



## **Infrastructure Finance Review**

---

**SCCS consultation response to HM Treasury & Infrastructure and  
Projects Authority**

**June 2019**

**Scottish Carbon Capture & Storage**

# Infrastructure Finance Review

## SCCS consultation response

---

### 1 Key points

**Carbon capture and storage (CCS) infrastructure is going to be essential** if the UK is serious about meeting its greenhouse gas emissions targets and making a fair contribution to the ambitions of the Paris Agreement.

**Hydrogen infrastructure will also be essential.** Hydrogen emits no carbon dioxide (CO<sub>2</sub>) when burned, and can displace natural gas for domestic and industrial heating, and petrol and diesel in transport.

**These must be included in the National Infrastructure Strategy.** The scope of the National Infrastructure Strategy, and the reviews and studies that feed into it, must include CO<sub>2</sub> transport and storage infrastructure and hydrogen infrastructure for heat and transport.

The expert panel appointed to support the infrastructure finance review **must include experts on CO<sub>2</sub> transport and storage infrastructure and hydrogen.**

### 2 Scope of Infrastructure Finance Review

The executive summary's description of "infrastructure fit for the 21<sup>st</sup> century" fails to mention the infrastructure that will be needed for deep decarbonisation: infrastructure to decarbonise industry, heat and transport, and to enable negative emissions. Carbon capture and storage is crucial to these activities – "a necessity, not an option", in the words of the Committee on Climate Change<sup>1</sup> – but the carbon dioxide (CO<sub>2</sub>) transport and storage infrastructure that will be needed across the UK is not mentioned in the consultation document.

This failure to consider infrastructure for industrial decarbonisation was embedded in the remit of the National Infrastructure Commission (NIC)<sup>2</sup>, which means that the UK's future infrastructure needs have not been fully assessed. SCCS raised this in our response to the NIC's interim assessment,<sup>3</sup> and the concern was repeated by the Business, Energy and Industrial Strategy (BEIS) Committee in their report on carbon capture, usage and storage (CCUS), who recommended that

"The Government tasks the National Infrastructure Commission—or a third party—to conduct a cost benefit analysis of the potential role of CCUS to decarbonise industrial emissions, taking account of how development of industrial CCUS would affect—and be affected by—the potential development of CCUS for other applications, notably hydrogen and power. The

---

<sup>1</sup> Committee on Climate Change (2019) *Net Zero: The UK's contribution to stopping global warming*, available at: <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf>

<sup>2</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/571097/Fiscal\\_Remmit\\_2016.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571097/Fiscal_Remmit_2016.pdf)

<sup>3</sup> [http://www.sccs.org.uk/images/expertise/reports/working-papers/WP\\_SCCS\\_2018\\_01\\_Consultation\\_Response\\_National\\_Infrastructure\\_Commission.pdf](http://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2018_01_Consultation_Response_National_Infrastructure_Commission.pdf)

results of this assessment should be taken into account during decision-making on spending for national infrastructure.”<sup>4</sup>

We urge the Government to act on this recommendation – and the other recommendations on CCUS made by the BEIS Committee. **We are concerned that unless this is addressed, the result will be a National Infrastructure Strategy with a massive gap in it that will leave us unprepared, unable to meet our climate targets, and cause us to lose industry and jobs unnecessarily.**

### 3 Carbon capture and storage infrastructure

The Committee on Climate Change found that the UK will need to be capturing and storing 75-175 Mt CO<sub>2</sub> per year by 2050, with “major CO<sub>2</sub> transport and storage infrastructure servicing at least five clusters.”<sup>5</sup>

Infrastructure to remove CO<sub>2</sub> from the economy will include pipelines, compressors, shipping, ports and secure geological storage. Although the principles of CCS have much in common with those of waste management or sewerage infrastructure (removal and disposal of a pollutant), CO<sub>2</sub> transport and storage has a unique set of characteristics (not least, that the material to be transported is a gas under ambient conditions) that mean it should be considered an infrastructure category in its own right.

In addition to CO<sub>2</sub> transport and storage infrastructure, it is likely that the UK will need infrastructure to transport and store hydrogen, for use in heat and transport. Hydrogen does not emit CO<sub>2</sub> when it is burned, meaning that it is zero-carbon at the point of use, and consequently a contender to displace fossil fuels. Hydrogen has potential for use in domestic heat and transport, and in industrial applications.

In the context of the consultation document’s definition of infrastructure, hydrogen would come under the ‘energy’ category. However, because it is an energy vector that is not yet in widespread use in the UK, we consider that it is necessary to highlight it as an emerging infrastructure need.

---

<sup>4</sup> Business, Energy and Industrial Strategy Committee (2019), *Carbon capture usage and storage: third time lucky?* Available at: <https://publications.parliament.uk/pa/cm201719/cmselect/cmbeis/1094/109402.htm>

<sup>5</sup> Committee on Climate Change (2019)

CO<sub>2</sub> transport and storage infrastructure will be a brand-new undertaking for the UK. Currently no such infrastructure exists in the UK at large scale, but this does not mean we will be developing from a standing start:

- We can draw on international knowledge:
  - CO<sub>2</sub> transport and storage infrastructure exists elsewhere in the world, including CO<sub>2</sub> transport pipelines in the USA, CO<sub>2</sub> storage in Norway, CO<sub>2</sub> transport by ship;<sup>6</sup>
  - International standards and codes have been agreed.<sup>7</sup>
- The UK has workers with the skills and experience that will be essential to developing this infrastructure: these include geology, engineering, chemistry and offshore expertise.
- We have existing infrastructure that can be repurposed: on-and offshore pipelines, and ports such as Peterhead.<sup>8</sup>
- A wealth of knowledge and understanding has been built up, through projects such as ACT Acorn<sup>9</sup>, ALIGN-CCUS<sup>10</sup>, Caledonia Clean Energy Project<sup>11</sup>, East Coast<sup>12</sup>; the cancelled CCS commercialisation competition projects at Peterhead and White Rose<sup>13</sup>; and the cancelled commercialisation programme project at Longannet.<sup>14</sup>
- SCCS partners carry out world-leading research.<sup>15</sup>

## 4 Financing CCS infrastructure

The Parliamentary Advisory Group on CCS (the Oxburgh Report)<sup>16</sup> highlighted that there is precedent for nationally important, first-of-a-kind infrastructure – as CCS is – to be state-owned and financed. It proposed a CO<sub>2</sub> transport and storage company as part of a CCS delivery company, that could later be privatised.

The CCUS Cost Challenge Taskforce<sup>17</sup> recommended a regulated asset base (RAB) model to fund CCS infrastructure. In much the same way that the government provided contingent financial support for low probability, high-impact risks in the Thames Tideway project, it could support investment in CCS by taking on the irreducible risks identified by the Taskforce: political risk, cross-chain risk, stranded asset risk and CO<sub>2</sub> leakage risk.

---

<sup>6</sup> See the SCCS Global Map for more information: <http://www.sccs.org.uk/expertise/global-ccs-map> and R. Doctor, A Palmer, D. L. Coleman, J. Davison, C. Hendriks, O. Kaarstad, et al. (2005). Transport of CO<sub>2</sub>. *IPPC Special Report on Carbon dioxide Capture and Storage. Chapter 4*. R. Pichs-Madruga and S. Timashev, IPCC: 179-193.

<sup>7</sup> See <https://hub.globalccsinstitute.com/publications/good-plant-design-and-operation-onshore-carbon-capture-installations-and-onshore-30>

<sup>8</sup> See SCCS's evidence to Scottish Affairs Committee: [http://www.sccs.org.uk/images/expertise/reports/working-papers/WP\\_SCCS\\_2018\\_04\\_evidence\\_to\\_Scottish\\_Affairs\\_Committee\\_inquiry\\_on\\_future\\_of\\_oil\\_gas\\_industry.pdf](http://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2018_04_evidence_to_Scottish_Affairs_Committee_inquiry_on_future_of_oil_gas_industry.pdf); the outputs of the ACT Acorn project <https://www.actacom.eu/about-act-acorn/infrastructure-reuse-and-decommissioning>

<sup>9</sup> <https://www.actacom.eu>

<sup>10</sup> <https://www.alignccus.eu>

<sup>11</sup> <http://www.ccsassociation.org/news-and-events/reports-and-publications/caledonia-clean-energy-project-feasibility-report/>

<sup>12</sup> <http://www.sccs.org.uk/news/441-new-study-east-coast-ccs-can-boost-uk-economy-by-160bn>

<sup>13</sup> <https://www.gov.uk/government/collections/carbon-capture-and-storage-knowledge-sharing>

<sup>14</sup> [https://webarchive.nationalarchives.gov.uk/20121217153246/http://www.decc.gov.uk/en/content/cms/emissions/ccs/ukccscomm\\_prog/feed/scottish\\_power/scottish\\_power.aspx](https://webarchive.nationalarchives.gov.uk/20121217153246/http://www.decc.gov.uk/en/content/cms/emissions/ccs/ukccscomm_prog/feed/scottish_power/scottish_power.aspx)

<sup>15</sup> <http://www.sccs.org.uk/expertise>

<sup>16</sup> Parliamentary Advisory Group on CCS (2016) *Lowest Cost Decarbonisation for the UK: The Critical Role of CCS*, available at: <http://www.ccsassociation.org/news-and-events/reports-and-publications/parliamentary-advisory-group-on-ccs-report/>

<sup>17</sup> CCUS Cost Challenge Taskforce (2018) *Delivering Clean Growth: CCUS Cost Challenge Taskforce report*, available at: <https://www.gov.uk/government/publications/delivering-clean-growth-ccus-cost-challenge-taskforce-report>

## 5 Supporting measures

The review is right to flag the role of local authorities: not just to fund infrastructure, but to use their land-use planning powers to ensure that essential infrastructure is developed in the right place. In the case of on- and offshore CO<sub>2</sub> infrastructure such as pipelines, this needs a cross-boundary approach, both between local authorities and between the countries of the UK, and for marine planning and land-use planning to be aligned.