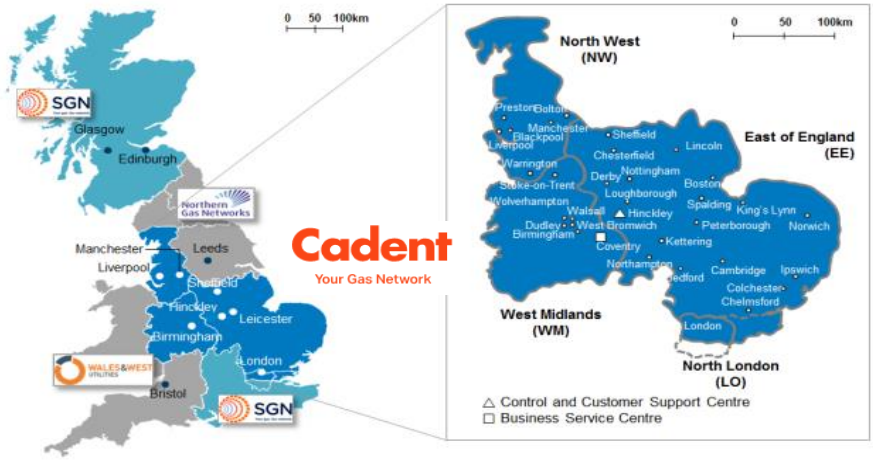
Cadent
Your Gas Network

Cadent Gas Limited response to Call for Evidence on Building a Zero-Carbon Economy

About Cadent

Cadent owns and operates four gas distribution networks in the UK, providing a safe, reliable and efficient network that transports gas to homes, schools and businesses from the North West to North London and from the Welsh Borders to the East of England.

Cadent serves 11m of the UK's 23m gas customers and is the largest gas distribution company in the country.



Cadent's size and scale ensures that we are a unique position to work collaboratively with the Government to develop and deliver low-carbon energy system, taking advantage of the critical importance of gas and the gas networks as the most cost-effective and efficient pathway for the country's transition to a low-carbon economy. As we outline in this submission, Cadent is already working quickly, and at scale, to support this transition.

Introduction

Cadent's submission in response to this Call for Evidence is based on three key principles that we actively promote:

1. The gas network is a critical part of an efficient, secure, low cost, low emission whole energy system;

2. Utilisation of the gas network and the production of new forms of green, clean gas is based on proven technology which can be scaled effectively and rapidly to provide the least-cost, least-regret pathway to a zero-carbon economy; and
3. To best utilise this valuable asset, long term policy and regulatory support for green gas production is required.

Overall, Cadent believes that gas, and the existing gas networks, have a critical role to play in reducing carbon emissions and supporting the move towards a low-carbon economy. There is a clear evidence base that shows that that re-purposing the gas network to deliver sustainable, secure, renewable, low-carbon gas represents the best value for consumers and tax payers. This is supported by the KPMG report[1], '2050 Energy Scenarios', the Policy Exchange 'Too Hot to Handle' report[2], the Policy Connect 'Next Steps for the Gas Grid' report [3] and the Energy Research Partnership 'The Transition to Low-Carbon Heat' report[4].

Recent reports on this matter include the Element Energy study for the National Infrastructure Commission[5] and the Imperial College work for the CCC[6] support our belief in the key role of gas. These studies may also underestimate the cost of electricity grid infrastructure, were a large proportion of the expanded electricity Grid will need to be installed underground to address public objections.

Cadent believes that there is now overwhelming evidence that using the gas network would be significantly cheaper per customer, than relying on electrification, with the gas network offering the best opportunity to quickly secure major reductions in carbon emissions by 2030.

The use of gas, with addition of increasing renewables and low carbon gases such as biomethane, Bio-SNG and hydrogen (when produced in a renewable way), can support the phasing out of coal and oil, decarbonise heat, transport and waste and provide the least cost, least disruptive pathway to a zero carbon economy and clean air environment. What is more, the infrastructure and capacity to deliver clean fuels at scale across the UK is in place today through the existing gas networks, and we there uniquely placed to lead on the UK's intent to move to a zero-carbon economy.

[1] https://www.energynetworks.org/assets/files/gas/futures/KPMG%20Future%20of%20Gas%20Main%20report%20plus%20appendices%20FINAL.pdf

[2] https://policyexchange.org.uk/publication/too-hot-to-handle/

[3] http://www.policyconnect.org.uk/research/next-steps-gas-grid-future-gas-series-pt-1

[4] http://erpuk.org/project/low-carbon-heat/

[5] https://www.nic.org.uk/wp-content/uploads/Element-Energy-and-E4techCost-analysis-of-future-heat-infrastructure-Final.pdf

[6] https://www.theccc.org.uk/wp-content/uploads/2018/06/Imperial-College-2018-Analysis-of-Alternative-UK-Heat-Decarbonisation-Pathways.pdf

Response to questions

Having reviewed the committee's Call for Evidence, we have identified five questions which we believe are particularly relevant to Cadent. Responses to these questions are included below.

Question 6 (Hard-to-reduce sectors): Previous CCC analysis has identified aviation, agriculture and industry as sectors where it will be particularly hard to reduce emissions to close to zero, potentially alongside some hard-to-treat buildings. Through both low-carbon technologies and behaviour change, how can emissions be reduced to close to zero in these sectors? What risks are there that broader technological developments or social trends act to increase emissions that are hard to eliminate?

1. Focussing on industry, in collaboration with Progressive Energy, Cadent has produced an initial conceptual project – HyNet. Through HyNet, hydrogen would be available for industry, local transport needs – including powering hydrogen trains - and to blend into the public gas network (subject to the successful completion of the HyDeploy project, referenced in question 8 of this document). This would deliver significant emissions savings to heavy industry and accords with the recent work of both the CCC and BEIS with respect to its focus on making a significant contribution in a particular geographical region (or cluster) where the technologies are best applied. The project will focus on industrial users with a heavy dependency on natural gas converted towards clean-burning hydrogen using a combination of steam methane reformation and Carbon Capture Utilisation and Storage (CCUS) technology in depleted offshore gas reserves. We believe this project offers a framework for further carbon reduction in industry, which, with further government support, can deliver a major reduction in emissions quickly, at the lowest cost pathway. Further information can be found here: www.hynet.co.uk

2. Cadent welcomes ambitions to reduce emissions from farming. We encourage biomethane connections to our gas network, including those from the agricultural sector, with the aim of reducing greenhouse gas emissions and waste and meeting energy demand using sustainable resources. We would recommend the support for energy feedstocks from the agricultural sector to be directed towards the efficient production of biomethane, rather than the less efficient combustion to produce electricity. There are many ways to make clean electricity, and such feedstocks are much more valuable when used to make gas, which can then be used in many areas, and can be stored for long periods.

3. Cadent welcomes the UK Government's intention to work with industrial sectors to review emission improvements, and produce sector roadmaps, including for the energy sector, setting out ambitious standards for further emissions reductions between 2018-2030. Cadent as the largest gas network would be happy to support government and be involved in an enduring steering group in developing these road maps, particularly with regards to development of a hydrogen economy. In addition to an energy sector roadmap, we propose that a cross utility sector emissions reduction group, covering not only energy but also other utilities, be developed.

Question 7 (Greenhouse gas removals): Not all sources of emissions can be reduced to zero. How far can greenhouse gas removal from the atmosphere, in the UK or internationally, be used to offset any remaining emissions, both prior to 2050 and beyond?

4. Cadent believes that sustainable feedstocks can increase the production of renewable gas, and science and technology could develop new crops (on or off shore) that can lock in more carbon quickly. These feedstocks can be used for biomethane and hydrogen, and the CO2 captured to support zero if not negative emissions.
5. There are currently 31 biomethane sites producing renewable gas connected to the Cadent network, drawing from a variety of feedstocks including food waste, sewage and energy crops.
6. Cadent wants to increase the amount of renewable gas in our network and by doing so help the government meet their challenging 2050 targets for reducing greenhouse gas emissions, reducing landfill waste and meeting energy demand using sustainable resources. Green gases such as biomethane offer significant decarbonisation opportunities without consumers having to make any changes to their appliances. Through our sustainability committee we are considering a RIIO GD2 option of asking the market to deliver investment in biomethane for our own use. This would be equivalent to around twenty further biomethane plants, driven through industry pull. Mandating this for other gas distribution networks could lead to, in total, forty further biomethane plants.

Question 8 (Technology and Innovation): How will global deployment of low-carbon technologies drive innovation and cost reduction? Could a tighter long-term emissions target for the UK, supported by targeted innovation policies, drive significantly increased innovation in technologies to reduce or remove emissions?

7. Cadent believes that with policy certainty, and a recognition of the key role gas can play in building a low-carbon economy, further innovation can and will take place, which will help drive down emissions.
8. This policy certainty should take the form of at least the continuation of the RIIO innovation funding model, and given the key role gas can play in decarbonising the economy, we believe that there should be closer to parity of funding, if not bias, towards gas.
9. Cadent believes this funding should first take the form of small scale pilots, followed by first large scale, then first of a kind. Adopting this approach will minimise risk and best ensure mass roll outs can happen.
10. Cadent is supporting the development and delivery of innovations around decarbonising heat, transport and waste via renewable gas, including Hynet (referenced in question 6 of this document). We believe these innovations are an illustration as to how under the current regulatory and policy framework, work is already underway to deliver a reduction in emissions. Building on existing innovations through further deployment of these technologies, such as CNG for HGVs, 20% hydrogen blending and building the H2 network out from the North West and Humber, will be key for building a low carbon economy. These technologies are already being deployed in the following forms:

    a. **CNG Refuelling station in Leyland**: Cadent has supported the UK's first commercial high-pressure CNG (Compressed Natural Gas)

refuelling station, in partnership with CNG Fuels, which has been operating since March 2016 in Leyland, Lancashire. Connecting directly to the high pressure pipeline is advantageous as it means less energy is needed to compress the gas; significantly reducing running costs and associated emissions. The John Lewis results from the first 12 months of operation also show that greenhouse gas emissions from the HGVs using the Leyland station were cut by 84%[7] when using biomethane. More information can be found here.

b. HyDeploy at Keele University: Working with Northern Gas Networks, this project aims to test the viability and amount of hydrogen which can be injected into the current gas **network** (up to 20%), without any changes for consumers. This will demonstrate the potential for a lower cost route to decarbonising the gas network through decarbonising a percentage of the gas without customers having to change their appliances.

Question 9 (Behaviour Change): How far can people's behaviours and decisions change over time in a way that will reduce emissions, within a supportive policy environment and sustained global effort to tackle climate change?

11. Cadent would urge caution if significant carbon savings are trusted to rely on changes in consumer behaviour. The risk of such an approach is that success is not guaranteed, and valuable time (5-10 years) may be lost realising the desired behaviours are not forthcoming, and then designing and implementing alternatives. It may be a lower risk strategy to deliver the bulk of carbon savings from designed and mandated solutions, with changing behaviours enabling faster, deeper and cheaper roll out.
12. Cadent recognises that the gas industry has a strong track record in the eyes of the public around trust and safety. To best leverage consumer behaviour changes in the moves towards a low carbon economy, we encourage the Government to take advantage of this track record by embracing the potential for low-impact changes in energy which the gas network offers – such as Hynet (see response to Question 8).
13. A whole energy system approach will also be key to understand the full costs, and behaviour change in one sector may influence another. For example, lack of satisfaction of managed EV charging may result in alternatives such as hydrogen fuel cells becoming more popular.
14. The recent CCC report on Hydrogen recommended the early roll out of hybrid heating systems. Whilst we fully appreciate any approach that minimises disruption in homes, the supporting behaviours will be key to overall success. If consumers override their hybrid systems, the scale of carbon savings could be reduced. This could further exacerbate local grid constraints, where large numbers of electric heating systems and electric vehicles, are all competing for local grid capacity. Ensuring homes are kept safe and warm in the coldest winter, and especially those households that are in the most vulnerable situations, must be an absolute requirement.
15. Cadent recommends assessing the potential impacts of various heating options by seeking consumer feedback through trials at scale. This could include a full electric village wired up for heat pumps and EV, hybrid heat pump/gas, 100% Hydrogen, and the HyNet NW model including 20% hydrogen blend.

[7] Using a well-to-wheel comparison

Question 10 (Policy): Including the role for government policy, how can the required changes be delivered to meet a net-zero target (or tightened 2050 targets) in the UK?

16. Many of the options to decarbonise the natural gas system will need solutions implemented across a region or whole community e.g. hydrogen or district heating.
17. Regional engagement will be absolutely critical to successful roll out; this is best achieved by local organisations with local accountability for delivery. These local bodies are better placed to ensure effective engagement and to determine the best location for the different decarbonisation options. A national framework will be key though, to ensure the least cost solution for the UK e.g. best use of limited feedstocks. Decarbonisation of the gas network could be achieved within such a national framework, which then allocates approaches and funding regionally.
18. Once a framework is in place, further policy adjustments should be minimised to reduce uncertainty. There are numerous examples, including the Renewable Heat Incentive, where policy reviews have massively reduced speed of roll out.
19. Investment to support a step change in green gas production requires policy certainty. Currently an unhelpful obstacle to this clarity is the debate about whether green gas is best used in road, transport, heat, power generation or aviation. There is a clear consensus that much higher levels of production are beneficial, so we would urge a decoupling of policy from end use, and the creation of an incentive to build and inject the gas to the gas grid.
20. Cadent welcomes continued support for projects that can help companies like Cadent to get the evidence base that enables Government to confidently make positive and ambitious future policy decisions that in turn will deliver the best results for customers at the same time as meeting out emissions targets. There is excellent work coming from other organisations such as Innovate UK, which is supported through the ICSF, BEIS hydrogen supply and CCUS innovation funding, which we further welcome the continuation of. Greater transparency of the gas networks' role in supporting Government policy development would of course always be welcomed.
21. Cadent believes Government policy must recognise challenges around planning permissions and installation of infrastructure required to meet the net zero target. Even achieving the renewal of existing infrastructure poses major challenges – wholesale development of new infrastructure is likely to pose major political, stakeholder and community challenge.
22. Finally, Cadent recognises the need for a mechanism for government to direct regulated networks to undertake works, and for government funds to be used to protect consumers.

Ends