Ocean-based Negative Emission Technologies

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Abstract: This report provides an overview on the cooperation activities with relevant EU projects and other initiatives on negative emission technologies in the first phase of the OceanNETs project (01.07.2020 – 31.12.2021).

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OceanNETs Report on cooperation activities

Introduction

This report on cooperation activities with relevant EU projects and other initiatives is a living document that will be updated as new opportunities for engagement are identified and exploited. The document will be updated before every periodic report.

Establishing a dialogue or clustering with other ongoing projects on negative emission technologies (NETs) or in related, relevant fields is important for obtaining information that is beyond the scope of OceanNETs. This is / will be done on a strategic and operational level, i.e., efforts have been / will be made to go beyond the simple exchange of information, and as the project progresses, we ultimately aim to hold joint meetings and develop products together (e.g., databases, synthesis papers, assessment reports, joint participation in meetings upon request of the European Commission to promote the outputs of the projects). As outlined below joint events have already occurred.

Cooperation with other EU projects on NETs

Three projects were funded under call **H2020-LC-CLA-2018-2019-2020**, work programme topic **LC-CLA-02-2019 - *Negative emissions and land-use based mitigation assessment, sub-topic a) Feasibility of negative emissions for climate stabilization***. These were NEGEM, LANDMARC, and OceanNETs. As the LANDMARC project focuses mostly on land-based mitigation, while NEGEM covers both land and ocean-based NETs, we have focused mostly on establishing close ties with the NEGEM project as their research on ocean-based CDR is highly relevant for OceanNETs. Information exchanges between the LANDMARC and OceanNETs coordinators have also occurred, but as the research topics are quite different (land vs. ocean NETs) we have not coordinated our activities as closely as with the NEGEM project.

OceanNETs and NEGEM project coordinators first spoke in the spring of 2020 and arranged opportunities to attend and present an overview of each project at the other's kick-off meeting in the summer of 2020. That is, the OceanNETs coordinator gave a 5 min. presentation at the NEGEM kick-off and the NEGEM coordinator did the same at the OceanNETs kick-off meeting. NEGEM consortium members were also invited to attend most of the OceanNETs kick-off meeting presentations (i.e., those that were not internal matters). It was agreed that these presentations were to be made available for the consortiums via their internal websites. Contact information (e.g., work package leader email addresses) was also shared with the NEGEM consortium.

In the first few months of the OceanNETs project the NEGEM coordinator was also invited to become a member of the OceanNETs international scientific advisory board and attend the board meeting. Note that when the NEGEM coordinator changed from

Ilkka Hannula to Kati Koponen, the advisory board position was then offered to and accepted by Dr. Koponen. The NEGEM project also invited D. Keller (the OceanNETs coordinator) to become a member of their advisory board and attend board meetings.

OceanNETs was also offered the opportunity to present at a NEGEM event on Dec. 11, 2020 and did so, providing a more in-depth introduction to the project work packages. As the LANDMARC project leaders and consortium members also attended and presented at this event, we shared the OceanNETs presentation with LANDMARC (i.e., the ppt was made available for them to download; workpackage leader contact information was also shared).

Since the start of the OceanNETs project we have held several knowledge sharing seminars (via Zoom) that were aimed mainly at educating other consortium members about either a specific type of ocean CDR (e.g., how it works) or about how a particular discipline is conducting research. We invited NEGEM partners to attend several of these seminars.

There have also been a few discipline / topic specific meetings between NEGEM and OceanNETs partners. For example, researchers who work with stakeholders and the public (WP2, WP3, WP7) met with their corresponding NEGEM partners to discuss best approaches for moving from having in-person focus groups and workshops to holding online focus groups and workshops (due to the COVID-19 situation making in-person meetings impossible for some time). A meeting was also held with the NEGEM stakeholder interaction manager to coordinate stakeholder activities in WP7 (e.g., to make sure that OceanNETs and NEGEM were not contacting the same stakeholder about the same topic).

OceanNETs has also had a discussion with members of the EU ERC-funded GENIE project (GeoEngineering and Negative Emissions Pathways in Europe) about sharing information on ocean-based CDR and potentially collaborating on policy briefs. To help GENIE, D. Keller participated in a GENIE led interview and survey on the topic of ocean CDR. While concrete plans have not yet been made, we will continue to pursue such collaborations.

OceanNETs has also participated in two EU knowledge sharing event (Nov. 26, 2020 and Dec. 7, 2021) that involved other projects who work on the same topic. These knowledge sharing events were coordinated by one of the projects (not yet OceanNETs, but our time will come) and involved the projects meeting beforehand to plan presentation topics and ensure that the presentations were complimentary.

OceanNETs also joined forces with several other projects including NEGEM, LANDMARC, and GENIE to hold a COP26 side event at the EU pavilion (01.11.21).

The topic of the presentation was Policy, business, and social challenges for carbon dioxide removals and carbon capture & storage.

OceanNETs also has close ties with EU H2020 COMFORT project (Our common future ocean in the Earth system – quantifying coupled cycles of carbon, oxygen, and nutrients for determining and achieving safe operating spaces with respect to tipping points). Here the OceanNETs coordinator (D. Keller) leads the COMFORT work package “Ocean mitigation options assessment” (WP5), which focuses heavily on ocean-based NETs. The exchange of information is beneficial to both projects.

The LANDMARC project has initiated an effort to write a practical handbook on NETs. OceanNETs has been invited to join this effort and partners are considering how they can best contribute.

The coordinators of OceanNETs, LANDMARC, and NEGEM have spoken about holding a joint meeting (e.g., policy event) towards the end of the projects to maximize the sharing of results. We have also discussed writing together either a policy brief or some other product. While concrete plans have not yet been made, we will continue to pursue such collaborations.

Cooperation with other projects on NETs

In Germany, a new research mission on ocean-based CDR, *CDRmare* (<https://cdrmare.de/en/>), was launched in August, 2021. Over the next three years, some 200 scientists will be investigating “*Marine Carbon Sinks in Decarbonisation Pathways*”, with a focus on CDR for Germany. The mission is coordinated by the GEOMAR Helmholtz Centre for Ocean Research, Kiel, and the Leibniz Institute for Baltic Sea Research Warnemünde (IOW). The German Federal Ministry of Education and Research is funding the research mission, providing 27 million euros over an initial period of three years. Six consortia will study different methods of marine carbon dioxide removal and storage, looking at their potential, risks, and possible side effects, as well as identifying their impact on the marine environment, the Earth system and society, and bringing them together in a transdisciplinary assessment framework. Many of the German partners who are involved in OceanNETs are also PIs in one or more CDRmare projects (e.g., ASMASYS, RETAKE, and Sea4soCiety). For the projects that they are involved in these PIs have proposed, and begun, research that extends and compliments the work being done in OceanNETs. Work with stakeholders is also being coordinated between CDRmare and OceanNETs. Cooperation activities will be undertaken when opportunities arise, including future joint policy events and publications.

D. Keller (OceanNETs coordinator) and P. Renforth (WP6 leader) were on an expert panel on ocean-based CDR that was convened by the Energy Futures Initiative organization and tasked with providing information used to write a report called

“Uncharted Waters, Expanding the Options for Carbon Dioxide Removal in Coastal and Ocean Environments”. The report is available at: <https://energyfuturesinitiative.org/s/Uncharted-Waterspdf.pdf>

A. Oschlies (OceanNETs core themes coordinator) and P. Renforth (WP6 leader) were appointed to a USA National Academy of Sciences, Engineering, and Medicine committee to write a report on, *“A Research Strategy for Ocean-based Carbon Dioxide Removal and Sequestration”*. The report is available at: <https://doi.org/10.17226/26278>

D. Keller (OceanNETs coordinator) was on an expert panel that was tasked with providing guidance on responsible ocean-based CDR research and development (i.e., a code of conduct). The initiative was led by the Aspen Institute and the document is available at: <https://bit.ly.co/9zrs>