

November 2018 London

PATHFINDER FORUM REPORT

Destination gas: mapping pathways for gas transmission and distribution businesses in a decarbonised Europe





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In November 2018, Gas Strategies hosted a Pathfinder Forum roundtable in London for a group of leaders and decision-makers in the gas infrastructure and financing industry. Among the invited participants were network operators, investors, and financial, legal and commercial advisors from across Europe. The event took place under the Chatham House Rule.

Opinion in the room was divided as to the future of gas networks; some believed that they were likely to be the cheapest and most cost-effective way of delivering energy, particularly in the heating sector, long into the future. Others suggested that gas networks faced a genuine existential threat from emerging and established technologies. Geography was also important; different European countries are pursuing different routes to address decarbonisation meaning that creating a single vision for the future of gas and gas networks is a huge challenge.

This report captures the main issues raised and points discussed.

SUMMARY

The discussion was divided into three main sections:

- the European climate challenge;
- routes for gas in a decarbonised Europe; and
- actions for today's gas industry.

De-industrialisation and economic recession and initial decarbonisation of the power sector have meant that the EU has made good progress towards meeting its 2020 climate targets; the ambitious 2030 and 2050 targets will be much harder to achieve coal-to-gas switching in the power sector has not yet realised its full potential and were all coal power to switch to gas it could lead to a reduction of almost 10% in CO₂ emissions across the EU. It was recognised that this represents a major short term “win” for CO₂ reduction. However, if gas is to play a significant role in a decarbonising Europe, the industry will need to look beyond fuel-switching in the power sector to make an impact on the overall result.

The heat sector was identified as one of the most challenging sectors to decarbonise with multiple pathways discussed; including district heating, all electric heating systems and replacing natural gas with sustainable alternatives such as hydrogen or bio / synthetic methane. District heating was seen as an attractive alternative to gas with well-established systems in many European countries but the costs of developing new networks and the level of disruption and cost that might be created for householders was seen as a significant potential barrier.

Repurposing gas infrastructure to use sustainable alternatives was recognised as representing one of the least disruptive solutions to decarbonise the energy system as a whole including heat. However, this will require collaboration between gas industry players to finance and develop large scale pilot projects to test the commercial and technical viability of the production, transmission and distribution of green gases⁽¹⁾. This in turn will necessitate a co-ordinated campaign to overcome the regulatory barriers and to be most effective will likely entail much greater co-operation with the electricity sector to maximise the efficiency of energy production, storage and delivery.

Finally, a consensus emerged that the gas industry needs to put together a cohesive narrative of gas' role in a decarbonised Europe to “sell” gas as a destination fuel to regulators, policy-makers and the general public, and debunk the myth that gas and electricity are locked in a “winner takes all” contest.

(1) Green gas in the context of this conversation was taken to mean biogas and biomethane, synthetic methane or hydrogen



THE EUROPEAN CLIMATE CHALLENGE

First up for discussion was the EU's climate goals, and the progress that has been made so far. The EU is likely to meet two of its three "20% by 2020" targets⁽¹⁾ – in carbon emissions reduction and renewable energy penetration in the primary energy mix. In part, this has been achieved with widespread fuel-switching in the power sector, from fossil fuels to renewables and coal-to-gas, and some efficiency gains in industry and buildings.

However, the financial crisis of 2008 and long-term de-industrialisation have also played a significant role.

The group noted that there remain significant emissions savings to be made from coal-to-gas switching in the power sector. This aside, much of the low-hanging fruit has already been picked and if long term targets are to be met, power generation, industry, heating and transport – will all need to step up their contribution.

(1) For more about the EU targets, download Gas Strategies' ViewPoint: The Challenge for European TSOs, by clicking or by typing the following URL into your browser. <https://bit.ly/2PrFiqm>

BEYOND POWER

Unabated natural gas burn will not play a long-term role in meeting 2050 targets, so investment in carbon capture utilisation and storage (CCUS) will be essential if natural gas is to continue in power generation.

Whilst there had been an assumption amongst some policymakers at national and EU level that decarbonisation will mean comprehensively electrifying heat and transport, the participants acknowledged that the European Commission and other policy makers were beginning to recognise the cost and technical challenge involved in the all electric future and gas was coming back on the agenda; one attractive feature of gas with regards to cost is the already existing gas storage.

There remained some doubt about Europe's long-term commitment to climate goals in the current global geopolitical climate, as well as the EU's ability to meet its targets. Nevertheless, the roundtable participants were broadly in agreement that even if the EU's targets are missed, the political ambition at EU level for carbon reduction is steadfast at present. Strategising only for a "business as usual" future is risky, and potentially calamitous.

ROUTES FOR GAS IN A DECARBONISED EUROPE

There are clear advantages to using gas in the energy mix as a complement to electricity. An all-electric future comes with high transmission and distribution costs, and storage issues. Gas, by comparison, can be stored easily and is highly dispatchable, and has readily available transmission infrastructure to share the energy distribution burden with the electricity networks. This makes green gas a potentially attractive option for the highly seasonal heating market but a number of competitor technologies were identified:

- District Heating
- Conventional electric
- Electricity combined with hybrid heat pumps (where gas is used when renewable electricity is not plentiful)

At present there is no clear preferred solution with different paths being evaluated in different countries and even within countries. District heating is well established in some regions in Europe (particularly Scandinavia) and is an obvious choice for further development where it is already established. Electricity with or without heat pumps is a zero-carbon solution using established networks as long as it is backed by renewable electricity. Green gas is also zero carbon and also benefits from the use of an established (high capacity) network.

COST + DISRUPTION

The sense in the room was that the choice of solution is likely to come down to two key issues; Cost and Disruption and some believed that this would give gas an advantage where it is already well established. The cost of building new district heat networks in major cities could be prohibitive and persuading householders to switch over to an entirely different and less immediately controllable form of heating their homes could be a real barrier to its development: there are cultural barriers to district heat in the UK that do not exist in other parts of Europe, for example. The same resistance might also be experienced by electric solutions, particularly if they required the installation of high cost heat pumps. Biomethane and synthetic methane would on the other hand require no changes within the customers home thereby minimising disruption although cost competitiveness will remain an issue. Switching away from methane to hydrogen (as some networks are proposing) is significantly more disruptive requiring

a change to equipment within the household but not the renewal of the distribution networks. However, proponents of hydrogen see it as offering a scalable and more affordable solution as compared with biomethane – with hydrogen produced from natural gas through methane reformation (the CO₂ produced then been sequestered using CCUS) and from renewable electricity through electrolysis. In the UK, in particular, hydrogen is seen as a compelling option with CCUS offering a new business opportunity for the upstream industry as well as creating a lifeline for downstream gas networks; indeed, CCUS is part of the UK government's industrial strategy with the stated ambition of having the option to deploy CCUS at scale during the 2030s, subject to costs coming down sufficiently.

The UK has two separate pilot project proposals (Leeds H21 and Liverpool-Manchester Hynet NW) being developed by Northern Gas Networks and Cadent, two of the UK's major gas distribution network companies.

However, it was thought unlikely that hydrogen, at least if produced from methane at the distribution grid level, would work everywhere.

In Germany in particular, it was thought that there would be strong opposition to CO₂ storage. Moreover, conversion of existing networks to hydrogen will require some infrastructure replacement and there is a belief it will also be perceived, in some but not all countries, by the public as a safety risk. Hydrogen conversion will therefore not be the answer everywhere; in fact the most likely outcome for the future will be hybrid with different solutions being adopted in different places.





ACTIONS FOR TODAY

A diverse range of views was in evidence on the extent of the risk posed by decarbonisation to gas' future in the energy mix, but there was broad agreement on the need to start planning now. Put simply: the gas network operators must take their future into their own hands. The substance of these plans boils down to three key elements:

- build a credible narrative to sell gas' role to policymakers and, the public;
- develop pilot projects of scale
- collaborate closely with other stakeholders in the energy industry including electricity network operators, upstream suppliers, gas retailers and consumers.

The Narrative - winning the support of the public will be essential, with many around the table arguing that the future of gas lives or dies on this point. A sustained campaign of gas advocacy will be necessary, perhaps in the form of advertising and infomercials. Even more important will be the construction of a compelling narrative of where gas fits in a decarbonised Europe.

Pilot Projects - the development of large pilot projects will also play a key role in this. Many network operators have made small investments in biogas, LNG bunkering, hydrogen and power-to-gas. But projects of scale will be crucial to make the case to investors, government and the public that these solutions are commercially viable, safe to operate, technically sound and have the capacity to make a major contribution to large scale decarbonisation.

Collaboration - questions remain, however, over who should take the lead. Gas network operators have the most to lose from an electric-only future, but they are stymied by regulatory barriers and funding constraints. Electric network operators may welcome the opportunity to earn a return on large investments in infrastructure upgrades. Governments could “blink first” and define the relevant technology solutions, then offer financial, political and regulatory support. However they are often reactive to public opinion and

lobbyists, and unwilling to “pick winners” if it is perceived there is competition between different technological solutions. Suppliers own the relationship with the consumer, making them a powerful stakeholder, but these companies have little vested interest in promoting gas as a low-carbon solution.

If network operators want to take the lead on developing pilot projects, they will need to agitate for regulatory change, particularly on unbundling. The current energy regulation system in the EU was developed to promote competition; it is not a regulatory system that is designed to drive investment in new technologies and enable a transition to an entirely new energy system. A compromise solution might be for regulators to allow network operators to fund pilot projects through their regulated asset base (RAB), allowing investment to flow and different concepts to be tested at scale.

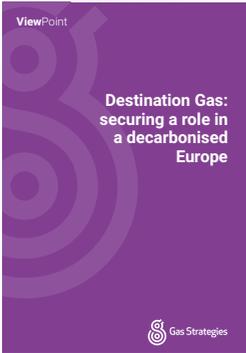
A unified approach across the board will be critical to secure gas’ role in a decarbonised Europe. Gas Network Operators will have to collaborate closely with the electricity sector and argue strongly for sector coupling; making the case for gas’ role as a complement for electricity, not a rival. In addition to working with each other, network operators will need to bring suppliers, shippers and producers of natural gas and renewable gas on board to sell the story of how gas will be the indispensable destination fuel of the future.

THANKS

Gas Strategies acknowledges the commitment of time and openness of conversation which the Pathfinder Forum participants brought to the event. Gas Strategies' Pathfinder Forums are opportunities for sharing experiences, thoughts and perceptions. This report captures some of the key exchanges during the London event, while respecting the Chatham House Rule convention. We look forward to facilitating and reporting on further events in 2019.

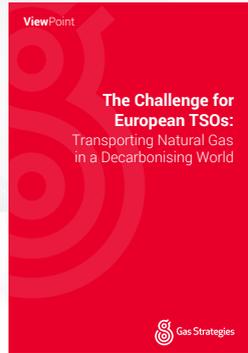


For more information on decarbonisation, visit the download section on our website or click on the following documents.



ViewPoint
Destination Gas: securing a role in a decarbonised Europe

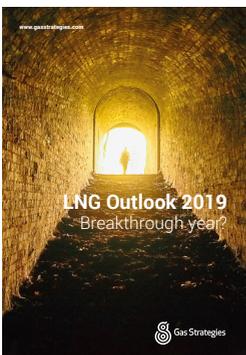
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