needed to support the development of different technologies that can deliver solutions for different local areas.

Continuing our collaboration with customers and stakeholders over the next few months, we aim to publish a winter document of key recommendations for our business, industry and Government. We want to set out a whole industry vision for the future of gas and the policy drivers required to support it. This will include a vision of how we as National Grid can best use our network to facilitate new sources of supply and demand; enable innovation and new technology; and work across our gas and electricity businesses, and with distribution companies, to deliver a smarter, efficient and reliable whole energy system.

We have had excellent engagement from stakeholders across government, industry, trade bodies, academia, consultancies and consumer bodies since we launched in November. We would like to thank everyone for their participation, and ask that you continue to engage with us: identifying risks and opportunities for the role of gas in the future and challenging our developing vision around gas and the NTS. We want to further expand our stakeholder engagement to ensure we continue to capture diverse views. Please share this report widely and encourage anyone with an interest in the future of gas, heat, energy or transport to get in touch to become part of the debate. Details of how to do so are included at the end of this report.

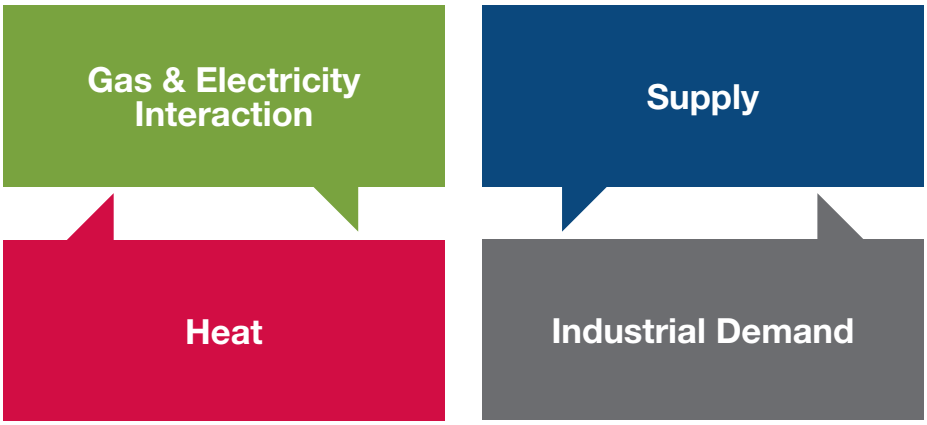
02 What has happened since November?

Since our initial document last November we have continued to engage stakeholders on FOG through bilateral meetings, seminars, workshops and at national and international conferences. We have also built relationships across a broader range of interests in order to gain a wider perspective on the UK's energy future. These have included consumer interest groups such as the Citizens Advice Bureau and Age UK. This engagement has provided us with some key insights into what really matters to end consumers now and in the future, and has led us to factor in 'consumer experience' as a key consideration alongside the energy trilemma that industry and policy-makers should focus on.

2.1 Our FOG workshops and emerging themes

During February and March 2017, we held a series of themed workshops. These followed on from the launch of our FOG engagement programme in November 2016 at the Gas Customer Seminar.

At the Seminar we facilitated a number of themed discussions, which provided the opportunity for stakeholders to tell us their views on different aspects of the UK's gas future. These discussions helped us to identify common topics that stakeholders view as important. To enable more focused debate we used these topics as the basis for our series of workshops:



The workshops were well attended with a wide range of representatives from different sectors and organisations, across gas and non-gas industry.

The purpose was to provide stakeholders with the opportunity to share their views, concerns and insights on the role that gas can play in the UK's energy future as it decarbonises, and how energy markets, regulatory frameworks and policies may need to evolve in order to best facilitate that role for industry and consumers.

Understanding what stakeholders see as the key challenges and opportunities for the future will help us to articulate the future role of gas transmission and how we will need to develop our systems and commercial frameworks to continue to meet GB's future energy needs.

Further information on the workshops, including the questions asked, attendees and a summary of the outputs, can be found on the FOG website: http://futureofgas.uk/news/outputs-from-the-stakeholder-workshop/

Themes emerging from our workshops

Throughout our recent engagement activities, there have been a number of themes that our customers and stakeholders have consistently highlighted in identifying the role for gas in the UK's future. We have taken their inputs and combined it with our own research and internal thinking, and summarised the emerging themes here.

National Policy

There was broad consensus amongst our customers and stakeholders that aligning national policy across heat, power, transport and industry will support emissions reductions and achievement of the 2050 decarbonisation target.

Achieving decarbonisation is a complex task and there are substantial uncertainties, but a comprehensive national strategy will maximise the options for decarbonisation, delivering a future energy system that represents the best value for consumers. This strategy needs to set out incremental policy steps; incentivise technology investment; facilitate a level playing field for a range of technologies and business models; and identify cost-effective energy solutions.

The Government has an opportunity to address some of this uncertainty and set out a clear vision of the future through their upcoming Clean Growth Plan, Industrial Strategy and review of the Heat Strategy, and we urge them to do so.

Whole Energy System

During the transition to decarbonisation, gas and electricity systems and markets working in isolation may lead to the development of sub-optimal or inefficient whole system solutions. Gas currently plays, and 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 alongside electricity. To maximise operational and cost efficiency it is essential that we identify and seek to remove some of the barriers to gas and electricity system interaction that are not in the best interests of consumers. We believe that better outcomes for consumers can be achieved by creating greater consistency between the two markets. Our customers and stakeholders have raised the need to consider whole energy system solutions when looking at the future of the UK's energy, and as a prudent gas transmission owner and operator we are therefore considering the future of gas and electricity interactions.

Affordability and Economics

Academic studies, gas network companies and consultants have indicated that carbon capture and storage (CCS) leads to the most cost-effective whole system future, particularly when used to decarbonise gas for power or industry, and/or to create hydrogen through steam methane reforming.

Macroeconomics and global market forces will play a key role in the attractiveness of the GB market. There is already an extensive GB gas network and a mature supply chain. Adapting the existing gas infrastructure to facilitate new technology and innovation, as well as opening up the market to greater diversity in sources of gas supply, will help us to meet GB's future energy demands. Optimising use of the existing infrastructure and supply chains will almost certainly be more affordable than full electrification of heat and transport. Given the number of potential routes to meeting decarbonisation targets, and the degree of uncertainty, maintaining an attractive and accessible gas market helps to keep options open for the future.

Optionality for the future

Our customers and stakeholders agree that no one single technology or solution in isolation will achieve decarbonisation in an affordable way. The combination that will develop remains uncertain so the energy industry, government and regulators should work together to ensure that ongoing network and market framework development keep as many credible future scenarios open for as long as possible.

For National Grid this might mean that it is best for us to maintain some of our gas assets in the short term, rather than decommission and potentially face a costly and long duration rebuild in the future.

This also means considering the 'least regrets' options for network and innovation investment, such as CCS, gas quality (including hydrogen) and energy storage. Investment confidence would be improved by a national strategy that removes barriers to these options.

Agility

Agility can be defined as having a network and a market that can respond quickly to changes in energy supply and demand. This is becoming increasingly challenging with decentralisation and decarbonisation. Gas provides electricity security of supply by offering quick response times supported by a cheap and plentiful fuel, but the industry needs to work together with Government to ensure that market arrangements value this flexibility and provide the right investment signals.

The rules, tools and assets available to the NTS must evolve to meet the needs of our customers and stakeholders in the future. Flexibility tools include storage, flexible and responsive compressors, flow control valves and varying supply sources.

Innovation and Technology

Promoting innovation is essential for achieving decarbonisation whilst meeting the UK's future energy needs in a reliable, sustainable and affordable way.

The current innovation mechanisms within the networks (Network Innovation Allowance and Network Innovation Competition) are delivering some exciting results, including those explored later in this document. Expanding the innovation mechanisms outside of the networks, or creating new frameworks and associated funding for all aspects of the supply chain – for example joint funding for gas and electricity innovations – would support broader and potentially more progressive innovation in gas technologies and alternatives.

There is consensus from our workshops on the urgent need to resolve the uncertainty around the UK's approach to CCS. Many commentators believe CCS will provide large-scale decarbonisation across the energy system in the most cost-effective way.

Consumer Experience

End consumers must be part of the energy debate. In some cases consumers will be able to choose their own solution; in others they may be driven by what is available to them locally (e.g. if a gas distribution network converts to hydrogen). In the absence of national policy drivers, consumers will likely be driven by a combination of cost and convenience, and smart technology will help them with their decision making. It is likely that making the best use of existing assets (rather than building new ones) will present better value for money for consumers and minimise the disruption caused.

2.2 FOG Sensitivities

In our November launch document, we set out the details of four sensitivities we had developed to test the boundaries of our network, by considering how it might operate in the various views of the future role gas could play, out to 2050. The original FOG sensitivities are included on page 16 of The Future of Gas – A Transmission perspective[3], published in November 2016.

The intention of the sensitivities is to provide a wide range of possible gas supply and demand cases while meeting the UK's 2050 decarbonisation target, in order for us to consider the physical and commercial impacts upon the gas network over the next 30 years.

Since November, we have continued to develop and refine the FOG sensitivities in line with stakeholder feedback and the development of National Grid's Future Energy Scenarios (FES 2017). We have subsequently reduced the number of sensitivities we are working on, and the previous "Balanced Pathway" sensitivity been further developed to align with the Two Degrees FES scenario. The revised sensitivities and scenario are summarised below. Full details are contained in FES 2017[4].

High Electrification

This sensitivity adopts an ambitious approach to the electrification of heat, decarbonisation of transport with electric vehicles and hydrogen fuel cells, and a very high roll out of renewable generation.

In this sensitivity electricity provides the majority heating needs of residential and commercial properties but peak heat demand is supplemented by gas boilers and there are some high temperature industrial processes where gas will still be required.

Achieving this sensitivity will require considerable government support and intervention.

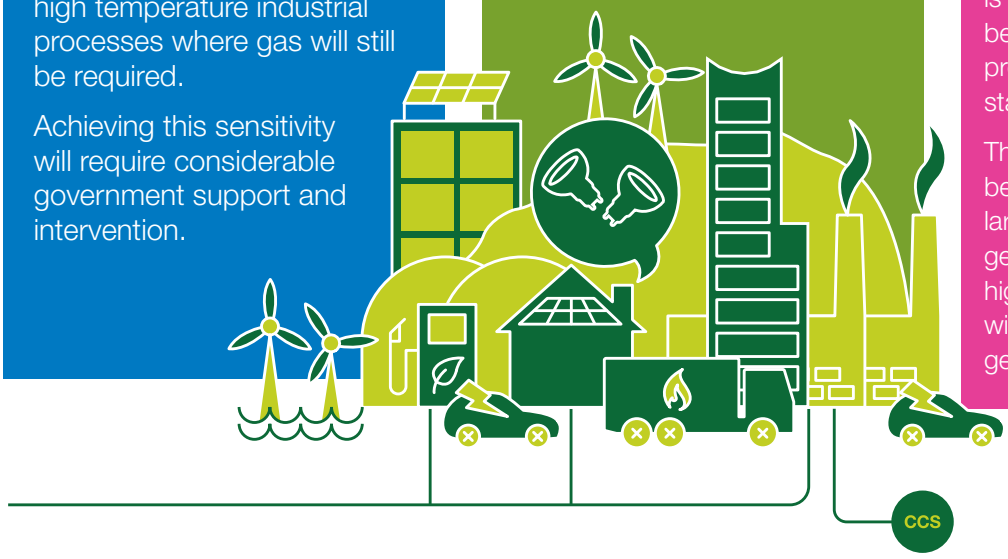
Two Degrees

This is one of our core Future Energy Scenarios, the only one in which the 2050 carbon reduction target is met. It is met through a cost optimal approach across electricity, transport and heating. CCS-enabled generation is deployed along with nuclear and renewable technologies. There is electrification of heat, although supported by more green gas, reducing the total requirements for electrification in order to hit the 2050 target.

Decarbonised Gas

This sensitivity meets the 2050 carbon reduction target without a wholesale switch to electric heating. Heating in some cities is provided by burning hydrogen rather than natural gas. The hydrogen is created from natural gas using a process that allows carbon to be captured, leaving a fuel with very low net carbon emissions. Using this low carbon fuel means that heating can be decarbonised without a large scale roll out of heat pumps. Outside converted cities, the majority of consumers can continue to use natural gas. CCS is essential for this sensitivity to be achieved, both in hydrogen production and at gas fired power stations.

This sensitivity also sees hydrogen being used for transport and a large deployment of gas fired generation with CCS supporting a high roll out of renewable capacity, without the need for nuclear generation.



The previous Carbon Capture sensitivity has no longer been included as a separate sensitivity, as we have included the features of Carbon Capture in Two Degrees and Decarbonised Gas, in order to avoid repetition.

Using these sensitivities and the outputs of the workshops we have run, we are now starting to consider the impacts on the NTS and the challenges this might create. This work is in its early stages, and we will engage further with customers and stakeholders on these topics before we publish further information in our next Gas Future Operability Planning[5] publication and in our FOG winter report. There is further information on future activities and themes towards the end of this document.

2.3 Consultations and calls for evidence

There have been a number of consultations and calls for evidence published over recent months, many of which have given us the opportunity to emphasise our Stakeholder's views by shaping our responses with the themes that came through our workshops and ultimately reiterate the important role that gas can play in the future alongside electricity. In particular, we have contributed to:

- BEIS's Industrial Strategy green paper[6];
- BEIS/Ofgem's flexibility call for evidence[7];
- BEIS's heat in buildings consultations[8];
- National Infrastructure Commission's National Infrastructure Assessment call for evidence[9];
- National Infrastructure Commission's Technologies call for evidence[10];
- BEIS's programme to demonstrate the use of hydrogen for heating[11]; and
- Scottish Government's Scottish Energy Strategy consultation[12]

We will continue to feed our views, along with those of our stakeholders, to policy makers as they refine their thinking, and we will provide policy recommendations in our winter document.

2.4 Innovation and Research

Our role as the gas transmission owner and operator is to facilitate the gas market. This includes providing access to the network for sources of gas, and enabling access to gas for new demand. It involves enabling innovation and new technology, by removing barriers to entry for new, different, or smaller customers. It also means supporting an attractive GB gas market. In light of all the new and innovative activity underway across the gas industry, we are considering how our approach and our network must evolve in order to meet the needs of GB and our customers along the various potential pathways to 2050.

There are some exciting innovations under development. In our November document we highlighted some emerging sources of supply and technologies and some of these areas have been explored further. This section is intended to highlight a selection of the innovations that we, or others in the industry, have been involved in since November.

NEW SOURCES OF GAS

Customer Low Cost Connections (Project CLoCC) – We introduced Project CLoCC in the November document: to recap, the objective is to halve the cost and reduce the time to connect to the NTS from three years to one year, thereby making connecting to the transmission network a far simpler, more affordable and customer-focused process.

At our stakeholder event in February, our customers highlighted a number of areas that require further consideration as part of the project: capacity – how people access and utilise the network; charging arrangements – how they pay to use the network; and gas quality – how we can maximise the use of the network by safely expanding gas quality limits, therefore increasing the different types of gas we can flow. Project CLoCC could be a key facilitator to supporting the growth of gas in transport in the UK, as it would offer customers quicker and more affordable connections to our network.

Should new gas sources, including shale gas and biogas, be developed and utilised economically and safely in the UK, Project CLoCC is a key enabler in allowing this gas to connect to the NTS. Project CLoCC will, in a world where the distribution networks have converted to hydrogen, provide developers with an affordable and timely connection to the NTS. If shale comes along sooner than the hydrogen conversions, CLoCC provides a viable alternative to a distribution connection.

HyDeploy[13] - Cadent, together with Northern Gas Networks and the HyDeploy Consortium, has been awarded £6.8 million by Ofgem's Network Innovation Competition. The funding will be used for a pioneering green heating initiative, using Keele University's gas network in Staffordshire.

The HyDeploy project at Keele University aims to inject hydrogen into the existing natural gas network. Hydrogen is a clean, carbon-free gas that does not contribute to climate change. The hydrogen would make up a maximum of 20% of the volume of gas in the network. It is anticipated that those using the gas wouldn't notice any difference to their supply, no changes would be required to gas appliances, and it would be no less safe than using natural gas. If the project is successful, this will enable hydrogen to be blended with natural gas in gas networks across the country. Potentially, the project could prevent 120 million tonnes of carbon reaching the atmosphere by 2050. This project is one of the regional solutions under development, as is the H21[14] project highlighted in our November document. We will use our FOG website (www.futureofgas.uk) to highlight more of these projects and we will work with industry to understand how we should support them.

Future Billing Methodology[15] - Launched by Cadent, Future Billing Methodology is a Gas Network Innovation Competition project to explore future billing options for the gas industry. This project will help unlock the full potential of the gas network to distribute unconventional gases, helping customers move to a low carbon energy future.

The current billing framework was designed for North Sea gas and can be a barrier for alternative sources of gas, particularly low carbon gases. This is because, currently, alternative gases must be pre-processed to meet billing standards. This is costly and can add fossil based carbon back in to the process. This project aims to remove the need for this pre-processing, unlocking the full potential for low carbon gases on the gas network. Cadent will be working collaboratively with colleagues across the gas industry, allowing them to explore different options for billing and recommending a 'proof of concept' methodology that presents the best solution for customers.

EMERGING TECHNOLOGY

Gas in transport – Over the last year the air quality debate in the UK, and globally, has become as important as reducing overall emissions from transport[16]. As transport is an area which, to date, has seen little progress on emissions in the UK since 1990[17], we have been exploring the potential role of gas in transport, and have recently joined the Natural Gas Vehicles (NGV) Network[18]. This network has representatives from across the transport supply chain, vehicle and component manufacturers, gas networks, infrastructure providers, gas trade associations and other interested groups. The objectives of the group are to:

- Enhance the UK's NGV industry through education and awareness building;
- Facilitate growth and stimulate investment; and
- Provide a platform for collaboration, knowledge sharing and support.

The future of fuels for transport will almost certainly differ by sector, but gas potentially has a significant role to play across all of them, both in the form of natural gas and hydrogen. Domestic transport is likely to heavily rely on electricity and hydrogen, whereas Compressed Natural Gas (CNG) has the potential to transform heavy goods and public service vehicles such as buses and trains: for example, Germany is set to commission the world's first hydrogen train[19] at the end of this year, and has recently announced a cross-industry collaboration that is looking to accelerate the growth of gas in transport with the aim of 1 million natural gas vehicles and 2000 filling stations by 2025. Liquefied Natural Gas (LNG) is also making good progress as a marine fuel, driven by a newly agreed, much lower global sulphur emissions cap that will take hold in 2020[20]. Aviation remains the most difficult transport sector to decarbonise, with previous efforts having focused on biofuels, but steps are being taken here too; for example, EasyJet are now developing a hybrid diesel/ hydrogen fuel cell engine[21].

Acorn Carbon Capture and Storage[22] - Acorn is a small scale full chain CCS project in North East Scotland. CO2 is captured from existing emissions at the St Fergus gas terminal, which would otherwise enter the atmosphere. The CO2 is then transported offshore and injected deep underground for permanent sequestration in a saline formation. The Acorn CCS project will re-use existing oil and gas infrastructure which is now redundant, prior to it being decommissioned. Re-using existing infrastructure reduces project costs and makes best use of old facilities. On its current timetable the project could be operational before 2022. The project is planning to capture about 200,000T/y of CO2 and is set to move forwards after being awarded funding for the EU funding round Accelerating CCS Technologies[23]. We are excited to see this project develop, our customer and stakeholders have told us, and FES 2017 shows, that CCS is key to meeting the decarbonisation target in the most cost-effective way.

Innovate UK Investment Accelerator Pilot Competition[24] - Innovate UK have allocated up to £6million of grant funding to fund feasibility studies that explore and evaluate the commercial potential of innovative ideas. Included in the competition, and eligible for up to £3million, is an Energy and Supply systems category. This is for innovation that improves value proposition, energy affordability and security, and reduces carbon emissions. These could include:

- energy supply solutions, such as carbon abatement, renewable energy technologies, nuclear power and hydrogen fuel cells;
- solutions that flexibly match energy supply and demand, such as storage, grid balancing and integration of micro-energy generation; and
- solutions that optimise performance across different energy vectors.

HEAT PROVISION

FREEDOM - Flexible Residential Energy Efficiency Demand Optimisation and Management[25] - FREEDOM's objective is to better understand if hybrid heating systems are technically capable, affordable and attractive to customers as a way of heating homes.

This project aims to investigate the feasibility of the use of heat pumps on both Western Power Distribution's & Wales & West Utilities' network in order to:

- Demonstrate the ability of the hybrid heating system to switch between gas and electricity to provide fuel arbitrage and highly flexible demand response services;
- Demonstrate the consumer, network, carbon and energy system benefits of deployment of hybrid heating systems with an aggregated demand response control system; and
- Gain insights into the means of balancing the interests of the consumer, supplier, distribution and transmission network while seeking to derive value from the demand flexibility.

BEIS Funding for innovative approaches to using hydrogen gas for heating[26] – The Department for Business, Energy and Industrial Strategy have announced a programme to demonstrate and de-risk the use of hydrogen for heating in UK homes and businesses. This complex hydrogen innovation programme will serve to support and inform future policy appraisal in Government and to inform the development of policies and measures to meet UK carbon budgets. The programme is intended to run over three years and will consist of nine packages including the development and trialling of domestic hydrogen appliances[27].

BEIS Heat Network Investment Project[28] - BEIS have announced a Heat Network Investment Project for which the pilot phase has now been completed. The £320m capital investment programme is expected to support up to 200 projects by 2021 through grants, loans and other mechanisms and to lever in up to £2bn of wider investment, reducing bills, cutting carbon and forming a key part of wider urban regeneration in many locations. A consultation was carried out on this funding in 2016 and BEIS aims to launch the main scheme by the end of 2017.

OTHER RESEARCH

Over the past few years, uncertainty around the future prospects for natural gas in both the UK and EU has led to a large number of studies taking place. The majority of these have been either government or industry driven and have focused on what recent policy measures and market developments mean for the future of gas and at a high level what changes could be made.

Whilst these are too plentiful to mention here, we have sponsored and contributed to a Centre on Regulation in Europe (CERRE) report entitled 'Challenges for Natural Gas in the Context of the Energy Union'[29], and we continue to engage European institutions and policy makers with regards to the future role of gas. During the next phase of FOG, we plan to highlight relevant new research when it becomes available via our FOG website, www.futureofgas.uk.

IN CONCLUSION

As the gas industry continues to innovate, an agile and responsive gas transmission network is going to be essential to successfully facilitate new sources of gas supply and demand, enable innovation across the energy sector, and be a critical and reliable partner to the electricity industry. As innovation comes forward, we as National Grid will have a role in linking together the potential combination of solutions that emerge, and we welcome feedback on our approach to this.

03 Our conclusions and next steps

An analysis of everything we have learned, from our customer and stakeholder interaction and our research of developments across the energy markets, has led us to the following conclusions. These conclusions summarise our current thinking and provide a clear direction for us to move forward with the FOG conversation:

1

Gas is critical to security of supply now and as Britain continues the transition to a low-carbon future. It will have a long-term role as a flexible, reliable and cost-effective energy source favoured by many consumers.

This mirrors one of the FES 2017 key messages, recognising that gas currently supplies more than double the energy annually as electricity, and could still provide more energy than electricity in 2050.[30]

2

While the pathways remain uncertain, this is not the time to shut down any network optionality

Our customers and stakeholders have told us that due to uncertainty around what a future decarbonised UK energy landscape will look like, options for future use of energy networks and markets should be kept open at present, as far as it is possible and economical to do so. An approach to identifying and incentivising 'least regrets' options is also required[31]. We will give an update on our progress in this area in the Future of Gas Winter Report.

3

Heat needs to be decarbonised by 2050, in the most affordable and least disruptive way - as well as being convenient, continued use of existing assets and infrastructure is likely to represent good value for the consumer.

Our FES 2017 document suggests that gas will continue to play an important role in this transition and beyond with new technologies and the potential use of hydrogen[32]. Our stakeholders have told us that in addition to affordability and the impact of change on consumer bills, policy-makers and energy industry participants should consider the impact of disruption to end consumers (domestic and industrial) as the UK transitions towards the future.[33]

4

Energy system operability is going to become increasingly challenging due to more volatile supply sources and demand dynamics, and gas will also be an essential partner to renewables in balancing the electricity system. The energy industry needs to prepare for that dynamic future.

We all know that traditional sources of gas are declining. However, FES 2017 points out that there are plenty of options for gas coming from the world market and from new sources within GB. Some of these may require innovative approaches to connecting and transporting gas[34]. Our stakeholders have told us that it would be beneficial to better understand the cross-market gas and electricity interactions, and the impact of a potential 'patchwork' of regional energy diversity. In the interests of facilitating greater operational and cost efficiencies that benefit customers, it may be appropriate to consider new approaches.[35] For example; our gas and electricity interaction work and project CLoCC.

5

Innovation will enable the future, and there is already some exciting activity in this area. There is a need to accelerate this further, and prove concepts around CCS and hydrogen. National Grid aims to facilitate and accommodate new technologies and the markets around them.

We are seeing activity and research across government and the gas industry (such as those referenced earlier in this document and our November 2016 document[36]) aimed at considering how the UK can meet decarbonisation targets, using new technology and innovation.

Where does the FOG programme go from here?

We believe that the gas industry needs to continue to work together to advocate for gas and develop solutions to decarbonise gas so that it can credibly play a role in the UK's energy future. We believe it is essential to work with the electricity sector to develop a holistic energy future, thereby ensuring secure and affordable energy for consumers for years to come.

From the perspective of the FOG programme, we will host a series of follow up workshops/webinars and we will use the outputs of these interactions and those listed above to develop our thinking and what all of this means for the NTS. We will publish a further document this winter to include:

- Our views of the potential gas futures including the future role for the NTS;
- Supply and the role of gas in heat, transport, power generation, industry and storage;
- Our thoughts on the market framework changes required to enable gas to have a long term future;
- Innovation in train and potential gaps; and
- Recommended actions that can and need to be taken in each decade by policy makers, industry, supply chain and networks in order to ensure the right solutions are available at the right time

This will form part of a suite of ongoing activities undertaken by National Grid on a much wider range of topics over the coming months. In addition to follow-up FES and FOG webinars and workshops, these topics will include our engagement with the industry on the gas transmission Charging Review, the May 2018 RIIO reopeners and the Transmission Planning Code. More broadly, we want to engage our customers and stakeholders on an ongoing basis in respect of our business priorities, our performance, and how we can continuously improve.

There will also be a number of other gas publications, which are detailed below.

Nov 2017

Gas Ten Year Statement
How we will plan and operate the gas network, with a ten year view.

Nov/Dec 2017

Future Operability Planning
How the changing energy landscape will impact the operability of the gas system.

Oct 2017
Winter Outlook Report
Our view of the gas and electricity systems for the winter ahead.

Apr 2018
Summer Outlook Report
Our view of the gas and electricity systems for the summer ahead.

May 2018
Winter Review
A comparison between the past winter's actual energy demand and supply and our forecast.

Jun 2018
Winter Consultation
An opportunity to share your views on energy demand and supply for the winter ahead.

04 Thoughts, feedback and contact information

What are your thoughts on the content of this document?

There is a comments section on our website www.futureofgas.uk

Twitter debate using #futureofgas

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2 https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q4_2016.pdf

3 http://futureofgas.uk/wp-content/uploads/2017/01/The-Future-of-Gas-A-Transmission-Perspective-Interactive.pdf

4 http://fes.nationalgrid.com/

5 The first GFOP, published in November 2016, is available on our website. GFOP this year will consider the FOG sensitivities and Future Energy Scenarios, together with a range of other operability areas. If you have any questions regarding GFOP you can get in touch with the team via box.GFOP@nationalgrid.com or subscribe to updates on our website

6 https://www.gov.uk/government/consultations/building-our-industrial-strategy

7 https://www.ofgem.gov.uk/publications-and-updates/smart-flexible-energy-system-call-evidence

8 https://www.gov.uk/government/consultations/heat-in-buildings-the-future-of-heat

9 https://www.gov.uk/government/publications/national-infrastructure-assessment-call-for-evidence

10 https://www.gov.uk/government/publications/national-infrastructure-commission-technology-study

11 https://www.gov.uk/government/publications/funding-for-innovative-approaches-to-using-hydrogen-gas-for-heating

12 http://www.gov.scot/Publications/2017/01/3414

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14 http://www.northerngasnetworks.co.uk/archives/document/h21-leeds-city-gate

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