

CEMICS

Contextualizing Climate Engineering and Mitigation: Illusion, Complement or Substitute?

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The University of Hamburg – KlimaCampus, the Institute for Advanced Sustainability Studies (IASS), and the Potsdam Institute for Climate Impact Research (PIK) are conducting the project CEMICS (Contextualizing Climate Engineering and Mitigation: Illusion, Complement or Substitute?). CEMICS aims at pioneering an integrative view of Climate Engineering (CE) and mitigation options. It is the initial hypothesis of the project that society will decide about CE deployment not only based on the characteristics of a certain technology, but in the context of available alternatives. Therefore, three carbon dioxide removal (CDR) options and one solar radiation management (SRM) option will be analyzed in the context of the established discourse on options for reducing emissions. It is the aim of the project to

compare the different options based on a techno-economic assessment and impact analysis, a normative assessment of possible consequences and risks of those options, and the use of integrated assessment models.

The three carbon dioxide removal technologies CEMICS will focus on are afforestation, direct air capture, and enhanced weathering.

In addition, a key solar radiation management option (stratospheric aerosol injection), which is presumably much less expensive than carbon dioxide removal technologies, will be included in the above scheme, emphasizing a risk-valuation approach.

MAIN RESEARCH QUESTIONS

- **How would different CE technologies compare to climate change mitigation strategies that aim at reducing greenhouse gas emissions at their source?**
- **From the perspective of applied ethics and decision analysis, under which conditions can mitigation and CE options be combined in an economic analysis of the portfolio of response measures?**
- **What would the result of such a portfolio analysis be?**
- **Are CE options a complement or (partial) substitute to mitigation**

**measures, or no
solution at all?**

The integrated analysis of these questions requires a transdisciplinary approach that brings together expertise in the fields of:

- Climate Engineering assessment, particularly relating to the focus technologies of the proposal, i.e. afforestation, enhanced weathering, direct air capture, and stratospheric aerosol injection;
- integrated assessment modelling of climate change mitigation strategies;
- applied ethics and decision analysis.

The CEMICS project team combines expertise at the forefront of all of these fields.