Geoengineering - solar radiation management, carbon capture and storage - - risky, unproven and energy-intensive climate mitigation technologies imposed on the Global South

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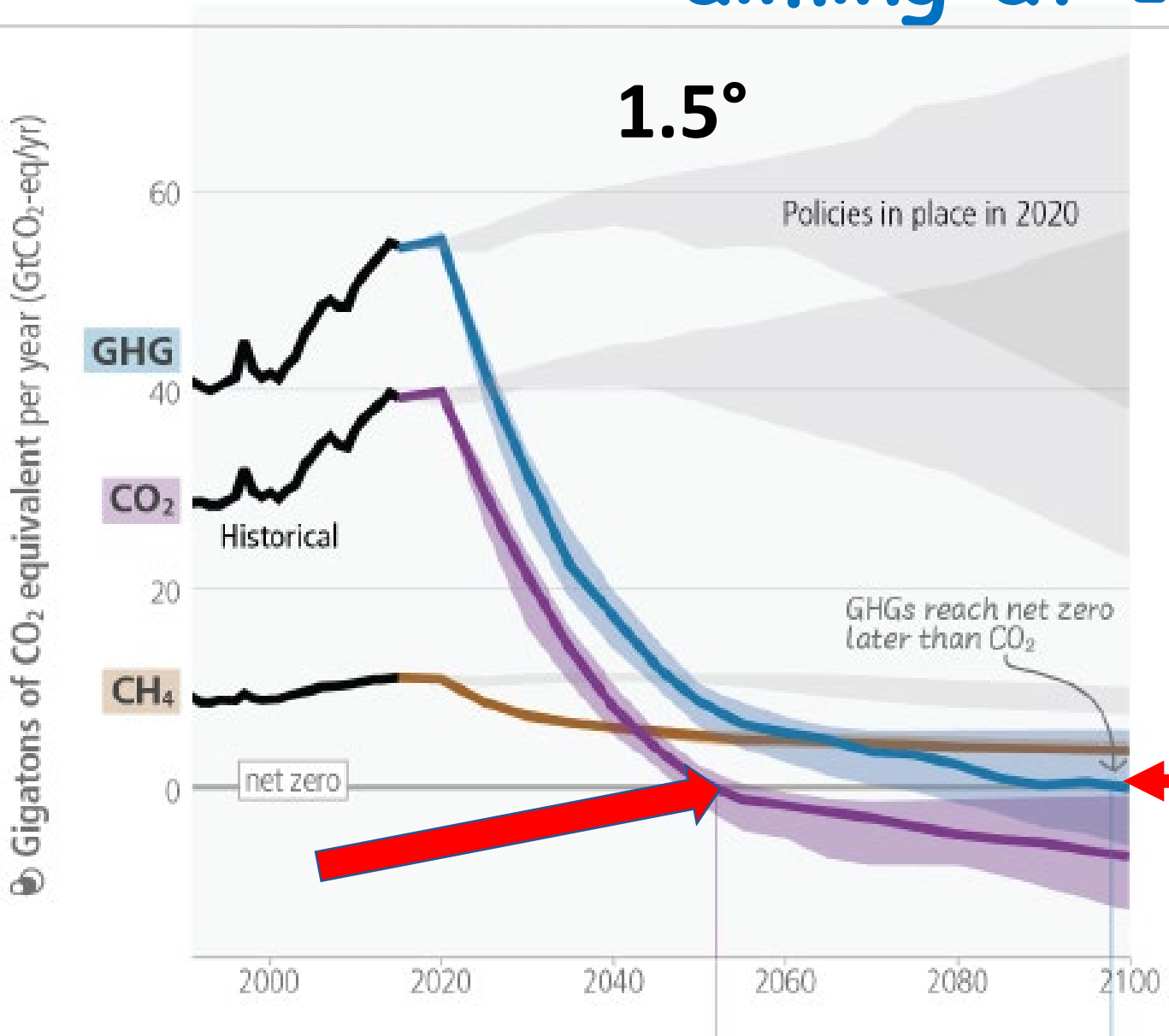
Pflanzenbau im Klimawandel
Fachhochschule Erfurt
Solarinput e.V., Mitglied AbL

Climate Models

Projection of GHG emissions until 2100
- aiming at 1.5°C -



All pathways in IPCC models project the **use of carbon dioxide removal (CDR)** on the order of

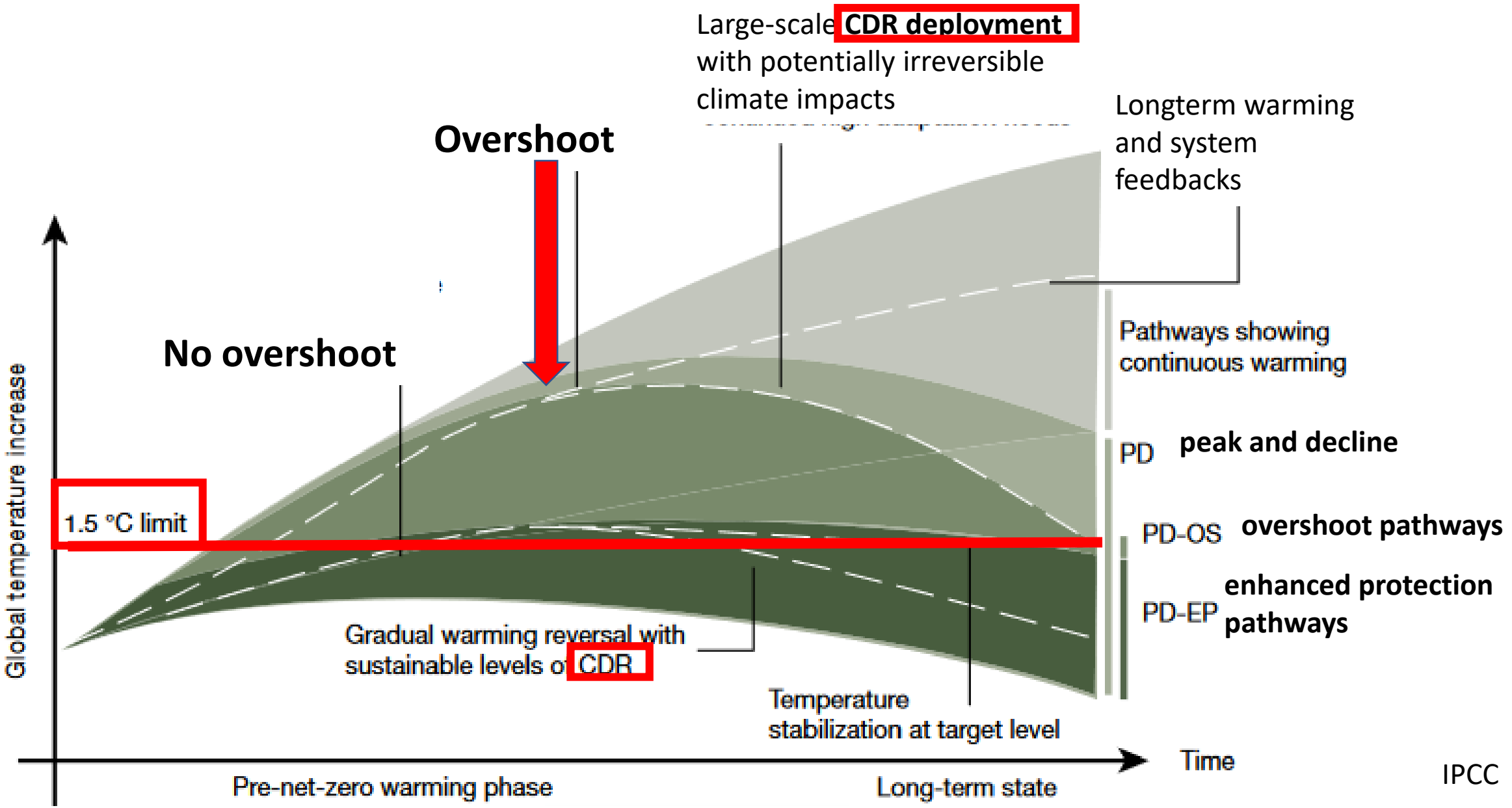
100–1000 GtCO2 until 2100

net zero in 2050

IPCC

Climate overshoot

Climate outcome scenarios and decline pathways

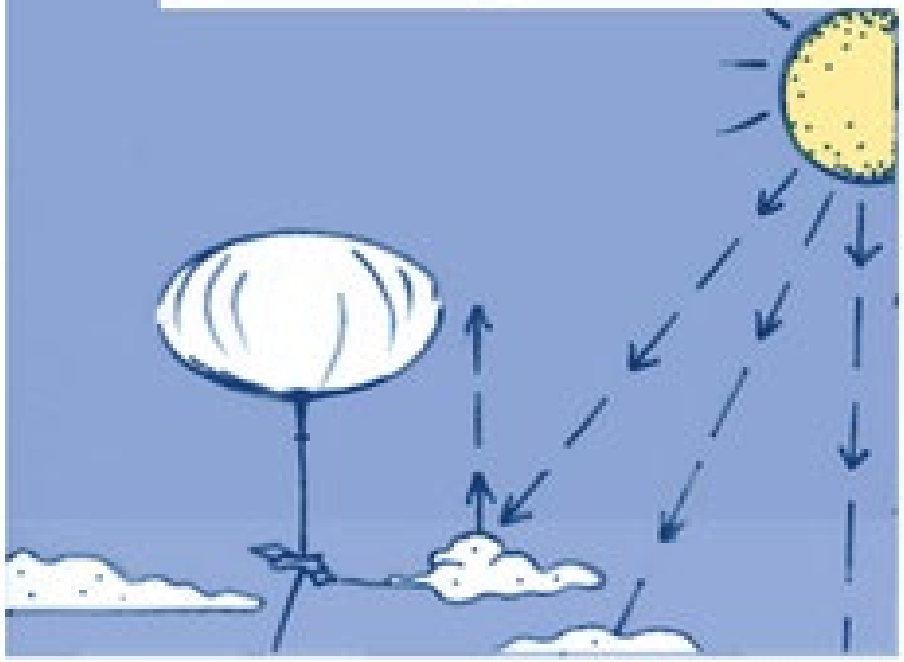


IPCC

Geoengineering

Types of geoengineering

Solar Radiation Management



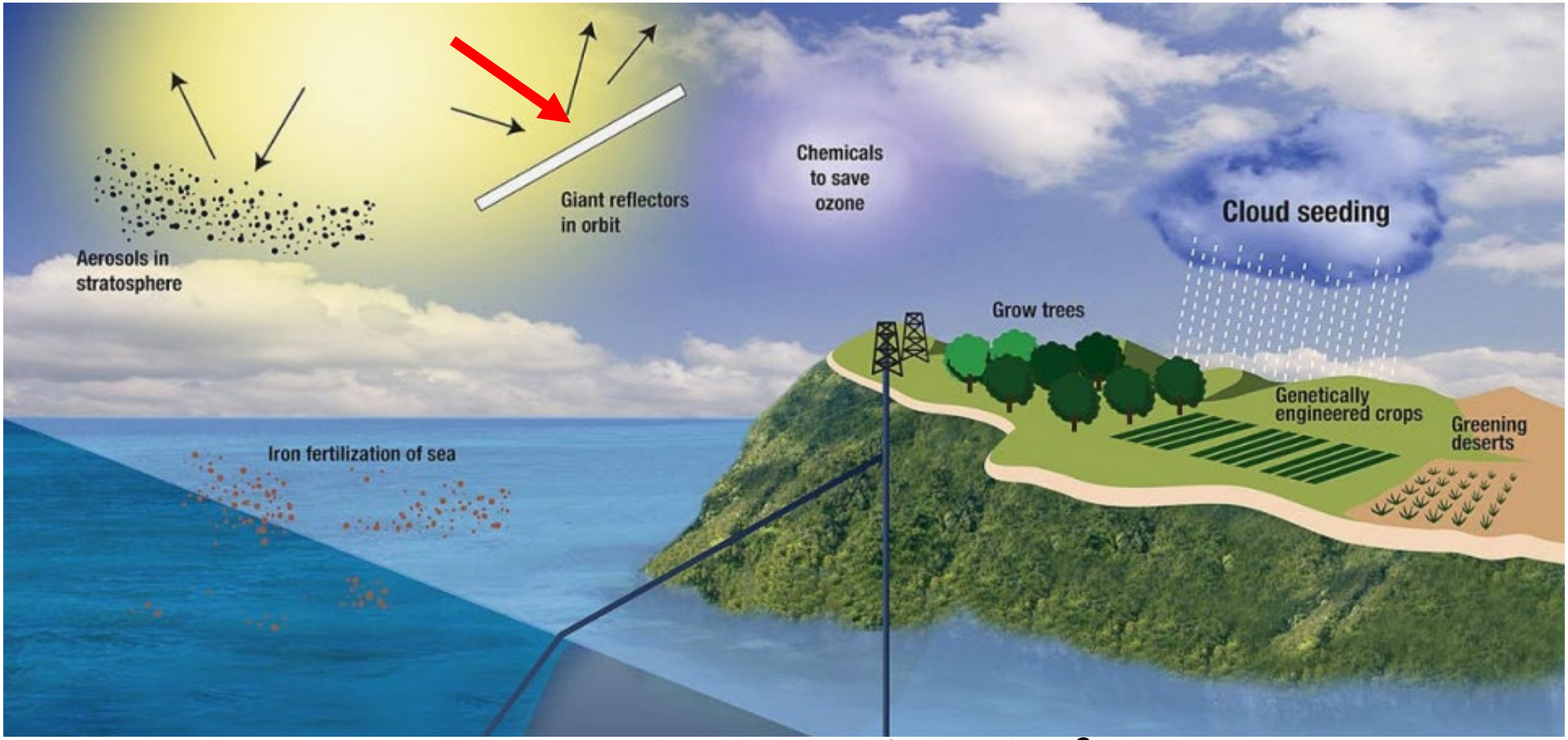
Carbon Dioxide Removal

+ weather modification

https://www.geoengineeringmonitor.org/

Solar Radiation Management
SRM

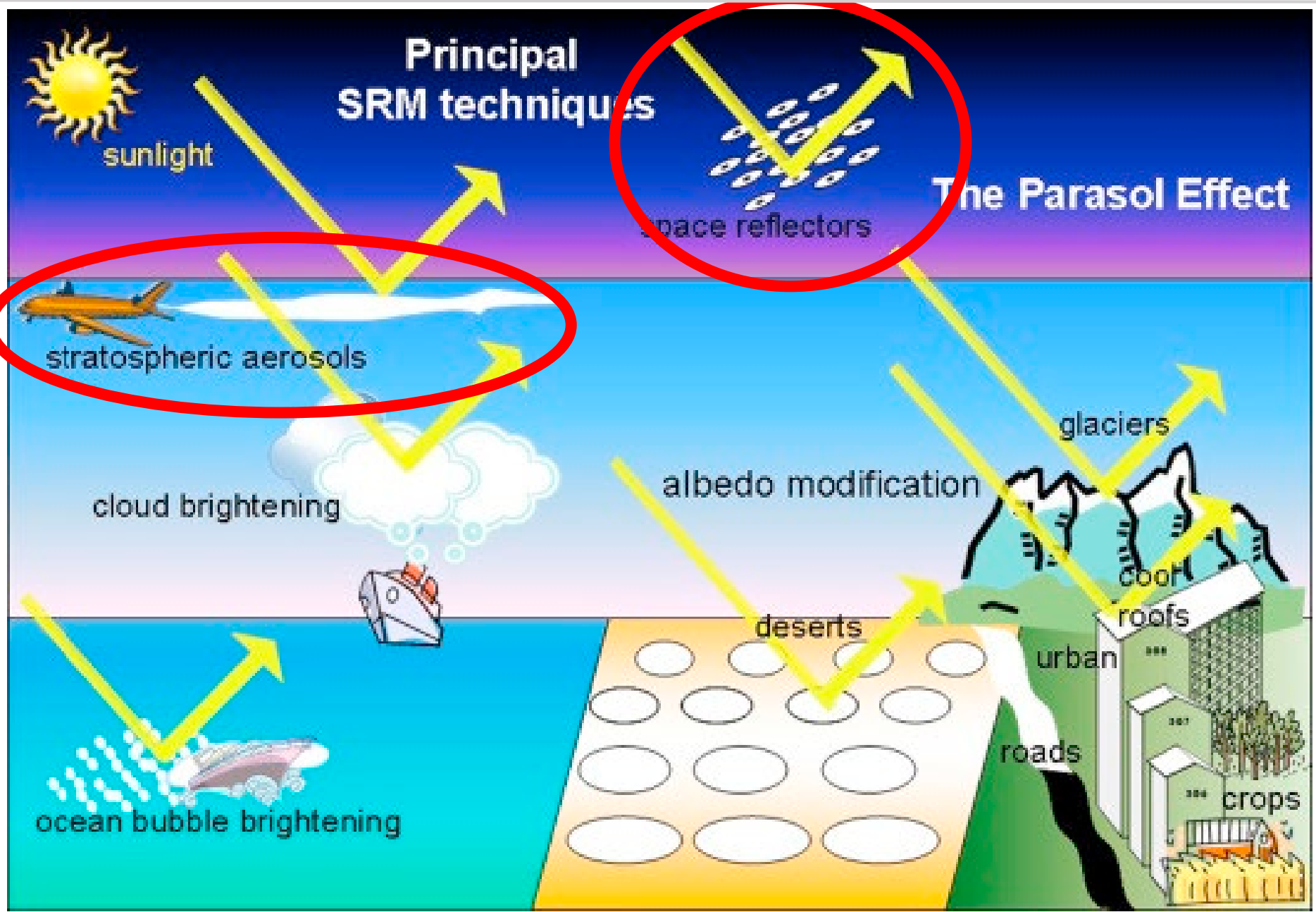
Solar radiation management (SRM)



55,000 s**pace mirrors in orbit** each of 100 km^2

Linda Schneider, Heinrich Böll Foundation, Peoples' Climate Summit, November 2017

Solar radiation management (SRM)



Solar radiation management (SRM)

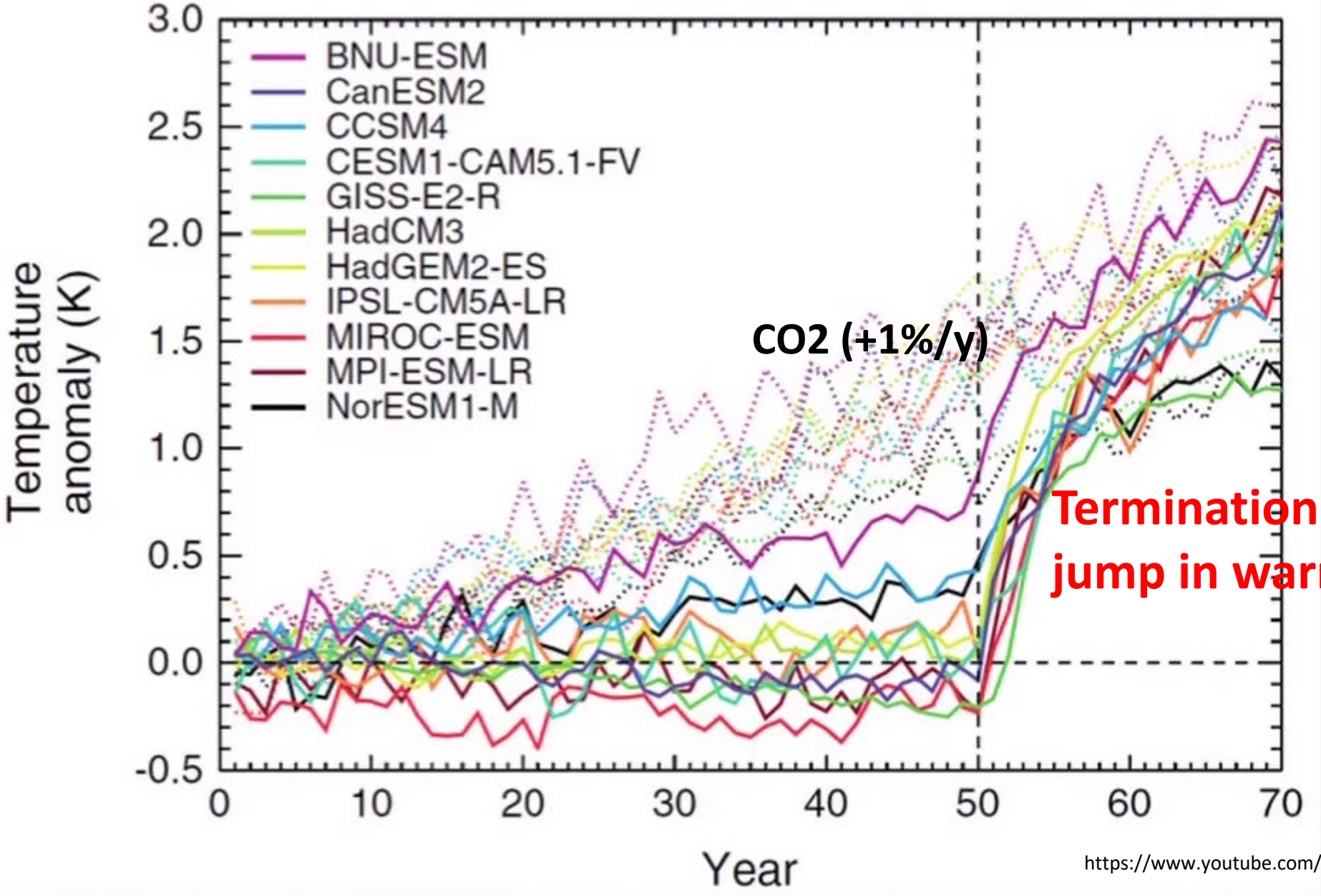
- Estimation: **continuous injection** rates over 100s and 1000s of years of **8–16 Tg of sulphur dioxide (SO2) per year** (8-16Mio t)
  (= Mount Pinatubo eruption in 1991)
  would reduce global mean temperature by 1°C.

- Aim: Sulfur Air Injection (SAI) **scaled up** for **global cooling of 2–5°C**

- Aerosols released by SRM deployments persist in the **stratosphere for 1–3 years**

- **Tropospheric aerosols would persist for about ten days in the case of** marine cloud brightening

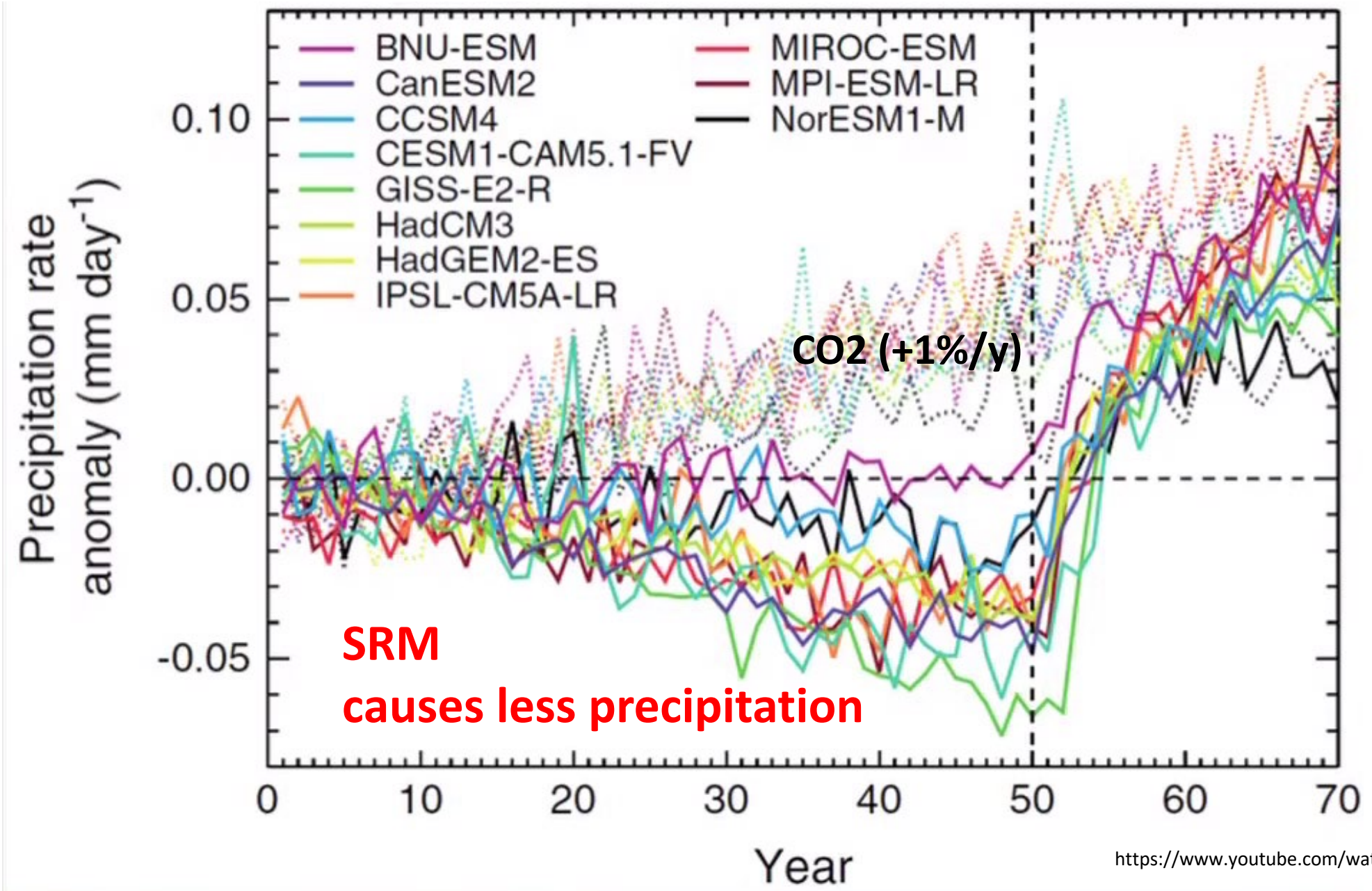
Risk of SRM



Termination shock: jump in warming

https://www.youtube.com/watch?v=0jJA-N3U5GY

Risk of SRM



https://www.youtube.com/watch?v=0jJA-N3U5GY

Risk of SRM

1. Drought in Africa and Asia
2. Perturb ecology with more diffuse radiation
3. Ozone depletion
4. Continued ocean acidification
5. Will not stop ice sheets from melting
6. Impacts on tropospheric chemistry
7. Whiter skies
8. Less solar electricity generation
9. Degrade passive solar heating
10. Rapid warming if stopped
11. Cannot stop effects quickly
12. Human error
13. Unexpected consequences
14. Commercial control
15. Military use of technology

https://www.youtube.com/watch?v=0jJA-N3U5GY

Risk of SRM

16. Societal disruption, conflict between countries
17. Conflicts with current treaties
18. Whose hand on the thermostat?
19. Effects on airplanes flying in stratosphere
20. Effects on electrical properties of atmosphere
21. Environmental impact of implementation
22. Degrade terrestrial optical astronomy
23. Affect stargazing
24. Affect satellite remote sensing
25. More sunburn
26. Moral hazard – the prospect of it working would reduce drive for mitigation
27. Moral authority – do we have the right to do this?

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22
2
23
26 nazard – the prospect of it working would reduce drive for mitigation
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There is no justification to test a technology that poses such extensive risks while at the same time doing nothing to reduce the drivers of climate change and ocean acidification.

Carbon Capture and Storage

Direct Air Capture (DAC) and liquefaction of CO2

Air contractor device for direct air capture (Carbon Engineering)

https://www.carbonbrief.org/around-the-world-in-22-carbon-capture-projects/

Carbon capture project

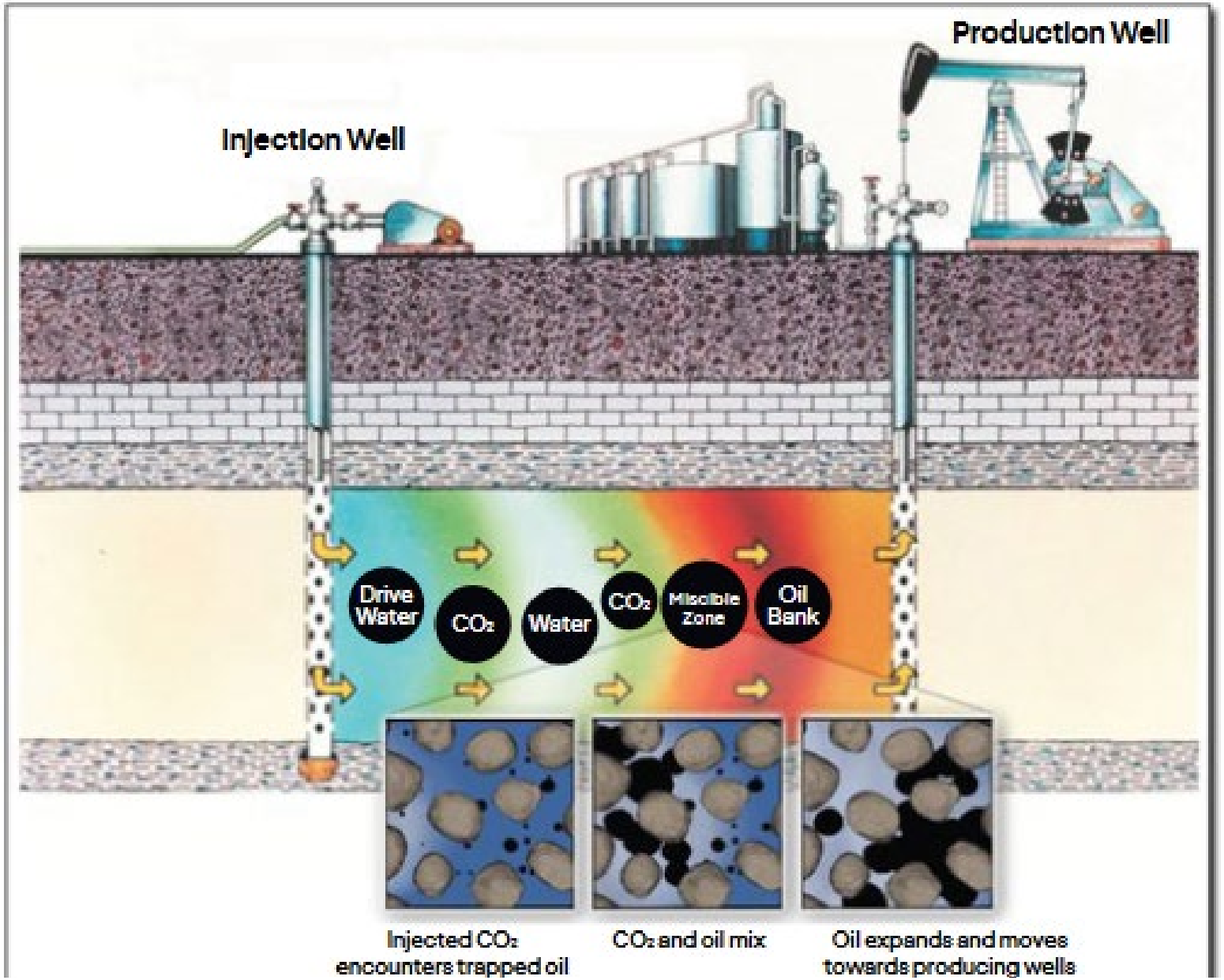
Iceland: World's largest DAC and CO2 storage plant

Orca CO2 direct air capture plant in Iceland (source: Climeworks)

- at full load (‚Vollauslastung')
  up to 4000t/year
  = emissions of only 1000 cars !!!!!!!!!

https://www.thinkgeoenergy.com/worlds-largest-direct-air-capture-and-co2-storage-plant-on-in-iceland/

>90% of CCS projects used for enhanced oil recovery



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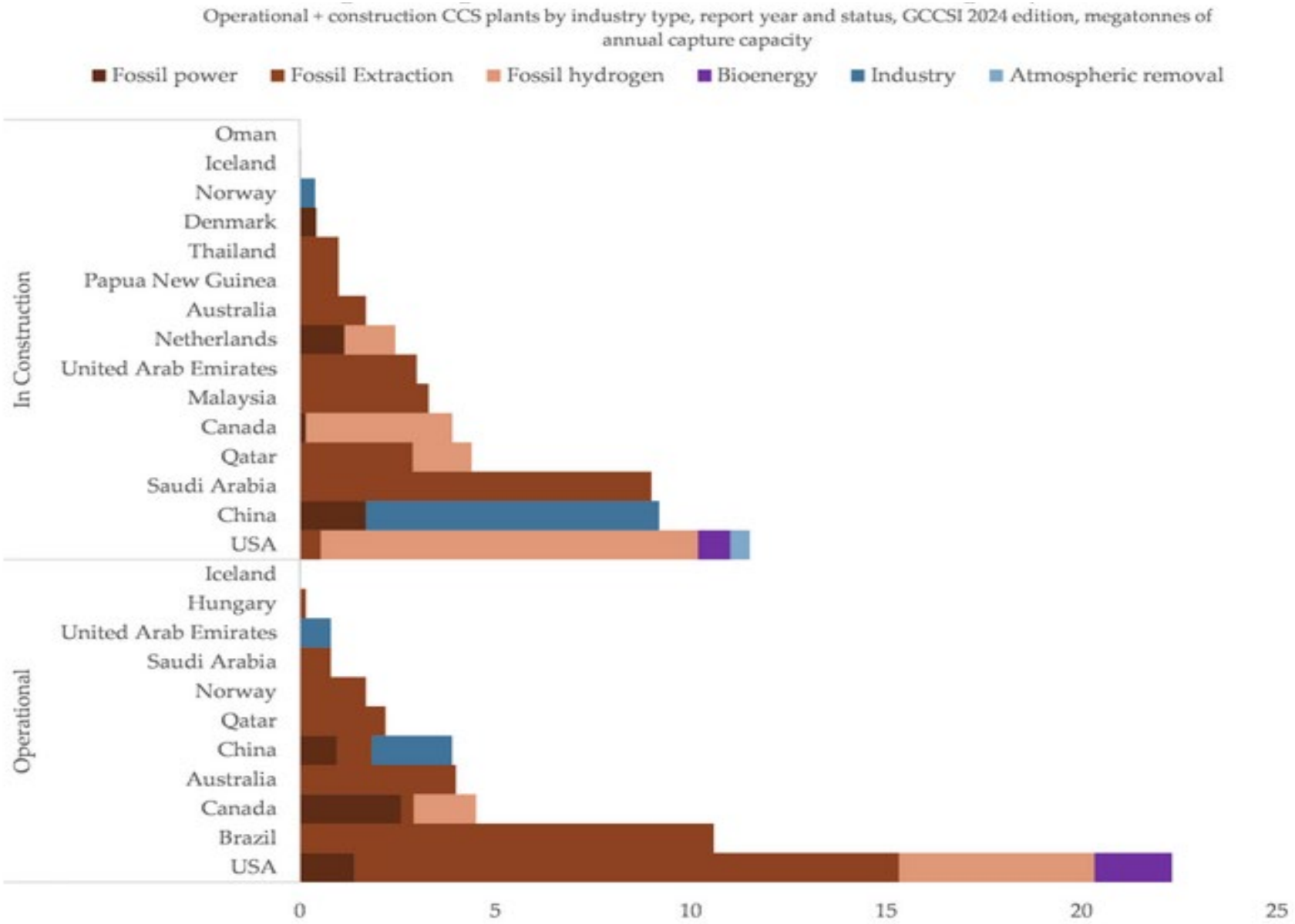

https://ketanjoshi.co/2024/11/24/2024-ccs-update-the-revolution-refuses-to-arrive/

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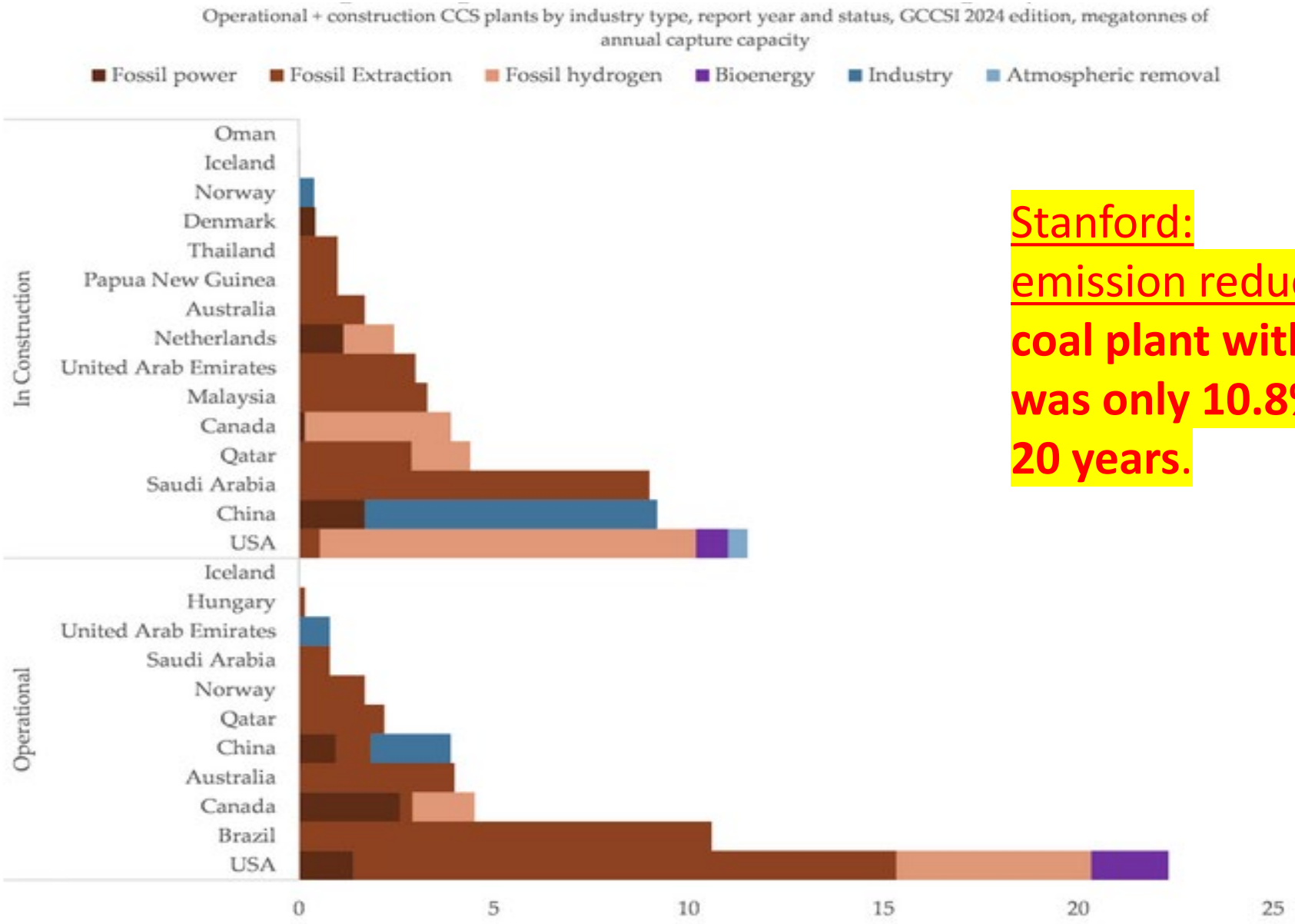


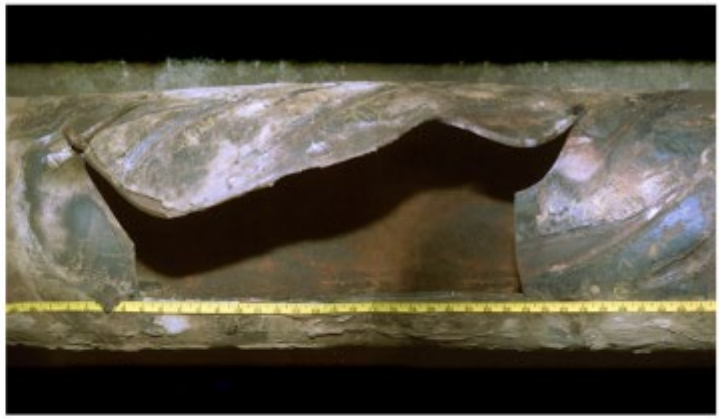
Stanford:
emission reduction of **coal plant with CCS was only 10.8% over 20 years.**

https://ketanjoshi.co/2024/11/24/2024-ccs-update-the-revolution-refuses-to-arrive/

CO2 transport hazard

A running fracture – result of a test

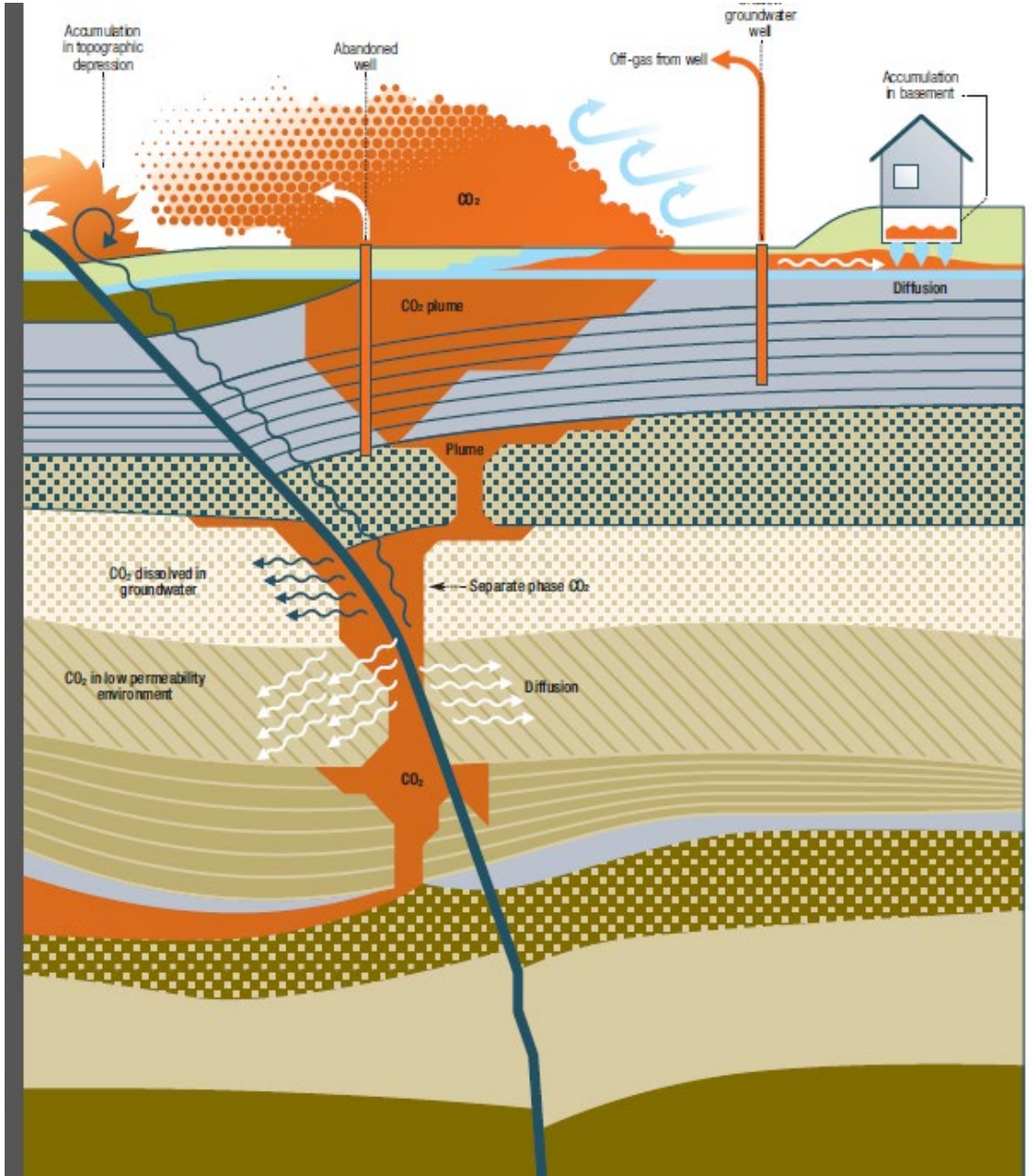
Fractured gasoline line– undetected damage



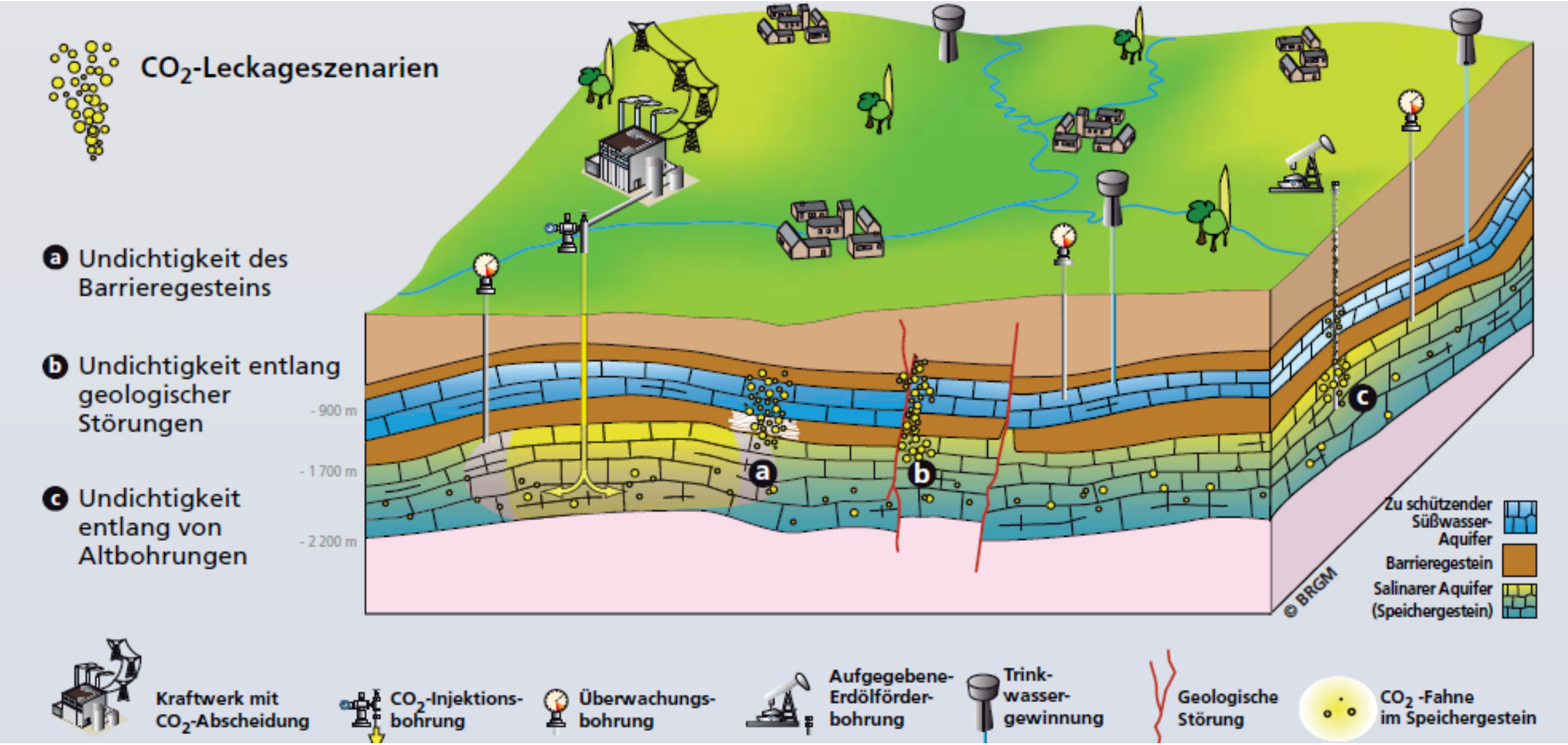
Results of metal embrittlement

15th January 2009 Vancouver-line rupture

CO2 storage hazard



CO2 storage hazard



Leakages and blowout

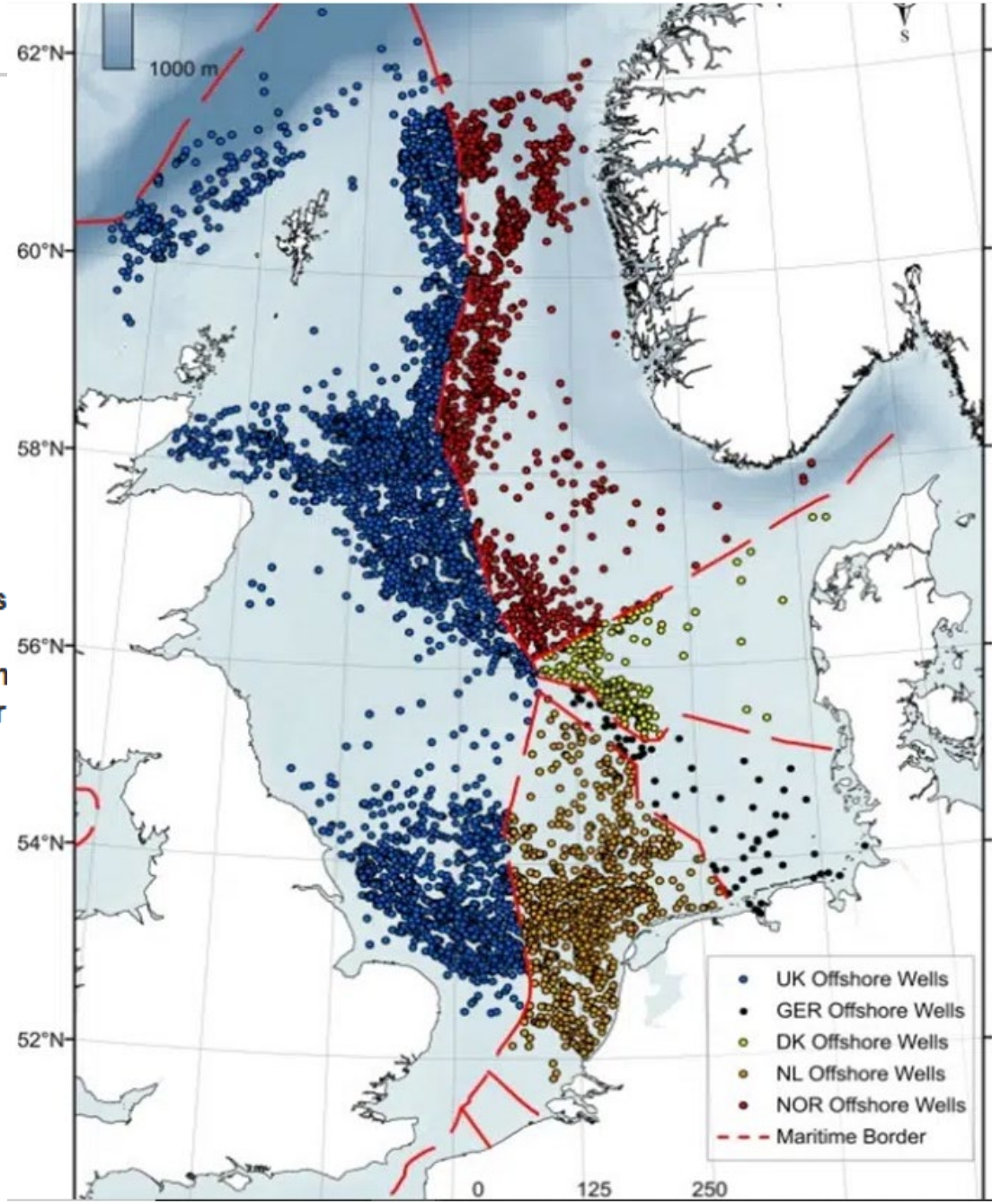
Leakages and blowouts

New study confirms extensive gas leaks in the North Sea

Stricter guidelines for handling of abandoned wells recommended

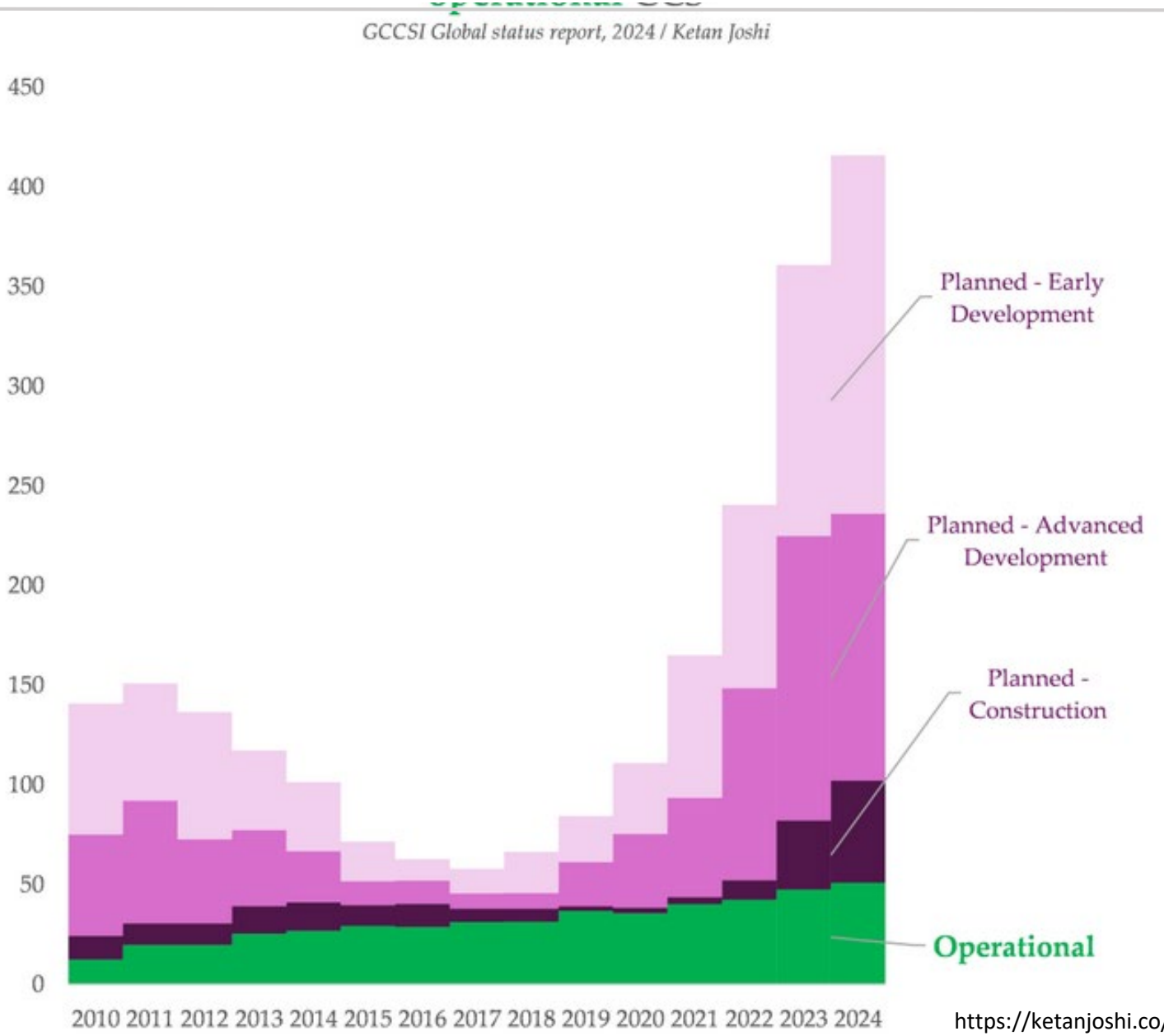
30 July 2020 / Kiel. At abandoned oil & gas wells in the North Sea, considerable quantities of the potent greenhouse gas methane escape uncontrolled into the water. These leaks account for the dominant part of the total methane budget of the North Sea. This is shown in a new study recently published by researchers from the GEOMAR Helmholtz Centre for Ocean Research Kiel in the International Journal of Greenhouse Gas Control. It confirms earlier studies based on a greatly extended data basis.

15.000 boreholes



https://www.geomar.de/en/news/article/neue-studie-bestaetigt-umfangreiche-gasleckagen-in-der-nordsee

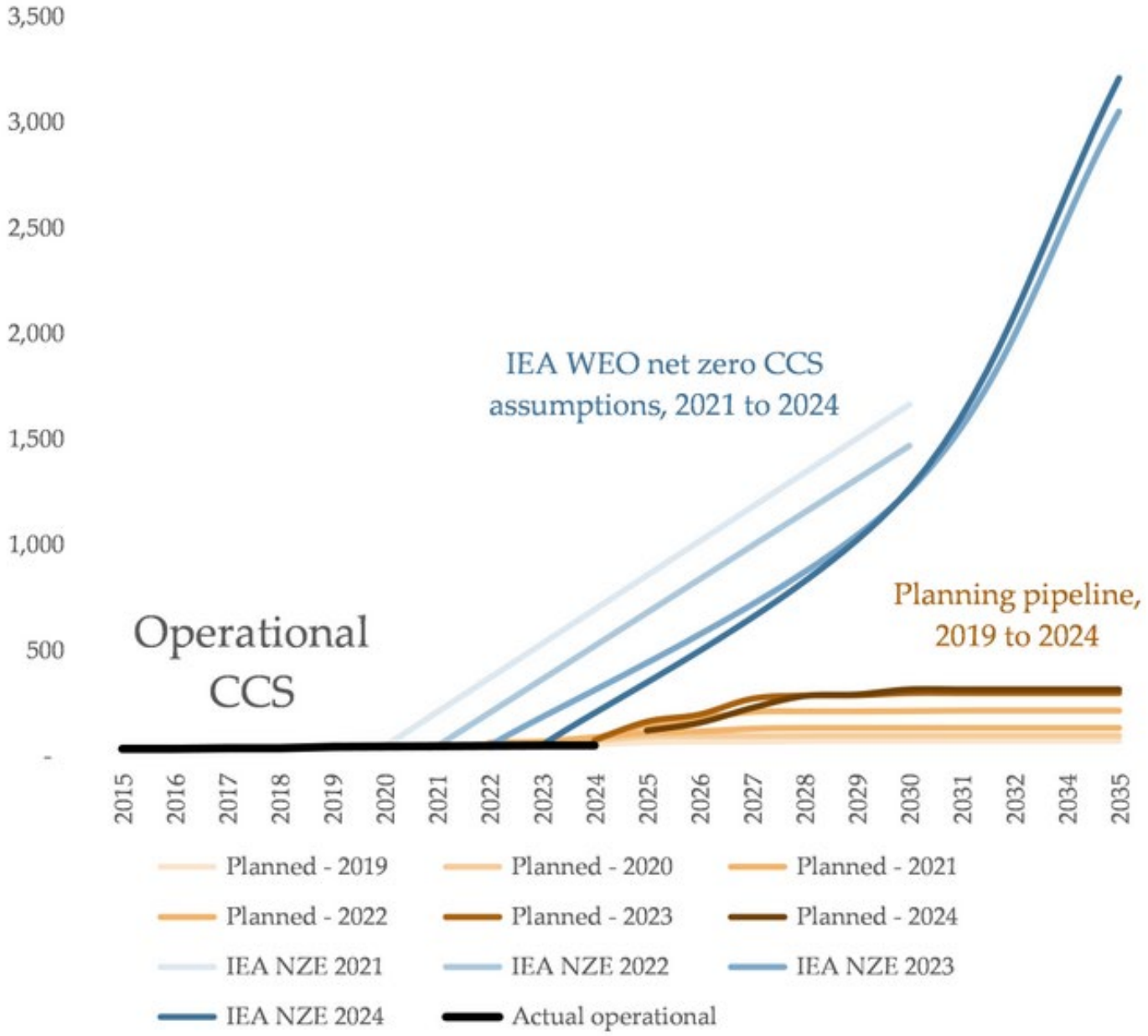
CCS-Project failure



Europäischer Rechnungshof: All 12 funded CCS projects did not achieve their goals (2018)

https://ketanjoshi.co/2024/11/24/2024-ccs-update-the-revolution-refuses-to-arrive/

CCS growth that never happens



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Energy need

Energy needs

- DAC removal in the U.S. of **850 Mt CO2** (2% of global energy-related CO2 emissions/y), would need the equivalent of almost **all current global wind power**

  + **vast amounts of water** and **toxic chemicals**

- 30,000 DAC facilities to capture **30Gt CO2 per year** needs 50 Ej of **electricity/y – more than half of what the entire world produces today** (energy for storage not incl.)

- **Energy required for large-scale DAC** is much greater than the **renewable energy capacity likely to be installed by 2050**.

Nature

Costs

Costs

COP23:

- **350-600 $ /t CO_2**
  = 600.000.000.000 $ (600 bio $)
  to 2.500.000.000.000 $ (2.5 trio $)

  to remove CO_2 from 1 year

> global military budget (1.7 trio $)

Resistance

Resistance

- **Solar geoengineering is the perfect excuse for inaction on climate change**

- SRM, and geoengineering more broadly, is a “perfect excuse” for **climate change deniers**, **industries and governments** seeking to **continue business as usual.**

Resistance and cancellation of projects in EU and US

JUNE 2024

The City of Alameda City Council votes unanimously to call off the University of Washington's Marine Cloud Brightening Project (MCBP), which had been conducting an early-stage geoengineering experiment off the coast of California.

Over 100 organisations globally issue a statement on the UN's World Oceans Day, during the Bonn intersessional climate negotiations (SB60), calling for an end to open-ocean marine geoengineering experiments.

MARCH 2024

The HOME! Alliance celebrates the cancellation of Harvard University's Stratospheric Controlled Perturbation Experiment (SCoPEx), following years of international pressure from civil society and Indigenous Peoples' Organisations.

Marine geoeng., UK

NOVEMBER 2023

The local community around St Ives Bay in Cornwall, UK, protests against Planetary Technologies' Ocean Alkalinity Enhancement (OAE) experiments that have taken place and are planned off their coast, demanding that decision-makers "Keep our sea chemical free."

JANUARY 2023

Following unauthorised open-air Solar Radiation Modification tests by US start-up Make Sunsets, Mexico upholds the CBD's hard-won solar geoengineering moratorium by banning geoengineering experiments, setting a global example of precaution.

Over 100 scientists issue call for non-use of SRM

JANUARY 2022

Over 100 scientists, academics and climate experts from around the world issue a call for a non-use agreement on solar geoengineering, arguing that *"solar geoengineering deployment at planetary scale cannot be fairly and effectively governed in the current system of international institutions. It also poses unacceptable risk if ever implemented as part of future climate policy. A strong political message from governments, the United Nations and civil society is urgently needed."*

https://www.geoengineeringmonitor.org/resistance

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STOPPED

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Resistance and cancellation of projects in EU and US

150 Groups to EPA: Halt Permitting of Carbon Injection Wells After Dangerous Leaks at Nation's First CCS Facility

Published Oct 22, 2024 CLIMATE AND ENERGY

USA, Oct. 2024

https://www.foodandwaterwatch.org/2024/10/22/150-groups-to-epa-halt-permitting-of-carbon-injection-wells-after-dangerous-leaks-at-nations-first-ccs-facility/

Transfer of geoengineering to Africa

Geoengineering projects in Africa

https://www.geoengineeringmonitor.org/

DEGREES Initiative: Ghana

Description

The UK-based DEGREES (DEveloping country Governance, REsearch and Evaluation for SRM) initiative aims to expand the discussion on Solar Radiation Management (SRM) around the world and has launched the DEGREES Modelling Fund (DMF). The DMF provides funding to enable scientists in the Global South to model SRM approaches and analyse the potential impacts of SRM on their regions. In Ghana, the DMF research team is based at the University of Ghana in Accra. Since 2023, the research team is modelling possible effects of SRM on precipitation in West Africa: "*Exploring changes to the Harmattan windy season and precipitation in southern West Africa*".

Type

Major research project

Status

Ongoing

Scale

Modelling the application of SRM technologies in West Africa.

https://www.geoengineeringmonitor.org/

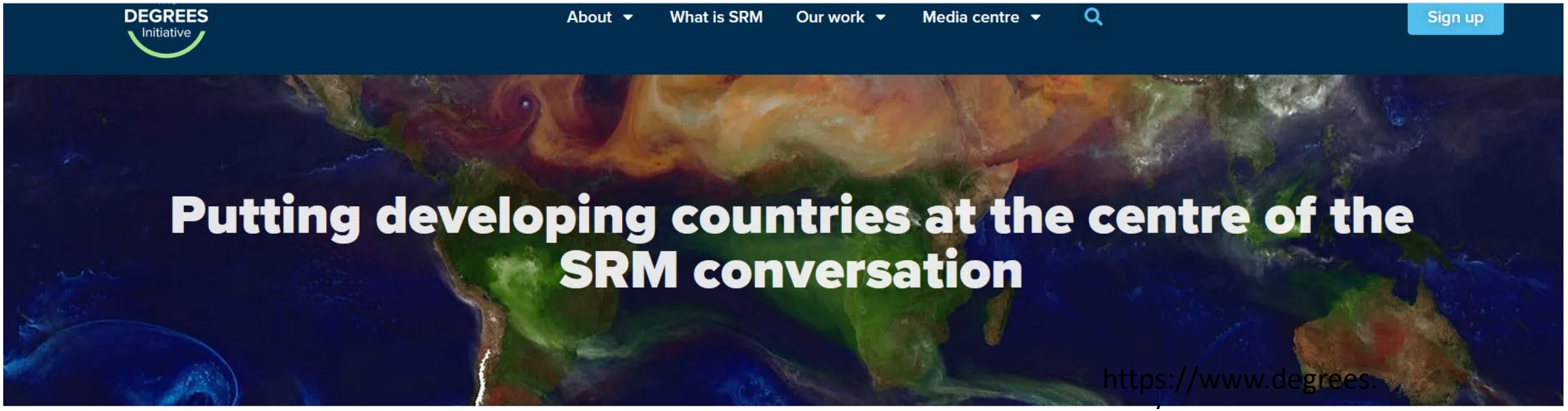
Geoengineering projects in Africa

UK based DEveloping country Governance REsearch and Evaluation for SRM (Degrees) Initiative

- aims to **facilitate the participation** of countries in the Global South in research relating to the deployment and governance of solar geoengineering
- in order **to give** it more legitimacy and the **impression that it isn't dominated by northern interests.**
- published research has focused almost exclusively on SAI deployment
- decision-making structures and funding sources are **dominated by academics and foundations in the Global North.**

https://www.geoengineeringmonitor.org/technologies/stratospheric-aerosol-injection

UK‘s Degrees Initiative for Solar Radiation Management in Global South



https://www.degrees.

https://www.degrees.ngo

About us

For over a decade, the Degrees Initiative has led the world in building the capacity of developing countries to evaluate solar radiation modification (SRM).

The use or rejection of SRM could be one of the biggest decisions humanity has faced, and this matters most to climate-vulnerable regions.

The world is going to need much more research if it’s going to make informed decisions about SRM, and a much broader cc

UK‘s Degrees Initiative for Solar Radiation Management in Global South

Latest news

SRM could reduce some risks of water deficits in Central Africa, reports Cameroon modelling team

4 December 2024

Join the largest SRM gathering at the 2025 Degrees Global Forum

27 November 2024

“If we don’t start to discuss this now, then when?”: Degrees at COP29

21 November 2024

Degrees autumn update 2024

22 October 2024

Why African scientists’ perspectives on SRM research are critical

20 September 2024

India team explores the impact of SRM aerosol injection altitude on precipitation

19 September 2024

UK‘s Degrees Initiative for Solar Radiation Management in Global South

News article | 20 September 2024

Why African scientists’ perspectives on SRM research are critical

SHARE

2024 marks an important year for African Science Leadership, with its coalition launching at the UN Civil Society Conference on May 9, 2024. Its work will be a focus for this year’s Science Summit, which will be held parallel to the 79th United Nations General Assembly (UNGA) and coincide with the Summit of the Future (SotF). The SotF will gather leaders to review global challenges and start planning for the post-2030 era. Scientific evaluations will underpin this process.

Climate change remains high on the UNGA’s agenda and there is increasing interest in emerging technologies to address climate change impacts. One of those technologies is solar radiation modification (SRM), a proposal for reducing the impacts of global warming by reflecting some sunlight away from the Earth.

Earlier this year, at the Sixth United Nations Environment Assembly, a resolution on SRM was withdrawn. It sought to provide member states with more information on research, deployment capabilities, ethics, and potential impacts, including risks, benefits, and uncertainties.

The next few years will be crucial for SRM research and governance, and climate-vulnerable regions

UK‘s Degrees Initiative for Solar Radiation Management in Global South

- awarding over $2.5 million in grants to Southern research projects, supporting over 170 researchers across 37 projects in 22 developing countries.

Influencing UN and UN General Assembly (UNGA)

- 2024 marks an **important year for African Science Leadership**, with its coalition launching at the **UN Civil Society Conference**. Its work will be a focus for this year’s Science Summit, and the Summit of the Future (SotF). The SotF will gather leaders to review global challenges and start **planning for the post-2030 era**.
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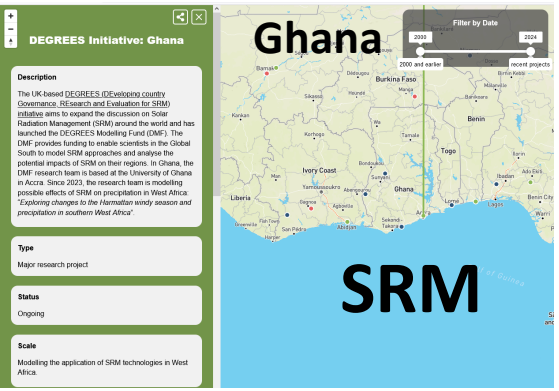
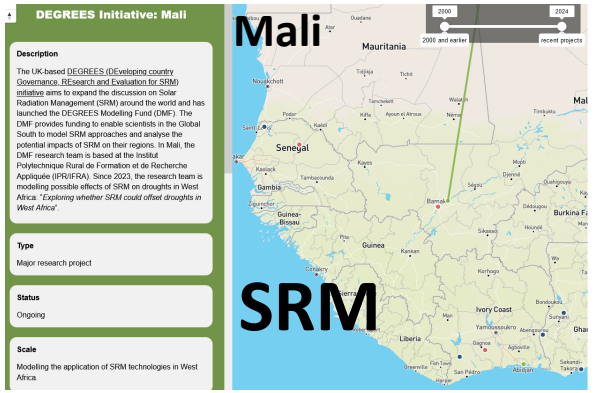
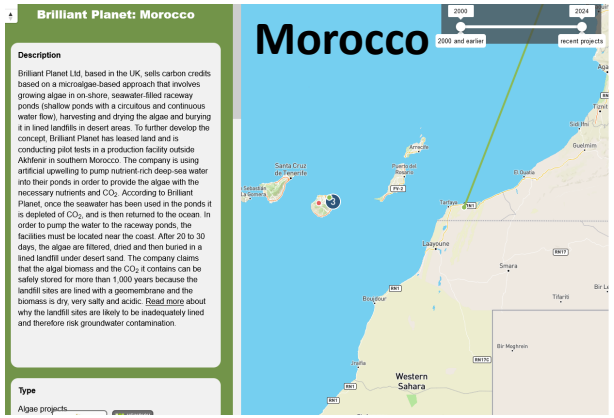
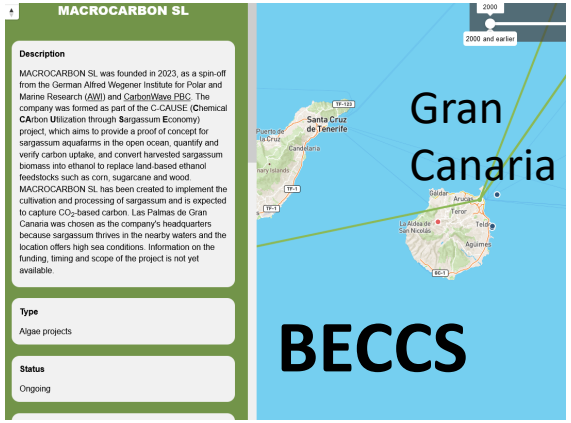
Completed: 2018-2022

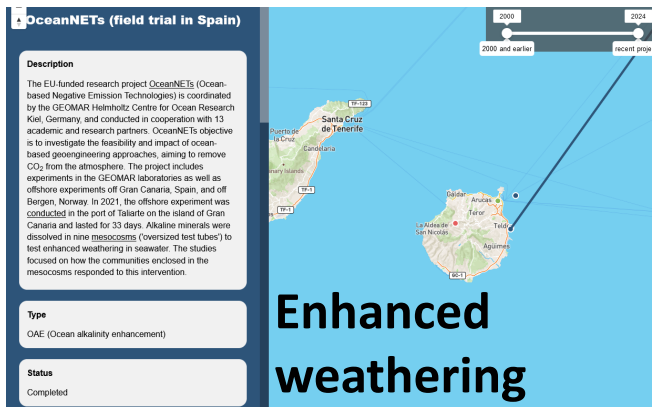
Solar Radiation Management, CCS and ocean-based geoeng.

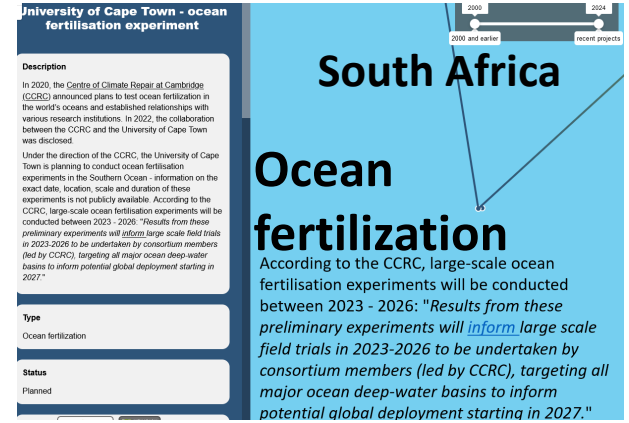


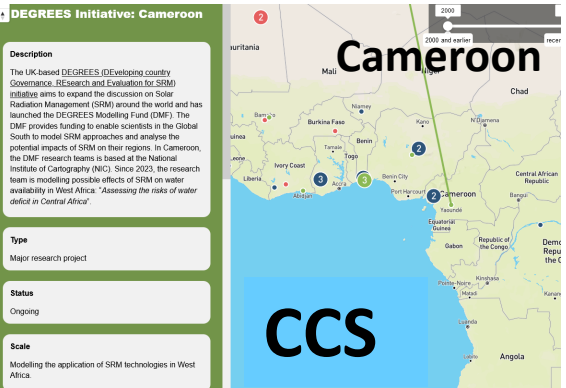


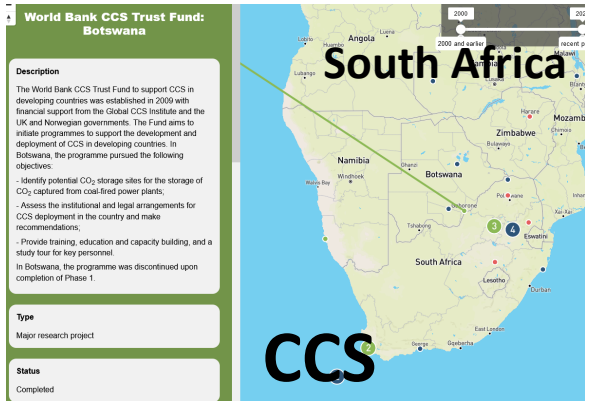


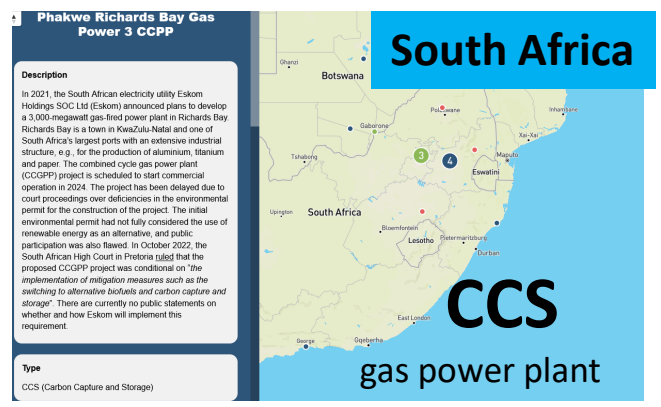












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Type

Major research project

Status

Ongoing

Scale

Modelling the application of SRM technologies in East Africa.

DEGREES Initiative: Kenya

Description

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Type

Major research project

Status

Ongoing

Scale

R&D: Application of SRM in East Africa; modelling the impact of SRM on climate extremes in urban areas.

Smart Stones Foundation: Tanzania

Description

The Smart Stones Foundation was founded to develop, promote and commercialise the use of olivine rock for CO_2 removal. In ~2011, Smart Stones proposed to crush olivine rock, or other silicate minerals, from a Tanzanian mining area, such as gemstone mining, and spread the rock powder on the surrounding rice fields. The project was to be supervised by the universities of Wageningen, Utrecht and Delft. The location of the proposed project was not disclosed, but most mining activities take place in the north-east of Tanzania.

Type

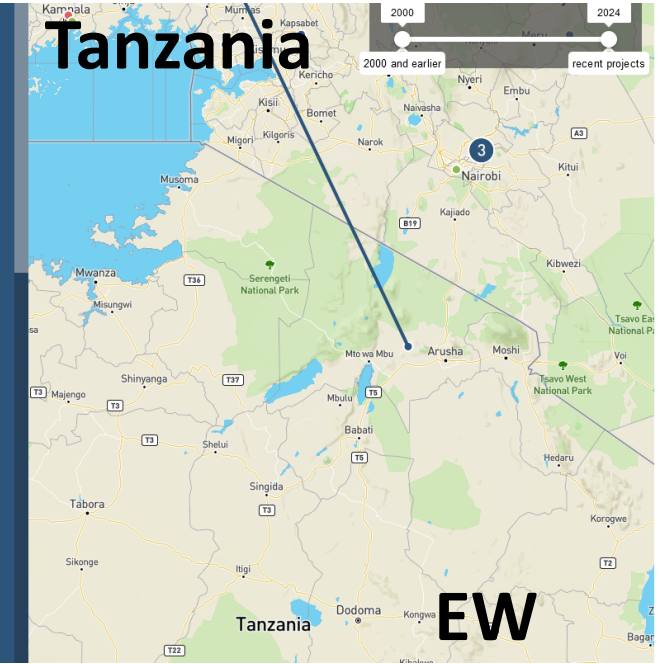
EW (Enhanced Weathering)

Status

Cancelled

Scale

Smart Stones aims to commercialise olivine rock for CO_2 removal and proposed a field trial in a Tanzanian mining area. [Project references are no longer available online.]



Rufiji Cluster

Description

The Swedish ethanol company SEKAB planned to build six large ethanol and power plants in the Rufiji region of Tanzania. The possibility of a CCS network was investigated. The network was intended to capture CO_2 from the planned ethanol plants and store it in a nearby geological formation. The project was never realied because it took a much longer time than expected to develop commercially viable methods.

Type

BECCS (Bio-Energy with Carbon Capture and Storage)

Status

Cancelled

Scale

Planned CO_2 capture capacity: 5-7 Mt per year.

Location

Tanzania

UK‘s Degrees Initiative for SRM in Global South: research papers…

DMF research papers
As of 14 March 2023
Fernández et al. 2024: Impact of Solar Radiation Management on Andean glacier-wide surface mass balance
Published in npj Climate and Atmospheric Science
Narenpitak et al. 2024: Regional impacts of solar radiation modification on surface temperature and precipitation in Mainland Southeast Asia and the adjacent oceans
Published in Scientific Reports
Xavier et al. 2024: An investigation of the relationship between tropical monsoon precipitation changes and stratospheric sulfate aerosol optical depth
Published in Oxford Open Climate Change
Odoulami et al. 2024: Africa's Climate Response to Marine Cloud Brightening Strategies Is Highly Sensitive to Deployment Region
Published in JGR Atmospheres
Tan et al. 2024: Assessment of solar geoengineering impact on precipitation and temperature extremes in the Muda River Basin, Malaysia using CMIP6 SSP and GeoMIP6 G6 simulations
Published in Science of the Total Environment
Fotso-Nguemo et al. 2024: Projected impact of solar radiation modification geoengineering on water deficit risk over major Central African river basins
Published in Environmental Research Letters
Usha et al. 2024: Sensitivity of the global hydrological cycle to the altitude of stratospheric sulphate aerosol layer
Published in Environmental Research Letters
Reboita et al. 2024: Response of the Southern Hemisphere extratropical cyclone climatology to climate intervention with stratospheric aerosol injection
Published in Environmental Research Climate
Ayissi et al. 2024: Changes in coastal upwelling in the northern Gulf of Guinea under Stratospheric Aerosol Injection
Published in Regional Studies in Marine Science
Rezaei et al. 2024: Future water storage changes over the Mediterranean, Middle East, and North Africa in response to global warming and stratospheric aerosol intervention
Published in Earth System Dynamics
Bonou et al. 2023: Stratospheric Sulfate Aerosols Impacts on West African Monsoon Precipitation Using GeoMIP Models
Published in Earth's Future
Patel et al. 2023: Potential impact of stratospheric aerosol geoengineering on projected temperature and precipitation extremes in South Africa
Published in Environmental Research: Climate
Rezaei et al. 2023: Changes in global teleconnection patterns under global warming and stratospheric aerosol intervention scenarios
Published in Atmospheric Chemistry and Physics
Tew et al. 2023: A review of the effects of solar radiation management on hydrological extremes
Published in IOP Conference Series: Earth and Environmental Science
Obahoundje et al. 2023: Implication of stratospheric aerosol geoengineering on compound precipitation and temperature extremes in Africa
Published in Science of the Total Environment
Ayissi et al. 2023: Impact of Stratospheric Geoengineering on Sea Surface Temperature in the Northern Gulf of Guinea
Published in Climate
Tan et al. 2023: Impacts of Solar Radiation Management on Hydro-Climatic Extremes in Southeast Asia
Published in Water
Obahoundje et al. 2022: Influence of stratospheric aerosol geoengineering on temperature mean and precipitation extremes indices in Africa
Published in International Journal of Climate Change Strategies and Management
Camilloni et al. 2022: La Plata Basin Hydroclimate Response to Solar Radiation Modification With Stratospheric Aerosol Injection

UK‘s Degrees Initiative for SRM in Global South: research papers…

DMF research papers

As of 14 March 2023

Camilloni et al. 2022: La Plata Basin Hydroclimate Response to Solar Radiation Modification With Stratospheric Aerosol Injection

Published in Frontiers in Climate

Carlson et al. 2022: Solar Geoengineering Could Redistribute Malaria Risk in Developing Countries

Published in Nature Communications

Alamou et al. 2022: Impact of Stratospheric Aerosol Geoengineering on Meteorological Droughts in West Africa

Published in Atmosphere

Pomalegni et al. 2022: Response of the Equatorial Atlantic Cold Tongue to Stratospheric Aerosol Geoengineering

Published in Aerosol Science and Engineering

Abiodun et al. 2021: Impacts of Stratospheric Aerosol Injection on Drought Risk Managements Over Major River Basins in Africa

Published in Climatic Change

Fauzi et al. 2021: Statistical Downscaling and Bias Correction of the Earth System Models (ESM) Outputs for Future Climate Projection under Solar Geoengineering: Case Study Indonesia

Published in Journal of Mechanical Engineering

Kuswanto et al. 2021: Impact of Solar Geoengineering on Temperatures over the Indonesian Maritime Continent

Published in International Journal of Climatology

Clarke et al. 2021: The Caribbean and 1.5 °C: Is SRM an Option?

Published in Atmosphere

Odoulami et al. 2020: Stratospheric Aerosol Geoengineering Could Lower Future Risk of ‘Day Zero’ Level Droughts in Cape Town

Published in Environmental Research Letters

Da-Allada et al. 2020: Changes in West African Summer Monsoon Precipitation Under Stratospheric Aerosol Geoengineering

Published in Earth’s Future

Karami et al. 2020: Storm Track Changes in the Middle East and North Africa Under Stratospheric Aerosol Geoengineering

Published in Geophysical Research Letters

Pinto et al. 2020: Africa’s Climate Response to Solar Radiation Management with Stratospheric Aerosol

Published in Geophysical Research Letters

Research and technical reports

Geoengineering the Climate [PDF]

Source: The Royal Society

Geoengineering in Relation to the Convention on Biological Diversity: Technical and Regulatory Matters [PDF]

Source: Convention on Biological Diversity

Climate Intervention: Reflecting Sunlight to Cool Earth

Source: National Research Council

Influence on Africa

- **Test of technologies which are under worldwide moratorium**
- **Numerous projects in SRM, CCS etc.**
- **Co-financing by African universities (often about 50%)**
- **Influence on and appropriation of African education and NGOs in energy sector (!)**

Resistance in Africa

March 2023

- Over **35 African NGOs** publish an **open letter calling on the African Union to not geoengineer Africa**

- citing the fact that the **false promise of techno-fixes** should not **provide an excuse for governments particularly in the Global North to avoid deep emissions cuts and continue relying on fossil fuels.**

Resistance in Africa

MAY 2020

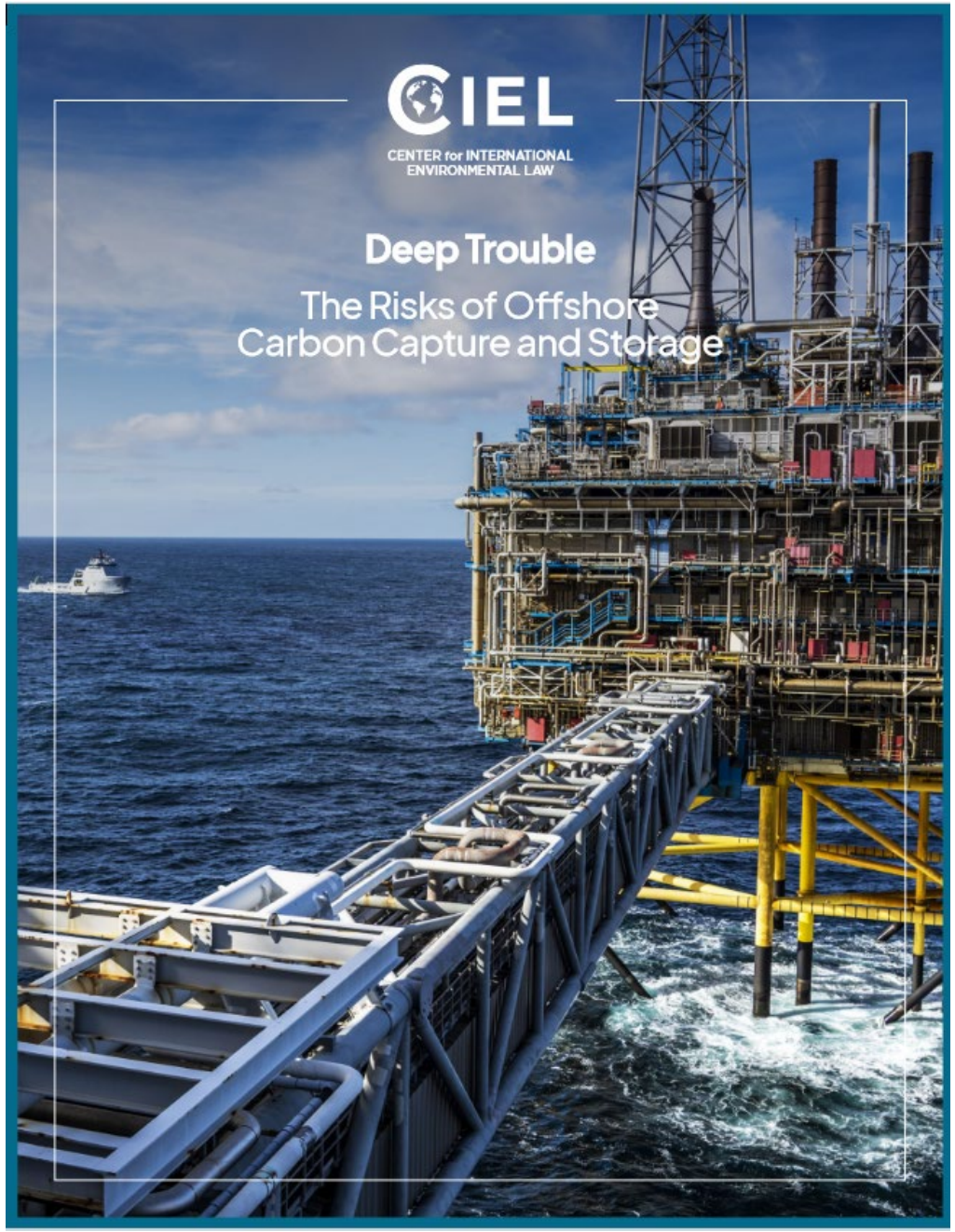

Forest offsets
#OurNature
IsNotYourSolution!
Carbon markets
Geoengineering

Additional information

Event "Solar Radiation Modification: a conversation on governance and research" at COP29, Baku (Azerbaijan), Science Advisor Thelma Krug:

Thelma Krug participated in an event on the governance and research of SRM at COP29. Other speakers included **Anita Nzeh and Andy Parker of The Degrees Initiative,** Nana Ama Brown Klutse, Vice-Chair of WG I of the IPCC, Matthias Honegger of the Perspectives Climate Group, Hassaan Sipra of the **Alliance for Just Deliberation on Solar Geoengineering**, and Lisa Graumlich, President of the American Geophysical Union (AGU).
Thelma Krug discussed the **inclusion of SRM in successive IPCC assessments**, noting increased references and research over time but no restrictive language. She emphasized the significant gap between modelling and experimental SRM research, expressing doubts about current progress. The **Climate Overshoot Commission** advocates for small-scale SRM simulations and stresses the **need for Global South researchers' involvement**. Krug highlighted the importance of research funding agencies supporting quality studies and called for governance principles to enable responsible research as part of broader climate strategies, with clear communication to the public and policymakers.

https://www.ciel.org/wp-content/uploads/2023/11/Deep-Trouble_The-Risks-of-Offshore-Carbon-Capture-and-Storage_CIEL_November_2023.pdf



Nov. 2023

Proposed CO_2 storage hubs are concentrated in areas most prone to leaks.

The single biggest risk of CO_2 leakage comes from the **interaction of injected CO_2 with legacy oil and gas wells.** And yet the sites being heavily targeted for offshore CCS development are zones of long-standing, intensive oil and gas drilling, such as the US Gulf of Mexico and the European North Sea, where old wells abound. **More than half of proposed offshore CCS projects plan to use depleted wells as storage sites**.

Avoiding catastrophic climate change requires immediate measures to accelerate the just and equitable transition away from fossil fuels and to safeguard vital natural ecosystems, like those found in the world's oceans. Offshore CCS does neither.

- In addition to keeping polluting facilities in operation, at least thirteen proposed offshore CCS projects are associated with the **development of new fossil fuel** resources.

- **There is little reason to believe that injecting CO_2 into areas where countless existing leaks from oil and gas wells go undetected or unreported would guarantee "permanent" storage.**

Degrees Initiative

2024 marks an important year for African Science Leadership, with its coalition launching at the UN Civil Society Conference on May 9, 2024. Its work will be a focus for this year's Science Summit, which will be held parallel to the 79th United Nations General Assembly (UNGA) and coincide with the Summit of the Future (SotF). The SotF will gather leaders to review global challenges and start planning for the post-2030 era. Scientific evaluations will underpin this process.

Climate change remains high on the UNGA's agenda and there is increasing interest in emerging technologies to address climate change impacts. One of those technologies is solar radiation modification (SRM), a proposal for reducing the impacts of global warming by reflecting some sunlight away from the Earth.
Earlier this year, at the Sixth United Nations Environment Assembly, a resolution on SRM was withdrawn. It sought to provide member states with more information on research, deployment capabilities, ethics, and potential impacts, including risks, benefits, and uncertainties.
The next few years will be crucial for SRM research and governance, and climate-vulnerable regions will need informed and confident representation if they are to effectively advocate for their interests.
The Degrees Initiative is an NGO that builds the capacity of developing countries to evaluate SRM. Working with a broad coalition of partners and volunteers, it has singularly transformed the field of SRM research, **awarding over $2.5 million in grants to Southern research projects, supporting over 170 researchers across 37 projects in 22 developing countries and emerging economies.** Beyond research, Degrees also supports Southern experts in informing processes that seek to strengthen governance for SRM.

The SRM researchers supported by Degrees are becoming leaders in the field. They publish their findings in prestigious journals, serve on UN panels and ensure that the Global South has its own SRM expertise and evidence. The power of an informed Southern voice was demonstrated last year when 18 African climate scientists who came into SRM research through the Degrees Modelling Fund wrote to the New York Times, emphasising the importance of Southern SRM research.

The science-policy interface is where the necessary ingredient, 'trust', is built to overcome barriers to progress. The SRM researchers supported by Degrees have built trust and are now recognised as credible voices by ensuring that their evaluations are regional and country context-specific, people-focused and overall sensitive to planetary needs.

As the world advances toward 2030, the world seeks means to reduce risks from one of the greatest challenges, climate change. The voices of scientists from climate vulnerable countries should be amplified amongst decision making processes, so that they are represented, and deliberations are evidence-based.

Description

The UK-based DEGREES (DEveloping country Governance, REsearch and Evaluation for SRM) initiative aims to expand the discussion on Solar Radiation Management (SRM) around the world and has launched the DEGREES Modelling Fund (DMF). The DMF provides funding to enable scientists in the Global South to model SRM approaches and analyse the potential impacts of SRM on their regions. In Côte d'Ivoire, the DMF project was based at the Félix Houphouet-Boigny University in Abidjan. The research team modelled possible impacts of stratospheric aerosol injection (SAI) on West and Central Africa: "*GeoMIP-Africa: impact of SAI on temperature and precipitation extremes over West and Central Africa and implications for water resources*". The modelling was based on a climate model developed in the Global North (GeoMIP -Geoengineering Model Intercomparison Project).

Modelling the application of SRM technologies (stratospheric aerosol injection (SAI)) in West and Central Africa.

Location

Ivory Coast

Period of time

2018 - 2022.

Sponsor(s)

Please see DEGREES Initiative, University of Félix Houphouët-Boigny.

Websites

- https://www.degrees.ngo/
- https://www.degrees.ngo/dmf/the-projects/ivory-coast/
- https://www.emerald.com/insight/content/doi/10.1108/IJCCSM-03-2021-0028/full/html#sec009
- https://twas.org/opportunity/twas-srmgi-decimals-funds-research-grants
- https://sciafmag.com/2019/06/26/dialing-down-the-sun/