CLEAN AIR TASK FORCE

Clean Air Task Force Response to the European Commission's Consultation on List of Candidate Projects of Common Interest: CO2 Networks

Background

CATF is an international nonprofit organisation that works to safeguard against the worst impacts of climate change by catalysing the rapid global development and deployment of net-zero climate technologies through research and analysis, public advocacy leadership, and partnership with the private sector.

CATF strongly supports the inclusion of projects in the thematic area of cross-border carbon dioxide transport infrastructure in the 1st Union list of Projects of Common Interest (PCIs) and Projects of Mutual Interest (PMIs) under the revised TEN-E regulation. Many of the candidate projects have significant potential to deliver the large-scale CO_2 transport and storage infrastructure required for the EU to meet its climate goals.

Modelling of the EU's transition to net zero consistently highlights a significant role for carbon capture and storage, with around 300 to 640 million tonnes of CO_2 captured and stored annually by 2050 across various scenarios.[1] These technologies will be particularly important for decarbonising hard-to-abate sectors like cement, lime, steel, chemicals, and waste management, helping to ensure the development of a competitive, net-zero industrial and manufacturing sector within the EU.

Rational planning of optimised, large-scale CO_2 infrastructure through PCIs and PMIs can help ensure widespread access to these decarbonising technologies and prevent piecemeal build-out that would increase costs and slow progress. If realised, the candidate projects represent a significant step towards an extensive cross-border network for CO_2 with the flexibility, scale, and geographical reach required for the EU to achieve its net zero ambition.

Promote greater geographical coverage

To date, the PCIs for CO_2 infrastructure have been largely confined to the area around the North Sea, where plans for geological CO_2 storage are most advanced. Ready access to CO_2 storage will also be essential for the decarbonisation of industrial sites in other regions and in inland areas, so it is vital to support the development of infrastructure that helps establish a level playing field for industrial decarbonisation throughout the Union.

It is therefore welcome that the current list of candidates is more geographically diverse, including projects in Southern, Central, and Eastern Europe. CATF strongly supports the inclusion of those projects that establish transport and storage infrastructure in these new regions, particularly where able to serve concentrated areas of industrial emissions.

[1] EU CCUS Forum 'A vision for CCUS in the EU' https://energy.ec.europa.eu/topics/oil-gas-and-coal/carbon-capture-storage-and-utilisation/ccus-forum_en

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Accelerate CO_2 storage site development

The lagging development of CO_2 storage sites remains a critical bottleneck for carbon capture and storage deployment in the EU, with only one site currently under construction in the wider region (in Norway). It is promising that a number of the candidate projects cover the development of new storage sites, including in new regions such as France, Croatia, Italy, and Greece. Also of note is the inclusion of several onshore storage projects as well as offshore. If realised in an environmentally and socially responsible manner, onshore projects can play a key role in bringing lower-cost access to CO_2 storage to more Member States. CATF supports those candidates that will help accelerate CO_2 storage capacity, particularly in regions with no or limited access to the North Sea. Forthcoming analysis from CATF highlights that by 2050, at least 30% of captured industrial emissions will require transport to non-North Sea storage, or potentially face prohibitive transport costs.[2] Nearly all Member States have enough theoretical geological storage capacity to support decarbonisation of their own industrial emitters.

Establish flexible transport networks with greater inland connectivity

However, with the majority of near-term storage capacity likely to remain in the North Sea or other offshore areas, it is essential to support the development of transport routes connecting inland sites with offshore storage sites. This connectivity will rely on a wide range of transport modalities, including shipping, river barges, trains, and pipelines, as well as associated terminals and temporary storage facilities. Of particular importance is ensuring large-scale connectivity to heavily industrialised inland clusters such as those of North-Rhine Westphalia and Southern Poland. CATF supports the inclusion of projects that develop these links via multiple transport modalities, establishing a resilient network and promoting technical developments in each modality. With CO_2 volumes available for transport expected to grow rapidly over the coming decade, infrastructure should be scaled ambitiously and appropriately to meet future demand and maximise economies of scale. Projects developing train, barge and ship transport are well suited to provide a more rapidly deployable and flexible solution to meet near-term, more dispersed demand. However, the planning of large-scale CO_2 pipeline projects (such as Delta Rhyne Corridor, the German Carbon Transport Network, and EU2NSEA) will also be critical to meet future demand at lowest cost.

Wider environmental, economic, and social impact

Together with an overarching EU strategy on carbon capture and storage, the inclusion of these projects as PCIs and PMIs would signal strong political support for CO_2 infrastructure, in turn encouraging emitters to invest in carbon capture and laying the groundwork for a carbon management market. These steps would create predictability for investments and, consequently, reduce perceived financial risks and foster much-needed investments in CO_2 infrastructure, while helping break the 'chicken-and-egg problem' that is slowing both capture and storage development.

[2] Element Energy for CATF '*Optimal CO_2 storage in Europe*' (in draft)

Moreover, access to funding from the Connecting Europe Facility will help these projects overcome significant upfront investment barriers, while encouraging a healthy pipeline of carbon capture and storage projects within their scope.

Given the time needed to build and commercialise carbon capture and storage infrastructure, earlier support for projects across the value chain can maximise their climate impact. Bringing forward deployment will deliver near-term abatement to help meet 2030 decarbonisation goals and promote technology learning that will support faster commercialisation of these technologies in the EU and globally.

Wider access to carbon capture and storage is essential for ensuring the longevity and future competitiveness of key industrial sectors in a net-zero EU, along with the millions of jobs and economic activity supported by those sectors. Support for these PCIs and PMIs can promote the EU-wide, cross-border transport and storage network that will be necessary to allow access to industry in all Member States.

Comments on the individual projects:

1. **CO2 TransPorts**
   This project will support CO_2 infrastructure within highly emissions-intensive clusters in the Netherlands and Belgium, as well as greater interconnectivity between these clusters which will help build a resilient transport network with economies of scale. It encompasses carbon capture and storage initiatives that are already in a relatively advanced stage of development which, if realised on schedule, can help maximise technical learnings and catalyse other developments.
2. **N-LiTES**
   As the only CO_2 transport and storage project under construction in the region, this initiative offers flexible access to storage on a timescale that will be vital for the completion of first-mover carbon capture projects, such as those selected by the Innovation Fund. The 5.2 Mtpa of capacity promised under the expanded second phase will likely provide a significant contribution to European storage capacity available before 2027.
3. **Aramis**
   This project aims to establish a high-capacity CO_2 pipeline to connect Rotterdam to storage sites in the Dutch portion of the North Sea. As a key, near-term route to North Sea storage in a highly emissions-intensive part of Europe, significant volumes of CO_2 are expected to route through Rotterdam in the 2020s and 2030s. The lowest-cost pathway to storage for these captured emissions will almost certainly be direct pipeline access to North Sea storage in this area.
4. **Nautilus**
   The Nautilus project offers a ship-based CO_2 connection to three of Northern Europe's major emitting clusters in Le Havre, Dunkirk, and Duisburg, linked to a new storage site in the Norwegian North Sea. Notably, this initiative would help develop carbon capture-based solutions to support steel sector decarbonisation in Dunkirk and Duisburg – a hard-to-abate sector where development of low-carbon alternatives

must accelerate. The wider region around Dunkirk includes two Innovation Fund CO_2 capture projects that will depend on CO_2 export facilities in Dunkirk. Nautilus will also develop the promising potential of the Rhine for barge-based CO_2 transport from the emissions-intensive area of North-Rhine Westphalia.

5. **EU2NSEA**
   This project proposes two major pipelines to connect Belgium and Germany to storage sites in the Norwegian North Sea, where estimates of theoretical storage capacity are significant (around 70 Gt) and several new storage areas are already licensed or in the licensing process. As such, it offers a potentially large-scale, lower cost route to CO_2 storage for EU emissions than ongoing reliance on ship-based transport alone.
6. **NORNE**
   This project centres on the transportation of CO_2 to two proposed onshore storage sites in Denmark. If developed with appropriate care and engagement with local stakeholders, such onshore storage projects can help lay the groundwork for other Member States to explore or revisit the option of onshore storage as a lower cost solution to CO_2 export.
7. **Delta Rhyne Corridor**
   This project aims to develop a pipeline route to connect heavily industrialised clusters in Germany to storage and shipping terminals in Rotterdam. This route is likely to be a key trunkline in the EU's emerging cross-border CO_2 infrastructure.
8. **German Carbon Transport Grid**
   Germany produces over twice as much industrial emissions as the next largest Member State. A country-wide CO_2 network, connecting major emitting clusters, will likely be required to fully decarbonise the sector. CATF analysis determines that around 70 Mt of industrial emissions may need to be captured in Germany by 2050.[2]
9. **WH2V**
   A proposal to ship CO_2 from Germany to the US or UAE where green hydrogen can be used to convert it to synfuels, which are then re-imported to the EU. The climate value of this project requires careful scrutiny and rigorous life cycle analysis to determine its potential emissions abatement relative to counterfactual scenarios (such as CO_2 storage within Europe).
10. **Noordkaap**
    This project aims to develop ship-based transport to storage from various emitters in Belgium and the Netherlands, starting with the Eemshaven area. Its focus on developing direct offshore injection of CO_2 could provide a flexible transport option for some emitters.
11. **Bifrost**
    This project centres on the development of a new offshore storage site in the Danish North Sea, which will provide much-needed EU-based storage capacity in the 2020s.
12. **ECO2CEE**
    Poland has one of the EU's largest shares of industrial emissions, but currently very poor access to CO_2 storage. Given the prevailing ban on onshore storage development in the country, the CO_2 export terminal and inland connections provided

by ECO2CEE will provide an essential ship-based exit point in the near term (or access to offshore storage in the medium term). CATF analysis estimates that around 23 Mt of CO_2 could require exporting from Poland's Baltic coast by 2050.[2]

13. **CCS Baltic Consortium**
    This project would provide a CO_2 export point in the Lithuanian port of Klaipeda, able to act as a collection hub for Latvia and Lithuania (both of which currently have bans on CO_2 storage).
14. **Geothermal CCS Croatia**
    This project supports the positive development of an onshore CO_2 storage site in Croatia, which could be the first storage site readily accessible to emitters in Central Europe. Emissions are sourced from cement plants in Croatia and Hungary, which will have no alternative option to fully decarbonise and will be reliant on such infrastructure to continue operating.
15. **Pycasso**
    The Pycasso project builds on the experience of a successful storage pilot in the depleted gas fields of South-West France (2010-2013). This prior experience could allow for relatively rapid development of larger-scale storage in a region with no other current storage developments, and several hard-to-abate emitters in the vicinity. Through pipeline access to the port of Bayonne, there is potential to extend the reach of this carbon sink to emitters over a much wider area, including coastal emitters in Northern Spain and Western France.
16. **Callisto**
    This project provides important access to CO_2 infrastructure for the heavily emitting industrial cluster in Fos-Marseille, via a ship-based connection to the Ravenna Hub. This cluster has already identified carbon capture and storage as a key part of its decarbonisation plans[3] and, although there is potential for geological storage in the area, a nearer-term export solution will catalyse earlier deployment of CO_2 capture and infrastructure in the cluster.
17. **Augusta C2**
    Relating to export of CO_2 from a cement plant in Sicily to the Prinos storage site (candidate 18), this project enables carbon capture and storage development for an industrial facility with no other options for complete decarbonisation.
18. **Prinos CO_2 Storage**
    This project seeks to develop a new storage hub in the North of Greece, which would receive emissions from the local area and by ship from the wider region (Eastern Mediterranean). This storage capacity and transport infrastructure would be a positive addition in a region with no other storage sites proposed.

[3] https://www.marseille-port.fr/sites/default/files/2023-01/SYRIUS_CP_JANV_2023.pdf