

Mr Jonathan Brearley
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Ofgem
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Decarbonised Gas Alliance response to the RIIO-2 open letter

Dear Mr Brearley,

We are writing as signatories to the Decarbonised Gas Alliance (DGA), in response to your open letter of 12 July 2017 on the RIIO-2 Framework.

The DGA is an alliance of gas producers, transporters, suppliers and users, hydrogen and carbon capture experts, alongside R&D, supply chain and local government specialists whose knowledge and expertise will be vital in decarbonising the UK's gas system and tackling poor air quality. Our aim is to work with all levels of government and with other expert organisations to use the gas system to help deliver our emission reduction and air quality goals.

Since the DGA was set up in late 2016, we have grown rapidly to 35 signatories. In the months since the DGA was formed, there has been welcome support from Government, including the formation of the BEIS Hydrogen Innovation Programme and the announcement of a new £23 million fund from the Office for Low Emission Vehicles to support hydrogen vehicles and infrastructure.

Why decarbonising gas matters

There is a compelling case for ensuring that the ambition for the gas system as a whole matches the ambition for the continuing growth of renewable electricity generation. Decarbonising gas can help deliver:

- **Overall emissions reductions:** Decarbonised gas can deliver substantial emissions reductions. Energy Research Partnership calculations show that 80 million tonnes of CO₂ a year could be saved from domestic and commercial heat and transport by 2050.¹ And city air quality could be greatly improved by the use of natural gas in transport, particularly in larger vehicles that are more difficult to electrify, and increasingly through hydrogen.

¹ Based on 9 million homes heated by hydrogen and 16 million fuel cell cars, with some additional commercial buildings, HGVs and buses also using hydrogen. Energy Research Partnership calculations based on scenarios in the following references: LowCVP, Element Energy, Transport Energy Infrastructure Roadmap to 2050: Hydrogen Roadmap Low Carbon Vehicle Partnership, June 2015 http://www.lowcvp.org.uk/news/lowcvp-2050-transport-energy-infrastructure-roadmaps-show-the-way-to-transport-decarbonisation_3263.htm; Northern Gas Networks, H21 Leeds City Gate, July 2016 <http://www.northerngasnetworks.co.uk/document/h21-leeds-city-gate/>

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- **Heating decarbonisation:** It will be much more difficult to decarbonise heating through wholesale electrification and without decarbonised gas, given that peak heating demand is around five times peak electricity demand. KPMG has calculated that an electric-only solution could cost an additional £274-318 billion by 2050, compared with a predominantly gas-to-hydrogen route costing £104-122 billion.² The gas-to-hydrogen option also results in far less disruption to households, making use of existing infrastructure and avoiding the need to replace entire central heating systems.
- **Industrial opportunities:** There are enormous industrial opportunities from decarbonised gas, including the use of hydrogen to produce 'green' steel and 'green' ammonia and the opportunity for the UK to develop and manufacture the underpinning decarbonised gas technologies. Developing decarbonised gas in the UK would encourage exports, as other countries look to decarbonise their gas networks.
- **Balanced growth:** Gas and electricity networks are increasingly working together, and this reliance is likely to increase. Using an increasingly decarbonised gas network, working closely with the electricity system, provides a synergistic and low risk approach to delivering safe, secure and flexible energy to UK plc. An increasingly constrained electricity system in some areas presents a potential barrier to new factories, businesses and industry that are critical to our economic growth. Delays in providing the capacity required can stifle or prevent planned investment in infrastructure. Similarly, decarbonised gas can help to meet new heating, cooling and transport loads which will emerge.

Decarbonised gas innovation

Industry is demonstrating considerable commitment, with numerous projects taking place across the country, including biomethane injection; hydrogen testing projects, refuelling stations and buses; and natural gas trucks. A range of projects have taken place under Ofgem's RIIO-1 Network Innovation Allowance and Competition, including:

- The H21 Leeds City Gate project is demonstrating the feasibility of using 100% hydrogen in the gas grid, and SGN is planning 100% hydrogen pilot projects in Scotland.
- The HyDeploy trials at Keele University – which will investigate how the gas grid can manage up to 20% hydrogen – are now underway.
- Wales & West Utilities and Western Power Distribution's 'Freedom Project' will be testing hybrid heating systems in 75 properties this winter.
- Cadent's BioSNG demonstration plant, which is demonstrating the feasibility of producing grid quality gas from black bag waste.
- National Grid's Project CLOCC, which is facilitating higher pressure connections for gas production facilities.
- SGN's Oban project showed a wider range of gases can be safely used in the GB gas grid. The resulting IGEM gas quality standard can be a useful enabler for more low carbon gas.

This network innovation is taking place alongside a suite of other activity across the industry, such as:

- Worcester Bosch has announced the development of a 100% hydrogen domestic boiler.
- The Liverpool to Manchester Hydrogen Cluster plans to secure the future of a large swathe of energy-intensive industry through decarbonisation, including CCS.

² KPMG, The UK Gas Networks role in a 2050 whole energy system, July 2016
<http://www.energynetworks.org/assets/files/gas/futures/KPMG%20Future%20of%20Gas%20Main%20report%20plus%20appendices%20FINAL.pdf>

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- Subject to securing funding, the Teesside Collective industrial CCS project is at an advanced stage of planning.
- Summit Power has demonstrated the feasibility of a power project with carbon capture in Grangemouth and Pale Blue Dot is studying the Acorn project at St Fergus near Aberdeen.
- Cambridge Carbon Capture Ltd and YLEM Energy Ltd are developing a demonstration unit at a landfill site in Liverpool to remove and permanently store CO₂ from landfill gas, making gas suitable for direct injection into the gas network.

We note that energy networks have a vital role to play in developing decarbonised gas, and strongly advocate that the RIIO-2 Framework reflects this opportunity.

Regulatory frameworks

As the section above suggests, network innovation funding has been vital to building the evidence around options for decarbonising gas and we believe it is vital that this work continues. The networks will continue to play a crucial role in connecting, managing and distributing decarbonised sources of gas.

Within the RIIO-2 Framework specifically, the DGA would like to see:

- **Continuing progress towards decarbonisation:** The RIIO-2 Framework clearly needs to deal with a range of uncertainties around issues like government policy, future gas demand, and the availability of different sources of gas. However, any uncertainty mechanisms must not prevent progress in the early part of the price control – progress towards decarbonising gas (for example through biomethane/bioSNG injection and hydrogen blending) and network innovation will be required in the early years of the RIIO-2 under any scenario for the future energy system.
- **Ongoing explicit innovation funding:** This should use mechanisms such as NIA and NIC which are well established and understood.
- **Continuing to fund the Iron Mains Risk Reduction Programme:** This programme will continue to improve the safety of the network, while also providing pipework which can carry a wider range of decarbonised gasses.
- **Investment in the future of the network:** This should include new connections for offtake customers and green gas producers.

Overall, there should be a focus on no regrets investments that will be valuable in multiple future scenarios, in particular those that open up the market to decarbonised gas sources. Investments within the RIIO-2 Framework also need to be complementary with other important developments, in particular CCS, which as explained below is vital for consumers.

How does decarbonising the gas system benefit consumers?

A RIIO-2 Framework which supports the decarbonisation of the gas system, including the role of the networks, will benefit current and future consumers. Under RIIO-1, over 80 biomethane sites have been connected to the gas network, allowing customers to benefit from lower carbon gas without making any changes to their appliances. As explained above, decarbonising gas will help meet the UK's climate change commitments in the most cost-effective way possible, protecting consumer interests, and this should be reflected in RIIO-2:

- Reducing emissions from buildings – and in particular from heating – is a major policy challenge: heating and hot water make up 40% of our energy consumption and 20% of

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greenhouse gas emissions.³ Progress in carbon reduction in this sector has stalled, and the regulatory environment for the energy system in the 2020s has a vital role in reducing emissions intensity and developing the evidence for future options. This will benefit consumers by ensuring that the UK can meet its environmental goals in the most cost-effective way possible.

- In their 2016 report on “Next Steps for UK Heat Policy”, the Committee on Climate Change said that:⁴

“For hydrogen, it will be necessary for CCS to be under active development, together with forward-looking regulations, demonstration projects and innovation support.”

“Shifting to a hydrogen gas supply, whether regionally or nationally, would require a coordinated Government-led effort to overcome major obstacles. To understand whether this is desirable and how best to proceed, it will be vital to undertake pilots and demonstrations in the next decade.”

“Preparatory action, including R&D and pilots, is required in order to... test the feasibility of hydrogen for heat and to reassure the public and businesses that fuel switching to hydrogen networks can be done safely, affordably, and with minimal disruption.”

- The Committee on Climate Change has also found that, by the 2040s, the overall costs of decarbonisation to consumers will be £4-5 billion a year higher if CCS is not developed.⁵

These statements emphasise the importance of continuing innovation work around hydrogen and other options for heat policy through the 2020s, to prepare for final policy decisions in the middle of that decade. Given the importance of the gas networks in these pathways, it is vital that the regulatory framework recognises the incremental steps that can be taken to integrate low carbon gas, and prepare the evidence base for future decisions. Indeed, the CCC explicitly said that progress on heat policy required “Ofgem to ensure RIIO framework reflects range of future gas options” (p.15).

The gas networks play a vital role in the energy system as a whole. The gas network intrinsically provides by far the largest energy store on the UK system. This allows the system to meet winter peaks in gas demand and supports intermittent renewable electricity by providing a flexible, fast-responding source of power. As an increasing proportion of electricity is generated by intermittent distributed sources, and new loads such as electric vehicles connect to the electricity grid, the importance of gas in meeting peak demands is likely to increase across the RIIO-2 period.

³ Committee on Climate Change, Next steps for UK heat policy, October 2016 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>, p.7.

⁴ Committee on Climate Change, Next steps for UK heat policy, October 2016 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>

⁵ Committee on Climate Change, A strategic approach to carbon capture and storage, Letter to DECC Secretary of State, 6 July 2016 <https://www.theccc.org.uk/wp-content/uploads/2016/07/Letter-to-Rt-Hon-Amber-Rudd-CCS.pdf>

Responses to specific questions

Q1. Do you agree with our overarching objective for RIIO-2 and how we propose to achieve it?

We welcome the commitment to a Framework that will continue “to deliver a reliable, safe and secure network system that supports the transition to a low-carbon future.” This could be brought out more clearly in the overarching objective, for example by specifying that network companies should be providing “services that current and future consumers want and need.”

Q19. Given the uncertainty around demand for network services, how much of an issue might asset stranding be and how should this risk be dealt with?

We do not consider asset stranding to be a major risk. As set out above, it is clearly important for the RIIO-2 framework to take account of uncertainty. However, Ofgem should also note the role the gas networks play in mitigating third party asset stranding risk – for example, distributed gas generation may be important to ensure sufficient capacity is available for electric vehicle recharging.

Alongside the opportunity to decarbonise gas, the role that the gas networks play across the energy systems mean that ongoing investment is required through the 2020s. Any risks can also be reduced through support for network innovation, particularly around the future role of the gas networks.

The reality is that the gas network is an incredibly valuable asset that should be used to the full in the UK’s decarbonisation programme. If the gas network can be decarbonised then it can continue to be used at scale. The gas network is a vital national asset, and unless clear policy direction from government dictates otherwise, the RIIO framework should seek to protect and enhance it.

Q28. What impact has the innovation stimulus had on driving innovation and changing the innovation culture?

As set out above, the innovation stimulus has played a highly significant role in supporting the evolution of the energy system, and providing evidence for potential future developments.

It is important that Ofgem works with BEIS, the networks, and wider energy stakeholders to ensure that the RIIO-2 Framework reflects a shared vision, including the need for CCS, with other innovation mechanisms complementing the innovation stimulus to support technology development across the whole value chain.

Q29. Have the incentives inherent in the RIIO model encouraged network companies to be more innovative and what should we consider further?

Yes. The RIIO-2 Framework should build on progress to date, and support network companies both in making incremental progress towards decarbonisation and in supporting the development of the evidence base for policy decisions to come. Ofgem should work closely with BEIS and stakeholders from across the energy sector to set the parameters for future innovation, identifying what is required and which areas of innovation network companies are best placed to deliver. This should reflect system-wide thinking in energy policy as closely as possible, for example by recognising the role of gas in supporting intermittent renewable electricity generators and the opportunities around decarbonised gas, including CCS.

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DGA members look forward to continuing to engage with Ofgem through the RIIO-2 process, including during the stakeholder engagement process this autumn. We would be happy to discuss any issues raised in this letter at your convenience.

Yours sincerely

- Alan Thomson, Director and Global Leader Energy Systems, **Arup**;
- Professor Martin Freer, Director of the **Birmingham Energy Institute, University of Birmingham**;
- Michael J. Evans, Chief Executive Officer, **Cambridge Carbon Capture**;
- Luke Warren, Chief Executive, **Carbon Capture and Storage Association**;
- David Mitchell, Senior Energy and Climate Change Executive, **Chemical Industries Association**;
- Graham Bennett, Vice President, **DNV GL**;
- Simon Gray, Chief Executive Officer, **East of England Energy Group**;
- David Smith, Chief Executive Officer, **Energy Networks Association**;
- Gordon Waddington, Chief Executive Officer, **Energy Research Accelerator**;
- Lawrence Slade, Chief Executive, **Energy UK**;
- Mike Foster, Chief Executive, **Energy and Utilities Alliance**;
- Lyn Calder, Commercial Director, **Ineos**;
- Jon Hilton, President, **Institution of Mechanical Engineers**;
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- Professor Marcus Newborough, Development Director, **ITM Power**;
- Sam French, Business Development Manager, **Johnson Matthey**;
- Mark Crowther, Technical Director, **Kiwa UK Group**;
- David Gill, Director of Stakeholder Relations, **Northern Gas Networks**;
- Sam Gomersall, Director, **Pale Blue Dot**;
- Myles Kitcher, Managing Director, **Peel Environmental Limited**;
- Ruth Cairnie, Chair, **POWERful Women**;
- Dr Keith MacLean, Director, **Providence Policy**;
- Colin Thomson, Investment Strategy Manager, **SGN**;
- Matthew Tipper, VP New Fuels, **Shell**;
- Stephen Kerr, Project Director, Caledonia Clean Energy Project, **Summit Power**;
- Professor Nigel Brandon, Director, **Sustainable Gas Institute, Imperial College London**;
- Neil Kenley, Director of Business Investment, **Tees Valley Combined Authority**;
- Professor Joe Howe, Executive Director and Professor of the **Thornton Energy Institute, University of Chester**;
- Professor Paul Lewin, Head of the **Tony Davies High Voltage Laboratory, University of Southampton**;
- Dave Mackinnon, Head of Technology Innovation, **Total**;
- Amanda Lyne, Managing Director, **ULEMCo**;
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- Steven Edwards, Director of Regulation & Commercial, **Wales & West Utilities**;
- Neil Schofield, Head of External Affairs, **Worcester Bosch**.