



German Research Foundation (DFG) priority program (SPP) 1689

Climate Engineering: Risks, Challenges, Opportunities?



The term climate engineering (CE) specifically describes large-scale technical methods that can be used to reduce the concentration of CO₂ in the atmospheric or to reduce incoming solar radiation. Recently, some scientists and politicians have begun discussing the possibility of using CE to deal with climate change. This discussion has taken place against a background of unabated (despite efforts to reduce CO₂ emissions), rising atmospheric concentrations of greenhouse gases. However, despite the interest in CE there is no reliable information about its effectiveness, risks, and side effects. Thus, the debate is both complex and controversial. There is hope that the new approaches may be able to deal with climate change and the fear that a failure to understand how CE could affect the complex climate system may lead to a great catastrophe. Therefore, any evaluation of CE must include technical, scientific, social, political, legal, and ethical dimensions that examine both the short- and long-term, and the regional and global, aspects of CE. Currently, the multidimensionality of the problem is being given very little attention by international research communities. In the priority program these aspects will be considered, and the topic of climate engineering will be thoroughly examined in a comprehensive, transparent manner.

A key goal of the priority program is to reduce the large uncertainties in our current understanding of CE impacts on the environment, politics, and society so as to create a scientific basis for a responsible approach to the issue CE. Problem-oriented basic research will evaluate the possible effects of CE on natural and social systems and international relations, study the challenges in research and governance strategies and communication between scientists and the public, and analyze the possible impact on climate policy in the context of CO₂ reduction and adaptation. Two areas of research are planned:

- - Investigation and assessment of the potential effectiveness, uncertainties, and challenges of CE

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Evaluation of the legal, moral, and public acceptability of CE

Initially the focus will be on three CE methods, which have been chosen to examine a wide range of methodological scales and characteristics:

- The injection of aerosols into the troposphere or stratosphere,
- increasing ocean alkalinity, and
- afforestation.

Since an integrative study of CE requires a significant exchange between different scientific disciplines, each project is tightly linked with a complementary partner project from another discipline.

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