Austria’s Climate Neutrality: An In-depth Evaluation of the Potential Contribution of CCU and CCS for the Austrian Long-term Climate Goals

Duration: 8/22 - 1/25

Motivation
The EU aims for climate neutrality by 2050, and Austria even targets 2040. CO₂ emissions have to be reduced but certain emissions will remain from hard-to-abate industries.

Carbon is an important resource for various sectors (e.g., chemical & down-stream industries).

- CO₂ Capture and Utilization (CCU) and Storage (CCS) are an opportunity for a Circular Carbon Economy and to reach climate change mitigation goals.

Research questions:
- Austrian CO₂ emission now and 2050?
- Domestic sinks: industry & storage?
- Legal & regulatory aspects?
- Economic & environmental feasibility?
- Stakeholder perspectives?
- Viable “Source-to-sink” routes?

Project Structure
- AP1 Project Management
- AP2 Technical Resources & Demand Potential for CCU
- AP3 Geological CO₂ Storage Potential in Austria
- AP4 Impact Assessment
- AP5 Stakeholder Involvement & Policy Recommendations
- AP6 Communication & Dissemination

Methods
- Literature reviews
- Legal & regulatory assessments
- Bottom-up/top-down potential analysis
- Techno-economic evaluation
- Interviews, surveys, workshops

Outlook
- Finalization CCU/CCS use-cases
- Techno-economic assessment ongoing
- Environmental considerations ongoing
- Further stakeholder interaction
- Finalization of legal analysis and development of policy recommendations
- Communication & dissemination of results

Results (selection)

CO₂ availability

- Fig. 1: Austria’s CO₂ point sources in 2019
- Fig. 2: Overview of carbon capture technologies
  - a) energy demand
  - b) cost ranges
- Fig. 3: Comparison of future resources & demands

CO₂ sinks: utilization & storage options
- Chemical industry: methanol, olefines, fertilizers, melanine etc.
- E-fuels: methane, kerosene etc.

Techno-economic & ecological impact
- Capture efforts and prioritization of sources
- Costs of individual utilization & storage routes

Stakeholder involvement
- CC, CCU, CCS online survey with 10 Austrian high-emitting corporations
- Workshop on insights in March 2023
- 1-on-1 interviews to deep-dive into drivers, obstacles and necessities
- Workshop on preliminary results in Q3/2024

Legal and policy aspects
- CCS forbidden in Austria → repeal of the ban under discussion
- EU ETS: no certificates for CCS, and for CCU where the CO₂ is permanently chemically bound in a product
- National Carbon Management Strategy for data-driven and cost-effective management of GHG capture, storage, transport and use

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