

Cost-effective integrated mitigation and solar radiation management scenarios under uncertainty

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Most likely society will decide about the application of climate engineering options not in mere isolation, but in the context of mitigation and adaptation options. Here we present a metric for an integrated assessment of mitigation options in conjunction with solar radiation management (SRM). As costs of SRM are rather low, the crucial non-trivial part of the assessment is to represent SRM risks in the integrated assessment.

In earlier work we extended a cost effectiveness analysis of the 2° target to include a key risk category of SRM: changes in precipitation patterns. We defined regional targets for precipitation changes that are consistent with the 2° target. We found that for a spatial resolution of the Giorgi regions, about 1/3 of mitigation costs could be saved by including SRM in the portfolio of climate policy options. Here we elaborate on the effects of the uncertainty whether SRM is allowed to enter the portfolio in the future. Furthermore we outline how to generalize our approach to include uncertainty about climate response. For this, major obstacles of including uncertainty in cost effectiveness analysis are discussed and solutions are offered.