

## INTRODUCTION

HyNet is the UK's leading industrial decarbonisation project which aims to unlock a low carbon future in the north west of England and north Wales by reducing carbon dioxide (CO<sub>2</sub>) emissions from industry and supporting economic growth in the region.

As part of the project delivery for a carbon capture and storage (CCS) system to serve the HyNet industrial cluster, three spur pipeline developments are proposed by Liverpool Bay CCS Limited (a member of the Eni SpA group) to connect to the HyNet Carbon Dioxide Pipeline, which was granted development consent in March 2024. Through this system, the spur pipelines will allow for carbon dioxide to be safely transported between selected industrial emitters of CO<sub>2</sub> and the CO<sub>2</sub> storage facilities in Liverpool Bay. This factsheet explains how carbon capture and storage works and why it is needed.

### WHY IS CCS NEEDED?

CO<sub>2</sub> released into the atmosphere is a major cause of climate change. Reducing CO<sub>2</sub> emissions into the atmosphere is an essential part of managing our climate emergency. In response to climate change, the UK Government has established a net zero emissions target. This means that by 2050, any CO<sub>2</sub> emissions to the atmosphere must be offset by equivalent emissions removal. International and domestic environmental agencies, including the Intergovernmental Panel on Climate Change<sup>(1)</sup> and the Committee on Climate Change in the UK<sup>(2)</sup>, consider CCS to be vital in achieving these targets.

### DID YOU KNOW?



HyNet has the potential to capture up to 10 million tonnes of CO<sub>2</sub> per year by the early 2030s, the equivalent of taking 4 million cars off the road.

Some industrial processes produce a huge amount of CO<sub>2</sub> that is currently released to the atmosphere. To meet the UK's targets, we need to significantly reduce these emissions. CCS is a vitally important process, particularly for industries like cement, chemicals and steel, which find it hard to lower their carbon emissions. These are known as 'hard-

to-abate' industries, as CO<sub>2</sub> is a byproduct of their manufacture. Capturing CO<sub>2</sub> at the source of production at these industrial sites enables their operations to continue to provide the necessary products we need, while reducing their carbon footprint, safeguarding industry jobs in the process and enabling the UK's transition to net zero emissions.

### HOW DOES CCS WORK?

CCS is a proven technology that can capture and store up to 95% of CO<sub>2</sub> emissions produced in industrial processes.

1. The first step involves installing technology that will capture CO<sub>2</sub> emissions. These will be installed at the premises of existing industry, such as the Viridor energy from waste facility in Runcorn and the Heidelberg Materials cement works at Padeswood, to capture the CO<sub>2</sub> that is currently generated as part of their industrial processes.
2. The CO<sub>2</sub> is then transported from the capture plants through pipelines to the Point of Ayr gas terminal where it will be transported through to secure offshore storage sites in depleted gas reservoirs underneath Liverpool Bay.

(1) Intergovernmental Panel on Climate Change (2022). Climate Change 2022: Mitigation of Climate Change. Available at [https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_FullReport.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf) (accessed 30/10/2024).

(2) Committee on Climate Change (2019). Net Zero Technical report. Available at <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-Technical-report-CCC.pdf> (accessed 30/10/2024).

- The CO<sub>2</sub> is transported through the pipeline to be stored up to 1km deep beneath the seabed in carefully selected sites, 20 miles offshore. The storage site which will serve the HyNet cluster is Eni UK's depleted Hamilton, Hamilton North and Lennox offshore natural gas reservoirs beneath Liverpool Bay. These reservoirs have previously held natural gas securely for millions of years.

### DID YOU KNOW?



We are repurposing existing infrastructure, such as natural gas pipelines and platforms, as part of our proposals to improve cost-efficiency and reduce the burden on UK taxpayers.

### PROVEN AND TESTED TECHNOLOGY

CCS is a well-established technology that has captured and stored CO<sub>2</sub> from industrial processes in Europe since 1996. There are currently over 40 operational CCS projects worldwide<sup>(3)</sup> and we are working with the international CCS community to share key results and lessons learned on other large-scale CCS projects.<sup>(4)</sup> We are making use of these valuable insights from international best practice as we develop our proposals. In the UK, CCS is regulated by the UK Government's Department for Energy Security and Net Zero (DESNZ) and we are working closely with them to ensure that our CCS projects comply with their legal requirements.

### ENSURING LONG-TERM SAFETY

The UK is home to a range of high hazard industries and has developed a safety regulatory regime that is world-class. Safety of the CCS infrastructure will be regulated by the Health and Safety Executive (HSE) and the North Sea Transition Authority (NSTA). Both of these regulatory bodies have a long track record of effectively regulating safety in the UK hydrocarbon sector.

Eni UK has extensive experience in designing, building and operating safe and effective high-pressure gas pipelines and will use this expertise to develop the CO<sub>2</sub> pipeline to the highest safety standards. Eni UK will carefully monitor the carbon dioxide and spur pipelines during all operational stages - CO<sub>2</sub> transportation, injection and secure containment within the reservoir. This will include advanced methods such as geophysical surveys, pressure sensors, seabed surveys and specialised monitoring wells.

### DID YOU KNOW?



HyNet could generate up to £17 billion for the regional economy by 2050, and will directly provide up to 6,000 jobs in the region.

To ensure the safety of the offshore storage under Liverpool Bay, a programme of monitoring, measurement and evaluation will assess the behaviour and integrity of the CO<sub>2</sub> throughout the planned 25-year life span. Following this, a 'post-closure' phase of works will take place to end the injection of CO<sub>2</sub> into the reservoir and ensure that it remains permanently enclosed within it. The post-injection monitoring period performed by the licence operator will be in compliance with legal and regulatory requirements and is not a subject of negotiation.

According to current UK legislation, measurement, monitoring and verification (MMV) activities must be guaranteed by the Operator for a period of 20 years after closure of the storage site. At the end of this period, the licence terminates and responsibilities pass to the government, but the Operator will continue to bear the monitoring costs with a financial contribution for a subsequent period of a further 30 years.

(3) International Energy Agency (2024). CCUS Projects Database. Available at: <https://www.iea.org/data-and-statistics/data-product/ccus-projects-database> (accessed 30/10/2024).

(4) HM Government (2022). Carbon capture, usage and storage (CCUS) innovation: HyNet CCUS key knowledge deliverables Available at: <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-innovation-hynet-ccus-key-knowledge-deliverables> (accessed 30/10/2024).