



RIO-2 Sector-Specific Methodology

SCCS response to Ofgem consultation

March 2019

Scottish Carbon Capture & Storage

RIO-2 Sector-Specific Methodology

1 Key points

Our interest in this consultation is twofold: we wish to raise some issues relating to hydrogen as a low-carbon energy vector; and others around the transport of carbon dioxide (CO₂) as part of carbon capture, usage and storage (CCUS) infrastructure to enable deep decarbonisation across the UK economy.

Low-carbon heat using hydrogen is gaining increasing prominence, as either an alternative or a complement to electrification and heat networks¹. Regardless of whether hydrogen is blended with natural gas, or fully replaces it in the gas grid, there are legal and technical issues that will need to be addressed.

Hydrogen produces no carbon dioxide emissions when it is combusted, meaning there is huge potential to use it to decarbonise hard-to-treat areas such as domestic and industrial heat, and transport (most likely in fuel cells). Hydrogen can be produced using electrolysis, and if this process is done using electricity from renewable sources, then the production can be considered zero-carbon. However, this means of production is not currently cost-effective for the amounts of hydrogen that would be needed to kick-start gas grid decarbonisation. It is preferable, therefore, to produce hydrogen in bulk from methane using steam reforming, and combining this with capture and geological storage of the CO₂ by-product.

In its Clean Growth Strategy, the Government announced its “ambition that the UK should have the option to deploy CCUS at scale during the 2030s, subject to the costs coming down sufficiently.” This means that the first working CCUS clusters, with pipelines and offshore storage sites, need to be operating in the early to mid-2020s. In the foreword to the recent CCUS deployment pathway action plan², the Minister of State for Energy and Clean Growth states “I believe that carbon capture, usage and storage represents a huge opportunity for the UK to become a global leader in a technology which will have a key role to play in tackling climate change – one of the most pressing global challenges. And we share in the broad international consensus that CCUS will be essential to meet the ambitions set out in the Paris Agreement, reinforced by the IPCC’s recent 1.5 degree Special Report.”

Pipelines to transport CO₂ from capture site to storage site are therefore expected to be essential infrastructure from the 2020s to enable bulk low-carbon hydrogen production, as well as for wider industrial and power sector decarbonisation, and negative emissions using bioenergy with CCS (BECCS) or direct air capture³. It is currently unclear who the regulator would be for any onshore and offshore CO₂ pipelines, but this needs to be established if CO₂ transport is to be funded through a regulated asset base (RAB) model, as recommended by the CCUS Cost Challenge Task Force⁴.

¹ See for example *Clean Growth – Transforming Heating*, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766109/decarbonising-heating.pdf

² Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/759637/beis-ccus-action-plan.pdf

³ Other options for CO₂ transport exist, such as rail and shipping, but pipelines are likely to be most efficient as CCUS is deployed at scale.

⁴ Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727040/CCUS_Cost_Challenge_Taskforce_Report.pdf

2 Consultation questions

CSQ2: Do you agree with our proposed three new output categories?

Yes, subject to our comments below.

CSQ3: Are there any other outcomes currently not captured within the three output categories which we should consider including?

“Maintain a safe and resilient network: Network companies must deliver a safe and resilient network that is efficient and responsive to change.” It is probable that the gas network of the future will need to carry either a blend of hydrogen and natural gas, or 100% hydrogen. Network companies will need to prepare for this, including trials to understand whether a transition to hydrogen for industry and for home heating would work in practice. There is also the question of whether Ofgem would remain the regulator for the gas pipe network if hydrogen is added to the mix.

The current regulatory regime⁵ does not allow for either blending of hydrogen in the gas mix, or 100% hydrogen; nor is it equipped to charge customers accurately where hydrogen is blended in. There is a need for legislation to change this, and for a steer from Ofgem to allow regulated companies to plan spending for a potential hydrogen future.

Furthermore, it is not clear which body will be responsible for regulating CO₂ pipelines, and we recommend that this is addressed urgently to enable CCUS projects to develop using the RAB model. It is therefore also unclear how commercial developers will be able to create an on- and offshore CO₂ transport RAB, and how it would be regulated

“Deliver an environmentally sustainable network: Network companies must enable the transition towards a smart, flexible, low cost and low carbon energy system for all consumers and network users.” SCCS’s mission is *enabling CO₂ emissions reduction through carbon capture and storage research and knowledge exchange*, so we are pleased to see that the need for a low-carbon energy system has been given more prominence than it was in the original consultation on RIIO-2. This must include enabling the deployment of hydrogen, and addressing the legislative issues raised above.

We support the recommendations made by Bright Blue in their publication “Pressure in the Pipeline: Decarbonising the UK’s gas”⁶, to reduce the carbon intensity of gas, including:

- Make decarbonisation of UK gas a priority in the next price control framework, including by increasing the available funding through the ‘Network Innovation Competition’ and ‘Network Innovation Allowance.’
- Establish a ‘low-carbon gas obligation’ on gas suppliers in the next price control framework to incentivise the injection of low-carbon gas flowing in the UK gas network.

CSQ9: What views do you have on our proposed approach to adopt a narrow focus for whole systems in the RIIO-2 price control?

Ofgem’s proposed approach is a whole system scope that adopts a narrow focus on coordination of investment planning and operation delivery between the ESO, the GSO and the four network sectors (gas transmission, electricity transmission, gas distribution and electricity distribution).

⁵ The Gas Safety (Management) Regulations and the Calculation of Thermal Energy Regulations. See SCCS Working paper 2018-10 at http://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2018_10_BEIS_CCS_Inquiry_requested_evidence.pdf

⁶ Available at: <http://green.brightblue.org.uk/publications/2019/2/15/pressure-in-the-pipeline-decarbonising-the-uks-gas>

We agree that it makes sense for the scope to be narrowed to the areas that Ofgem regulates. However, these sectors need to understand future demand patterns that will result from new or expanded uses of electricity, such as electric vehicles and electric heating, and the potential use of hydrogen in heat and transport. This future demand will depend strongly on government policy decisions in the next few years.

There is also the question of who will regulate CO₂ pipelines; if the regulator is to be Ofgem, then that would require a broadening of this scope.

CSQ40: Do you have any views on our direction of travel with regard to anticipatory investment?

The consultation document rightly recognises (section 7.19) that the future of the gas distribution network is dependent on policy decisions to be taken in the 2020s regarding the future of heat. However, investment decisions relating to hydrogen would also need a change in the law: both the Gas Safety (Management) Regulations and the Gas (Calculation of Thermal Energy) Regulations. Changes would be required in the way that gas is billed, from billing by volume to billing by energy content. This would require multiple new billing zones around the UK, with Ofgem permission.

Anticipatory investment may also need to include investment in CO₂ transport and storage infrastructure.