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Global governance of ocean-based negative emission technologies. Exploring gaps, challenges, and opportunities

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To achieve the ambitious but necessary climate targets set by the Paris Agreement, the IPCC model pathways for limiting global warming to 1.5°C compared to pre-industrial levels make apparent the need for safeguarding and enhancing the natural global carbon sink – including via carbon dioxide removal (CDR). A range of ocean-based CDR approaches, also termed “negative emissions technologies” (NETs), has been proposed to make use of the ocean’s potential to take up carbon dioxide from the atmosphere and store it in water, biomass, and sediments. The governance framework in place to regulate CDR in the ocean, at this time, is limited to the direct and articulate regulation of ocean fertilization. Meanwhile, other NETs such as ocean alkalinity enhancement and artificial upwelling emerge, but a comprehensive and foresight-oriented regulation for the testing or even deploying at larger scale is missing. Specifically, there is large uncertainty on unintended (positive and negative) effects of these technologies on the condition of the ocean, in addition to enhanced carbon uptake and storage, and how these may impede on or support other global sustainability goals. The deployment of NETs in the ocean poses additional governance complexities relating to unknowns, uncertainties, and transboundary issues. In a study that is part of the EU H2020-project OceanNETs, we explore to what extent the current global governance framework directly or indirectly regulates emerging ocean-based NETs and reflect on the particularities and requirements for their comprehensive governance. The analysis considers the gaps, challenges, needs, and opportunities for comprehensive governance of ocean-based NETs.