

Evaluating Carbon Capture and Sequestration in Perspective of the Very Long Term

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Abstract. Climate change research with the economic methodology of cost-benefit analysis is challenging because of valuation and ethical issues associated with the long delays between emissions and potential damages, typically over 100 years and more. The large uncertainties by which climate change impacts are characterised and the possibly temporary nature of some CO₂ abatement options exacerbate this challenge. For example, potential leakage of CO₂ from geological reservoirs once this greenhouse gas has been stored artificially underground for climate control reasons requires an analysis in which the uncertain climatic consequences of leakage are valued over many centuries. We present a stylized discussion of some of the relevant questions in this context and provide preliminary calculations with the top-down integrated assessment model DEMETER, which we extended for this purpose to cover a time span until the year 3000.

Keywords. Climate change, carbon dioxide emissions, climate control, CO₂ capture and storage (CCS), geological leakage