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Expanding our understanding of the potential to use marine Carbon Dioxide Removal (mCDR) approaches to support climate mitigation efforts in an environmentally safe, socially acceptable and economically viable manner.

A blueprint for sustainable marine Carbon Dioxide Removal

Human-driven greenhouse gas emissions, including carbon dioxide (CO_2), are driving rapid global warming, with potentially catastrophic consequences on human populations and natural ecosystems. Limiting this temperature increase to below 2˚C in line with the Paris Agreement requires an urgent reduction in emissions as well as CO_2 to be safely and sustainably removed from the atmosphere.

As the largest surface reservoir of exchangeable carbon, the ocean has huge potential to help meet global Carbon Dioxide Removal (CDR) targets. Natural marine processes already absorb approximately 10 billion tonnes of atmospheric CO_2 annually (equivalent to 25% of human-induced emissions). mCDR approaches typically seek to replicate or enhance these natural processes.

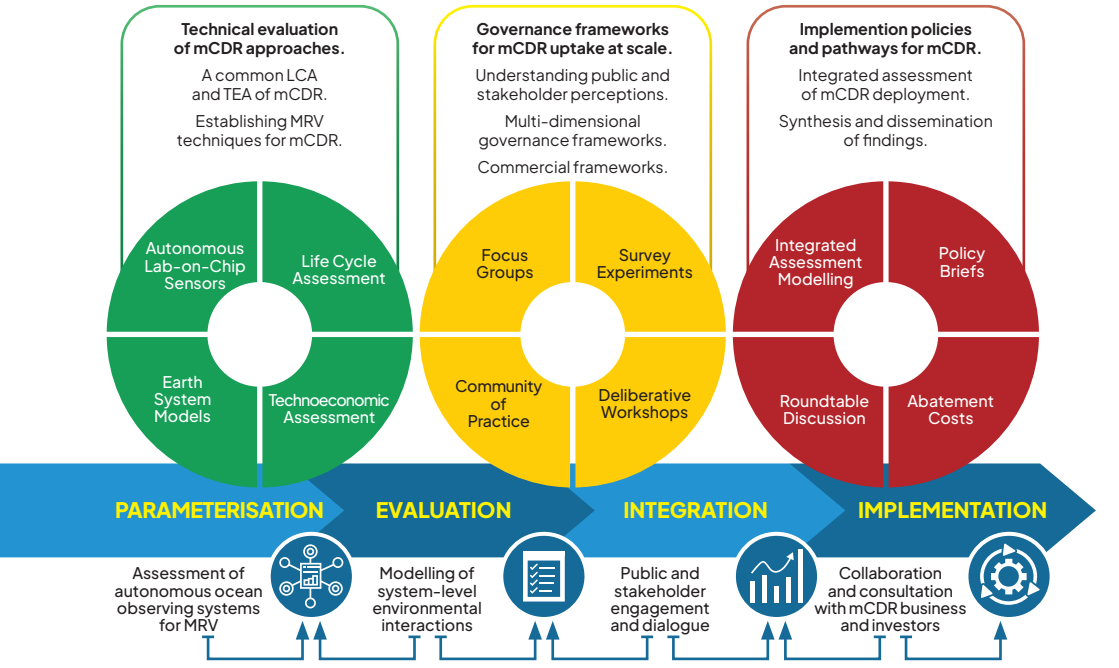
While the scientific concepts behind most mCDR approaches are well understood, many uncertainties remain regarding the costs, impacts and trade-offs associated with conducting mCDR at commercially and climatically relevant scales. Advancing responsible mCDR implementation therefore requires robust monitoring mechanisms, governance frameworks and improved understanding of public perception towards the different technologies and their potential social and environmental impacts.

The SEAO2-CDR project is working to help overcome these challenges. By integrating state-of-the-art scientific, social, legal and commercial knowledge we are developing the tools, mechanisms and guidelines required to ensure that potential mCDR techniques can be developed and assessed in a responsible and transparent manner.

Activities conducted through SEAO2-CDR will:

- Enhance our understanding of emerging mCDR approaches by characterising their potential using common frameworks for life cycle assessments (LCA) and techno- economic assessments (TEA).
- Develop, assess and harmonise technological solutions for mCDR monitoring, reporting and verification (MRV).
- Improve understanding of public and stakeholder perceptions by exploring the societal acceptability of mCDR.
- Derive a scientifically grounded and stakeholder oriented multidimensional governance framework for mCDR that considers the legal, ethical, policy and geopolitical implications of upscaling mCDR approaches.
- Develop the commercial frameworks and incentivisation strategies needed to support the potential for mCDR operationalisation, including via improved abatement cost estimates and standardised carbon accounting.
- Support assessment of the ecological and economic feasibility of mCDR deployment on a regional scale through the improved representation of mCDR approaches in Integrated Assessment Models (IAMs).
- Generate the roadmaps required to help policy makers bring mCDR to scale.

Evaluating and assessing mechanisms for enabling environmentally safe, socially acceptable and economically viable implementation of mCDR.



About the SEAO2-CDR Consortium.

The SEAO2-CDR project, funded by the EU and UKRI, runs from June 2023 until June 2027. Our consortium consists of 14 partners from across Europe.

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SEAO2-CDR Partners

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Edinburgh, UK

University of Cambridge
Cambridge, UK

National Oceanography Centre
Southampton, UK

University of Leiden
Leiden, The Netherlands

Uniresearch
Delft, The Netherlands

CASE - Center for Social and Economic Research
Warsaw, Poland

World Ocean Council Europe
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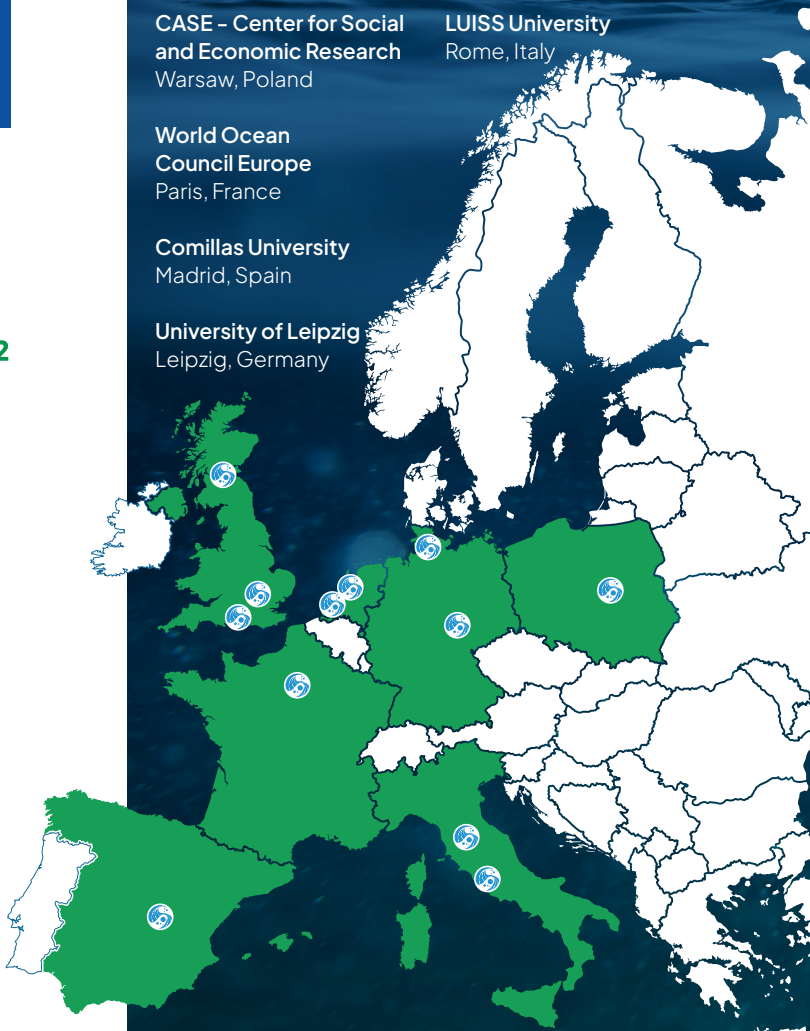

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