

## A CCS industry to support a low-carbon European economic recovery and deliver sustainable growth

Europe and the world are facing an unparalleled economic crisis as a result of the COVID-19 pandemic. Large public investments will need to be mobilised over the coming years to stimulate economic recovery. European recovery can go hand in hand with the ambitions of the European Green Deal – to reach net-zero GHG emissions by 2050 – and Carbon Capture and Storage (CCS) technologies will be an important tool to both deliver the needed climate change mitigation and safeguard European industrial competitiveness.

### **CCS will be key in the industrial transition towards net-zero GHG emissions – safeguarding jobs, industrial activity and economic growth.**

Reaching climate neutrality by 2050 requires strategic investment decisions. The pathway towards climate neutrality will bring about a major transformation of energy-intensive industries, such as cement, lime, steel and chemicals, that are at the core of the European economy and provide products that are at the heart of how we live our lives. For these sectors, pathways including CCS represents the lowest-cost route to decarbonisation whilst maintaining industrial activity<sup>1</sup> and preserving existing jobs. It can capture and store emissions produced during industrial processes, and it also plays an important role in the manufacturing of clean hydrogen which can be used to fuel energy-intensive industries and households. When applied to industrial processes and power plants, CCS can secure jobs and incomes and ensure European industrial competitiveness in international markets while delivering sustainable growth.

CCS will help both the retention of existing jobs and create new jobs by supporting the gradual yet irreversible decarbonisation of European energy-intensive industries that will be impacted by climate change and the economic crisis. By providing a low-carbon alternative, existing jobs in industries - such as cement, steel, lime, chemical- will be preserved. In Europe alone, building CCS facilities, as well as transport and storage networks, will potentially provide 150,000 jobs by 2050, considering those indirectly employed in supply chains.<sup>2</sup> This will make European regions competitive and attractive for forward-looking, long-term, low-carbon investments. Ultimately, CCS can enable European industrial regions to remain competitive in a net-zero landscape.

Additionally, the European Union should set the foundations for a transition towards a climate neutral economy incentivising decarbonised industrial products. Introducing public procurement standards is an example of how to encourage the uptake of low-carbon products, building investors' confidence. Coupled with a functional CO<sub>2</sub> price, this should enable the CCS industry to become self-sustainable in the long-term, after the initial support mechanisms that are needed to demonstrate CCS at a large scale in Europe.

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<sup>1</sup> Zero Emissions Platform, "[Climate Solutions for EU industry](#)", 2017

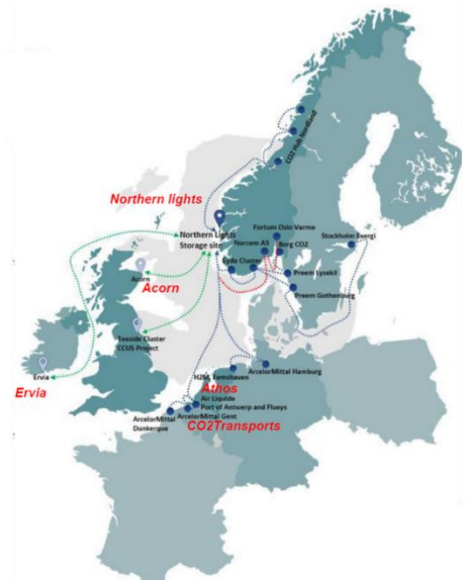
<sup>2</sup> GCCSI, "[The Value of CCS](#)", 2019

**European CO2 transport and storage infrastructure is a no-regret investment opportunity to pave the way for a climate-proof European economy.**

Investing in shared CO2 transport and storage infrastructure is the ultimate European project, and it represents a strategic and instrumental policy decision to preserve Europe’s welfare and to make the European society future-proof for a climate neutral economy. As several CO2 capture projects are near-ready for large-scale deployment, European CO2 transport and storage infrastructure would connect CO2 emitters (industrial hubs and power plants) to storage sites and enable the extensive decarbonisation that will be needed to meet the climate neutrality target. Timely development of this infrastructure is crucial and will also enable industry to take a proactive role in the discussions around 2030 and 2050 climate targets.

Europe benefits from privileged conditions. The North Sea basin area is a world-class region for storage. Industrial hubs – such as those around the Ports of Rotterdam, Antwerp, Amsterdam, Le Havre, Dunkerque, the North Sea Port, as well as the Teesside, Humber, Ruhr and Cork regions – would be able to capture CO2 from industrial processes and power plants and use CO2 transport and storage infrastructure to securely store the CO2 under the North Sea.

Securing political support for the five cross-border CO2 Projects of Common Interest<sup>3</sup> (PCI) is vital. These projects are on the right track to become operational before 2025. A solid policy framework providing a degree of predictability for long-term investments should be a priority for European policymakers. CO2 infrastructure projects call for European legislators to extend the scope of existing legislation – such as the TEN-E regulation and EU ETS directive – to prepare for the rollout of CO2 and clean hydrogen infrastructure. As indicated in the European Taxonomy for Sustainable Finance, all modes of CO2 transportation to permanent geological storage – pipeline, ship, barge, train, truck – are allowed. This outcome is critical and should be preserved in revised TEN-E and EU ETS, as it will allow near-ready CO2 transport and storage projects to be realised and to create opportunities for numerous CO2 emitters throughout the entire EU area to have access to low-cost decarbonisation pathways.



**CO2 infrastructure can kickstart a clean hydrogen economy and deliver carbon removals.**

A clean hydrogen economy will initially rely on large volumes of clean hydrogen produced from natural gas with CCS, therefore requiring the development of cross-border CO2 infrastructure<sup>4</sup>. The initial investment in blue hydrogen production and associated infrastructure – linking this clean energy carrier to the customer – will pave

<sup>3</sup> European Commission, “[Technical Information on Projects of Common Interest](#)”, 2020

<sup>4</sup> Material Economics, “[Industrial Transformation 2050. Pathways to Net-Zero from EU Heavy Industry](#)”, 2019

the way for the scaling up of green hydrogen, as renewable electricity becomes more abundant.

Clean hydrogen is emerging as a central narrative for the European Green Deal, as hydrogen has the potential to be applicable across many sectors. Synergies between CCS, CCU and hydrogen can be realised as CCS can support extensive volumes of clean hydrogen for early application in industrial clusters.

All efforts to mitigate the impact of climate change must also look at increasing carbon removals from the atmosphere, as confirmed in the proposed European Climate Law. Carbon removals are needed to address residual emissions to achieve overall net-zero emissions. Given possibilities to connect to the CO<sub>2</sub> transport and storage infrastructure, Europe would have great opportunities to become a global leader on carbon removal solutions.

**CCS are proven technologies, are cost-efficient, available now and necessary for Europe to reach its target of net-zero emissions by 2050.**

CCS technologies can make a significant contribution to climate change mitigation. Their potential for carbon emissions abatement and removal is scientifically proven and acknowledged by the European Taxonomy for Sustainable Finance<sup>5</sup> and the ‘Clean Planet for All’ scenario<sup>6</sup>. Commercial, full-chain CCS projects have been operational since the 1980s, with more than 260 million tonnes of CO<sub>2</sub> emissions from human activity captured and stored over 40 years and an overall estimation of around 40 million tonnes of captured and stored CO<sub>2</sub> per year<sup>7</sup> at present.

**Include CCS in the economic recovery stimulus – shovel-ready projects can make a difference**

The EU recovery plan presents a unique opportunity to drive forward the clean agenda. Shovel-ready CCS projects (projects that are scheduled to commence execution in 2021 and through the following years). – building on European know-how and creating a European centre of excellence – can achieve climate change mitigation and maintain industrial competitiveness and should be an integral part of the European Commission’s recovery plan.

A non-exhaustive list of CCS, CO<sub>2</sub> infrastructure and clean hydrogen projects:

- **5 PCIs: Northern Lights, Athos, ERVIA CCUS, CO<sub>2</sub> TransPorts, Acorn/Sapling**
- **Hydrogen projects: H2M** (clean hydrogen), **H2morrow** (clean hydrogen for clean steel production), **HyDemo** (clean hydrogen for maritime sector), **H-Vision**
- **Capture projects: ViennaGreenCO<sub>2</sub>** (solid sorbent capture technology pilot), **Technology Centre Mongstad** (post-combustion capture technologies), **Norcem** (capture from cement plant), Carbon capture projects in **Germany, Belgium and Sweden.**

<sup>5</sup> European Commission, “[Taxonomy Report: Technical Annex](#)”, 2019

<sup>6</sup> European Commission, “[A Clean planet for All](#)”, 2018

<sup>7</sup> Global CCS Institute, “[2019 Global Status of CCS Report](#)”, 2019.

- **Industrial projects: Leilac 2 project** (Pilot installation for breakthrough technology in cement production), **onshore storage projects** (including capture of emissions in cement plants) in Eastern Europe, **Net-Zero Teesside**.

We recommend:

- To put in place an enabling policy framework, making it economically feasible for companies to invest in the whole value chain of CCS.
- To recognise and ensure political support for common infrastructure, both for CO<sub>2</sub> and clean hydrogen.
- To use the green recovery to kick-start projects along the whole value chain of CCS and clean hydrogen now.