# Ocean-based Negative Emission Technologies

OCEAN NETs

| Deliverable Title | D3.5: Report on public perceptions in cross-country survey |
|---|---|
| Lead | IfW |
| Related Work Package | WP 3 |
| Related Task | Task 3.3 |
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| Prieto Dissemination Level | Embargoed |
| Due Submission Date | 30.04.2023 |
| Actual Submission | 30.09.2023 |
| Project Number | 869357 |
| Start Date of Project | 01. July 2020 |
| Duration | 60 months |

**Abstract:**
This deliverable synthesizes the first results on public perceptions of marine Carbon Dioxide Removal (CDR) methods from a cross-country survey in Canada, China, France, Germany, Norway, and Taiwan. The purpose is to inform the other work packages in OceanNets and stakeholders about our results in a timely and brief manner about the ways members of the public view marine CDR specifically. The survey was fielded in April 2023, has approximately 2000 observations in each country, and aims to be representative for the population active online in the respective country. It covers the marine CDR approaches ocean alkalinity enhancement (OAE), macroalgae farming with BECCS (mBECCS) or macroalgae farming with biomass sinking. Our analysis found notable differences in perceptions of the three methods and between the countries. OAE received the largest shares of negative assessments in all countries, mBECCS received the highest shares of positive assessments. Overall, respondents in the Asian countries assess ocean-based CDR approaches more positively than respondents in Western countries. We also find differences in self-reported familiarity. In Western countries, a majority (55-84%) report never having heard of these approaches; in Asian countries, a majority (56-75%) report having heard of the approaches before. Results on the associations with the methods confirm the results for the general question and add more nuanced insights into how the methods are perceived. The survey also included an experimental design that indicates a potential spillover effect, wherein presenting OAE first negatively influenced perceptions of the subsequent technology.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 869357.

**Document History**

| Date | Version | Description | Name/Affiliation |
|---|---|---|---|
| 30.09.2023 | 1.0 | First submitted version. | Merk, Andersen & Tvinnereim |

## List of abbreviations, acronyms and definitions

| | |
|---|---|
| BECCS | Bioenergy with Carbon Capture and Storage |
| CCS | Carbon Capture and Storage |
| CDR | Carbon Dioxide Removal |
| mBECCS | Marine bioenergy with Carbon Capture and Storage |
| NETs | Negative Emission Technologies |
| NGO | Non-governmental organisation |
| OAE | Ocean Alkalinity Enhancement |

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**Acknowledgements**
Christian Rischer for research assistance. Tony Cabus, Wan-Shin Liu, Wanxuan Ben Yao and Corentin Poyet, for help with the translation. Åsta Dyrnes Nordø contributed to discussions of survey items and design.

# 1. Introduction

## 1.1 Context

OceanNETs is a European Union project funded by the Commission's Horizon 2020 program under the topic of Negative emissions and land-use based mitigation assessment (LC-CLA-02-2019), coordinated by GEOMAR Helmholtz Centre for Ocean Research Kiel (GEOMAR), Germany.

OceanNETs responds to the societal need to rapidly provide a scientifically rigorous and comprehensive assessment of negative emission technologies (NETs). The project focuses on analyzing and quantifying the environmental, social, and political feasibility and impacts of ocean-based NETs. OceanNETs will close fundamental knowledge gaps on specific ocean-based NETs and provide more in-depth investigations of NETs that have already been suggested to have a high CDR potential, levels of sustainability, or potential co-benefits. It will identify to what extent, and how, ocean-based NETs can play a role in keeping climate change within the limits set by the Paris Agreement.

## 1.2 Purpose and scope of the deliverable

D3.5 reports the results from OceanNETs task 3.3 – a cross-country survey on public perceptions of marine CDR methods. The survey was run in Canada, China, France, Germany, Norway, and Taiwan. The purpose of this deliverable is to inform the other work packages in OceanNETs and stakeholder beyond the project about our results in a timely and brief manner about the ways marine CDR options are viewed by the public.

## 1.3 Relation to other deliverables

The survey design for task 3.3 built on the results of the two previous tasks in WP3 as reported in D3.1-D3.3 and summarized in D3.4. D3.5 will inform the work package synthesis report, D3.6, and the overall project synthesis (D7.10 and D7.12).

## 2. Cross-country survey

Work Package 3 seeks to provide a deeper understanding of the variations in acceptance of ocean-based CDR based on individual values, political attachments, framings, preferences related to fairness, and demographics. We assessed laypersons' perceptions and reasoning about marine-based CDR through focus groups in Germany and Norway (task 3.1) and a deliberative mini-public (task 3.2). The main objective for the comparative survey experiment is to explore cross-country variation in perceptions of and associations with marine CDR methods, their risks and benefits. Further, the study also provides the opportunity to explain variations in acceptability, based on attitudes, demographics and across national contexts.

Building on the results of the focus groups and the deliberative survey, we further narrowed down our focus to compare perceptions of three different marine CDR options:

(1) Macroalgae cultivation, i.e. seaweed, and using it for Bio-energy with Carbon Capture and Storage (Marine BECCS)
(2) Macroalgae cultivation with sinking it to the bottom of the sea
(3) Ocean alkalinity enhancement (OAE)

This provides different dimensions for comparison: biological vs. chemical removal, geological storage (via CCS) vs storage in the water vs. storage on the seafloor. The survey countries include countries with prior experience with ocean iron fertilization or direct CO2 injection, such as Canada, Germany, and Norway (Figueiredo, Reiner, and Herzog 2003; Gannon and Hulme 2018; Gewin 2002; Giles 2002; Schiermeier 2009). In Norway and Canada, liming has been practiced to mitigate the acidification of lakes and watersheds (Moore et al. 2015; Rosseland and Hindar 1988). Since the 80ties, forests have been limed in Canada and Germany to improve forest health (Moore et al. 2015) . While Norwegian focus group participants were aware of liming activities in the past, German participants were not aware of such widespread practices beyond the application in gardening (Veland and Merk 2021).

The relationship to the ocean varies between countries and also the openness to technological innovation. Together with the variation in the cultural background, we expect these factors to influence the perception of marine CDR (see (Andersen et al. 2022) for discussion).

### 2.1 Survey design and implementation

#### Experimental design

The English language version of the questionnaire is available in the appendix. Figure 1 illustrates the survey's experimental design. The participants were randomly assigned to one of eight treatment groups. Groups 1-4 first answered questions about their support of or opposition to climate policies in their country, such as increasing taxes on fossil fuels, and removing $CO_2$ from the air. A brief explanation of CDR was given without mentioning specific approaches. These were

followed by two blocks of information and questions about specific marine CDR options. Groups 5-8 first assessed two technologies and then answered the general questions pertaining to climate policy and the deployment of CDR. By comparing the outcomes of groups 1-4 and groups 5-8 we can determine whether providing information about CDR approaches increases support for reducing emissions as we had previously observed in the focus groups (Veland and Merk 2021) and the deliberative survey (Andersen et al. 2022) or if it actually decreases support for climate policies that reduce emissions, so called moral hazard.

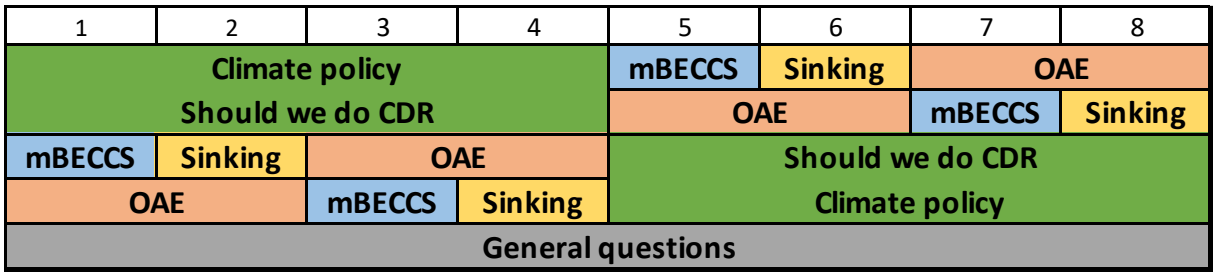


*Figure 1: Design of the survey experiment, showing the variation in the sequence of question blocks.*

To reduce survey complexity and duration, every participant evaluated two out of three methods. All participants evaluated ocean alkalinity enhancement (OAE), also known as ocean liming. Respondents in odd-numbered groups evaluated macroalgae cultivation with marine Bioenergy with Carbon Capture and Storage (mBECCS), while respondents in even-numbered groups evaluated macroalgae cultivation with subsequent sinking of the biomass to the seafloor. The order in which the methods were presented varied. Thus, we can identify context effects and interactions between technologies. In the focus groups (Veland and Merk 2021), coastal ecosystem management was presented last after introducing and discussing OAE, ocean iron fertilization, and artificial upwelling. We observed that participants were relieved when they heard about the ecosystem-based approach and stated that this was finally something they could agree to. We want to test, whether this effect also occurs for seaweed-based approaches.

**Descriptions of technologies**

The descriptions of technologies followed the same logic and the questions assessed the same aspects for all methods. They were adapted from the descriptions in the mini-public survey (Andersen et al. 2022). We describe the underlying natural processes and the way the uptake would be intentionally enhanced. Resources required for implementation such as mined rock and energy for grinding in the case of OAE are also detailed. The effects on other marine activities such as aquaculture that precludes fishing and shipping, are considered. Additionally, applicable side-effects, co-benefits, and remaining uncertainties are explained. For instance, mBECCS provides bioenergy but the macroalgae farms can deplete nutrients. Macroalgae farming for sinking has the same negative side-effect, the permanence of $CO_2$-storage is very uncertain, and is does not have any co-benefits. OAE can counteract ocean acidification but necessitates new quarries and its side-effects on the marine environments remain uncertain or unknown.

The descriptions varied in length. The English description of ocean liming is shortest with 133 words, followed by macroalgae cultivation with sinking with 148 words and marine BECCS with

207 words. The description of mBECCS is longer because it included a description of CCS. We avoided complicated language, so we used ocean liming instead of ocean alkalinity enhancement, seaweed instead of macroalgae, or air instead of atmosphere.

**Questionnaire design**

Participants were then asked whether they would feel positively or negatively if their country used this method to remove $CO_2$ from the air. To measure perceptions more broadly, participants were then able to choose any number of associations they had with the technology from a list of 8 terms. The list included 4 positive terms – natural, innovative, environmentally friendly, feasible – and 4 negative terms – harmful, risky, costly, and uncontrollable. They could also enter free text responses. We then asked about whether respondents thought the measures could help fight climate change, whether they were worried that the method might do more harm than good, or that the stored $CO_2$ might leak back into the atmosphere. Finally, we asked if they saw an opportunity to create jobs by deploying the method. Because the methods tend to be less well known to the lay public, we asked respondents for all methods whether they had heard of them, and the response scales for the rating questions included "don't know" and "no opinion" options. After reading and rating two methods, they were asked to write a few words about how they felt about them.

At the end of the survey, all respondents received more general questions about their perception of climate change, worry about environmental problems, trust in institutions, political preferences, and their personal connectedness to the ocean.

Comparing survey results between countries can be difficult because words that have different meanings and connotation can bias results and cultural differences, such as stronger effects of social desirability in Asian countries, can lead to systematically different response levels (Middleton and Jones 2000). To ensure the comparability and reliability of data across 6 countries and languages, we apply several strategies: Whenever possible, we use established questions and response scales that have already been tested and used in other internationally comparable surveys such as the European Perceptions of Climate Change Project (Steentjes et al. 2017) or other studies that had already validated the items (Kleespies et al. 2021). Especially questions on climate change (policy) perceptions were already available. To measure perceptions of the three technologies we used different question and response formats, such as Likert-Scales and multiple-choice questions. We use items that ask about benefits and about harms. This allows to assess different dimensions and reduce social desirability bias. In addition, we combine qualitative and quantitative data. The qualitative data from free-text answers adds depth and context to the quantitative findings. Introducing experimental variation within the survey design can help identify causal relationships and enhance the survey's analytical power. By systematically varying certain factors, we can draw more robust conclusions about relative changes in within-country perceptions.

The original English survey was translated by professional translators who are well-versed in both the source and target languages. Their expertise promotes accurate and culturally sensitive translations of survey materials. Especially, the description of the technologies contains unusual and potentially complicated terms that should be as accessible as possible to respondents in all

languages. We, therefore, provided the translators with a dictionary for the technical terms such as ocean liming where colleagues from the marine CDR community who are native speakers provided translations into their languages. They also helped with the quality control of the translations. Their input helped identify any nuances, idiomatic expressions, or cultural references that might require adjustment. Incorporating these quality control measures into the survey process promotes that the data collected is not only accurate but also culturally sensitive and methodologically sound. This, in turn, facilitates meaningful international comparisons and enhances the overall reliability of the survey's findings.

**Survey administration**

We conducted an online survey from March, 29th to April 20th, 20231. The survey aimed to collect 2000 observations per country, and we selected respondents based on age, gender2, and education quotas to ensure that the sample was representative of the active online population. Consequently, the sample skews towards younger and more highly educated individuals compared to the general population in the respective countries. In China, the study sample is limited to major coastal cities due to the inability to achieve adequate representation for inland regions. Figure A-1 displays the distribution of age groups, gender, and educational attainment levels. Respondents in China and Taiwan are on average the youngest and in Germany the oldest. The share of survey participants with higher education degrees ranges from 39% in France to 47% in Taiwan, with the German sample having only 27% which is due to differences in the education system.

Already during data collection, speeders were excluded from the sample. Speeders were respondents who took less than 7 minutes to fill out the survey. The median completion time was lowest in Norway with 11′29′′ and highest in China with 18′08′′. The difference is probably not driven by the cultural background as interviews in Taiwan took a median time of 14′03′′.

After completing the survey, participants were asked to rate how easy or difficult they found the survey. France had the highest proportion of participants who found the survey “rather difficult” or “very difficult” at 15% and 4%, respectively, while China had the lowest at 6% and 2%, respectively. The results showed that 11% found the survey “rather difficult” and 2% found it “very difficult”, on average. Additionally, approximately 49% and 39% of participants found the survey to be “rather easy” or “very easy” to comprehend.

[1] After quality control, a few observations had to be replaced in a new round of recruitment. These were surveyed May 5th – May 9th & May 23rd.

[2] A small share identified as non-binary (max. 0.95% in Canada). As there are no estimates for the share of non-binary people in the population available, we were not able to use quotas for this group. Furthermore, their small number renders statistical analysis problematic. We therefore had to exclude them from the analysis.

## 2.2 Survey results

The share of respondents unfamiliar with the respective method is greatest for OAE, ranging from 38% in the Chinese sample to 84% in the German sample (see Figures A-2 – A-4). In the Western countries, only a small percentage of respondents have substantial level of prior knowledge. Awareness of seaweed farming and sinking it to the ocean floor is somewhat higher across all countries. In China and Taiwan, only 40% and 31%, respectively, were not previously aware of it, while this figure amounts to 80% in Canada. Farming seaweed and using it to generate biomass in combination with CCS is most well-known. In Taiwan, up to 26% of respondents reported familiarity with it. Conversely, this method is least known in Canada, where 72% of respondents have never heard of it. Among the Western countries, Norway stands out with only 55% of respondents reporting no prior knowledge. This difference can likely be attributed to the relatively high level of awareness about CCS in Norway (Merk et al. 2022).

Tables A-6 through A-8 in the Appendix show the distribution of responses to the question of how respondents would feel if their respective countries began using this technology. We used a 6-point Likert scale ranging from very negative to very positive, in addition to the options "don't know" and "no opinion" (NODK). Notably, our results show that the NODK share was consistently highest for Ocean Alkalinity Enhancement (OAE) across all countries surveyed, with percentages ranging from 5% in China to 22% in Norway. On the other hand, the NODK share was consistently lowest for marine bioenergy with Carbon Capture and Storage (BECCS) across all countries, ranging from approximately 5% in China and Taiwan to 16% in France. Overall, Chinese and Taiwanese respondents were less likely to select the NODK option. However, respondents from Taiwan were significantly more likely to express uncertainty (NODK) when it came to OAE compared to the other two methods (one-sided binomial test $p<0.001$).

Our analysis found notable differences in perceptions of the three methods and between the countries. Firstly, there was a consistent gap in how these technologies were assessed. OAE received the largest shares of negative assessments in all countries, indicating higher levels of skepticism or concern among respondents. On the other hand, mBECCS received the highest shares of positive assessments. It is noteworthy that the evaluation of seaweed sinking was more similar to the sentiments about OAE, potentially revealing similar concerns or uncertainties about the two approaches.

Norway had the most favorable attitude towards all three approaches in Western countries. However, the variation in assessments between Western nations was small for marine BECCS, indicating more similar perceptions of this method between these countries. Chinese and Taiwanese respondents showed a more positive attitude towards the two seaweed-based methods compared to Western respondents. In China, participants also expressed more favorable views about OAE. In Taiwan, on the other hand, OAE was evaluated in a comparable way as in the Western countries.

The results on the associations with the methods confirm the results for the general question and add more nuanced insights into how the methods are perceived. Figure 2 shows the share of respondents that had chosen the respective association with the methods. Our findings show that for all Western countries, negative associations with OAE prevail in the responses. The most frequent association with OAE is "risky", followed by "costly". In particular, in Canada, France and Germany, shares are high and range from 37% to 43%. Notably, the associations "harmful" and "uncontrollable" occur less frequently in comparison. Only 11 to 16% of respondents chose positive associations like "natural" or "environmentally friendly". "Innovative" and "feasible" are slightly more common. Regarding positive association, Norway falls somewhere between Western countries and China, with shares of respondents with positive associations similar to the Western countries but lower shares for negative associations. Respondents in China consistently show the highest level of positive associations and have the lowest share for most of the negative associations. Respondents in Taiwan associate OAE more positively compared to the Western countries but less positive than participants in China. Taiwan also has the highest percentage of respondents who consider OAE "risky". The most frequent positive association is "innovative", while "uncontrollable" is not among the strongest negative associations, despite the ocean's transboundary and fluid nature.

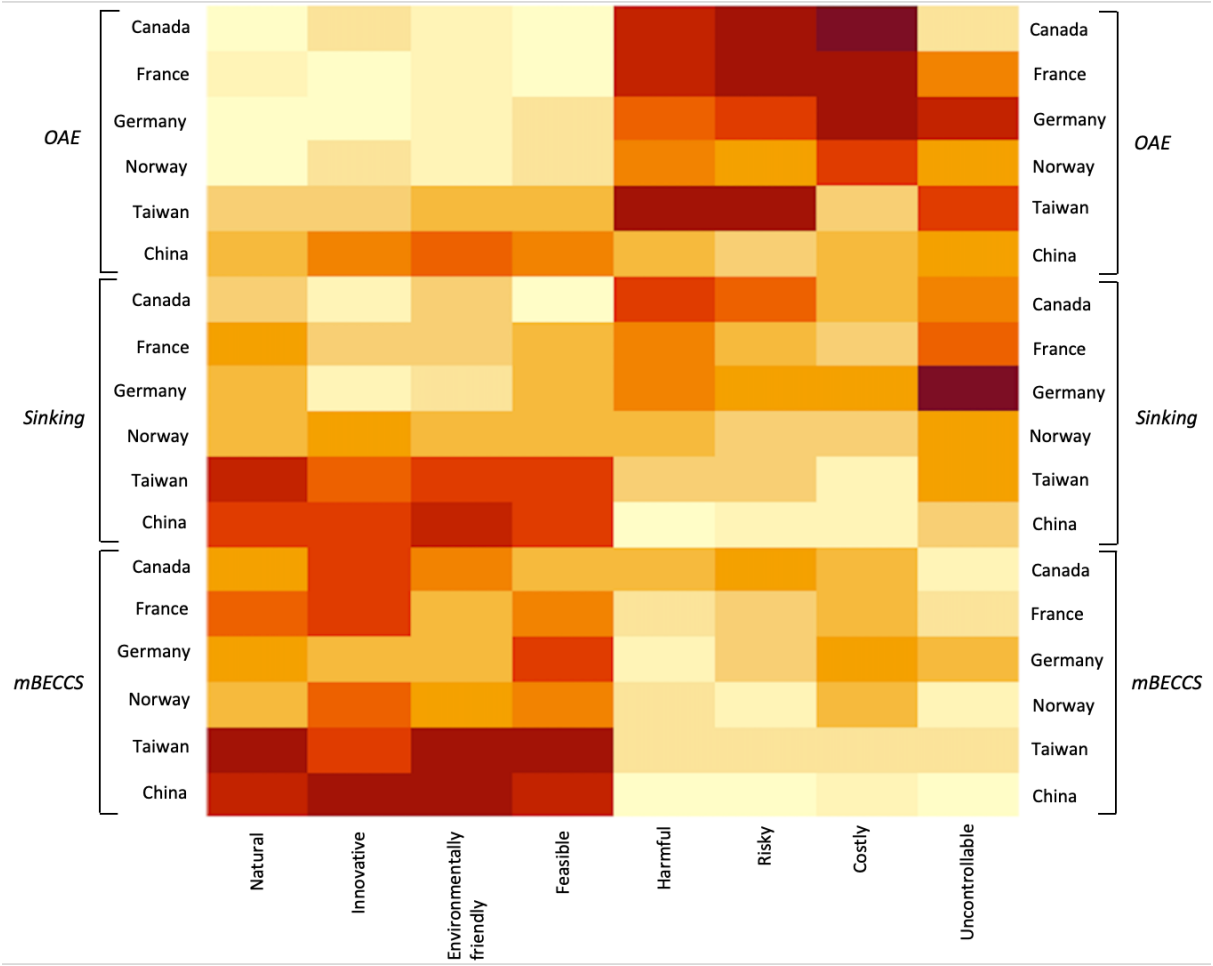


*Figure 2: Heatmap for the share of respondents by country and technology (y-axis) that have chosen the respective association (x-axis)*

*Note: Lighter shades indicate low values, darker shades indicate high values; for data see also Table A-1.*

Positive associations are more frequently selected for both seaweed-based methods, although their shares are lower than for mBECCS. For instance, the percentage of "environmentally friendly" ranges from 17% in Germany to 42% in China for sinking seaweed and from 23% in Germany to 47% in China for mBECCS. "Uncontrollable" is frequently picked for sinking seaweed similar to OAE. This can to a large extent be attributed to the lack of control over storage as this association is markedly less frequent for seaweed farming with BECCS. However, it seems not to be driven by concerns about $CO_2$ leakage but a general sense of risk and potential harm. Concerns about leakage are generally lower for mBECCS than for sinking. However, this difference is significant only for respondents from Germany (t-tests *PERMANENT_mBECCS vs PERMANENT_SINK*: $p<0.05$), Norway ($p<0.05$), and Taiwan ($p<0.001$). The worry that sinking seaweed could do more harm than good is significantly higher than that for mBECCS among individuals from Canada (t-tests TRADEOFF_*mBECCS vs TRADEOFF_SINK*: $p<0.001$), France ($p<0.01$), Germany ($p<0.001$), and Norway ($p<0.05$).

Once more, we can see a clear division between Asian and Western nations. China and Taiwan have comparable levels of positive and negative associations with mBECCS and sinking. Norway's contrast with other Western countries for the two methods is less distinct than with OAE, despite having extensive experience with CCS.

**Experimental results**

The survey's experimental design (see Figure 1) allows us to investigate two questions.
First, we can use it to investigate whether providing information about CDR approaches changes support for policies to reduce emissions. Our preliminary analysis shows that the order of presenting information has no significant effects on the support for climate policies such as increasing fossil fuel taxes, subsidizing renewable energies, banning inefficient household appliances, or committing to lower emissions in international climate negotiations (Wilcoxon ranksum tests). This means informing about CDR methods neither increases nor decreases support for traditional climate policies.

Second, we also varied the sequence of methods in the questionnaire. Table 1 shows the mean difference in the evaluation of a technology between the group that read about the approach second minus the mean of the group that read about it first. Negative values indicate a "penalty" for being presented second. On average, the evaluation is always less positive when the technology is presented second. However, often these differences are not statistically significant except for mBECCS. It was perceived more negatively when OAE was presented first, a pattern observed in all countries except China and Taiwan. For sinking seaweed, we observe a similar pattern, but the effect is weaker and only significant for Germany and France. For OAE, we do not find the same pattern, except for Canada, where OAE was perceived more negatively when presented after sinking seaweed. Interestingly, there were no significant differences in the proportion of "don't knows"/"no opinion" responses between the two presentation sequences, indicating that the level of certainty did not change. Overall, this finding indicates a potential halo effect, wherein the initial presentation of OAE influenced subsequent perceptions of related technologies.

| | OAE vs sinking | sinking | OAE vs. mBECCS | mBECCS |
|---|---|---|---|---|
| Canada | -0.26 ** | -0.11 | -0.07 | -0.29 ** |
| China | 0.02 | -0.02 | -0.05 | -0.07 |
| France | -0.02 | -0.24 * | -0.08 | -0.48 *** |
| Germany | -0.12 | -0.31 ** | -0.13 | -0.33 *** |
| Norway | -0.17 | -0.06 | 0.10 | -0.38 *** |
| Taiwan | -0.07 | -0.07 | -0.05 | -0.12 |

*Table 1: Experimental effect, changes in mean evaluation. Mean comparison (t-tests) for "Imagine that <country> starts to <approach> to remove $CO_2$ from the air. How would you feel about this?" when (reading about <approach> second) – (reading about <approach> first). OAE was always included but in combination with either sinking seaweed or mBECCS. Therefore, the results for OAE specify which approach the respondent read about first.*

*Note: 6-point response scale from "very negative" to "very positive"; two-sided t-tests: * p<0.05 **p<0.01 *** p<0.001*

To explore this change further, we take a closer look at the change in the associations with mBECCS when reading about it second compared to when reading about it first. Figure 3 shows the percentage point change in the share of respondents that had the respective association with mBECCS when reading about mBECCS after OAE compared to reading about mBECCS first. We see that the share that have negative associations (harmful, risky, costly, uncontrollable) increases and the share with positive associations (natural, innovative, environmentally friendly, feasible) decreases. The penalty by association effect is significant for several association in most Western countries. This effect is weaker, not significant and less consistent in the two Asian countries. The largest changes in associations occur in the countries w here we observe the halo effect. In France, the changes for all dimensions are rather large and significant (p<0.01) for "environmentally friendly", "risky", "costly", and "uncontrollable". In Germany, the changes also occur for several associations, but only on a 5%-level. Among Norwegian respondents are particularly more likely to perceive mBECCS as "uncontrollable" and Canadians associate it more often with "risky" and less often with "innovative". We hypothesize that these changes are triggered by the information about OAE that was provided before. As the methods are presented in the same context of removing $CO_2$ from the air, the associations spillover from the less positively perceived technology to the other.

| | Natural | Innovative | Env.friendly | Feasible | Harmful | Risky | Costly | Uncontroll. |
|---|---|---|---|---|---|---|---|---|
| **Canada** | 0,0 | **-6,2** | -4,6 | 4,9 | 2,3 | **9,3** | -2,9 | 1,2 |
| **France** | **-7,7** | -4,0 | **-10,6** | -0,1 | **4,9** | **9,6** | **8,6** | **8,9** |
| **Germany** | -1,4 | **-6,6** | **-6,8** | -4,7 | **3,7** | **6,0** | **6,2** | **5,5** |
| **Norway** | 1,8 | -2,5 | -2,0 | -5,5 | 2,2 | 4,1 | -2,5 | **8,4** |
| **Taiwan** | -2,4 | -3,2 | -2,8 | 1,0 | -0,2 | -1,4 | 1,8 | 1,2 |
| **China** | -1,4 | -4,8 | -0,1 | 1,0 | 0,8 | -4,3 | -0,7 | -2,7 |

*Figure 3: Experimental effect, changes in association for mBECCS. Percentage point change in the share of respondents indicating the associations natural, innovative, environmentally friendly, feasible, harmful, risky, costly or uncontrollable with mBECCS when it is presented after OAE compared to presenting bBECCS before OAE*

*Note: Positive values indicate an increase, negative values a decrease in the share of respondents who had the association; darker blue shades indicate stonger decrease, darker red shades indicate stronger increase. Values printed in bold indicate a significant difference with p<0.05 in binomial tests between groups; framed values indicate a significant difference with p<0.01.*

## 3. Conclusion

The first analysis of the cross-country survey data reveals interesting differences between the approaches studied and differences in public perceptions and associations between the six countries included. Our data indicate low public support for OAE in all countries (Figure A-5); it is also the least known approach (Figure A-2). The associations for OAE indicate that it is often perceived as "risky" and "costly". Fewer associate the approach with "uncontrollable" than we expected based on previous results in focus groups and mini-public. The public support and familiarity with seaweed sinking is also low and comparable to OAE (Figure A-7 and A-4). As for OAE, it is often associated as "risky"; the association for "uncontrollable" is highest for this approach. Of the three approaches studied, mBECCS receives the highest public support. The level can be considered low/medium in Western countries surveyed and medium in Asian countries. The self-reported familiarity varies. The level is higher for China, Taiwan and Norway than for the other approaches (Figure A-6 and A-3). The method also creates the most positive associations (natural, innovative, environmentally friendly, feasible) in almost all countries.

We find interesting differences between the Western and Asian countries surveyed. The public in China and Taiwan evaluate the approaches more positively and report being more familiar with them than in Western countries. There are also differences in the associations the approaches create. Further analysis of the collected data is needed to understand the observed variations across countries and demographic groups. As part of the survey, we included open-text fields that can be used to understand these differences better. Further analysis of these differences will be included in D3.6.

The first analysis of the comparative survey data confirms our previous assessment of the public support level and provides a more nuanced picture of the associations' laypersons' have to the three approaches. Table 2 summarizes public perceptions of the eight NETs studied in WP3. It combines results from focus groups (FG), deliberative survey (DS), and cross-country survey (CS). The table is an updated version of the table provided in D3.4.

| CDR approach | Data | Associations | Concerns | Public support |
|---|---|---|---|---|
| **Artificial upwelling** | FG | Offshore wind energy | Feasibility | Low |
| **Blue carbon ecosystem management** | FG | Natural process | Invasive species<br>Human interventions going wrong | High |
| **Ocean fertilization** | DS | Marine pollution | Feasibility and controllability | Low |
| **Ocean alkalinity enhancement** | FG, DS & CS | Marine pollution, freshwater liming. In CS: risky, costly, not environmentally friendly nor feasible. | Additionality, mining, energy footprint, controllability | Low, low/medium in China. |
| **Enhanced weathering** | DS | Fertilization | Mining, energy footprint | Low/medium |
| **Macroalgae farming** | DS & CS | Aquaculture | Monoculture, pollution | |
| *With sinking* | | Waste dumping at sea. In CS: Risky, uncontrollable | Controllability, impermanence of storage | Low in western countries, low/medium in Asian countries |
| *With CCS* | | CCS as climate solution. In CS: Innovative | Additionality related to CCS | Low/Medium in Western countries. Medium in Asian countries. |
| **Terrestrial BECCS** | DS | Agriculture, CCS as climate solution | Land-use, food production | Low/Medium |

*Table 2: Summary of public perceptions of eight NETs studied in WP3, combined results from focus groups (FG), deliberative survey (DS), and cross-country survey (CS). Data source, associations, concerns and indication of public support.*

We find no evidence for an average effect of providing information about CDR on the support for climate policies such as raising taxes on fossil fuels or subsidizing renewable energies. Thus, this does not align with our previous research on the matter. Our focus groups (Veland and Merk 2021) and the deliberative survey (Andersen et al. 2022) both showed an increase in the perception of urgency to cut emissions. Neither do the results support prior findings from the literature where information on CDR has led to less support for climate policy (Campbell-Arvai et al. 2017). Further

analysis of our data must investigate if this finding is robust across sub-groups such as respondents with higher and lower concerns about climate change.

To analyze interactions and context effects of the sequence in which the methods are presented, we randomized the order in which respondents were informed about the methods. Contrary to our hypothesis based on findings from the focus groups, we observe a negative effect on the evaluation of mBECCS when it is presented after OAE. This halo effect occurs in the Western countries and does not – or only to a limited extent – extend to seaweed sinking. We hypothesize that these changes are triggered by the information about OAE that was provided before. As the methods are presented in the same context of removing $CO_2$ from the air, the associations spillover from the less positively perceived technology to the other. As sinking seaweed is in general perceived less positively than mBECCS this halo effect does not occur.

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## Appendix

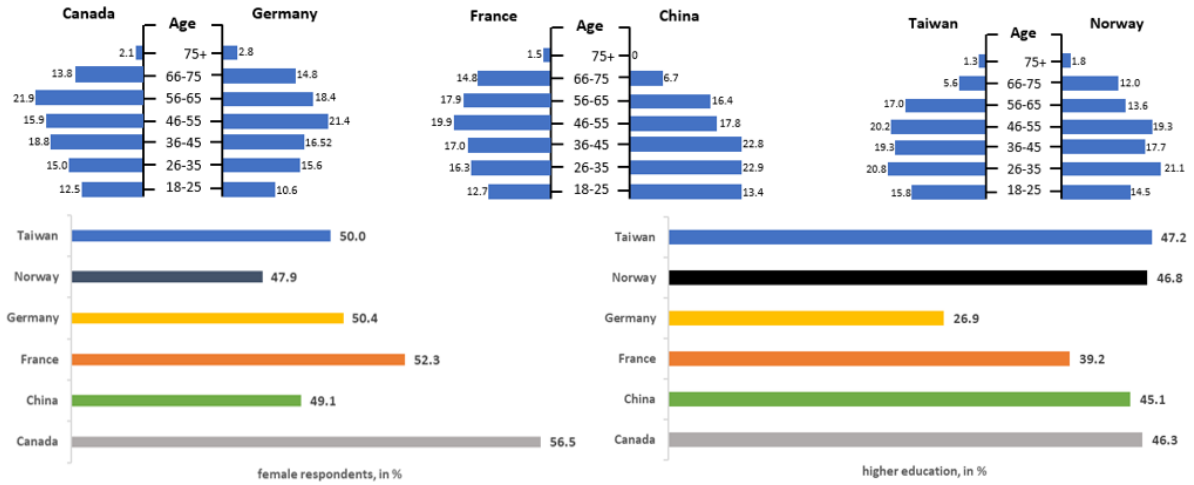



*Figure A- 1: Distribution across age groups, share of female respondents and respondents with higher education.*

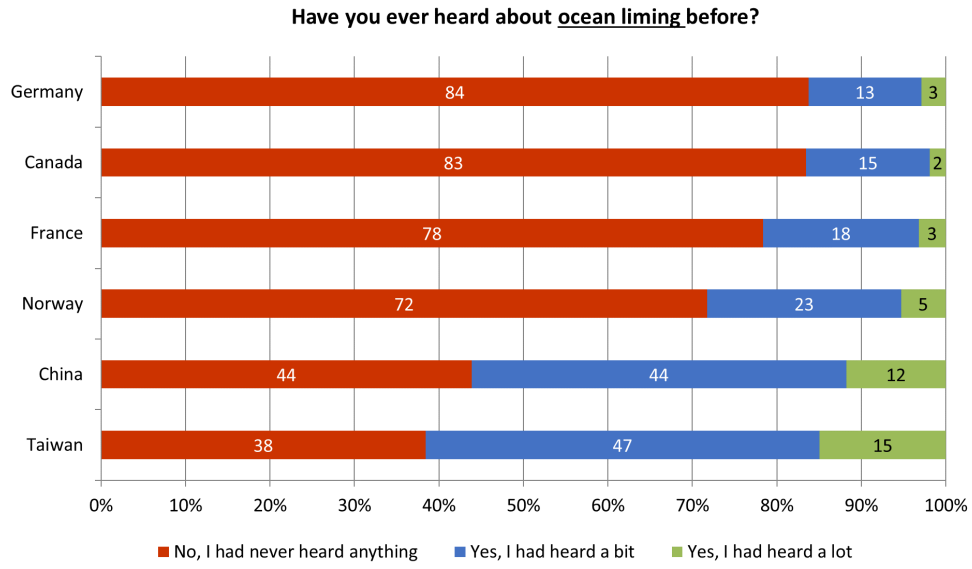



*Figure A- 2: Awareness about ocean liming before reading about it in the survey.*

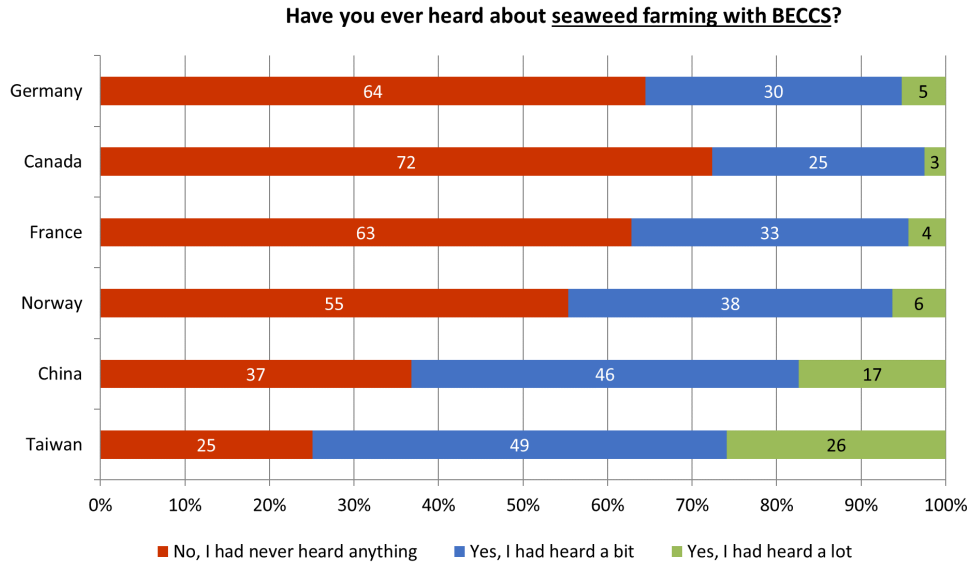



*Figure A- 3: Awareness about mBECCS before reading about it in the survey.*

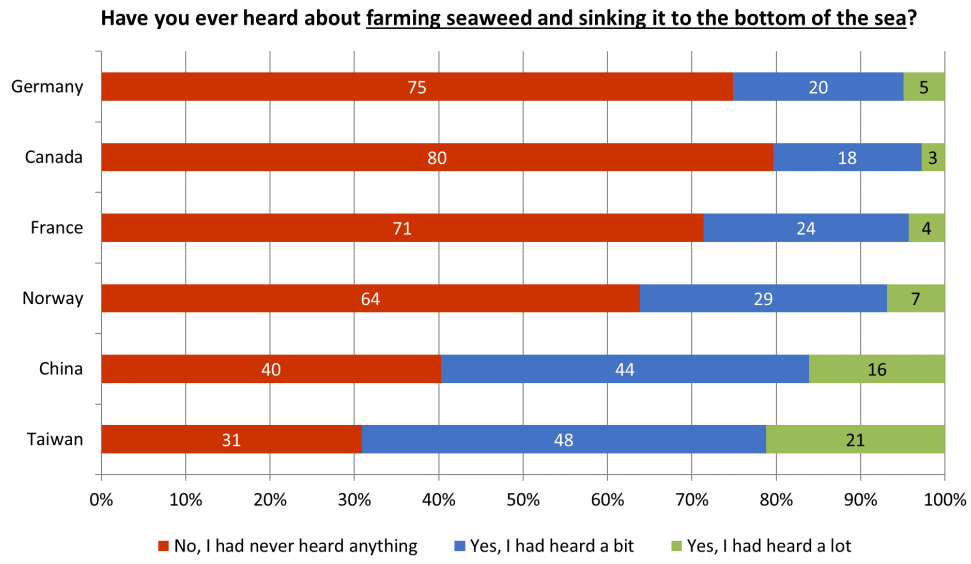



*Figure A- 4: Awareness about seaweed sinking before reading about it in the survey.*

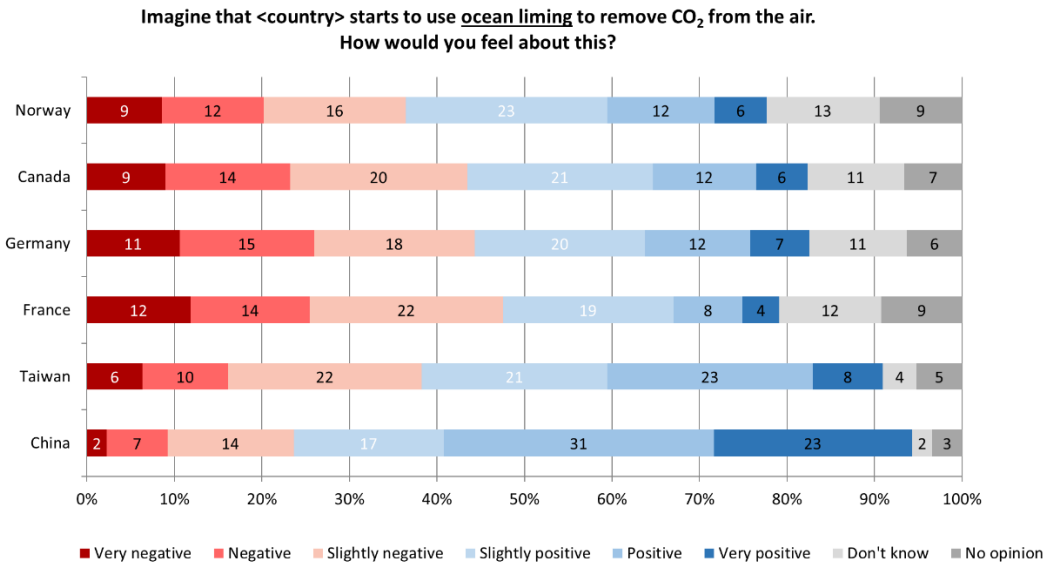



*Figure A- 5: Distribution of responses to the question FEEL_OAE «Imagine that <country> starts to use ocean liming to remove $CO_2$ from the air. How would you feel about this?»*

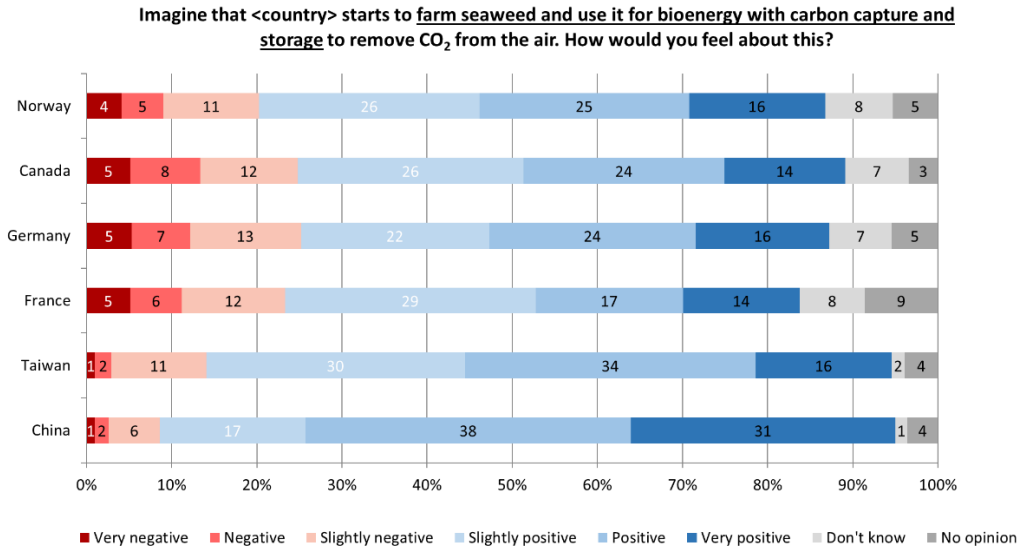



*Figure A- 6: Distribution of responses to the question FEEL_mBECCS «Imagine that <country> starts to farm seaweed and use it for bioenergy with carbon capture and storage to remove $CO_2$ from the air. How would you feel about this?»*

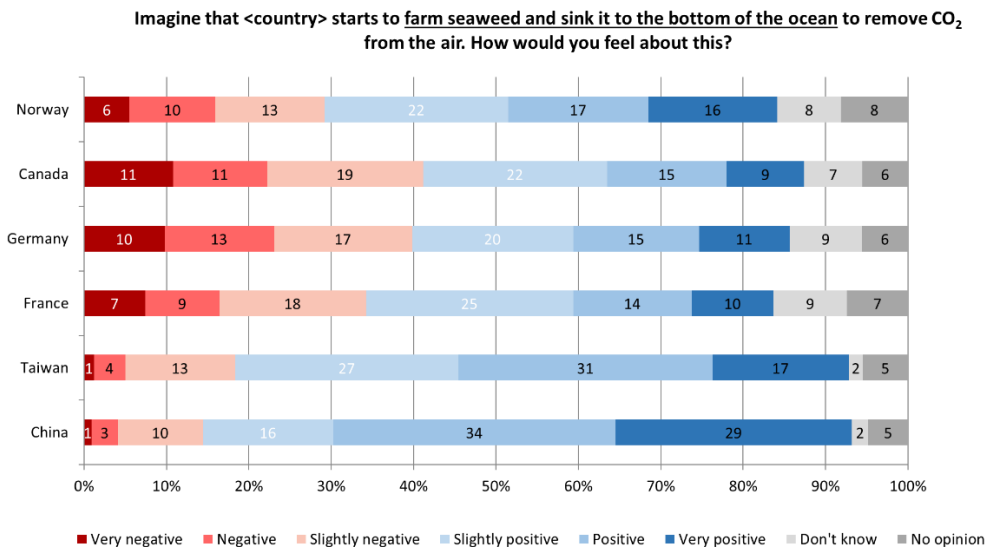



*Figure A- 7: Distribution of responses to the question FEEL_SINK «Imagine that <country> starts to farm seaweed and sink it to the bottom of the ocean to remove $CO_2$ from the air. How would you feel about this?"*

| | OAE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Natural | Innovative | Environmentally friendly | Feasible | Harmful | Risky | Costly | Uncontrollable |
| **Canada** | 13% | 23% | 12% | 15% | 24% | 43% | 43% | 13% |
| **France** | 16% | 19% | 11% | 14% | 24% | 43% | 39% | 21% |
| **Germany** | 13% | 18% | 11% | 21% | 19% | 37% | 41% | 27% |
| **Norway** | 13% | 23% | 12% | 19% | 18% | 31% | 34% | 19% |
| **Taiwan** | 20% | 25% | 23% | 24% | 27% | 45% | 20% | 25% |
| **China** | 25% | 32% | 35% | 29% | 14% | 24% | 23% | 19% |
| | Sinking | | | | | | | |
| | Natural | Innovative | Environmentally friendly | Feasible | Harmful | Risky | Costly | Uncontrollable |
| **Canada** | 21% | 21% | 20% | 16% | 22% | 34% | 23% | 21% |
| **France** | 28% | 25% | 20% | 24% | 17% | 28% | 21% | 23% |
| **Germany** | 23% | 20% | 17% | 26% | 17% | 29% | 26% | 31% |
| **Norway** | 23% | 29% | 22% | 24% | 14% | 23% | 20% | 19% |
| **Taiwan** | 39% | 33% | 39% | 36% | 11% | 23% | 16% | 19% |
| **China** | 35% | 36% | 42% | 36% | 6% | 17% | 15% | 15% |
| | mBECCS | | | | | | | |
| | Natural | Innovative | Environmentally friendly | Feasible | Harmful | Risky | Costly | Uncontrollable |
| **Canada** | 28% | 36% | 29% | 26% | 14% | 29% | 22% | 12% |
| **France** | 33% | 37% | 24% | 29% | 10% | 24% | 22% | 14% |
| **Germany** | 26% | 26% | 23% | 34% | 8% | 25% | 26% | 17% |
| **Norway** | 23% | 33% | 28% | 31% | 9% | 19% | 22% | 12% |
| **Taiwan** | 42% | 35% | 45% | 39% | 9% | 22% | 17% | 14% |
| **China** | 37% | 40% | 47% | 37% | 6% | 16% | 15% | 9% |

*Table A- 1: Shares of respondents by country and technology (y-axis) that have chosen the respective association; questions: ASSOCIATE_OAE, ASSOCIATE_SINK, ASSOCIATE_mBECCS*

**Questionnaire**

*Note: Order of questions corresponds to experimental groups 1-4 (Figure 1).*

Dear participant,

Thank you for taking the time to answer in this survey. We will ask you questions about climate change and methods for removing carbon dioxide ($CO_2$) from the air, as well as some background questions about you.
The survey is part of a research project funded by the European Union. There are no right or wrong answers. We are interested in citizens' opinions and your views matter even if we ask you about things that are new to you. Answering the questions should take about 13 minutes
Your answers will be processed anonymously. They will be merged with those of other participants in the study. All answers together will be analysed with statistical methods and may be used in scientific publications. Your participation is voluntary, and you can leave the survey at any time. If you have any technical issues, questions or feedback before or after completing the questionnaire, please contact us via fieldwork@surveyengine.com.

---

**CC_ACTION_TXT:** What, if anything, do you think <country> should do against climate change? Please write a few words or sentences. We welcome all answers.
[free text]

---

**[Info_Split2 Tech later]**
**Climate change and methods to remove carbon dioxide ($CO_2$) from the air**
We humans cause global warming when we burn coal, oil and gas to produce goods, when we travel, when we cut down forests and when we produce food. This leads to the emission of greenhouse gases, especially carbon dioxide (often shortened to $CO_2$), which accumulate in the air. When there are more greenhouse gases in the air, the so-called greenhouse effect becomes stronger. This heats up the Earth and changes the climate. We must stop emitting these gases and switch to renewable energy such as hydropower, wind power and solar power, if we want to avoid even more warming.

**CLIM_POL1:** In order to cut emissions, a number of measures have been initiated in <country>. Overall, what do you think of the efforts that have been made to cut greenhouse gas emissions in <country>?

a) The efforts are far too small
b) The efforts are too small
c) The efforts are rather too small
d) The efforts are appropriate
e) The efforts are rather too big
f) The efforts are too big
g) The efforts are far too big

---

**CLIM_POL2: Various policies might be used to reduce climate change.**
**To what extent do you support or oppose the following policies in [COUNTRY]?**

[RANDOMIZE ORDER]

1. Having taxes on any use of fossil fuels (such as coal, oil, diesel, gas, petrol)
2. Using public money to subsidise renewable energy such as wind and solar power
3. Ban the sale of household appliances that are least energy efficient
4. Promise to cut emissions in international climate negotiations

a) Strongly oppose
b) Tend to oppose
c) Neither support nor oppose
d) Tend to support
e) Strongly support
f) Don't know

---

In addition to cutting emissions, we can remove $CO_2$ from the air and then store it permanently so that it cannot escape into the air again. This way, we could lower the amount of $CO_2$ in the air and reduce the greenhouse effect. If we want to keep global warming below 1.5 degrees Celsius, we will probably have to remove $CO_2$ from the air.
There are different ways to actively take carbon dioxide ($CO_2$) out of the air. But none of them has yet been tried on a large scale. These methods can have different effects on the environment and people, depending on the approach. This is the reason why this research project wants to find out what people in <country> - such as you - think about different methods to remove $CO_2$ from the air.

---

**DO_CDR:** Based on what you know so far, do you think <country> should work actively towards removing carbon dioxide ($CO_2$) from the air?

a) Definitely yes
b) Probably yes
c) Probably not
d) Definitely not
e) Don't know
f) No opinion

**GEN_CDR:** To what extent do you agree or disagree with the following statements?
RANDOMIZE ITEMS

1. We have a moral responsibility to remove $CO_2$ from the air.
2. Removing $CO_2$ from the air is only a quick-fix not a solution to the problem.
3. If we apply methods to actively remove $CO_2$ from the air, it will distract us from solving the actual task of cutting emissions.

a) Strongly disagree
b) Disagree
c) Somewhat disagree
d) Somewhat agree
e) Agree
f) Strongly agree
g) No opinion
h) Don't know

---

We will now present two methods that have the potential to remove substantial amounts of $CO_2$ from the air. We want you to tell us what you think about them.

---

**[Randomize sequence of Tech_Split AND OAE]**
**[Randomize participants into Tech_Split1 OR Tech_Split2]**
**[Tech_Split1: MBECCS]**
**Seaweed farming with bioenergy carbon capture and storage (marine BECCS)**
Plants, whether on land or in the sea, take up carbon dioxide ($CO_2$) naturally from the air as they grow. To remove $CO_2$ from the air, it is possible to grow seaweed in the ocean and use it to generate bioenergy which can be used for heating or electricity.

When the bioenergy is used, $CO_2$ is normally released back into the air. To avoid this and keep the $CO_2$ permanently out of the air, we can capture the $CO_2$ and store it deep underground, for example in empty oil and gas fields. This method is called seaweed farming with bioenergy carbon capture and storage (marine BECCS).
There is a small probability that $CO_2$ leaks from storage. This would have no immediate effects on people's health and safety at the storage site, but the leaked $CO_2$ would escape and have a negative effect on the climate. To prevent leakage, the storage sites have to be chosen carefully and monitored continually. The oil and gas industry has been storing small amounts of $CO_2$ for several decades and has experience in selecting storage locations.
The areas where seaweed is grown, cannot be used for fishing or shipping. The seaweed farms can take away nutrients from other plants in the ocean.

**FEEL_mBECCS:** Imagine that <country> starts to farm seaweed and use it for bioenergy with carbon capture and storage to remove $CO_2$ from the air. How would you feel about this?

a) Very negative
b) Negative
c) Slightly negative
d) Slightly positive
e) Positive
f) Very positive
g) No opinion
h) Don't know

**ASSOCIATE_mBECCS:** You have just read about seaweed farming with bioenergy carbon capture and storage (marine BECCS). Thinking about it, what comes to your mind?
Please choose all that apply:
[MULTIPLE CHOICE, RANDOMIZE OPTIONS]

1. Natural
2. Innovative
3. Environmentally friendly
4. Feasible
5. Harmful
6. Risky
7. Costly
8. Uncontrollable
9. Other _____

---

**FIGHT_CC_mBECCS:** To what extent do you agree or disagree that farming seaweed and using it for bioenergy carbon capture and storage can help us fight climate change?

a) Strongly disagree
b) Disagree
c) Somewhat disagree
d) Somewhat agree
e) Agree
f) Strongly agree
g) No opinion
h) Don't know

---

**TRADEOFF_mBECCS:**
How worried, if at all, are you that seaweed farming with bioenergy carbon capture and storage (marine BECCS) could do more harm than good?

a) Not worried at all
b) Not very worried
c) Fairly worried
d) Very worried
e) Extremely worried
f) No opinion
g) Don't know

---

**PERMANENT_mBECCS:** How worried, if at all, are you that the removed $CO_2$ might eventually leak back into the air?

a) Not worried at all
b) Not very worried
c) Fairly worried
d) Very worried
e) Extremely worried
f) No opinion
g) Don't know

---

**JOBS_mBECCS:**
To what extent do you agree or disagree that farming seaweed and combining it with bioenergy carbon capture and storage could be an opportunity to create new jobs in <country>?

a) Strongly disagree
b) Disagree
c) Somewhat disagree
d) Somewhat agree
e) Agree
f) Strongly agree
g) No opinion
h) Don't know

---

**[Tech_Split2: Macroalgae sinking]**
**Seaweed farming and sinking it to the bottom of the sea**
Plants, whether on land or in the sea, take up carbon dioxide ($CO_2$) naturally from the air as they grow. To remove $CO_2$ from the air, it is possible to grow seaweed and sink it to the bottom of the sea.
When the seaweed dies and rots, $CO_2$ will normally be released back into the air. To avoid this and keep the $CO_2$ out of the air, we can sink the seaweed in the deep ocean. This method is called seaweed farming and sinking.
Part of the $CO_2$ that has been taken up by the seaweed would then remain at the bottom of the sea for a long time, but how much of the $CO_2$, and for how long, is still uncertain.
The areas where seaweed is grown, cannot be used for fishing or shipping. The seaweed farms can take away nutrients from other plants in the ocean.
**FEEL_SINK:** Imagine that <country> starts to farm seaweed and sink it to the bottom of the ocean to remove $CO_2$ from the air. How would you feel about this?

a) Very negative
b) Negative
c) Slightly negative
d) Slightly positive
e) Positive
f) Very positive
g) No opinion
h) Don't know

---

**ASSOCIATE_SINK:** You have just read about seaweed farming and sinking it to the bottom of the ocean. Thinking about it, what comes to your mind?
Please choose all that apply:
[MULTIPLE CHOICE, RANDOMIZE OPTIONS]

1. Natural
2. Innovative
3. Environmentally friendly
4. Feasible
5. Harmful
6. Risky
7. Costly
8. Uncontrollable
9. Other_____

**FIGHT_CC_SINK:** To what extent do you agree or disagree that farming seaweed and sinking it to the bottom of the sea can help us fight climate change?

a) Strongly disagree b) Disagree c) Somewhat disagree
d) Somewhat agree e) Agree f) Strongly agree
g) No opinion h) Don't know

**TRADEOFF_SINK:**
How worried, if at all, are you that farming seaweed and sinking it to the bottom of the sea could do more harm than good?

a) Not worried at all b) Not very worried c) Fairly worried
d) Very worried e) Extremely worried f) No opinion
g) Don't know

**PERMANENT_SINK:** How worried, if at all, are you that the removed $CO_2$ might eventually leak back into the air?

a) Not worried at all b) Not very worried c) Fairly worried
d) Very worried e) Extremely worried f) No opinion
g) Don't know

**JOBS_SINK:**
To what extent do you agree or disagree that farming seaweed and sinking it to the bottom of the sea could be an opportunity to create new jobs in <country>?

a) Strongly disagree b) Disagree c) Somewhat disagree
d) Somewhat agree e) Agree f) Strongly agree
g) No opinion h) Don't know

**[OAE – all participants]**
**Ocean liming**
The gas carbon dioxide ($CO_2$) naturally flows between the ocean and the air. The ocean currently takes up more $CO_2$ from the air than before because of human-made $CO_2$ emissions. To remove more $CO_2$ from the air, it is possible to grind up special types of rock and spread it in the sea. This method is called ocean liming.
Human-made emissions are currently making the ocean more acidic. This threatens marine animals that depend on building shells, such as coral reefs. Adding rock dust would make the water less acidic and counteract ocean acidification.
Ocean liming would mean that rock must be mined from quarries, and new quarries must be created. Grinding rock to dust requires a lot of energy. The effects of ocean liming on marine animals and plants are still unknown.
**FEEL_oae:** Imagine that <country> starts to use ocean liming to remove $CO_2$ from the air. How would you feel about this?

a) Very negative b) Negative c) Slightly negative
d) Slightly positive e) Positive f) Very positive
g) No opinion h) Don't know

**ASSOCIATE_OAE:** You have just read about ocean liming. Thinking about it, what comes to your mind?
Please choose all that apply:
[MULTIPLE CHOICE, RANDOMIZE OPTIONS]

1. Natural
2. Innovative
3. Environmentally friendly
4. Feasible
5. Harmful
6. Risky
7. Costly
8. Uncontrollable
9. Other _____

---

**FIGHT_CC_OAE:** To what extent do you agree or disagree that ocean liming can help us fight climate change?

a) Strongly disagree b) Disagree c) Somewhat disagree
d) Somewhat agree e) Agree f) Strongly agree
g) No opinion h) Don't know

---

**PERMANENT_OAE:** How worried, if at all, are you that the removed $CO_2$ might eventually leak back into the air?

a) Not worried at all b) Not very worried c) Fairly worried
d) Very worried e) Extremely worried f) No opinion
g) Don't know

---

**TRADEOFF_OAE:**
How worried, if at all, are you that ocean liming, i.e. adding rock dust to the ocean, could do more harm than good?

a) Not worried at all b) Not very worried c) Fairly worried
d) Very worried e) Extremely worried f) No opinion
g) Don't know

---

**JOBS_OAE:**
To what extent do you agree or disagree that using ocean liming could be an opportunity to create new jobs in <country>?

a) Strongly disagree b) Disagree c) Somewhat disagree
d) Somewhat agree e) Agree f) Strongly agree
g) No opinion h) Don't know

[END RANDOMIZED SECTION]

---

**PRE_KNOWLEDGE:** These methods that remove carbon dioxide from the air are fairly new. Before reading about them in this survey, had you ever heard about ocean liming or <tech_split> before?

1 Ocean liming
2 Seaweed farming with bioenergy carbon capture and storage → [only Tech_Split1]
3 Farming seaweed and sinking it to the bottom of the sea → [only Tech_Split2]

a) No, I had never heard of it
b) Yes, I had heard a bit about it
c) Yes, I had heard a lot about it

**PRE_KNOWLEDGE_GEN:** And in general? Had you ever heard about the possibility to actively remove $CO_2$ from the air to fight climate change before reading about it in this survey?

d) No, I had never heard of it
e) Yes, I had heard a bit about it
f) Yes, I had heard a lot about it

---

**CHOOSE**: Imagine <country> wants to use one of the methods you have just read about. There are only enough funds to use one of the methods. What do you think, which of the two should it be? Or do you think that the money for this should be spent on neither of the two?

[RANDOMIZE ORDER Except last option]

- ◯ Ocean liming
- ◯ Seaweed farming and sinking it to the bottom of the sea ← [Split sinking only]
- ◯ Seaweed farming with Bioenergy Carbon Capture and Storage ← [Split MBECCS only]
- ◯ Neither of the two

---

**[Filter: only Tech_Split1 mBECCS]**
**TECH_TXT_mBECCS:**
You have just read and answered questions about two methods to remove $CO_2$ from the air and thus counteract climate change. One method is ocean liming, i.e. grinding rock and spreading it in the ocean. The other method is farming seaweed and using it for bioenergy with carbon capture and storage (marine BECCS).
What do you think about these two methods to remove $CO_2$ from the air?
Please write a few words or sentences. We welcome all answers.
[free text]

**[Filter: only Tech_Split2 Macroalgae sinking]**
**TECH_TXT_SINK:**
You have just read and answered questions about two methods to remove $CO_2$ from the air and thus counteract climate change. One method is ocean liming, i.e. grinding rock and spreading it in the ocean. The other method is farming seaweed and sinking it to the bottom of the sea.
What do you think about these two methods to remove $CO_2$ from the air?
Please write a few words or sentences. We welcome all answers.
[free text]

---

In the next part of the survey we will ask you more general questions about climate change and the environment.

**EFFICACY: To what extent do you agree or disagree with the following statement?**
**I am confident that, together, people in <COUNTRY> can make a difference when it comes to climate change.**

a) Strongly disagree
b) Disagree
c) Somewhat disagree
d) Somewhat agree
e) Agree
f) Strongly agree
g) No opinion
h) Don't know

**WRY_CC: How worried, if at all, are you about climate change?**

a) Not worried at all
b) Not very worried
c) Fairly worried
d) Very worried
e) Extremely worried
f) Don't know

---

**GEN_ENV:** To what extent do you agree or disagree with the following statements?

[RANDOMIZE ORDER]

1. We need industrialized agriculture to feed the world population.
2. Technological innovations will eventually solve our problems with climate change.

a) Strongly disagree
b) Disagree
c) Somewhat disagree
d) Somewhat agree
e) Agree
f) Strongly agree
g) No opinion
h) Don't know

---

**ENV_CONCERN: How worried, if at all, are you about the following environmental issues?**
[RANDOMIZE ORDER]

1. Ocean acidification
2. Environmental impact of aquaculture
3. Marine plastic pollution
4. Overfishing
5. Air pollution

a) Not worried at all
b) Not very worried
c) Fairly worried
d) Very worried
e) Extremely worried
f) No opinion
g) Don't know

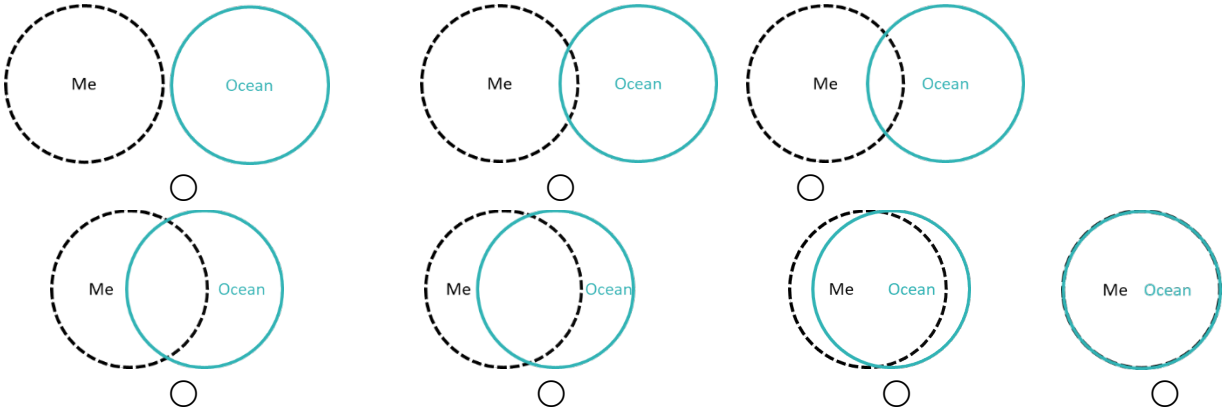
---

**KNOW_ACID:** Had you ever heard about ocean acidification before taking this survey?

a) No, I had never heard of it
b) Yes, I had heard a bit about it
c) Yes, I had heard a lot about it

---

**CONNECTED**: Please choose the picture below that best describes your relationship with the ocean. How connected do you feel with the ocean?
The more the circles overlap the stronger is the connection.




○ Don't know

---

**TRUST:** Now you will see a list with different organizations, institutions, and groups of people.
For each of these, to what extent do you trust or mistrust that they would act in the interest of society's welfare and interest of the environment?

[RANDOMIZE ORDER]

1. Government
2. Private companies that want to apply methods to remove $CO_2$ from the air
3. Researchers studying methods to remove $CO_2$ from the air at publicly funded research institutes
4. Environmental non-profit organizations

a) Very high trust
b) High trust
c) A little trust
d) A little mistrust
e) High mistrust
f) Very high mistrust
g) No opinion
h) Don't know

---

**PROBLEM:** You have just read a lot about climate change, but there are also other serious problems.
Please choose up to three of the most serious problems that <country> faces as a whole?
[RANDOMIZE]

a) Climate change
b) Poverty
c) Hunger
d) Spread of infectious diseases
e) The economic situation
f) Deterioration of nature
g) Deterioration of democracy and rule of law <not in China>

h) The increasing global population
i) International terrorism
j) Armed conflicts
k) Health problems due to pollution
l) Proliferation of nuclear weapons
m) Lack of drinking water

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**VOTE_CA:** Which party would you vote for if there were a parliamentary election tomorrow?

a) Liberal Party
b) Conservative Party
c) NDP
d) Bloc Québécois ← Display if "In which province or territory are you currently living?" = Quebec
e) Green Party
f) I am not eligible to vote
g) I would not vote
h) Don't know
i) Another party (please specify)

**VOTE_CN** <not asked in China>
**VOTE_FR:** Pour quel parti voteriez-vous s'il y avait des élections législatives demain?

a) Lutte Ouvrière, LO
b) Nouveau Parti Anticapitaliste
c) Parti Communiste Français
d) La France Insoumise
e) Parti Socialiste
f) Europe Ecologie les Verts
g) Renaissance (La République en Marche)
h) Modem
i) L'Union des Démocrates
j) Les Républicains, LR
k) Debout La France
l) Front National, FN
m) Indépendants Reconquête
n) Je n'ai pas le droit de vote
o) Je ne voterais pas
p) Je ne sais pas
q) Autre parti (à préciser)

**VOTE_DE:** Für welche Partei würden Sie stimmen, wenn morgen Bundestagswahl wäre?

a) CDU/CSU

b) SPD
c) Die Linke
d) Bündnis 90/Die Grünen
e) FDP
f) AfD
g) Piratenpartei
h) Ich bin nicht stimmberechtigt
i) Ich würde nicht wählen
j) Ich weiß es nicht
k) Andere:

**VOTE_NO:** Hvilket parti ville du stemt på hvis det var stortingsvalg i morgen?

a) Velg bare ett svar
b) Rødt (R)
c) Sosialistisk Venstreparti (SV)
d) Arbeiderpartiet (AP)
e) Venstre (V)
f) Kristelig Folkeparti (Krf)
g) Senterpartiet (SP)
h) Høyre (H)
i) Fremskrittspartiet (FrP)
j) Miljøpartiet De Grønne (MDG)
k) Ikke stemmeberettiget
l) Jeg ville ikke stemt
m) Vet ikke
n) Annet (vær vennlig å spesifiser):

**VOTE_TW: 若明天是國會選舉，您會投給哪個政黨？**

a) 中國國民黨
b) 民主進步黨
c) 新黨
d) 時代力量黨
e) 親民黨
f) 無黨團結聯盟
g) 綠黨
h) 社會民主黨
i) 台灣基進黨
j) 泛藍聯盟
k) 泛綠聯盟
l) 我沒有投票權
m) 我不想投票
n) 不知道
o) 其他。請填寫。

**CLARITY:** You have reached the last question. Overall, how easy or difficult was it for you to understand the information you had to read in this survey?

a) It was very difficult to understand.

b) It was rather difficult to understand.

c) It was rather easy to understand.

d) It was very easy to understand.

**Thank you for taking the time to answer our questions!**

This survey is an important part of the European Union-funded project OceanNETs (Ocean-based Negative Emission Technologies - analyzing the feasibility, risks, and co-benefits of ocean-based negative emission technologies for stabilizing the climate). This project receives funding from the European Union's Horizon 2020 research and innovation programme (grant agreement No. 869357).