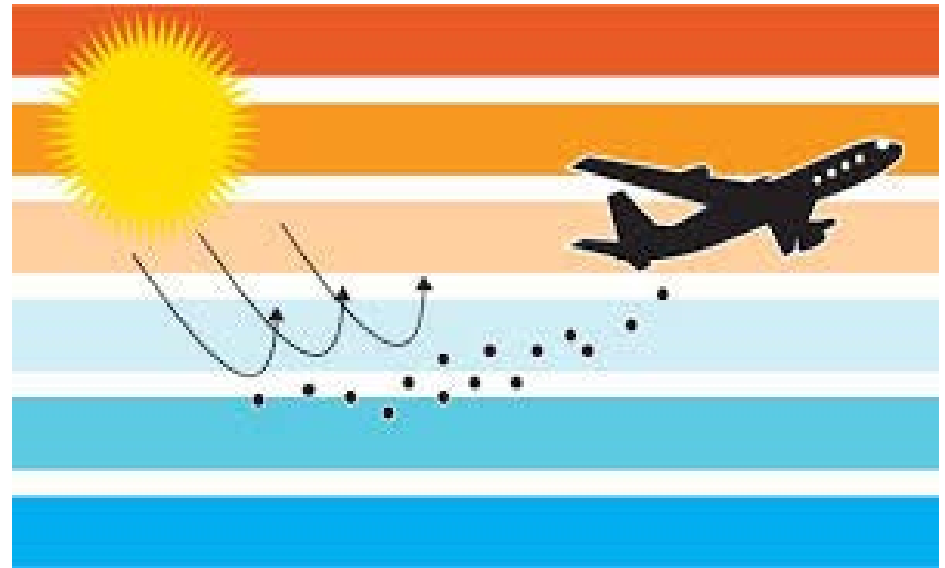




# Climate Engineering: Science Fiction or Future?



## Frank Biermann

Professor of Global Sustainability Governance  
Copernicus Institute of Sustainable Development  
Utrecht University



**Difficult questions and discourses  
cannot be avoided.**



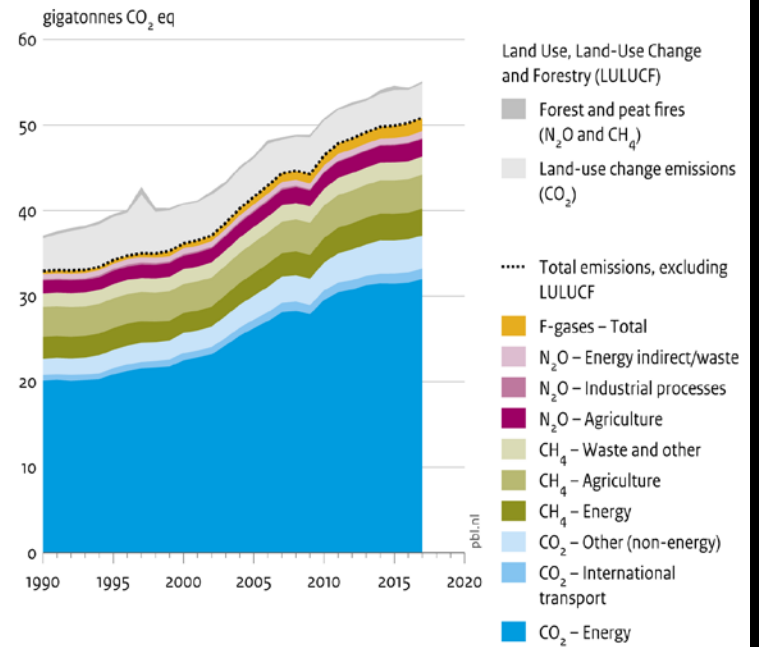


UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT

Rio de Janeiro 3-14 June 1992



Global greenhouse gas emissions, per type of gas and source, including LULUCF



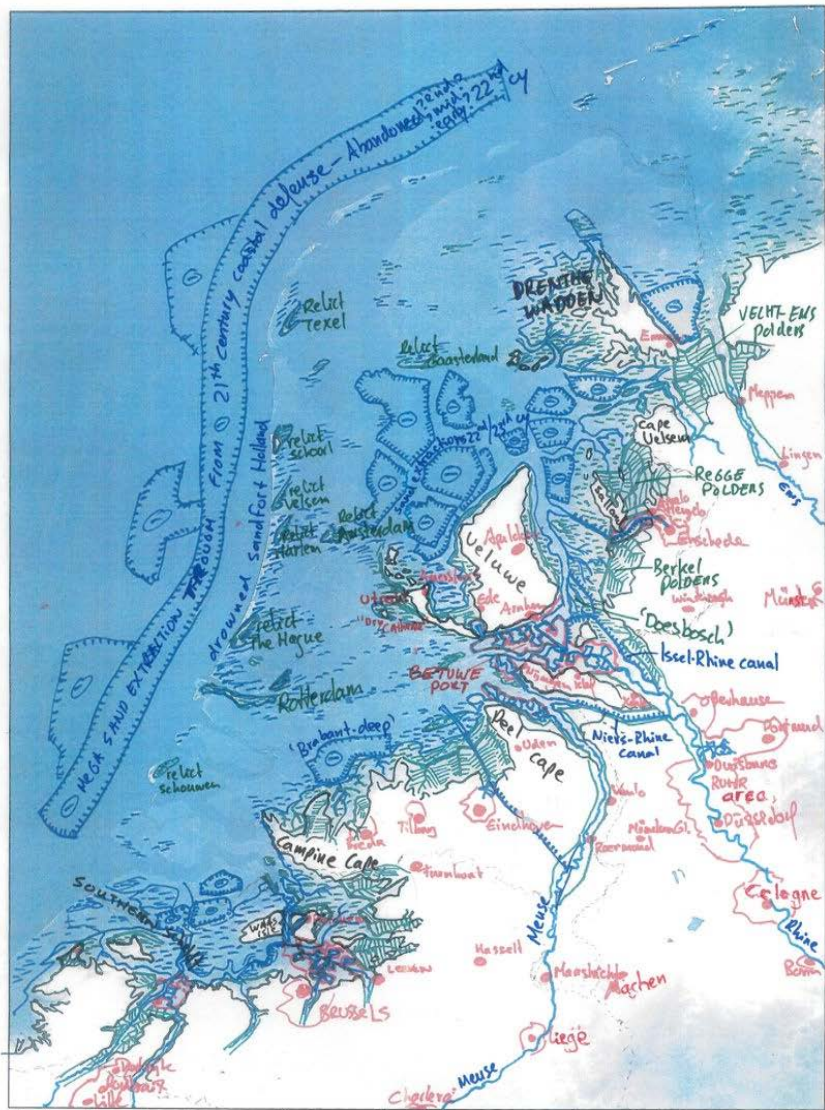
Source: EDGAR v5.0/v4.3.2 FT 2017 (EC-JRC/PBL, 2018); Houghton and Nassikas (2017)



“Given that [the 2° target] is an ambitious target, ... we should be prepared to adapt to 4 degrees.”

R. Watson, The Guardian, 2008

# Adapting to 4 Degrees?

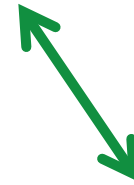
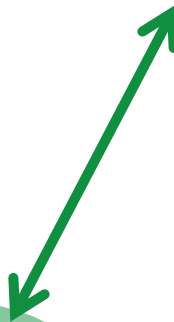
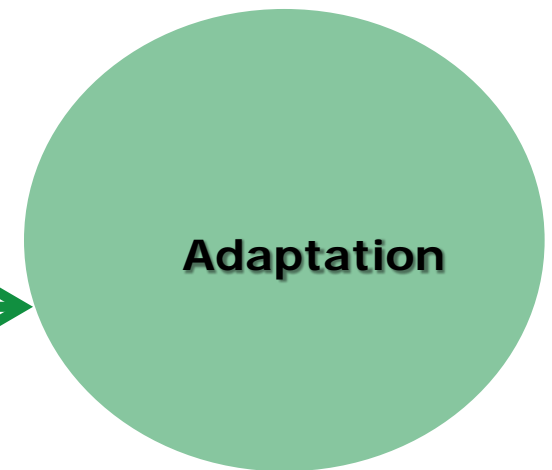
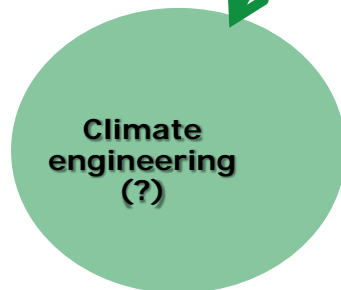
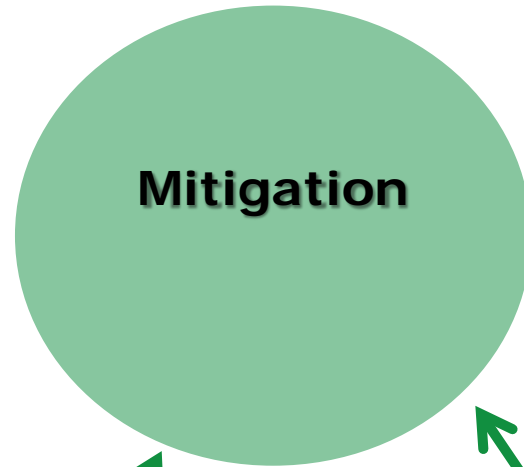
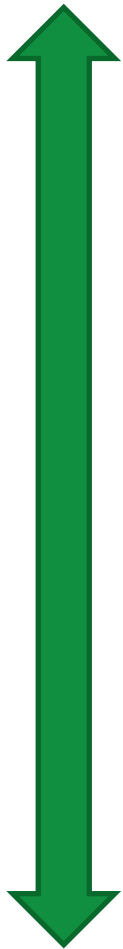


Reclamation-disclaimer: Past results do not guarantee future performance



# The 21<sup>st</sup> Century Challenge

**"Good Anthropocene"**



**"Terrible Anthropocene"**

# Can we govern climate engineering technologies?



# Different Governance Challenges

## Solar radiation management

### Key governance problem:

- Control
  - Democratic decision-making
  - Effective co-decision by all countries



## Negative Emissions Technologies

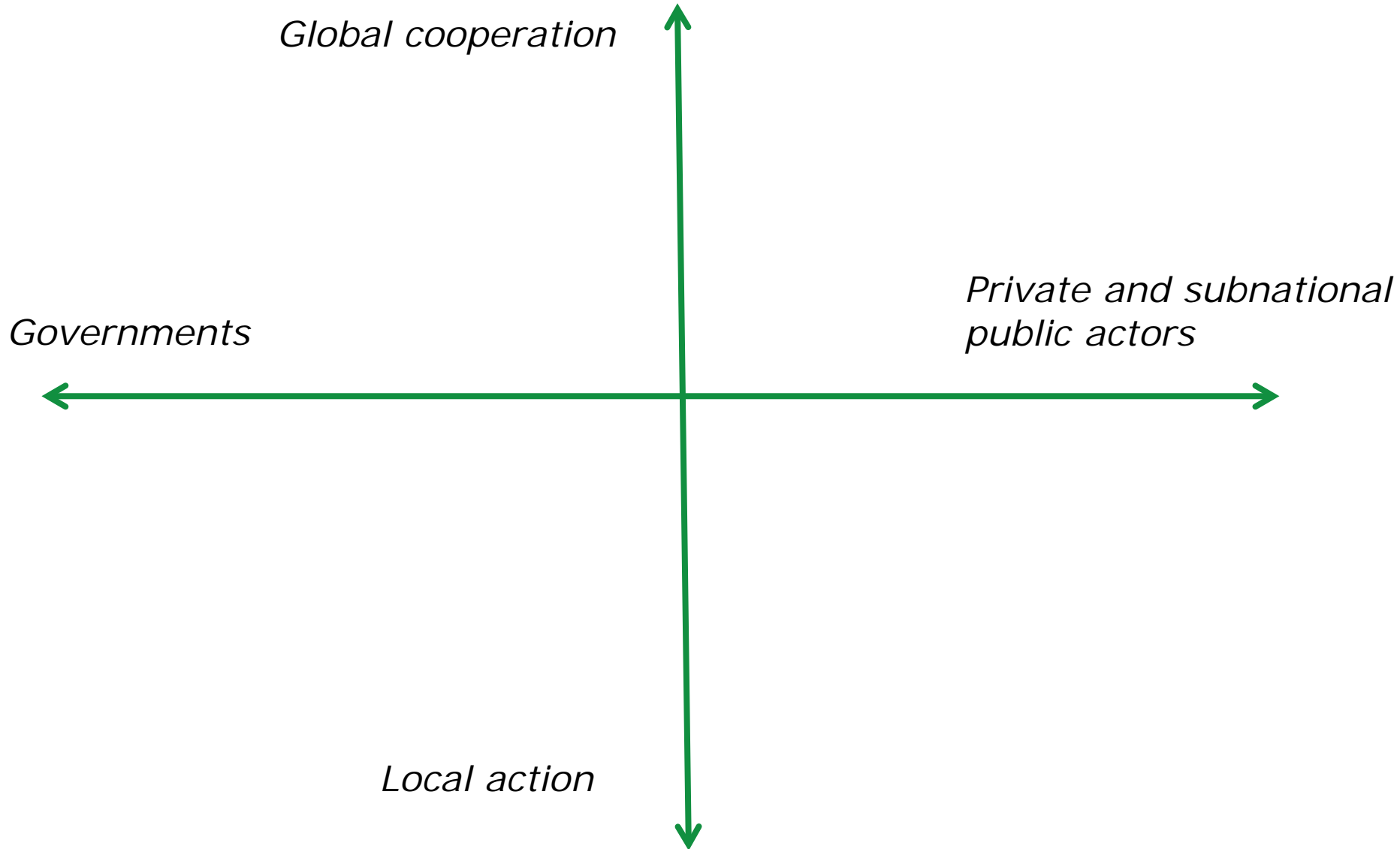
### Key governance problem:

- Incentivization and cooperation
- Coordination and monitoring
- Control of side effects (food security, biodiversity, etc.)





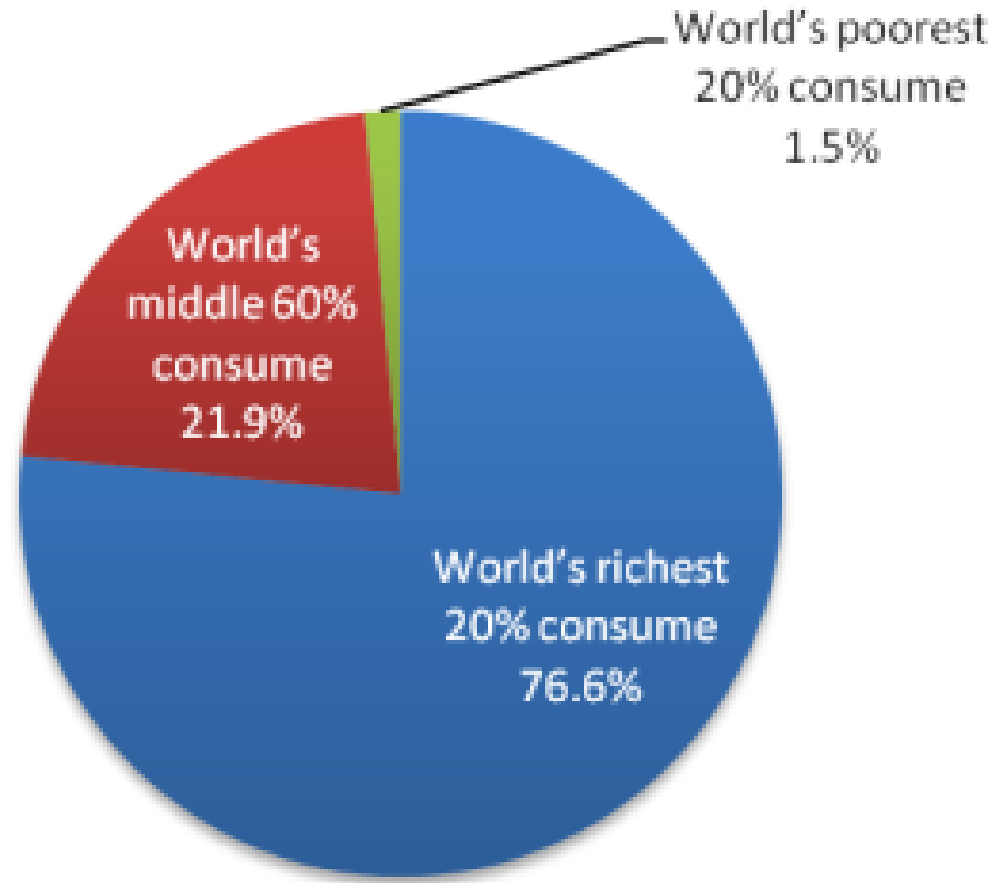
# Public vs. Private & Global vs. Local



# **Concern No. 1: Global inequality**

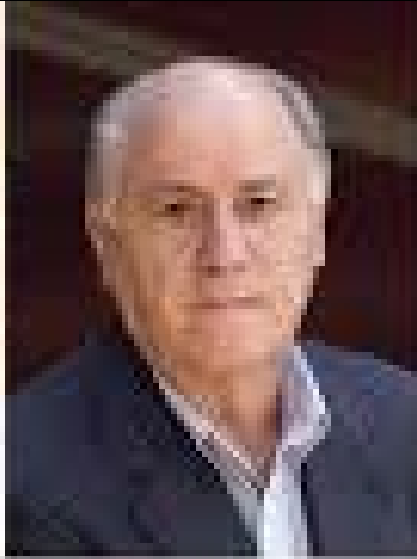


## Share of world's private consumption, 2005



Source: World Bank Development Indicators 2008

# The "Group of Eight"



# Climate Engineering & Poor Countries



# Rich man's solution? Climate engineering discourses and the marginalization of the Global South

Authors

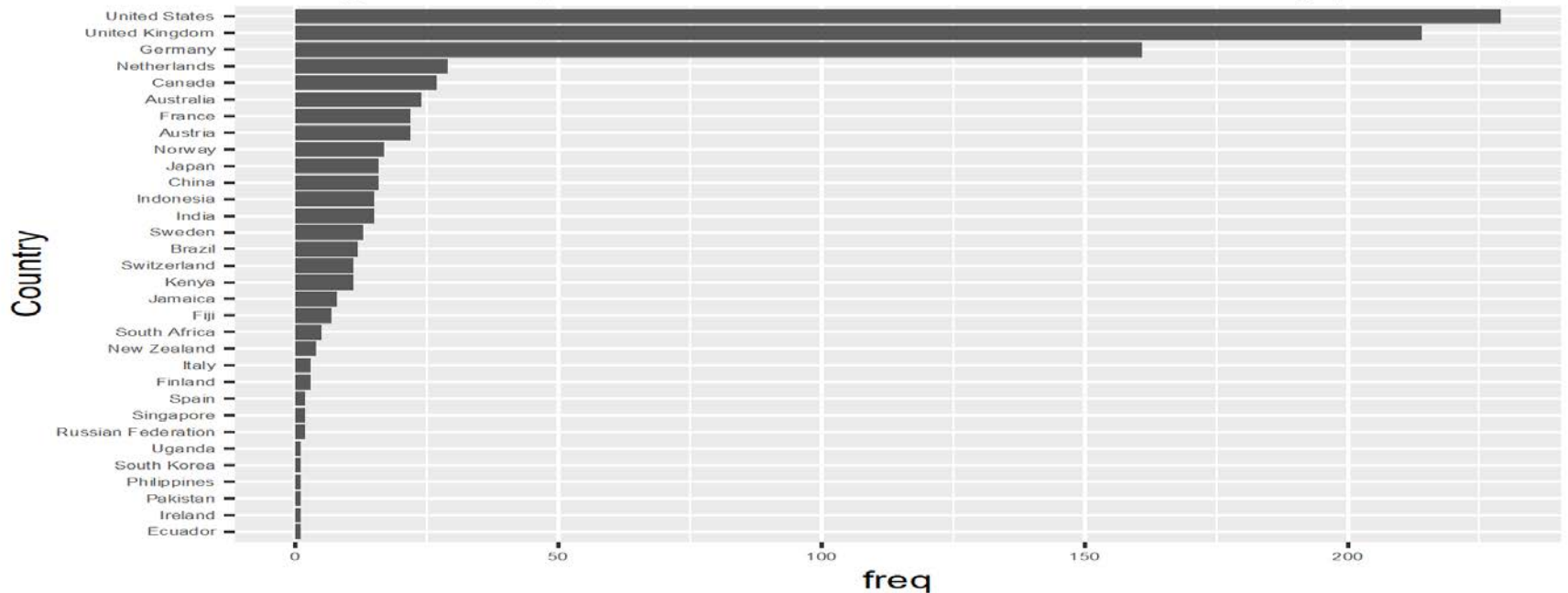
Authors and affiliations

Frank Biermann , Ina Möller

[Open Access](#) | [Original Paper](#)

First Online: 06 March 2019

## Origins of represented institutions at CE events (speakers)



## Proposition No 1:

1. *Any deployment* of climate engineering technologies requires full prior informed consent by the Global South, in particular by least developed countries.
2. *Any research* on climate engineering requires full prior informed consent by the Global South, in particular the least developed countries.
3. *Any discourse* on climate engineering requires a global programme to strengthen the independent scientific capacity in the Global South.

# Effective Global Governance & Control





# The Need for a United Nations 2.0



## DECLARATION BY UNITED NATIONS

**DECLARATION BY UNITED NATIONS**

WE, the peoples of the United Nations, have determined to reaffirm our common principles, to strengthen our mutual confidence, to achieve a more just and lasting peace, and to promote the well-being of the people of the world.

WE have decided to enter into a solemn agreement, to be known as the Charter of the United Nations, which shall be signed by all the Members of the United Nations, and which shall be subject to ratification, acceptance, or accession, as may be determined by each of them.

WE have decided to meet in a conference at San Francisco, California, on the twenty-first day of April, 1945, for the purpose of discussing and adopting a charter for the United Nations, and for the purpose of signing the said charter, and for the purpose of recommending to the United Nations Conference on International Organization, which shall be held at San Francisco, California, on the twenty-first day of April, 1945, the said charter, and for the purpose of recommending to the said conference the said charter, and for the purpose of recommending to the said conference the said charter, and for the purpose of recommending to the said conference the said charter.

*[Handwritten signatures of various world leaders follow, including Franklin D. Roosevelt, Winston Churchill, and Chiang Kai-shek.]*

# Earth System Governance

World Politics  
in the Anthropocene



Frank Biermann

**UN Environment  
Organization**

**UN Council for Sustainable  
Development**

**Trusteeship Council for  
Areas beyond National  
Jurisdiction**

**New Modes of Voting and  
Representation**

**Global Environmental  
Assessment Commission**

**Climate Refugee Treaty**

# Beyond Consensus

A large assembly hall, likely the European Parliament, with many people seated at desks. Some people are raising their hands, indicating a vote or a point of order. The scene is captured from a low angle, showing the backs of several people in the foreground and the vastness of the chamber in the background.

Structural reforms are needed in how global negotiations are conducted. Treaties must rely more on qualified majority voting.

## Proposition No 2:

1. *Any deployment of (and research on) of climate engineering technologies requires fundamental strengthening of global institutions.*
2. Among others, new methods of qualified majority voting are required, which are not yet known.

# "Control" across time



All types of climate intervention require new forms of "Governance across Time"

# Explorative learning from organizations with "extreme longevity"



Research Article

THE  
ANTHROPOCENE  
REVIEW

# Deep-time organizations: Learning institutional longevity from history

Frederic Hanusch<sup>1</sup>  and Frank Biermann<sup>2</sup>

The Anthropocene Review

1–23

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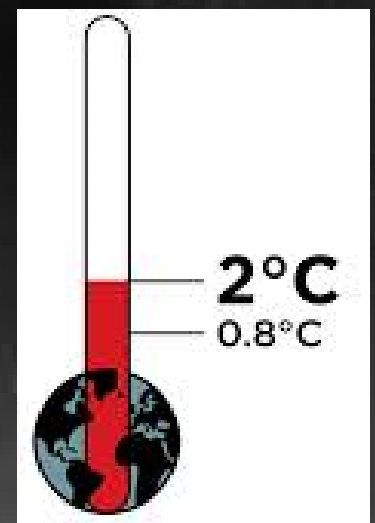


## Proposition No 3:

1. *Any deployment of (and research on) climate engineering technologies requires new types of global decision-making across time as well as “deep time organizations”.*
2. *Such fundamental decisions require new types of democratic legitimacy.*



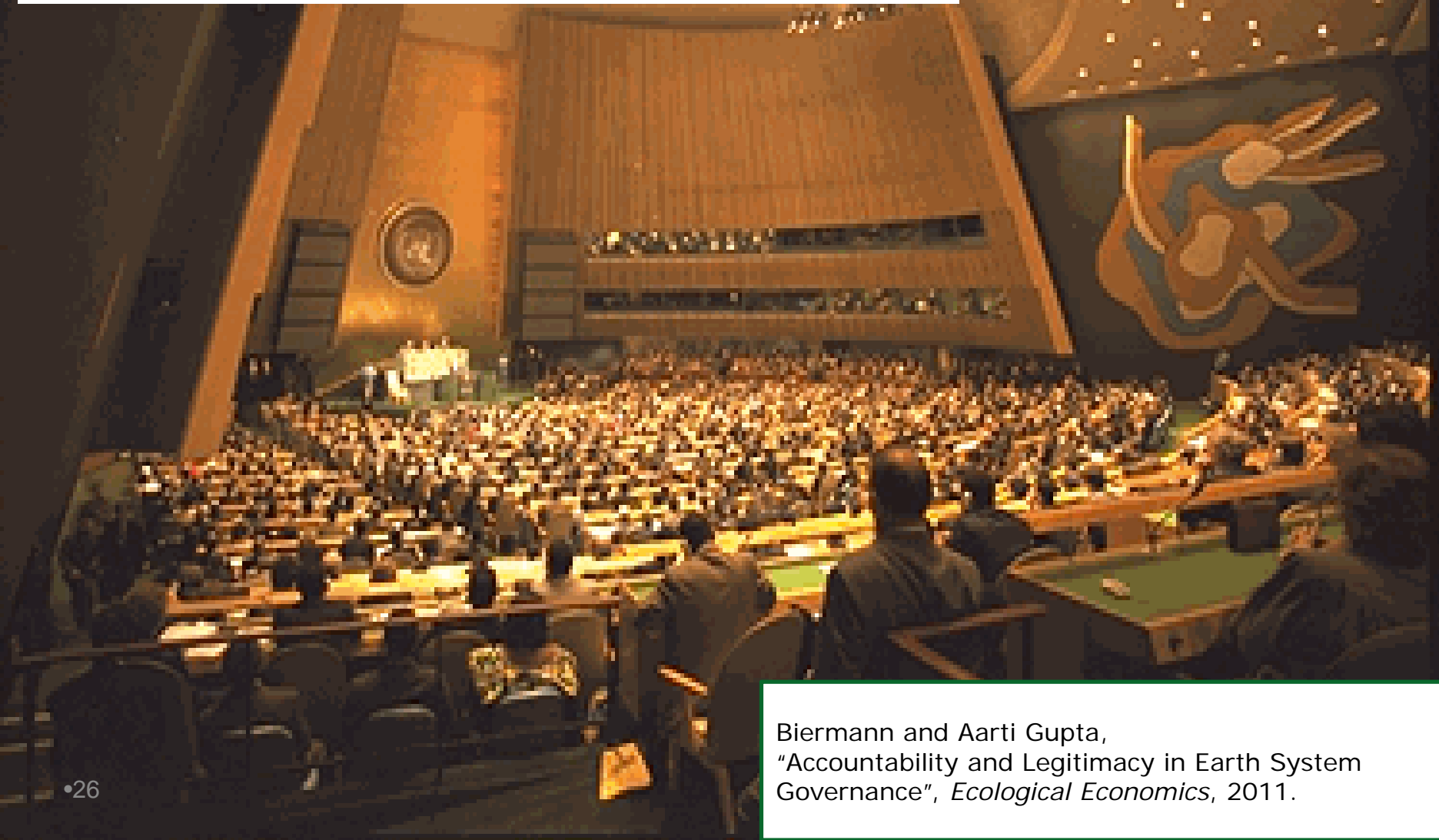
Controlling in what direction?



# How Do You Want Your Earth?

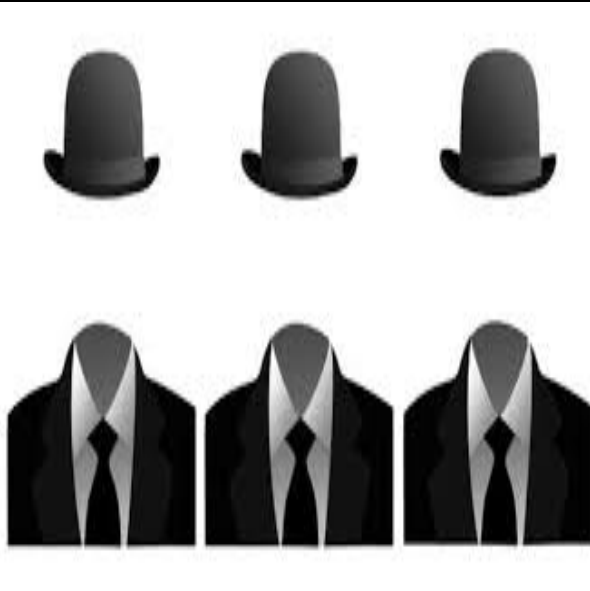
Scientists now agree the planet is being pushed past its sustainable boundaries. Are we listening?

# Democratising Global Governance ?



Biermann and Aarti Gupta,  
"Accountability and Legitimacy in Earth System  
Governance", *Ecological Economics*, 2011.

# Democratic Global Governance & Control?



# Democratising Control (I)

## Parliamentary Control:

- Specialised (global) parliamentary chambers, meetings or committees
- Drawing on debate on United Nations Parliamentary Assembly (Bummel, Falk, Strauss, et al.)
- Drawing on regional experience

## Problem:

- Global diversity in political systems
- Country representation challenging

# Democratising Control (II)

## Democratisation through Civil Society

- Specialised chambers, meetings or committees of civil society organisations (“Forum of Civil Society”, 1995)
- Drawing on example of the nine UN Major Groups
- Drawing on regional experience (European Economic and Social Committee)

## Problems:

- Global power differentials
- Issue-based representation difficult
- Internal accountability questionable

# Democratising Control (III)

## Deliberative Spaces:

- Global (networks of) citizen juries (Barber, Bartlett et al.)
- Global deliberative assemblies of citizens based on random selection (Dryzek et al.)
- Virtual assemblies (e.g., online consultations) (see S nit, Biermann, Kalfagianni, et al.)

## Problems:

- Power differentials (language, education, interest)
- National representation difficult

## Proposition No 4:

1. Democratic global governance of fundamental, intentional interventions into the global climate system is hardly possible within the current system of global decision-making, implementation and control.
2. Such fundamental global policies would require new types of democratic legitimacy and stronger types of global governance – which are not yet available.



## First steps (for Dutch Government?)

1. Immediate action through the United Nations, such as UN Environment Assembly (*alliance with Switzerland initiative*).
2. First goal: global research moratorium until first-order governance questions are resolved.
3. No deployment without regulatory authority in the United Nations system.
4. Parallel / additional action possibly through:
  - a) multilateral environmental agreements;
  - b) UN Security Council (article 39 UN charter);
  - c) International Court of Justice.
5. Self-regulation through global science networks.



“2015 is a year of historic opportunity.

We are the first generation that can end poverty, and the last one that can take steps to avoid the worst impacts of climate change.

With the adoption of a new development agenda, sustainable development goals and climate change agreement, we can set the world on course for a better future.”



Ban Ki-Moon  
UN Secretary-General



**@FHB Biermann**