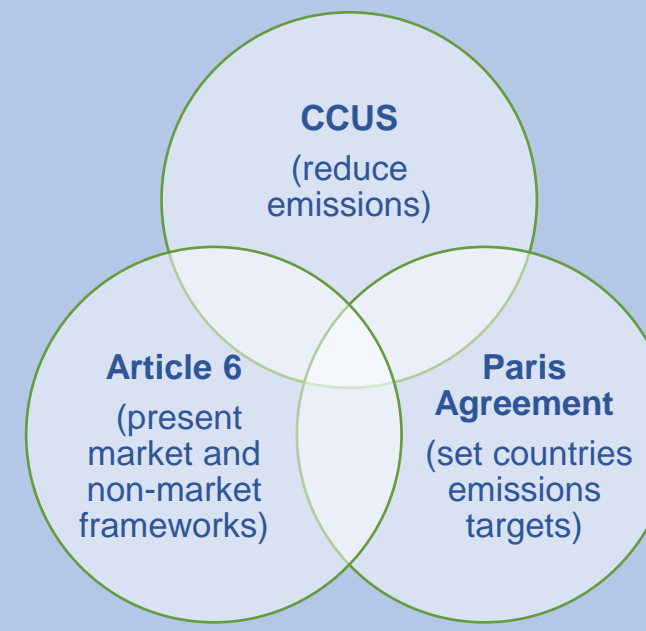


Main challenge

Effective policies remain insufficient to drive down CCUS costs to decarbonise end-use sectors (ammonia, methanol, iron & steel, cement) and **equitably** reach NetZero objectives by 2050.



Research Questions

- 1 Are current policies for CCUS uptake effective in creating a demand-pull?
- 2 How can a market be upscaled through policy interventions for different sectors and countries?
- 3 How can uncertainty be accounted for and communicated in determining the tipping point, policy interventions and timeline?

Research Implications

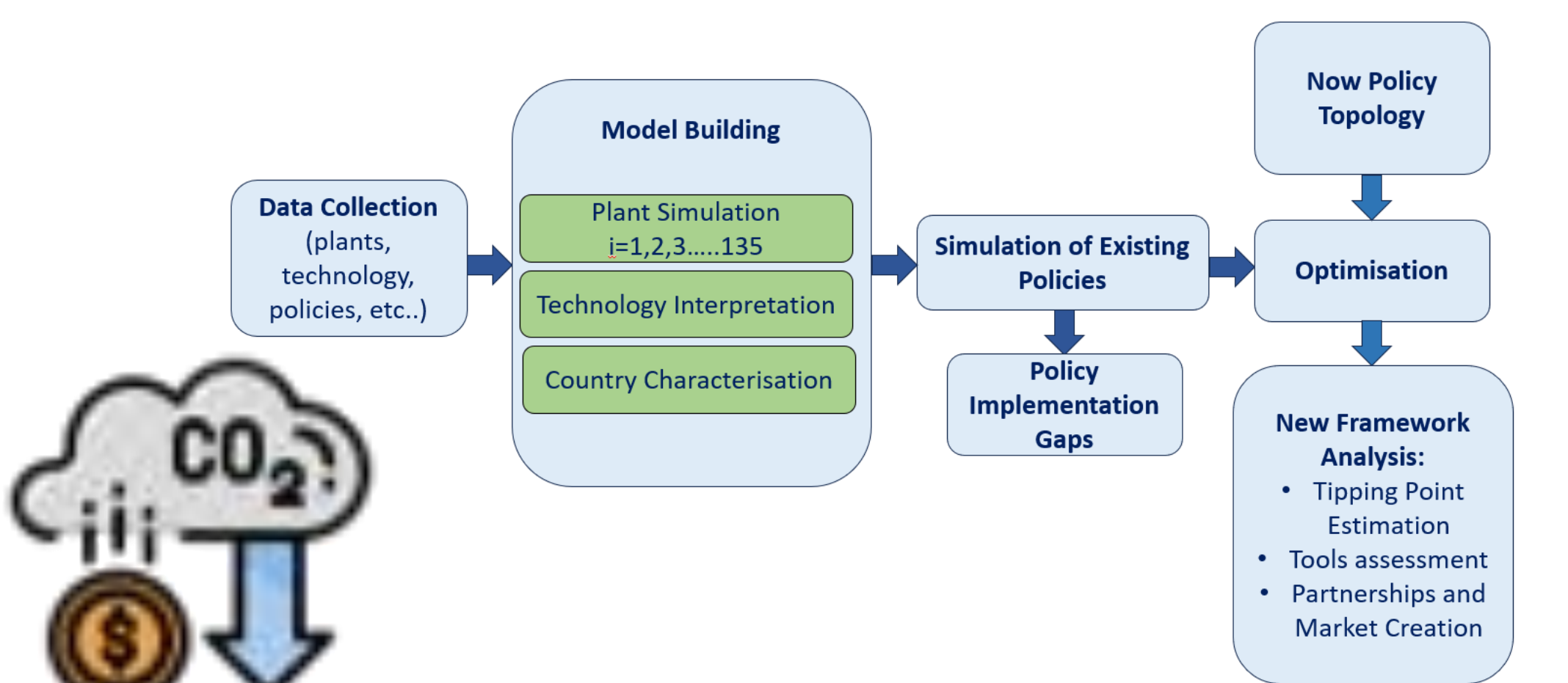
- For Industrials: highlighting investment opportunities
- For Policy-makers: providing tailored policy support and evaluation
- For Academics: emancipating decarbonisation research

Methodology

Participatory Spatio-Temporal Market Penetration Optimisation Framework

Literature Review

Research Novelty



What has been done?



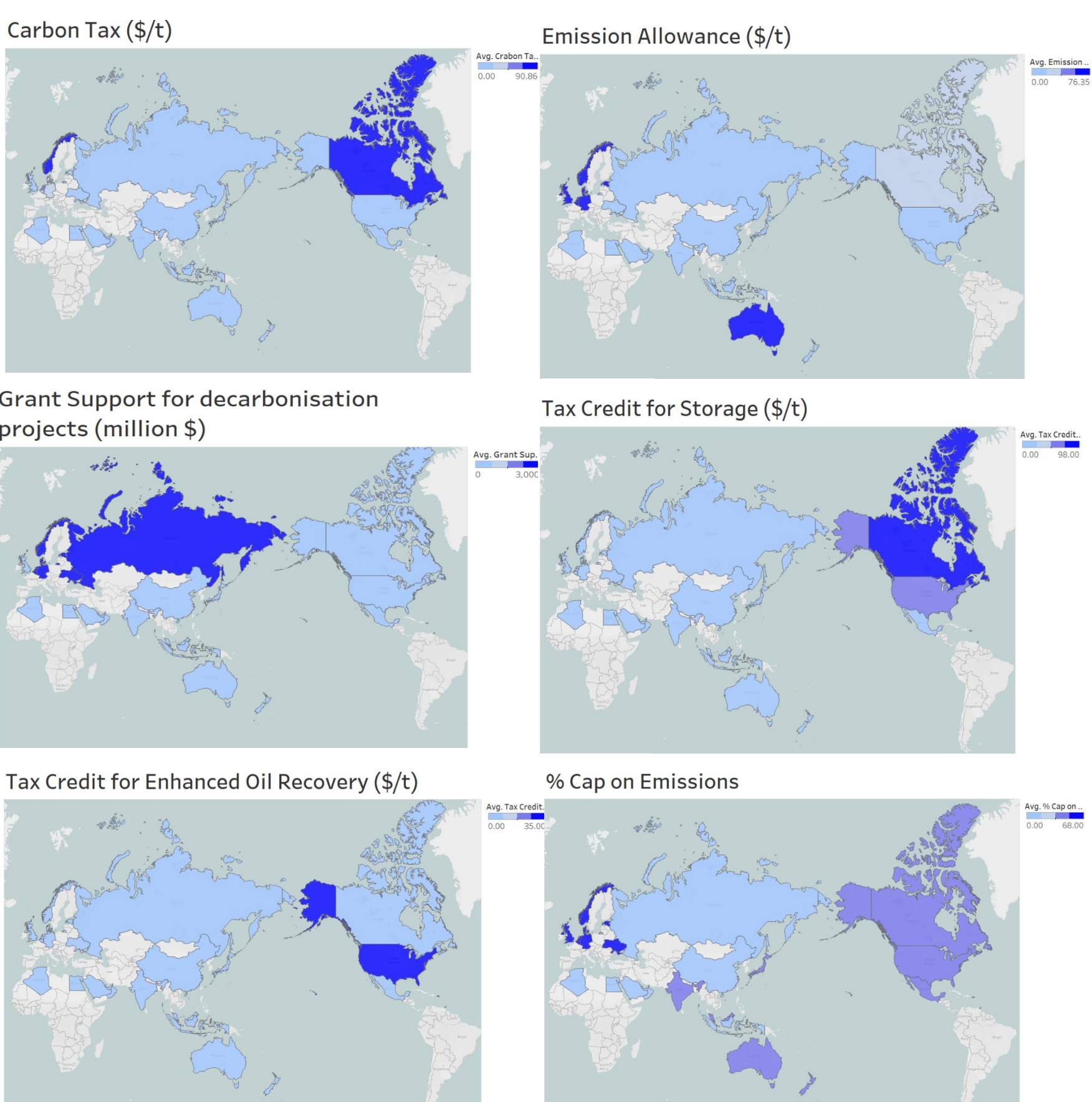
- Impact of CCS investments in real world economy³
- Process Design, LCA and Techno-Economic Analysis¹
- Economic, Energy and Environmental Analysis of Policy Options²

What is missing?

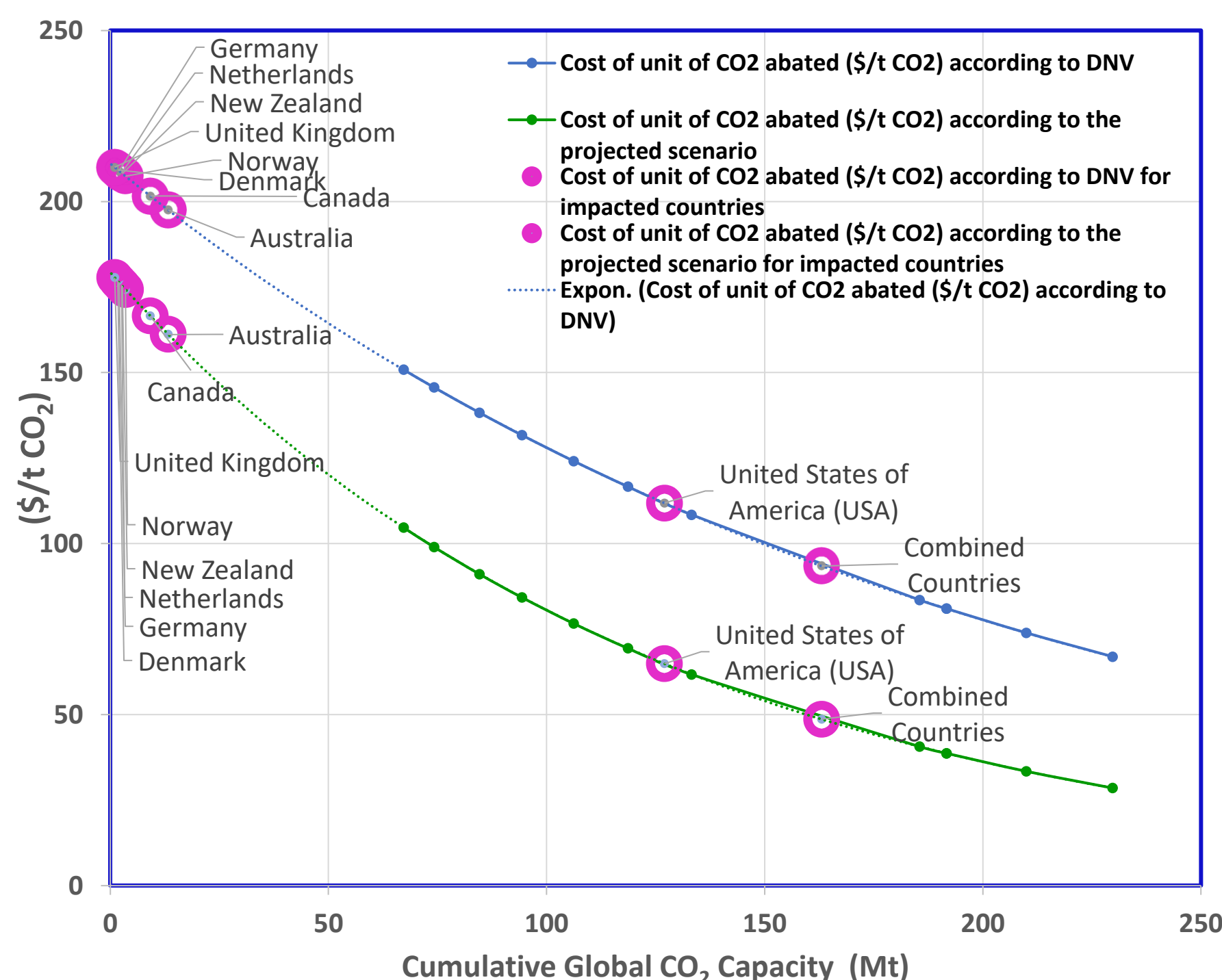
- No Studies to effectively derisk CCS investments
- No sufficient demand-pull for CCS
- No policy analysis for specific industries
- No concrete reduction in CCS prices



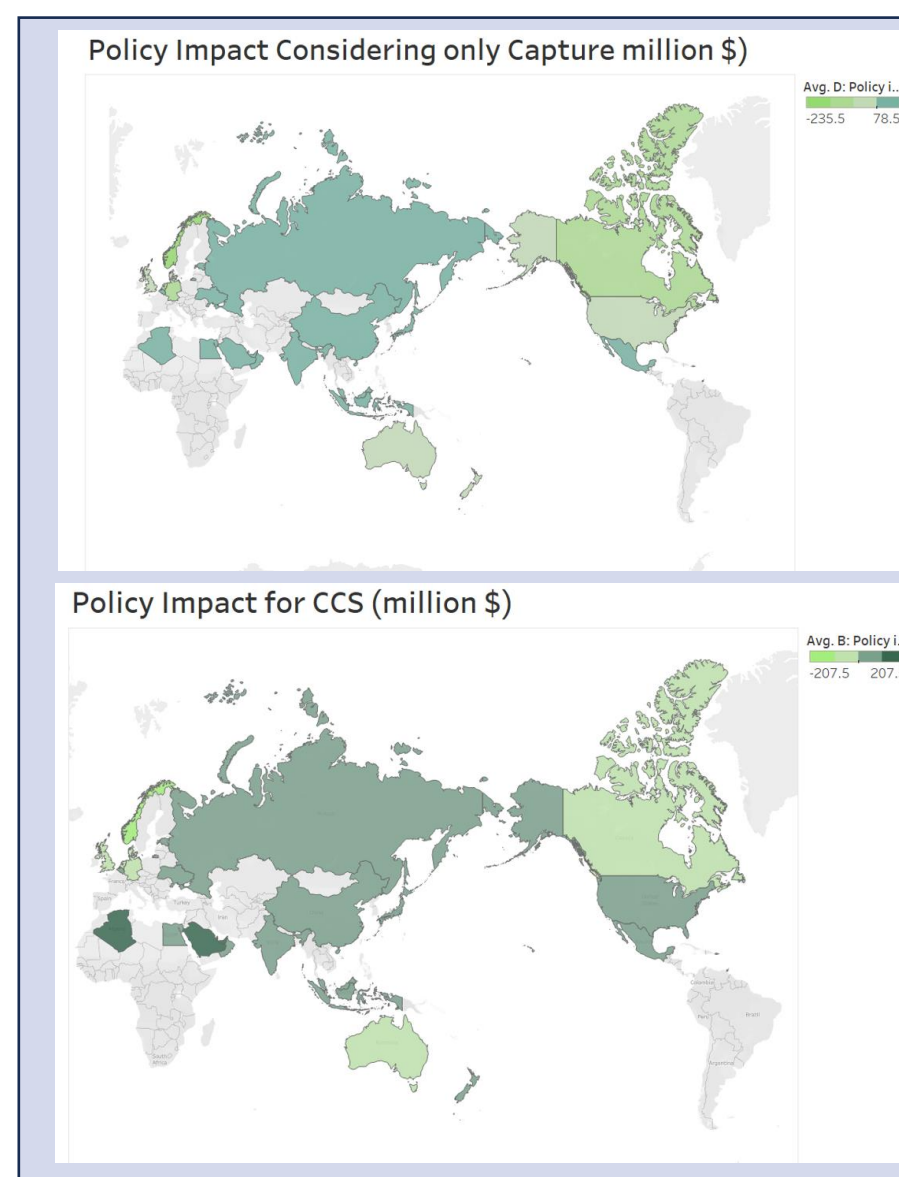
Findings so far...



Impact of policies on the decrease in cost of CCS in the ammonia industry



Conclusions



- 1 Policies should include transport and storage cost analysis and not be limited to capture.
- 2 Governments present distinctive policy mechanisms tailored to their economic models that accelerate the deployment of CCS in ammonia. While the Americas are proponents of carbon taxes and taxes on storage, the EU and its partners rather favour Emission Trading Systems (ETS).
- 3 Countries with effective policies cannot create demand on their own.

References

(1) Rouwenhorst, K. (2022). Decarbonizing fossil-based ammonia production in North America. [online] Ammonia Energy Association. Available at: <https://ammoniaenergy.org/articles/decarbonizing-fossil-based-ammonia-production-in-north-america/>.
 (2) Ming, X., Wang, Q., Luo, K., Zhang, L. and Fan, J. (2024). An integrated economic, energy, and environmental analysis to optimize evaluation of carbon reduction strategies at the regional level: A case study in Zhejiang, China. *Journal of Environmental Management*, [online] 351, p.119742. doi:<https://doi.org/10.1016/j.jenvman.2023.119742>.
 (3) Banacloche, S., Lechon, Y. and Rodriguez-Martinez, A. (2022). Carbon capture penetration in Mexico's 2050 horizon: A sustainability assessment of Mexican CCS policy. *International Journal of Greenhouse Gas Control*, 115, p.103603. doi:<https://doi.org/10.1016/j.ijggc.2022.103603>



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