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# International governance of climate engineering research and deployment


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# What is climate engineering? (also “geoengineering”)

- techniques to cool the earth at a global scale, without reducing GHG emissions, by reducing incoming solar radiation or by removing CO2 from the atmosphere
- generic and general term comprising several different concepts:

**Solar Radiation Management (SRM)**

- Sulfate aerosols in the atmosphere
- Cloud brightening from ships
- Desert reflectors
- Installations in outer space

**Carbon Dioxide Removal (CDR)**

- Ocean fertilisation
- Ocean liming
- Ocean biomass storage
- Biomass and biochar on land
- Enhanced weathering
- Air capture of CO2 (“artificial trees”)
- [ Carbon capture and storage (CCS) ]

CE mostly at conceptual or modelling stage, but also **field experiments** on ocean fertilisation and initial attempts at aerosol injection

# Policy implications and challenges

- research funded at least by EU, UK, Germany, USA, private foundations
- emerging public debate and a rapid growth of literature
- link to international climate policy
- climate engineering will be in IPCC AR5

**=> need for international governance framework?**

Main existing governance:

- regulatory efforts on ocean fertilisation: London Convention / Protocol (LC/LP)
- two CBD decisions on climate engineering in general

# Research project for the German Federal Environment Agency

"Options and proposals for governance of geoengineering research and deployment", - UBA research project FKZ 3711 11 101 –

http://www.ecologic.eu/4632 http://www.ecologic.eu/8109

## Research project's focus

- *international* regulation / governance of climate engineering
- political feasibility

## 3 parts

- definition of CE
- existing governance framework under international law
- governance options and proposals => this presentation

## Different climate engineering concepts

# Developing CE governance options - overview

**Step 1:** develop **objectives and criteria** for *international* governance of climate engineering

**Step 2:** derive **core elements** of the envisaged governance from step 1

**Step 3:** analyse which CE concepts **primarily require** international governance

**Step 4:** identify **regulatory gaps:** does existing international governance correspond to the envisaged governance?

**Step 5:** Options and propsals for **filling the regulatory gaps** identified in step 4

# Step 1: Objectives and criteria for international CE governance

Need for **explicit objectives and criteria** that any proposed governance arrangements are meant to pursue, balance and fulfil

**Overarching objectives**

- avoid transboundary environmental and health impacts
- avoid political tensions, in particular unilateral CE activity
- coordinate scientific research

**Specific criteria**

- precautionary approach relating to the risks of CE
- facilitate broad international participation and acceptance
- not undermine mitigation efforts
- aim at legitimacy through public participation and transparency
- flexibility: ability to incororate new scientific knowledge and public debate

**Note: „trade-offs“** – between conflicting objectives and compromises

# Step 2: core elements of the envisaged governance

Key questions :

- how high is the risk of unilateral action
- how high is the risk of transboundary impacts

=> **prohibition in principle, combined with** clear conditions for **exceptions**, e.g. for legitimate research

- many design options in terms of substance and procedure
- international level / national level
- in principle includes research activities beyond “indoor” activities (see next slide), but also a potential exemption under clearly defined conditions.

# Step 2: core elements of the envisaged governance (cont.)

in principle include **research** in general prohibiton:

- separation of governance structures and implied sequencing of their elaboration seems problematic and non-advisable because
  - (1) there is no clear-cut separation of the application of CE techniques “for research” from the application “for other purposes” and
  - (2) separate governance structures for research would be likely to provide an important precedent and blueprint for the governance of deployment (for other purposes)
- => in principle include research activities beyond “indoor” activities, but also a **potential exemption** under clearly defined conditions.
- For governance purposes a combination of elements should be defined at the international level as **guidance for determining exemptions**.

# Step 2: core elements of the envisaged governance (cont.)

- **No closed definition** determining normative consequences. A general definition could be combined with a positive list of activities addressed.
- clear **separation** of scientific input and political decisions.
- possibility to include or refer to international scientific and technological assessments.
- appropriate structures for **reporting** and monitoring of national-level decisions and activities.
- **central institution** as “first point of contact”
  - “overarching but not supervisory" function
  - dos not exclude horizontal division of labour with specialised regimes
- possibility for regular meetings in order to ensure flexibility.
- ability to address regime conflicts.

# Step 3: identify geoengineering concepts primarily requiring international governance

Not all CE concepts have to be regulated at the international level

- risk of unilateral action
- risk of transboudary impacts

⇒ **priority**:

- atmospheric SRM
- marine geoengineering

# Step 4: regulatory gaps in existing international governance

= to what extent does the existing governance framework under international law correspond to the envisaged governance for the CE concepts requiring priority attention?

**In general: rudiments of an emerging regime complex**

- CBD central regime and LC/LP specialised regime
- other institutions not or hardly active
- CBD and LC/LP (with OSPAR) at least basically correspond to our normative governance approach.
- However, **significant shortcomings**, e.g.
  - horizontal and vertical division of labour unclear
  - CBD not fully established as central forum
  - providing or compiling scientific assessments; a common forum for review

# Step 4: governance gaps (cont.)

**Main governance gap: atmospheric SRM**

- highest risk potential
- not specifically regulated so far; overarching governance by CBD insufficient

**Ocean fertilisation:**

- detailled but not (yet) binding regime under LC/LP

**Other CE concepts:**

- additional normative gap, but international governance not or not yet necessary (space, desert reflectors)

# Step 5: Options for filling the governance gaps

**Good reasons for central regime with overarching functions**

- central point of first contact, but not sole regulatory instance
- build on existing institutions where appropriate - evolutionary approach
- time is not (yet) ripe for specialised CE regime

**CBD prime candidate for becoming the central institution** recognised as a first point of contact and overarching functions

- existing basic governance can be developed, despite shortcomings
- alternative: UNEP, but need to wait for current developments
- climate regime not well suited (but might nevertheless attain specialised role)

# Step 5: Options for filling the governance gaps (cont.)

## SRM

- CBD may also be the most appropriate forum, perhaps UNEP (see above)
- consider options under LRTAP regime
- Montreal Protocol has crucial shortcomings

## Marine CE

- generally support LC/LP approach as example of specialised regime
- design the inclusion of further marine geoengineering concepts

## Research

- Need for international scientific assessments => mandate for international central institution

# Thanks!

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