



The IPCC is clear that the deployment of Carbon Dioxide Removal is an ‘unavoidable’ component of net-zero. The EU should do more to facilitate both industrial and natural carbon removals, but it is important to highlight that industrial and natural carbon removals must be treated distinctly. Natural removals are subject to continual carbon fluxes and higher reversal risks; therefore, they cannot be accounted for the same, nor used in the same way, as an industrial removal with permanent geologic storage.

CO<sub>2</sub> capture should be applied in sectors which have almost no other ways to decarbonize and the CO<sub>2</sub> should be permanently stored. The use of biomass should not be a license to emit. Biogenic CO<sub>2</sub> should also be subject to CCS and may generate negative emissions, subject to a comprehensive lifecycle assessment. While CO<sub>2</sub> capture may be relevant for cases other than those identified here, support for any CO<sub>2</sub> capture must depend on the full climate impact of the project. Use of fossil carbon as a feedstock, to be later emitted into the atmosphere, should not be supported by climate policies.

### ***CO<sub>2</sub> as feedstock: undetermined climate impact***

The call for evidence as well as the open public consultation for the Industrial Carbon Management Strategy highlight CCS, CCU and CDR as part of the upcoming strategy. Bellona Europa would again like to repeat that the different potential for climate impact from CCS and CCU, with the latter’s climate impact being highly variable. This must be taken into consideration when determining where the public’s support and where funding is best placed to foster market development in a manner consistent with the climate crisis.

CCS’ potential to contribute to emission reduction lies clearly in the full value chain from capture to permanent storage. CCU, on the other hand, entails utilisation of the CO<sub>2</sub> in new products. The climate impact of CCU needs to be determined on a case-by-case basis through a thorough climate impact assessment including the production, use and disposal of a given CCU product. Due to the diversity of CCU products, no general statement accrediting climate impact to CCU can be made. As a result, the public good nature underlying CCS as a justification for public support for deployment, is not always present when it comes to CCU. If there are cases where CCU products applying for or being considered for public funding have a substantial climate impact, a case-by-case evaluation including a full life-cycle analysis must be conducted.

The utilization of fossil carbon in applications where the CO<sub>2</sub> is emitted to the atmosphere (e.g., fuels, plastics) should never be presented as carbon neutral nor supported with public finance on a general basis. Process emissions, while harder-to-abate via means other than CO<sub>2</sub> capture and storage, are still fossil carbon emissions which should be prevented from reaching the atmosphere. For any CO<sub>2</sub> use to be compatible with the aims of the Paris Agreement, the CO<sub>2</sub> must either be of non-fossil origin or must be used in a manner where the CO<sub>2</sub> is permanently kept away from the atmosphere. There is a climate benefit derived from potentially displacing a fossil-based product, however this alone is not sufficient to justify climate action support for fossil-CCU. The use of biogenic or atmospheric CO<sub>2</sub> is therefore better, although upstream emissions, from (indirect) land-use change and energy consumption respectively, must be considered. It must be noted that there may be more climate efficient uses of biomass than combustion, for example fermentation, where the CO<sub>2</sub> can also be captured. All CO<sub>2</sub> use is energy intensive, and the emissions associated with the entire process must be accounted for in measuring the climate impact of these projects.

Given their different climate impact, support for CCS and CCU projects should be separated to avoid the redirection of funds from full-scale CCS projects with permanent CO<sub>2</sub> storage into various CCU projects which may not deliver the same emission reductions.

### ***Carbon Dioxide Removals: long-term availability is key***

The EU's long-term climate target is to eventually reach net-negative greenhouse gas emissions, an ambition that will likely require a significant quantity of permanent removals, which today only exist at a negligible scale, as well as minimal quantity of residual emissions to be counterbalanced. Ensuring their long-term availability requires financial and policy investment in basic research, MRV, and scaling incentives, all of which should be supported by the European Commission. The atmospheric benefits of CDR are a public good and high-quality removals will be a limited resource. However, there is currently limited incentive in the private sector to ensure that removals are of high quality and account for the full climate impact of the activity. In that context, the European Commission has a vital role to play in ensuring their development is based on robust carbon accounting while also preventing removals from interfering with emission reduction efforts or having other adverse impacts.

The simpler supply chains and security of geologic storage allow direct air capture and storage (DACCS) to be a less complex carbon removal option, though the direct and indirect impacts of energy use must always be fully accounted for. Accounting for removals from BECCS is made more challenging due to the involvement of biomass and (indirect) land use change. The sustainable supply of biomass is limited and is expected to have many competing demands. However, retrofitting CCS to existing installations emitting biogenic CO<sub>2</sub> (e.g., biomass CHP plants, waste incineration, biogas and biofuel plants, pulp and paper mills) is potentially an attractive initial action, as it abates existing emissions of preexisting uses of biomass, with a lower energy requirement than DACCS. Biochar and enhancement of mineralization both require substantially more research and have much higher uncertainties regarding how they store carbon in real world environments, in particular how the storage media affects the decay rate of different minerals. Nevertheless, neither of these two approaches relate to the types of carbon capture addressed in this strategy.

BECCS and DACCS suffer from same market barriers as CCS. CO<sub>2</sub> removals also suffer from lack of clarity of the role the EU expects them to play in meeting its climate targets, and thus what scale will be required or available. The lack of a CDR market reflects a broader market failure to address climate pollution and the absence of any incentives to generate removals. Any CDR market must ensure the demand does not come from balancing of emissions which could otherwise have been abated.

### ***Public Perception and Awareness Raising***

Over the past decades Bellona Europa has, as mentioned above, observed a tendency to conflate the terms CCS and CCU, most recently in the use of the abbreviation CCUS. Without clear differentiation in underlying methodology and clear understanding amongst users of the terms, this conflation carries with it substantial risks. Such a conflation of terms does not take into consideration the different climate impact of CCS and CCU.

To what extent the much needed public support will be awarded to CCS projects in the long-term, in a predictable manner reducing investment risks and foster market development, depend on public support

and awareness of the technology. There is a great need for further information and awareness raising on the topic across Europe. A range of misunderstandings surround CCS, so a central and credible source of scientifically based information on CCS would be most useful. We see the European Commission as well suited to take on the role as such a communicator, while at the same time also encouraging other actors and stakeholders at the national and local levels, as well as from both civil society and the private sector, to contribute to these efforts. Guidelines on how best to contribute would be useful, perhaps along the lines of the ongoing work of the Public Perception Group under the CCUS Forum.

It is also of crucial importance that the upcoming strategy highlight the importance of CCS in a Just Transition for all, taking into consideration a cohesive approach to market development. This means ensuring the development of CCS as a tool to decarbonise across all of Europe, including parts of Europe which currently have reduced access to storage opportunities for CO<sub>2</sub>. Differences across Europe in geology, legal frameworks and stage of market development, results in different challenges and solutions. The strategy on CCUS must take into consideration, as highlighted by Bellona Europa's ongoing CCS campaign [#CCS4NetZeroIndustry](#), as well as our projects focusing on the CEE and Netherlands, Belgium and Germany.

A 2022 study by Ecologic examined the role of CCS, CCU, and CDR in NECPs, finding that the use of the terms was inconsistent, that few countries coherently ascribed a role to CCS, CCU and CDR, and that hard-to-abate emissions were not clearly identified. It is therefore crucial that NECPs clarify the extent to which a Member State plans to rely on CDR to meet its climate targets and how this deployment is intended to counterbalance emissions identified as being 'hard-to-abate'.

In the case of CDR, Bellona Europa continues to advocate for a clear definition of what can be considered a carbon removal (a permanent, physical, extraction of CO<sub>2</sub> from the atmosphere, net of all associated greenhouse gas emissions) as a guiding principle for CDR policy. The European Commission could also be well suited to clarify the confusion surrounding characteristics and uncertainties of different types of Industrial Carbon Removals, particularly around the issue of stability of geological carbon storage, while also leveraging the knowledge base of the Carbon Removals Expert Group and the European Scientific Advisory Board on Climate Change.

### ***The need for a CO<sub>2</sub> Market Regulation***

Bellona Europa has sought to identify and highlight the need for a CO<sub>2</sub> market regulation, with a particular focus on transport of CO<sub>2</sub>. While it is crucial not to overregulate a market still in its infancy and early stages of development, the substantial public support mechanisms used to kick-start the market, as well as the risks of monopolistic tendencies accompanying economic activities highly reliant on capital intensive infrastructure, makes it highly necessary with basic rules on market operation. In particular, as highlighted also by a recent [ENTEC Report on "EU regulation for the development of the market for CO<sub>2</sub> transport and storage"](#). Several of the report's findings were also echoed by the CCUS Forum's WG on Infrastructure. In particular, such a regulation must aim to ensure:

- Harmonised Regulatory Framework reducing investment risks and fostering EU Network development of CO<sub>2</sub> transport and storage
- Open access infrastructure
- Transparency on price setting
- Ensuring fair competition void of abuse of market power as a result of public funding or support

- Harmonisation on function, operation and standards across borders within Europe
- Platform or channels for systematic and frequent information and knowledge exchange across EEA Member States

Bellona Europa urges the European Commission to take these considerations into account, alongside the already submitted response to the Public Consultation and the feedback to the ongoing process of the NZIA. Welcoming the opportunity to contribute, we urge the EC to get in contact with any additional questions or comments to these submissions.