

# Geoengineering and China: Progress and Prospect

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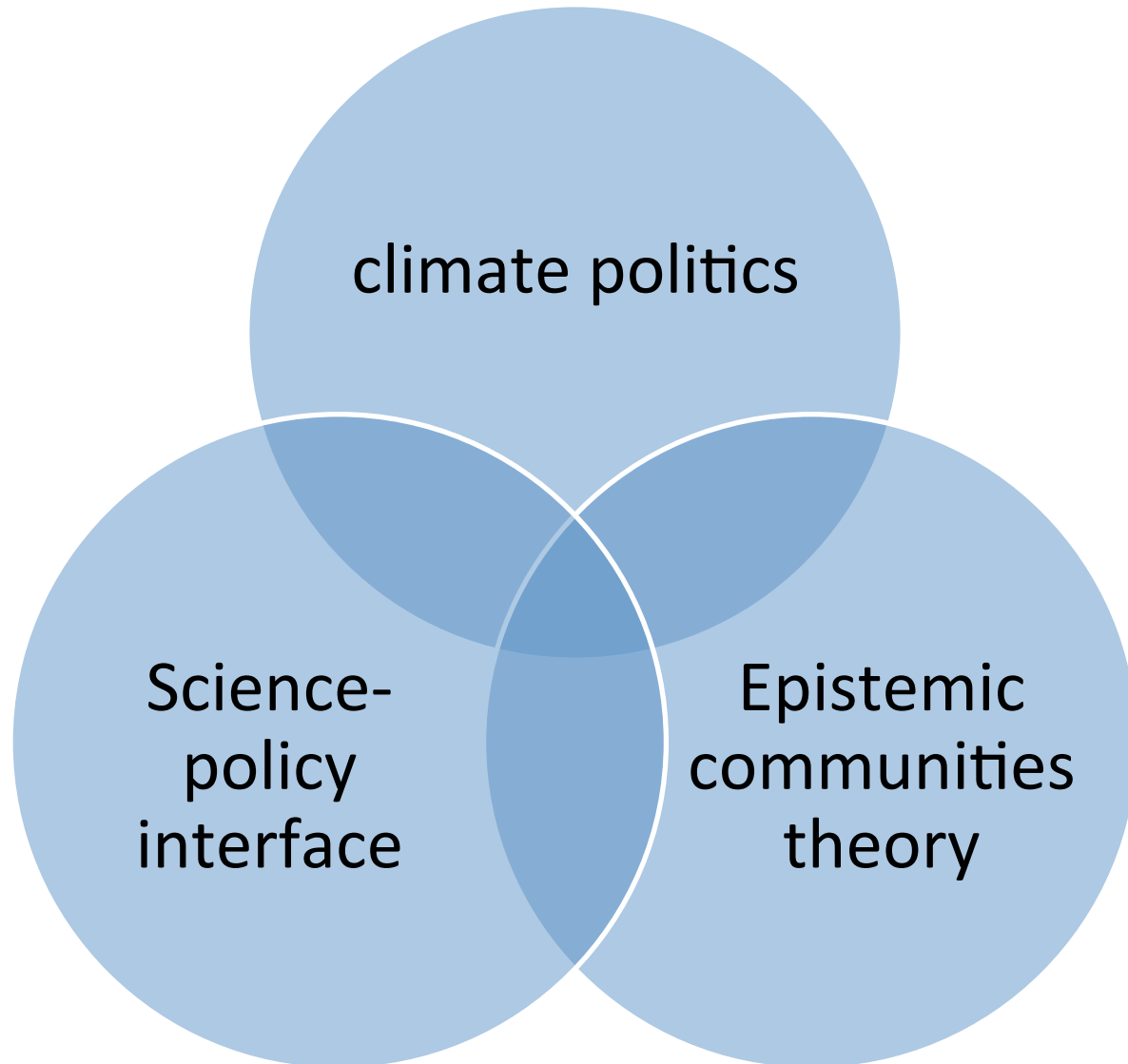
# Mental map

- Why geoengineering is attractive to this Chinese and China
- What are the current saturation on geoengineering in China? (public debate and research)
- What future prospects for China? ( Unilateral Action? )

Why THIS Chinese is interested in  
Geoengineering?

Connecting the dots---

# Connecting the dots



climate politics

Science-  
policy  
interface

Epistemic  
communities  
theory

Why China is interested in  
Geoengineering?

SRM has three  
essential  
characteristics: it is  
**cheap, fast,**  
-----and imperfect.

( 2010 Testimony before the Energy and Environment Subcommittee  
of the US House of Representatives Committee on Science and Technology

# China as One of the biggest emitter

- External & Internal Pressure
- cut greenhouse-gases & economic development
- (factory for the world?)

# Geoeignering in China

- China Geo-Engineering Corporation (1982)



中国地质工程集团公司  
CHINA GEO-ENGINEERING CORPORATION





# Current Status of Geoengineering in China

*The Pacific Review*, 2013

<http://dx.doi.org/10.1080/09512748.2013.807865>



**China and the blunt temptations of  
geo-engineering: the role of solar  
radiation management in China's  
strategic response to climate change**

*Kingsley Edney and Jonathan Symons*

# Current Status of Geoengineering in China

- **Public discussions** of Geoengineering issues
- **Elite awareness** and opinions
- Geoengineering as a **policy** option
- **Academic publications** and Geoengineering research programs

Summarizing, Reporting, Introducing  
the ABCs of geoengineering.

- Ding Yihui
- Academician of Chinese Academy of Science
- ( Founding member of Advisory Committee on Climate Change, 2007 )
- *Scientific Chinese* (2011)

Ding is not talking about  
geoengineering in a serious way.

- “The South–North Water Transfer Project is a geoengineering project in adaption to imbalances of water distribution”
- “Everyone saves energy, water is a big geoengineering project”

# Academic publications?



- 地球工程面面观
- Looking at both sides of Geoengineering
- Published in
- *Discovery of Nature*

1	“地球工程”作为减缓气候变化手段的几个关键问题	潘家华	中国人口、资源与环境	2012/05	2	↓	135	📖	+
2	气候变化背景下地球工程研究的国际管制探析	孙凯; 王刚	鄱阳湖学刊	2012/05	2	↓	36	📖	+
3	地球工程开展现状及其对生物多样性的影响	银森录; 李俊生; 吴晓蕾; 李果; 徐靖	生物多样性	2013/03		↓	27	📖	+
4	利用地球工程控制气候	Dave Cohen; 韩熔桓	低碳世界	2012/07	1	↓	34	📖	+
5	旨在减缓全球变化的海洋地球工程有可能加速气候变暖	王金平	地球科学进展	2010/03		↓	143	📖	+
6	地球系统:从过程认识到地球管理——德国地球工程科学计划以及战略构想	赵生才	中国地质教育	2002/02		↓	69	📖	+
7	地球工程:回归现实	迈克·胡尔姆	资源与人居环境	2010/19		↓	33	📖	+
8	地球工程,拯救地球?	凯文·布利斯	科技创业	2010/05		↓	4	📖	+
9	利用地球工程改变全球气候国际学术研讨会在天津举行	李兆江	地理科学进展	2011/11		↓	34	📖	+
10	抑制海平面上升“地球工程”非妙方	陈瑜	前沿科学	2010/03		↓	43	📖	+
11	实施地球工程向苍天要水	冯正祥; 刘春兰	决策与信息	2000/02	1	↓	11	📖	+
12	美国地球工程公司为国内水厂提供气浮处理工艺	刘岩岩	中国水利	2007/13		↓	24	📖	+
13	海洋地球工程包括海洋肥沃化活动纳入国际公约修正案		船舶标准化工程师	2013/06		↓		📖	+

Current Research Groups  
on Geoengineering: mainly A  
Western Country Research Field  
several groups in China-----



# Those few notable researchers in the field

- John Moore

**Beijing Normal University**

Cui Xuefeng

Cao Long      Zhejiang Univ.

# Efficacy of geoengineering to limit 21st century sea-level rise

J. C. Moore<sup>a,b,c,1</sup>, S. Jevrejeva<sup>d</sup>, and A. Grinsted<sup>e</sup>

<sup>a</sup>College of Global Change and Earth System Science, Beijing Normal University, China; <sup>b</sup>Arctic Centre, University of Jyväskylä, Finland; <sup>c</sup>Thule Institute, University of Oulu, PL3000, 90014 Oulun Yliopisto, Finland; <sup>d</sup>National Oceanography Centre, 6 Brownlow Street, Liverpool L3 5DA, United Kingdom; and <sup>e</sup>Centre for Ice and Climate, Niels Bohr Institute, Copenhagen, Denmark

Edited by Robert E. Dickinson, University of Texas, Austin, TX, and approved July 15, 2010 (received March 12, 2010)

Geoengineering has been proposed as a feasible way of mitigating anthropogenic climate change, especially increasing global temperatures in the 21st century. The two main geoengineering approaches are solar radiation management (SRM) and carbon dioxide removal (CDR). SRM is a short-term solution that can be implemented quickly and financially relatively cheaply. CDR is a long-term solution that may be thought of as a "geoengineering" project. The two main geoengineering approaches are SRM and CDR. SRM is a short-term solution that can be implemented quickly and financially relatively cheaply. CDR is a long-term solution that may be thought of as a "geoengineering" project. The two main geoengineering approaches are SRM and CDR. SRM is a short-term solution that can be implemented quickly and financially relatively cheaply. CDR is a long-term solution that may be thought of as a "geoengineering" project.

## The Science of Geoengineering

Ken Caldeira,<sup>1</sup> Govindasamy Bala,<sup>2</sup> and Long Cao<sup>3</sup>

<sup>1</sup>Department of Global Ecology, Carnegie Institution for Science, Stanford, California 94305; email: kcaldeira@carnegiescience.edu

<sup>2</sup>Center for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore 560 012, India

<sup>3</sup>Department of Earth Sciences, Zhejiang University, Hangzhou, Zhejiang 310027, China

# Chinese Academy of Social Sciences

## Considerations on Plan B to Address Global Climate Change

CHEN Ying LIU Zhe

(Institute of Urban and Environmental Studies, CASS)

**Abstract:** Human society is facing great challenges to address global climate change. How to move the international climate process forward is still a serious problem for the politicians. Geoengineer-

## Key Issues Related to Geo-engineering as Approaches to Climate Change Mitigation

*PAN Jia-hua*

(Institute for Urban & Environmental Studies, Chinese Academy of Social Sciences, Beijing 100005, China)

**Abstract** Climate change mitigation can be implemented through the approach of engineering technologies at a large geographic scale. Geo-engineering refers to, in the large Earth yardstick or scale, all kinds of artificial approaches of engineering technologies in temperature reduction by removing CO<sub>2</sub> in the atmosphere or directly controlling solar radiation, instead of emission reductions related to

# National Agenda?

- National Scientific and Technological Actions on Climate Change During the 12<sup>th</sup> Five-Year Plan Period (2011-2015)
- **Key Research Field:** Basic Theory on Geoengineering

China is trying to catch up through  
international collaborations

# 13<sup>th</sup> Annual Meeting of China Association of Science and Technology September 21-23, 2011 Tianjin, China

## 分8 利用地球工程改变全球气候国际学术研讨会 **International Symposium on Climate Geoengineering: Research, Governance and Uncertainty**

**Co-Sponsor:** China Association for Science and Technology; The Royal Society, UK

**Organizer:** Department of International Affairs, CAST

**Co-organizer:** The Geographical Society of China

**Chairman:** *Liu Yanhua* (Professor and President of the Geographical Society of China, China)

**Chairman of Academic Committee:**

*Qin Dahe* (Academician of CAS, Vice President of CAST, and President of the Chinese Meteorological Society, China)

**The Members :** *John Shepherd Lv Daren Andy Parker Wang Wuyi Xue Lan*

**15:30-18:30 Plenary Session**

**15:30-16:30 Chair:**

*Andy Parker* (Senior Policy Adviser, The Royal Society, UK)

**Presentations** (Each Report: 30 mins)

1. The Effects of Rising Sea Levels

*Sir Crispin Tickell* (Honorary Vice President, The Royal Geographical Society, UK)

2. The Emerging Geopolitics of Geoengineering

*Jason Blackstock* (Dr., Centre for International Governance Innovations, Canada)

**Presentations** (Each Report: 30 mins)

3. International Governance of Solar Geoengineering

*Arunabha Ghosh* (Dr. CEO, Council on Energy, Environment and Water, India)

4. The Solar Radiation Management Governance Initiative (SRMGI)

*Parker Andrew* (Senior Policy Adviser, The Royal Society, UK)

The Social and Economic Analysis of Geoengineering  
July, 11, 2012  
China Meteorological Administration & Chinese  
Academy of Social Sciences



# Future of Geoengineering in China

- Wait and see
- Transparency, wider participation, equity, justice, fairness
- Sovereignty?
  
- Not being left out: support research and International cooperation
- (more institutionalized research)

# **China could move first to geoengineer the climate?**

- “the senior leaders in China have engineering backgrounds and, for many of them, geoengineering the climate will have a natural appeal”

Clive Hamilton

# Unilateral Action?

- “Facing a revolt from a population under extreme climate stress, the Chinese government **seeks the US government’s consent to cool the planet** by spraying sulphate aerosols into the stratosphere. Popular protests prevent Washington endorsing the plan **but it tacitly agrees not to shoot down China’s planes**. That would be enough, and from that point there would be no going back”
- ( Interview of Clive Hamilton by The Guardian)

# Unilateral Action?

- Can China do this?
- Scale, impacts, capability?
- No in a foreseeable future
- More countries should be consulted

# conclusion

- China is at the very early stage of geoengineering research, but it is catching up
- No institutionalized research at present, but---
- Support more research, but for implementation, a big question mark
- Unilateral action from China is unlikely at a foreseeable future
- The Public is missing in the game

Thank you!

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