



Policy Brief

Key messages for the ethical governance of Carbon Dioxide Removal (CDR)

TECHETHOS
FUTURE ◦ TECHNOLOGY ◦ ETHICS

Highlights



To ensure responsible, just and sustainable development of Carbon Dioxide Removal (CDR), the Horizon 2020-funded [TechEthos](#) project encourages European Union (EU) policymakers to:

- Clarify the implications of existing EU principles for the implementation and governance of CDR, in particular the Do No Significant Harm (DNSH) principle and the Leave No-one Behind (LNOB) principle;
- Clarify how CDR can be implemented by EU member states in accordance with the UNFCCC's principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC). Since the CBDR-RC includes the Polluter Pays Principle (PPP) and the Ability to Pay Principle (APP), the role of the fossil fuel industry in CDR deployment requires scrutiny;
- Clarify how CDR can be implemented by EU member states in accordance with the EU's Biodiversity Strategy 2030, especially the potential for 'nature-based' forms of CDR;
- Establish effective CDR governance to ensure fair and sustainable implementation of CDR across the EU and CDR suppliers beyond the EU, especially for biofuels;

- Consider how CDR can be implemented by EU member states in accordance with norms of procedural justice, including the All Affected Principle (AAP), in decision-making concerning the siting locations of CDR facilities;
- Consider how CDR can be implemented by EU member states in accordance with norms of global distributive justice, with a focus on avoiding harmful impacts upon non-EU nations, and especially in low and middle income countries.

Who is this for?

This brief seeks to inform EU policymakers and officials involved in the international coordination of climate policy and the coordination of research ethics. In addition to these core targets, the brief will also be of interest to Intergovernmental Organisations including agencies of the UN system, national governments, research funders and research policymakers at both the national and international levels, and research organisations.

Background

CDR is already part of many national climate mitigation strategies. Some techniques, such as carbon sequestration in agriculture, may benefit both climate mitigation and agricultural productivity, and be cost-neutral. Some forms of CDR, such as Direct Air Capture with carbon capture and storage (DACCS), show few environmental side effects, but are limited by very high unit costs. Other forms of CDR, such as Bioenergy





with Carbon Capture and Storage (BECCS), raise considerable ethical concerns if deployed at large scales and inappropriately governed. Furthermore, these risks accumulate as near-term mitigation is deferred.

Ethical and governance concerns related to with CDR include:

- **A 'moral hazard' effect** when the presumed (but unproven) future availability of CDR at large scales encourages slower near-term emissions reduction;
- **Unjust distribution of the costs** of CDR, including regressive economic effects;
- **Unjust uses of CDR within climate policies**, such as to protect stranded fossil assets;
- **Unjust side effects of CDR implementation**, including effects on biodiversity, food security, water resources, and human rights;
- **Ineffective climate action** as the mitigation potential of CDR measures might prove much lower than expected;
- **Insufficient public participation** in CDR decision-making, including implementation, and siting of locations.

prices by competing with food production for land, which would also lead to losses in biodiversity;

- » On LNOB, consider those who are directly affected by CDR in the design and implementation of CDR measures. CDR has the potential to exacerbate economic inequalities. These risks may be overcome through appropriate policy design, including international financing and redistribution of carbon pricing revenues; and by involving local stakeholders in decision-making and implementation, such as in reforestation programmes;
- Clarify how CDR can be implemented by EU member states in accordance with the UNFCCC's principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC). The costs associated with individual CDR techniques (regarding research, deployment, and management) for countries should be proportional both to their contribution to climate change and their ability to pay for climate policies;
- **Scrutinize the role of the fossil fuel industry in CDR deployment.** CBDR-RC includes the Polluter Pays Principle (PPP) and the Ability to Pay Principle (APP). Given the large historical emissions of the fossil fuel sector, there are serious justice concerns with economic incentivization of these actors to undertake CDR. Where possible, entities without large historical emissions should be prioritized for subsidies to undertake CDR;
- Clarify how CDR can be implemented by EU member states in accordance with the EU's Biodiversity Strategy 2030, especially the potential for 'nature-based' forms of CDR. Enhancing natural processes, for instance through afforestation and reforestation, soil carbon sequestration in croplands and grasslands, agroforestry, peatland and coastal wetland restoration, and improved forest management, has both a high mitigation potential and potentially beneficial effects on biodiversity.

Key messages



Clarify CDR implementation under existing principles and commitments

- Clarify the implications of existing EU principles for the implementation and governance of CDR, in particular the Do No Significant Harm (DNSH) principle and the Leave No-one Behind (LNOB) principle;
 - » On DNSH, consider harms to human life, security, wellbeing, and prosperity, and ecological harms, which harm both people and nature. For instance, unregulated bioenergy production is likely to raise food





Establish fair and effective governance of CDR

- **Establish effective CDR governance** which ensures fair and sustainable implementation of CDR across the EU and CDR suppliers beyond the EU, especially for biofuels;
- **Harmonise industrial policy on CDR with climate policy** to ensure current action is consistent with future requirements for carbon removals. Conduct frequent periodic assessment to prevent under-delivery;
- **Set out clear objectives on CDR capacity and long-term ambitions** as a matter of industrial policy, and clear metrics for assessing removals against emissions reduction targets;
- **Anticipate the moral hazard effect** by prioritizing emissions reduction measures over CDR measures and using CDR only as a complement to extract carbon emissions from economic activities that are the most difficult to decarbonise;
- **Consider how CDR can be implemented by EU member states in accordance with norms of procedural justice**, including the All Affected principle, in decision-making concerning the siting locations of CDR facilities;
- **Consider how CDR can be implemented by EU member states in accordance with norms of global justice**, with a focus on avoiding harmful impacts upon non-EU nations, and especially in developing countries. For instance, consider including protections for fundamental rights in the criteria for certifiable removals under the European Commission's Carbon Removal Certification Framework (CRCF) initiative;
- **Include transfers of CDR technologies to developing countries** in climate finance obligations and in measures to counteract carbon leakage.

Further reading



- Adomaitis, L., Grinbaum A., Lenzi, D. (June 2022) TechEthos D2.2: Identification and specification of potential ethical issues and impacts and analysis of ethical issues of digital extended reality, neurotechnologies, and climate engineering. TechEthos Project Deliverable. Available at: techethos.eu.
- Cannizzaro, S., Bhalla, N., Brooks, L. and Richardson, K. (2023), TechEthos Deliverable D5.3: Operational guidelines/codes for selected technologies. TechEthos Project Deliverable. Available at: techethos.eu.
- Vinders, Julie (2023). TechEthos D5.2 Enhancing Legal Frameworks at the National and International Level, For the governance of climate engineering, neurotechnologies and digital extended reality. TechEthos Project Deliverable. Available at: techethos.eu.
- Vinders, J., Howkins, B. (2023). Policy briefs on enhancing EU legal frameworks. Deliverable 6.2 for the European Commission. TechEthos Project Deliverable. Available at: techethos.eu.

This policy brief is based on the results of the social, ethical, and legal analyses of the TechEthos project. Policy briefs on other project results are provided at www.techethos.eu.

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