

Main results from research project *Public Perceptions of Carbon Capture and Storage* (PerCCSeptions) – Summary for policymakers

Considerable variation in support for CCS in Norway and Germany

This project has explored factors that influence attitudes towards carbon capture and storage in Norway and Germany. The main picture is that the majority of Norwegians are positive towards carbon capture and storage, we typically find that around 60 to 70 per cent are positive somewhat depending on how the question is phrased. In Germany, we find that around half are positive towards the technology. There is a very big difference in how familiar the population in the two countries is with the technology. Only 15 percent of Norwegians state that they have never heard of the technology, in Germany this figure is 63 percent.

These findings must be understood in the light of how the technology has been discussed in public and political debates in recent decades. In Norway, CCS has for a number of years been widely discussed in the debate about how the country can reduce its greenhouse gas emissions. The discussion of the technology itself has consistently been positive and there has largely been a cross-party consensus that the technology should be used. The technology has also been supported by a number of environmental protection organisations. In Germany, CCS has generally been less discussed. When the topic has come up, the use of CCS has been disputed. Very few political parties have supported CCS and environmental protection organizations have often compared the storage of CO₂ with the storage of nuclear waste. The public debate has contributed to the fact that the storage of CO₂ is largely prohibited in German states where there are suitable geological formations.

In our results, we see that this affects how support for CCS varies with other attitudes. In Norway, for example, those who are concerned about the effects of climate change are more positive about CCS than people who are not concerned about climate change. This tendency is weaker in Germany. In Norway, we also see that those who believe that the current climate policy is insufficient are more positive about CCS than people who consider the current climate policy to be too ambitious.

Norwegians are most concerned with overall environmental impact

For Norwegians, we have also carried out a study of what people choose to write about when they get to freely formulate what they think about CCS (open text responses). The answers show that although the majority of Norwegians are positive about CCS when they answer a close-ended question, there is also a majority who in open-ended answers formulate conditions for their support for the technology. Most emphasize that it is crucial that CCS overall has a real positive environmental effect. It is the possibility that this environmental effect will be reduced or, in real terms, could become negative, which causes many to express a conditional positive view of CCS. Factors that Norwegians believe can have a negative impact on the overall environmental effect of CCS are typically:

- The danger of emissions from transport
- The danger that CCS could become a sleeping pad that prevents the necessary transition towards low-carbon solutions or facilitates continued high consumption of fossil energy.
- The danger of CCS becoming very expensive.

There is also a small group that expresses unconditional support for CCS and a group that is negative about the technology. A negative attitude towards the technology is generally justified by the factors mentioned above. We therefore find that both those who express a negative attitude and those who are positive about the technology mainly highlight the same factors. The overall environmental impact therefore appears to be decisive. Support for CCS appears to be particularly vulnerable to leaks from storage and transport, and to being linked to extended use of fossil energy. In addition, the cost level is relevant.

New challenges linked to the establishment of a European market for CO₂ capture and storage

The storage potential for CO₂ is significant in the geological formations under the seabed in the North Sea and the projects under development in Europe aim at offshore storage. In Norway, the Longskip (capture) and Northern Lights (transport and storage) projects for storage under the seabed in the North Sea are now in the process of being completed.

From 2024, they will begin to capture, transport and store CO₂ from two large point emissions, the incineration plant at Klemetsrud in Oslo and from cement production in Breivik. Northern Lights is designed to have the capacity to store carbon captured in other European countries and this can start as early as 2028. There are similar plans both in the British part of the North Sea and off the coast of the Netherlands. In order to scale up CCS, transport, often across national borders, is necessary since the location of large point emissions is not co-located with suitable storage locations.

As part of the project, we have tested how Norwegians and Germans react to the idea of importing or exporting CO₂ across national borders. In this experiment, it turns out that Norwegians react very negatively to a concrete proposal to import CO₂, both when we refer to imports from Germany or from Europe in general. While 81 percent of Norwegians express support for a project where our own emissions are stored in Norway, support is reduced to 42 percent when the emissions come from Germany. In Germany, the proposal to export own emissions to Norway or other European countries has no measurable effect on support for CCS, but here at the same time the level of support is significantly lower (see figure 1).

Attitudes towards the import and export of CO₂ are being studied in a new project

A new project with funding from CLIMIT will in the next few years provide a better understanding of attitudes towards the import and export of CO₂ in northern European countries - Does the nationality of CO₂ matter? Public perceptions of a Northern European market for CO₂ storage (project number 325960). In this project, we seek to gain a better understanding of how the export of CO₂ to other countries affects the support for CCS in the exporting nations and how it affects the support for CCS in the importing nations. The aim is both to map the variation between countries and to gain a better understanding of the mechanisms behind these attitudes. To investigate this, surveys are used in Norway, Germany, Great Britain, the Netherlands and Denmark.

The need for clear information to the public

The research shows that in both countries it is important to (continue to) inform the public about the role CCS can have in reducing greenhouse gas emissions and ensuring the lowest possible global warming. It is particularly important to provide good information about the plans to establish a European infrastructure for transport and storage, and why such cooperation and transport is necessary. It seems relevant to point out that the technology is the only known option for reducing emissions for some industry processes, from cement production and from waste incineration. In Germany, it would be important to talk publicly about CCS in the first place and to make clear that it is not about maintaining coal-fired power plants, but about being able to continue producing cement or operating waste incineration plants. In Norway, it should especially be communicated that the research and development investments, which are to a large extent state-funded, are only worthwhile if in the future CO₂ is imported from other countries as well. In the design of and communication about concrete capture, transport and storage solutions, emphasis should be placed on ensuring the lowest possible environmental impacts. There is a particular need for good and clear information about what happens to CO₂ when stored in geological formations and the probability and consequences of leaks both during storage and transport.

About the project

- Research project funded by Norwegian Research Council, Climit, 2019-2022, projektnummer 295014
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- Coordinated by NORCE Norwegian Research Centre, cooperation with Kiel Institute for the World Economy in Germany
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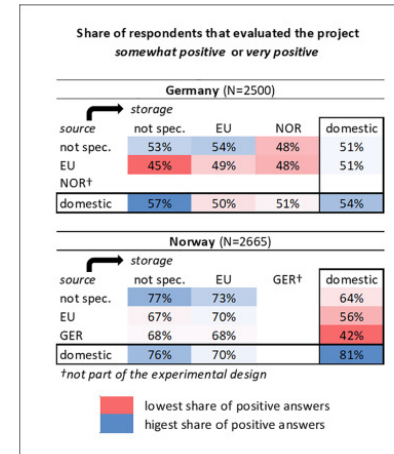


Figure 1: Share of respondents in Norway and Germany that evaluated a CCS-project somewhat positive or very positive.

Figure from Merk, et al. (2022), <https://doi.org/10.1016/j.erss.2021.102450>

