

WHY DO PUBLIC RESPONSES TO CCUS MATTER IF CO₂ IS STORED OFFSHORE?



Image source: <https://beeldbank.rws.nl>, Rijkswaterstaat / Harry van Reeken

Social scientists working on public perceptions and acceptability in the CCUS field often get asked this question. When CO₂ storage takes place offshore, rather than onshore, perhaps making use of existing infrastructures from the oil and gas industry; do we still need to be concerned with public responses to CCUS? After all, in the case of offshore CO₂ storage there seems to be no obvious local community directly near the storage site, and the CO₂ injection wells are often far enough from land that they are largely out of public view. So, assuming that out of sight will mean out of mind - why are public responses to offshore CO₂ storage worth studying?

To answer this question we can look at a recent CCS project taking place in Victoria, Australia which is currently in the project development phase (the CarbonNet Projectⁱ). Here the government is looking into storing CO₂ offshore. In response, community members along the coastline have set up the Ninety Mile Beach Action Group Against Carbon Storageⁱⁱ. Clearly, these communities feel affected by the offshore CCS plans, even though they do not live directly next to the storage site. Offshore CO₂ storage is not 'out of mind' for them – instead, locals have voiced concerns about the effects that CO₂ storage will have on the 'pristine' environment, and unhappiness about the level of information communicated by the government.



Image source: ABC Gippsland/Nicole Asher

This is only one example of public responses to offshore CC(U)S but there is evidence to suggest that this is not an unique story. Most of the environmental social science research on comparing public responses towards offshore and onshore developments has been done in the wind energy sector. Similar to offshore CCUS, offshore wind is often posed as a less problematic, more acceptable alternative to onshore wind by academics, policy makers and developersⁱⁱⁱ. However, research in this field has shown that this isn't necessarily the case, which is also relevant for offshore CCUS; in fact:

There is no evidence for an universal preference for offshore developments over onshore developments^{iv}

Instead, public responses depend on the local context of a development. Although there are examples of offshore developments which have led to little public resistance, acceptability isn't a given when developments are placed offshore rather than onshore. In a recent study on CCS storage options among the German public, the majority of respondents said that they would prefer CO₂ to be stored nowhere at all when asked whether they preferred onshore or offshore storage. Also, although offshore CO₂ storage was seen as a slightly better option than onshore storage among the general public, citizens of coastal regions were equally negative about both storage options^v.

So, what do we know about the factors that are important when it comes to public responses to offshore developments? In the case of wind energy, studies have shown that the factors that influence public responses to offshore wind are largely the same as those that influence public responses to onshore wind energy. Importantly, this includes factors related to the decision-making process around a project: e.g. does the (local) public have a voice within this process, does the (local) public trust the stakeholders involved in this process? For onshore CC(U)S projects we know that when there is a lack of trust between local communities and stakeholders (such as the project developer or local authorities), and/or communities aren't given a meaningful voice as part of the decision-making process this can give rise to public resistance and can cause delays for a project^{vi}. These factors are also likely to play an important role in public responses to offshore CCUS projects.



Image source: Øyvind Hagen/Statoil

Thus, as is the case for onshore developments, spending time to understand the local context, identifying relevant (on-and offshore) stakeholders and local needs and concerns will be crucial for public support. This awareness already exists within some offshore CCUS projects that are currently being planned, but identifying who the relevant community is may be more complex and time-consuming for offshore developments compared to onshore developments. Nevertheless, it should be an important step in the project development phase especially since the general public and local communities may have very different ideas about what the sea represents and what it can be used for, compared to developers and policy makers^{vii}. The sea, for many people, is a place of 'openness'

and 'wilderness' where human structures do not belong and which isn't owned by anyone. It is not difficult to imagine that an offshore industrial development, such as a CCUS project, can lead to strong public reactions when the development is seen as destroying those qualities that make the sea a special place for many. We saw this in the Australian CCS project, which we started with, where locals felt that their 'pristine part of the world' was being threatened. Also, when it comes to identifying the relevant communities and their concerns an often overlooked factor with offshore developments is that there will always be an onshore element as well. In the case of CCUS, this will most likely be in the form of transport pipelines. There is little research available on public responses to onshore pipelines (or offshore pipelines for that matter), as social science research has mainly focused on societal perceptions of CO₂ storage sites. What we do know suggests that these pipelines could be a safety concern for local communities and are likely to have a negative influence on public responses to offshore CCUS if these concerns are not taken seriously and addressed^{viii}.

What is the ALIGN CCUS project doing to contribute to our knowledge about public responses to offshore CCUS?

From the research and examples discussed so far it is clear that studying public responses to CCUS is important, even when storing CO₂ offshore. Research gaps remain, for instance around successfully engaging communities with offshore CCUS and public responses towards onshore and offshore pipelines. Within ALIGN CCUS WP6 'Implementing CCUS in Society' contributes to this timely and relevant research area by examining the factors influencing societal support of industrial CCUS using various methods:

- 1) An important part of the work within WP6 involves a large-scale survey of public perceptions towards various aspects of industrial CCUS, including views towards transport and storage. This survey will offer an opportunity to examine public perceptions, and importantly – the key factors underlying these perceptions.
- 2) Literature reviews, media analyses and stakeholder interviews will delve deeper into current debates around public responses to industrial CCUS. This work will provide novel insights into the experiences that stakeholders have with regards to engaging the public with CCUS, the knowledge gaps that still exist, and the role of the offshore context.

Overall, through innovative basic and applied research WP6 will provide tools that CCUS stakeholders can use to understand and engage with local communities and the wider public, thereby helping to reduce nontechnical risk of offshore industrial CCUS implementation.

For questions about WP6 please contact WP lead Emma ter Mors, EMors@FSW.leidenuniv.nl

References

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Biography Christine Boomsma

Since obtaining a PhD in Environmental Psychology at the University of Plymouth (UK) in 2013, Christine Boomsma has worked as a post doc researcher on various interdisciplinary, applied projects - always working closely together with diverse governments, NGOs and businesses. The majority of her research has focused on the human dimension of energy systems. Within this field Christine has studied how new (visual) technologies such as serious games, thermal imaging, feedback displays and virtual reality can be integrated within the household and organisations. Since 2017 Christine Boomsma is employed as a senior researcher at Leiden University, the Netherlands.

In ALIGN-CCUS, Christine contributes to Work Package 6 (WP6) Implementing CCUS in society, where she leads task 6.2 on Community compensation. Her research involves examining public perceptions of CCUS and stakeholder views towards public engagement strategies (e.g. compensation) in order to develop tools that CCUS stakeholders can use to understand and engage with local communities and the wider public.

Biography Emma ter Mors

Emma ter Mors received her M.A. in Social and Organisational Psychology from Leiden University, The Netherlands in 2003 (cum laude). In 2009 she obtained a PhD from the same university. Her dissertation focused on the influence of source perceptions on the selection, processing and acceptance of information concerning CO₂ capture and storage technology (CCS). From 2009-2014 Emma worked at Leiden University as a project leader and senior researcher on the subprogram "Public Perception" of CATO-2, the Dutch national research program on CCS. Since 2015 she is employed as an assistant professor of Social and Organisational Psychology at Leiden University.

In ALIGN-CCUS, Emma is the leader for Work Package 6 (WP6), Implementing CCUS in society, and member of the Project Management Team (WP0). In her research, she focuses on identifying factors that influence public perception and acceptance of CCS, focusing on topics such as public awareness, knowledge, perception, acceptance, communication, compensation, trust and fairness.