

Towards a just and habitable world: exploring the role of technology

Sustainability, technological choices, and democracy

Deliberative Communication for a Just Carbon Transition

Hannah Müller*¹ | Dr. Julia-Lena Reinermann² | Merle-Marie Johannsen³

* hannah.mueller@fernuni-hagen.de

^{1,2,3} Chair of Environmental Sciences, Fernuniversität in Hagen, Hagen, Germany

Background

The IPCC considers industrial carbon management technologies for the capture, utilization, and storage of carbon dioxide essential to achieving net-zero emissions, particularly to offset residual emissions that are difficult to reduce.^{1 2} Among these technological approaches, Carbon Capture and Utilization (CCU) is closely linked to the vision of a circular or “technical” carbon cycle, in which CO₂ is treated as a reusable resource rather than waste.

Research Problem

However, CCU approaches remain largely unknown outside of expert circles. Studies point to significant knowledge gaps and uncertainties among the general public.^{3 4} Discourse is dominated by expert and industry framings of regulation, innovation, and economic potential, while ethical, social, and distributive concerns are sidelined.

Communication plays a crucial role in this context, as it mediates between scientific knowledge, political decision-making, and everyday understandings, thereby contributing to the formation of technopolitical orders.^{5 6} Moving beyond one-way information provision, deliberative communication offers a pathway to more inclusive and reflexive engagement. This is particularly important for addressing questions of fairness, responsibility, and societal desirability, and for fostering socially robust and legitimate pathways for carbon management technologies.

Research at the intersection of technology and society in the BMFTR collaborative project Carbon2Chem®

Since 2016, Carbon2Chem® has been conducting transdisciplinary research on the capture and utilization of CO₂ from industrial process gases in order to replace fossil raw materials, close carbon cycles, and promote climate protection.



Research Question & Design

How can communication and participation practices be designed to support the just governance of carbon capture and utilization technologies?



First Results

- Need for dialogue, but there is a lack of appropriate communication channels and points of contact
- Early involvement is encouraged to collect objections, feedback, and comments, but practical guidance on how to implement it is still lacking.

Literature

¹ IPCC 6th Assessment Report (2021).

² Klimadiskurs.NRW (2026). CC(U)S in NRW – Diskussionspapier.

³ Oltra, C., Dütschke, E., Preuß, S., Gonçalves, L., & Germán, S. (2022). What influences public attitudes and acceptance of CCUS technologies on the national and regional level? Results from a survey study in France and Spain.

⁴ Wolf, I., Ebersbach, B., and Huttarsch, J.-H. (2023). Soziales Nachhaltigkeitsbarometer der Energie- und Verkehrswende 2023. Potsdam: Forschungsinstitut für Nachhaltigkeit – Helmholtz-Zentrum Potsdam RIF.

⁵ Knorr Cetina, K. (1999). Epistemic Cultures: How the Sciences Make Knowledge. Harvard University Press.

⁶ Star, S.; Griesemer, J. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39". Social Studies of Science. 19 (3): 387-420.