

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, Austria even targets 2040.

CO₂ emissions have to be reduced but certain emissions will remain from hard-to-abate industries.

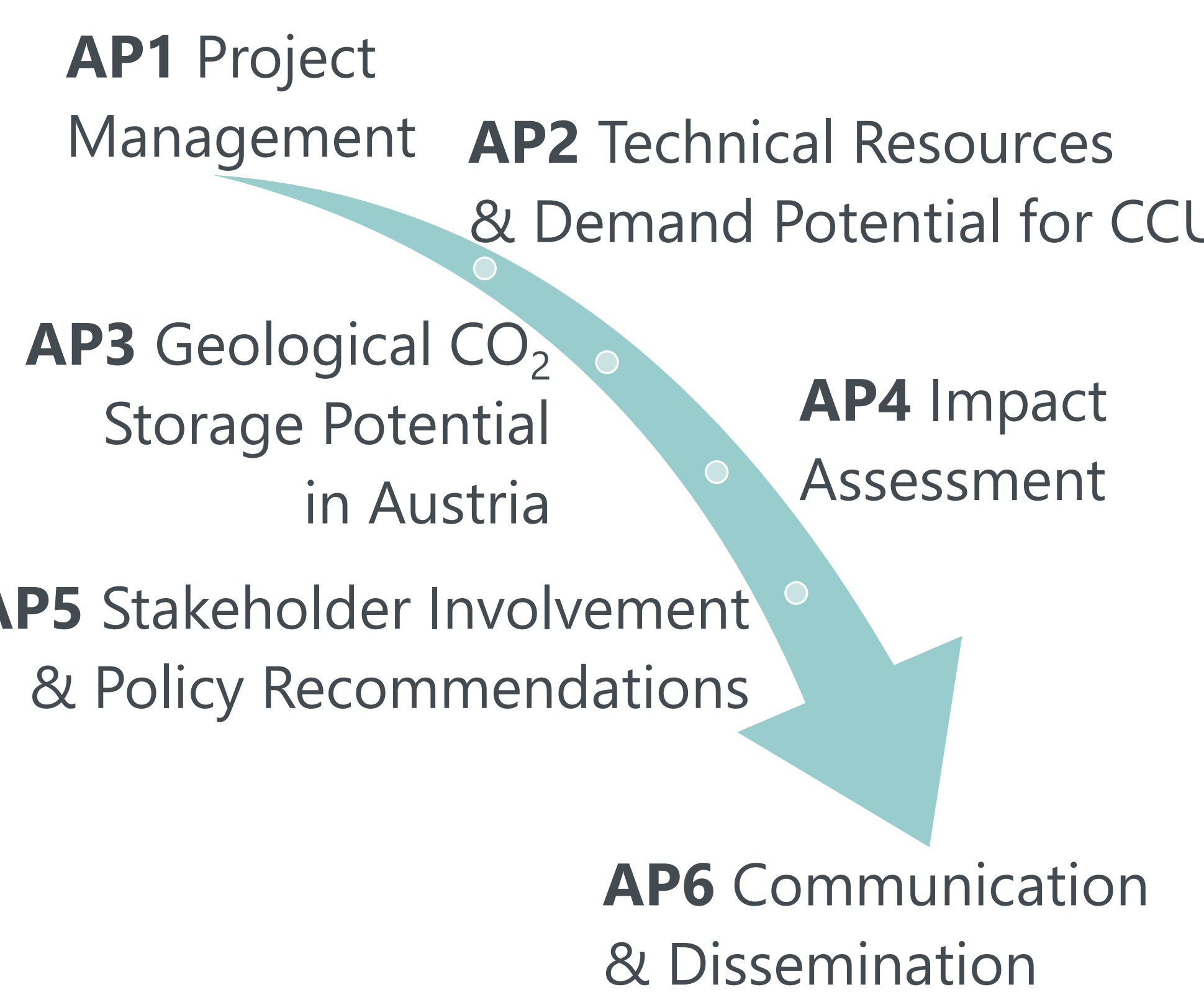
Carbon is an important resource for various sectors (e.g., chemical & downstream industries).

→ 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

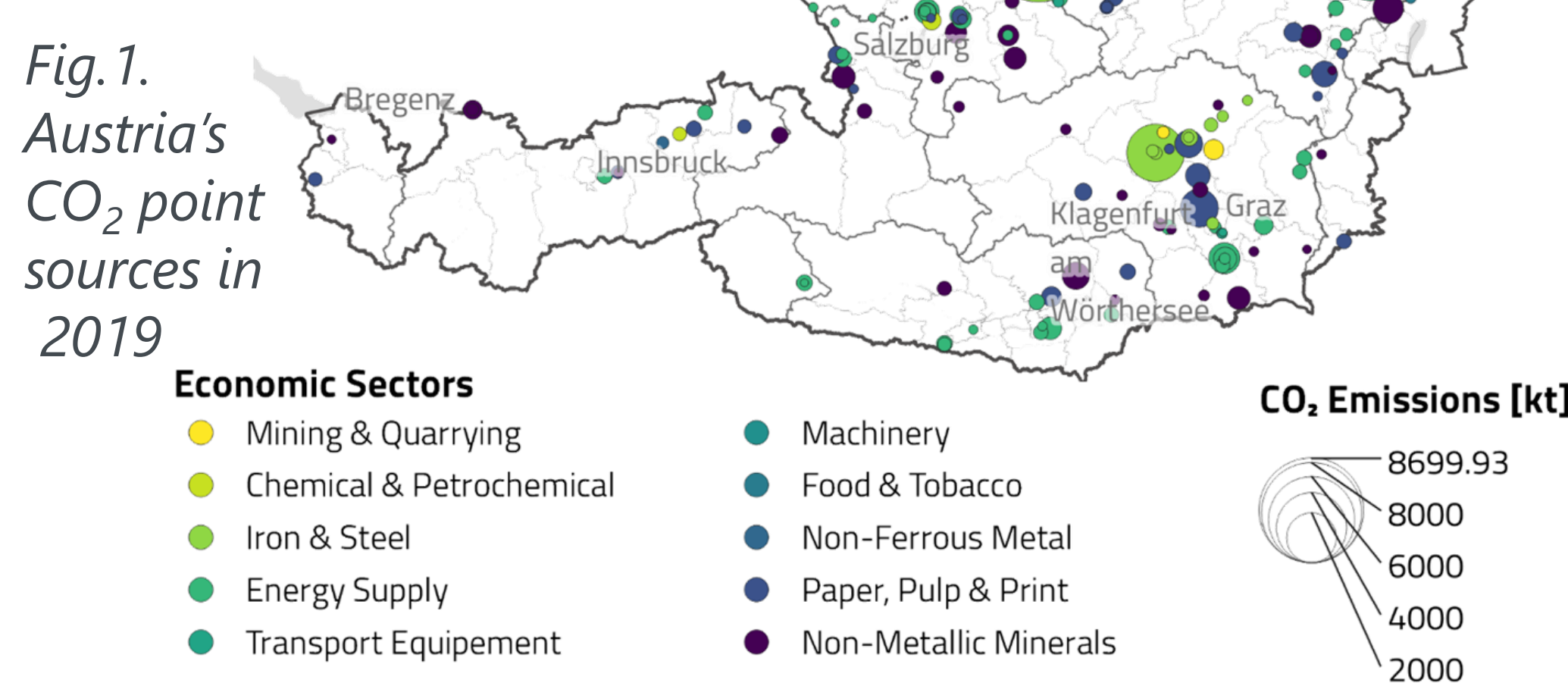


Methods

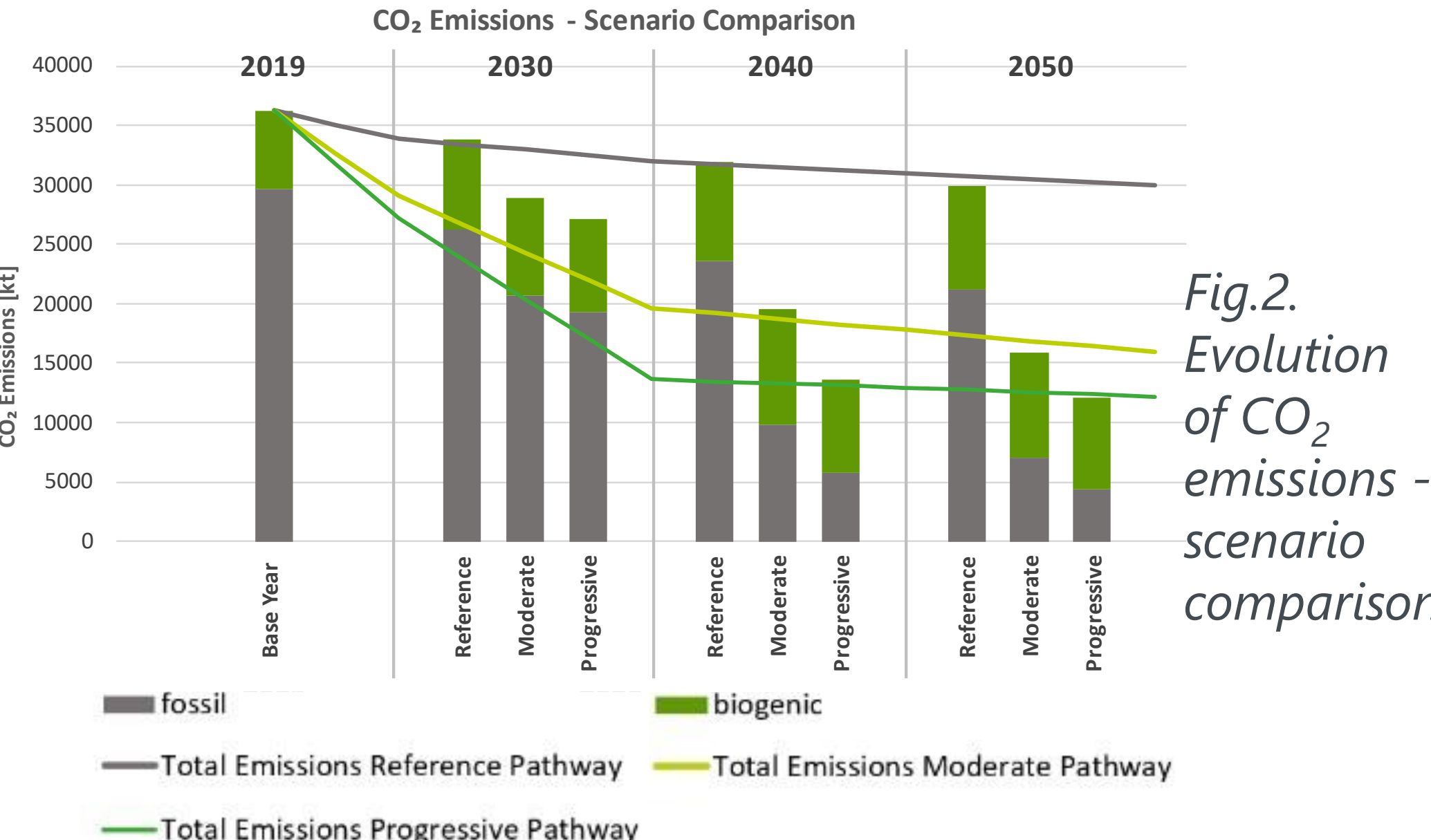
- ❖ Literature reviews
- ❖ Legal & regulatory assessments
- ❖ Bottom-up/top-down potential analysis
- ❖ Techno-economic evaluation
- ❖ Interviews, surveys, workshops

Results (selection)

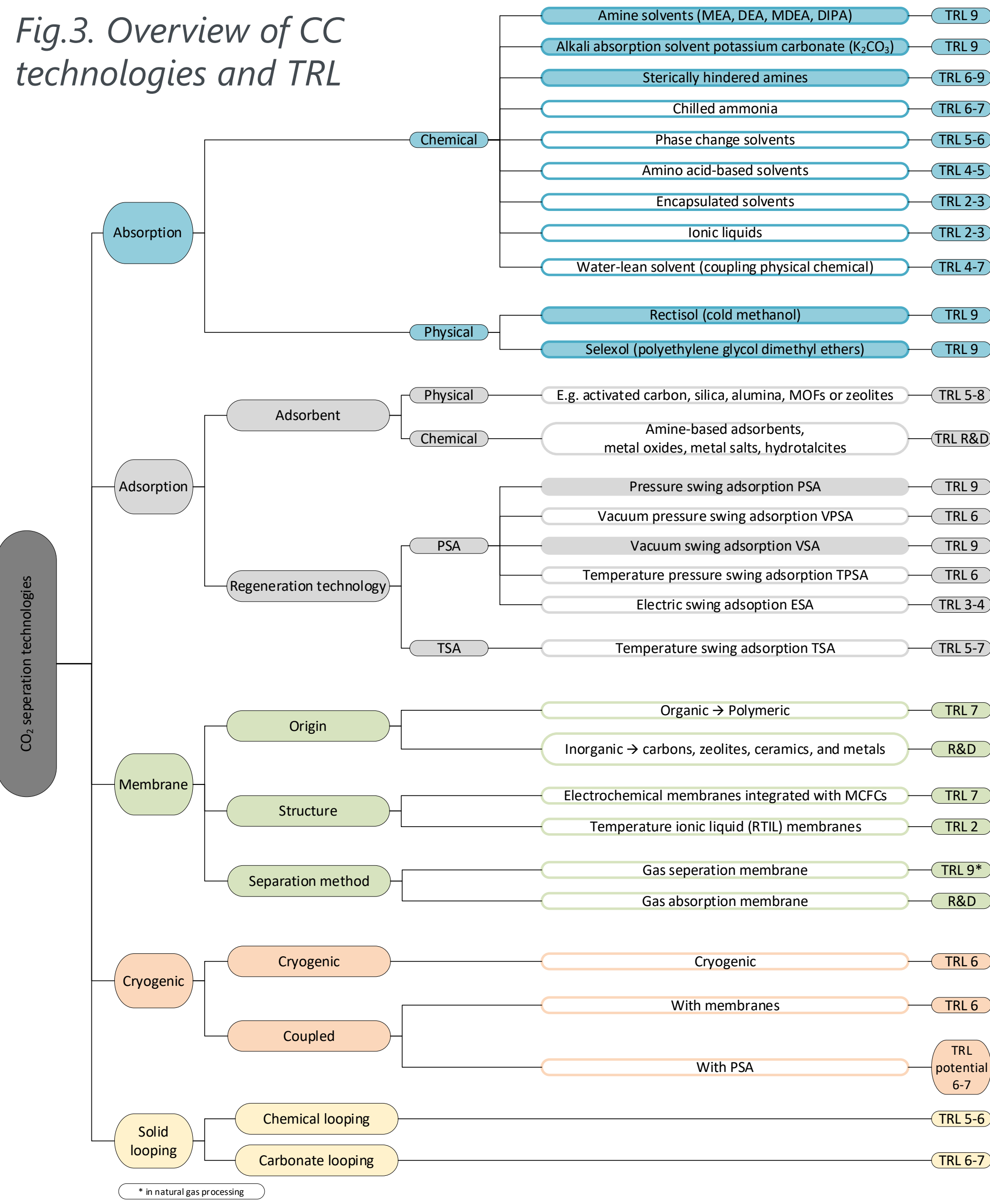
CO₂ availability



Scenario-based evaluation of today's point sources and their development



CO₂ capture technologies



CO₂ sinks: utilization & storage options

- ❖ Chemical industry: methanol, olefines, fertilizers, melamine etc.
- ❖ E-fuels: methane, kerosene etc.
- ❖ Direct use: food & drinks, inert gas etc.

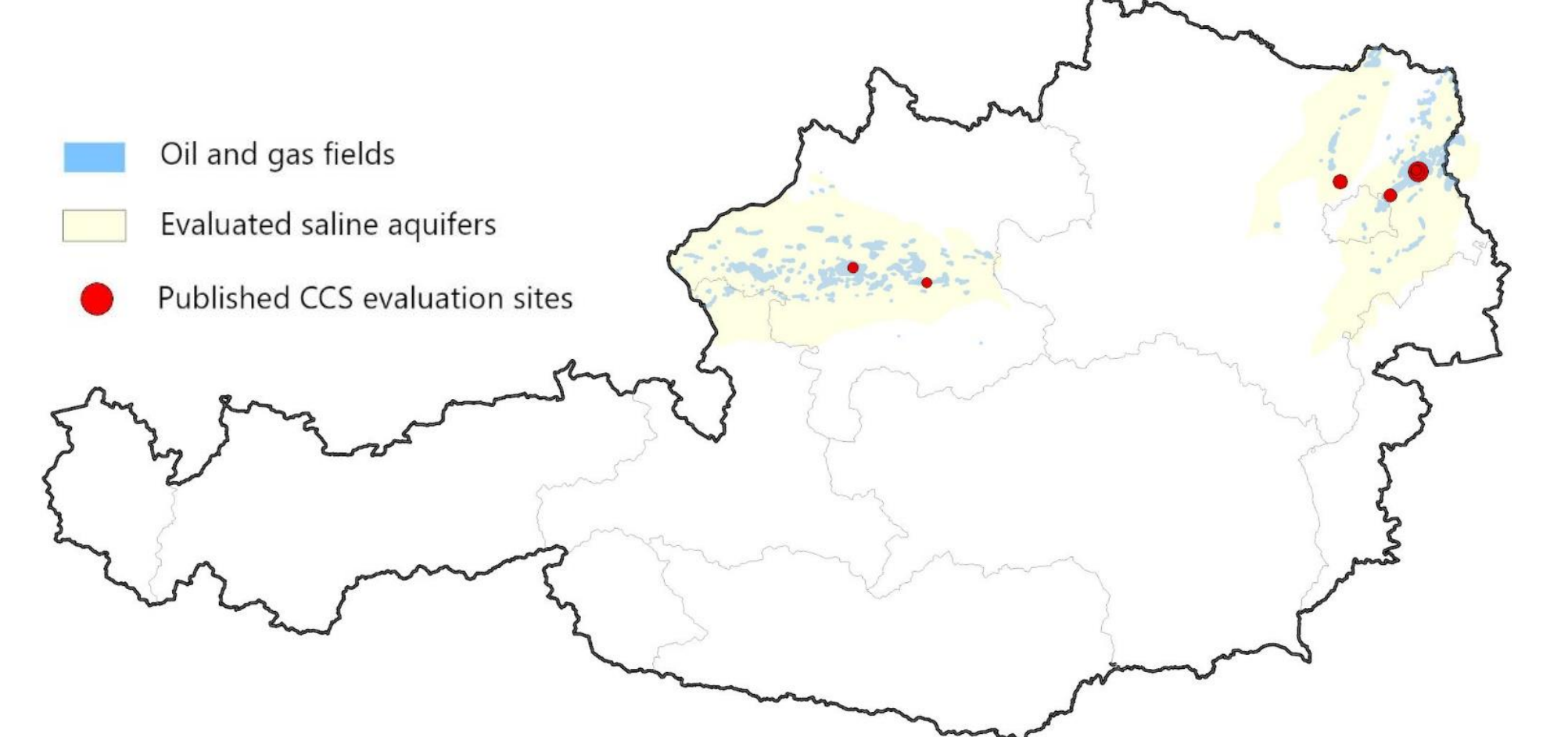


Fig. 4. Geological storage options currently under evaluation

Techno-economic & ecological impact

- ❖ Mitigation cost
- ❖ Emissions avoided + other impacts

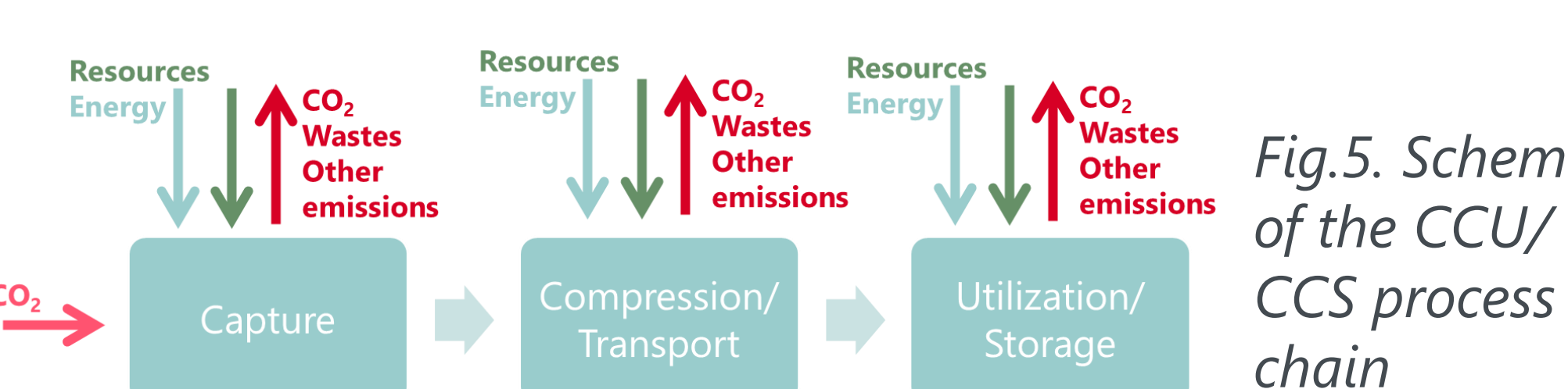


Fig. 5. Scheme of the CCU/CCS process chain

Stakeholder involvement

- ❖ CC, CCU, CCS online survey with 10 Austrian high-emitting corporations
- ❖ Workshop on insights in March 2023
- ❖ Further stakeholder deep-dive into drivers and obstacles

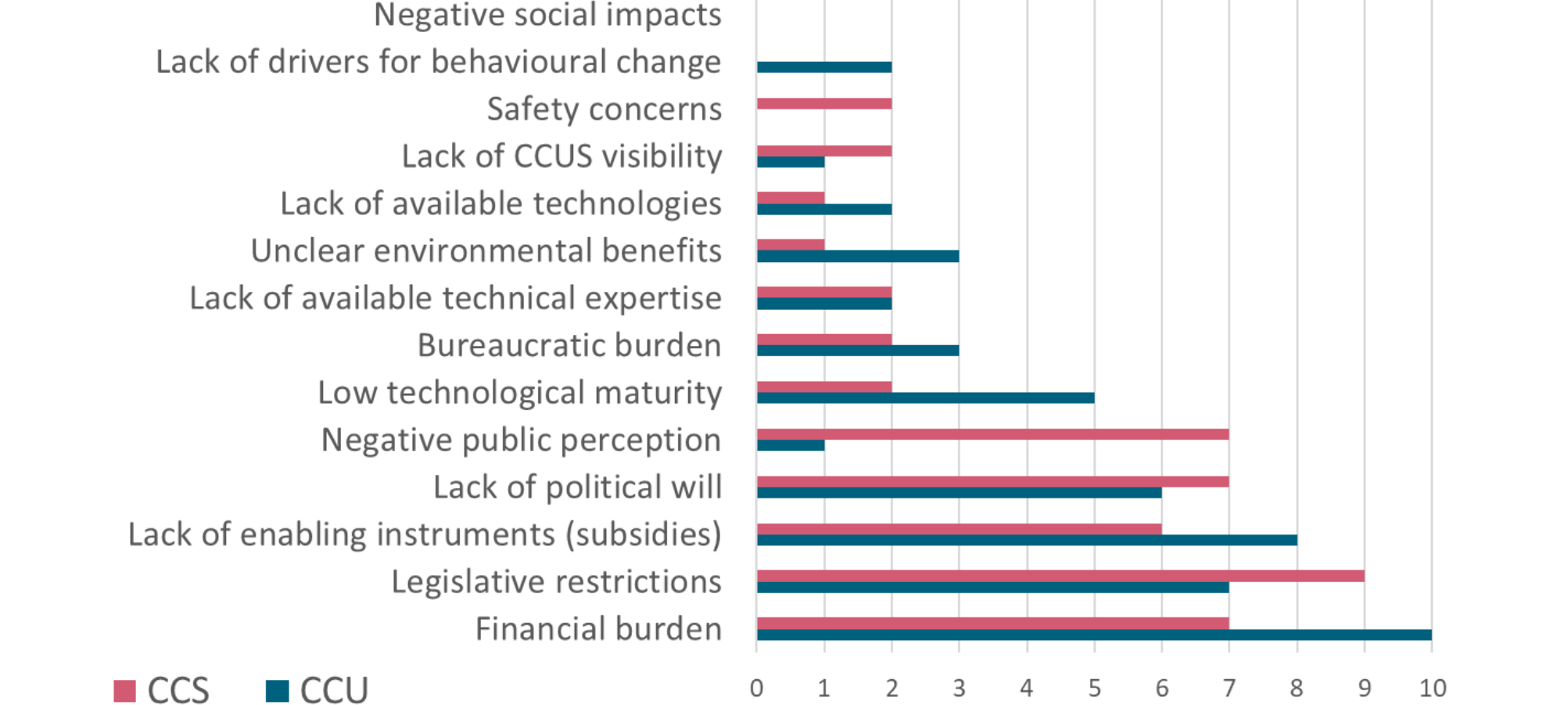


Fig. 6. Barriers to CCU / CCS implementation (survey excerpt)

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

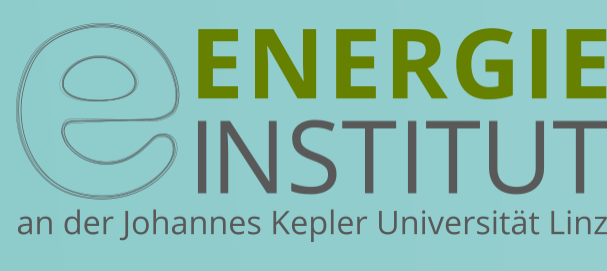
Outlook

- ❖ Use-Case development for CCU/CCS in Austria
- ❖ Techno-economic assessments
- ❖ Environmental considerations
- ❖ Quantification of sources & sinks
- ❖ Stakeholder interaction
- ❖ Policy recommendations

Meet us at the Austrian Climate Day 2024!

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