

Auftaktveranstaltung „Auf Holz bauen“, ifbau Architektenkammer BW
Livestream, 14 Dezember 2020

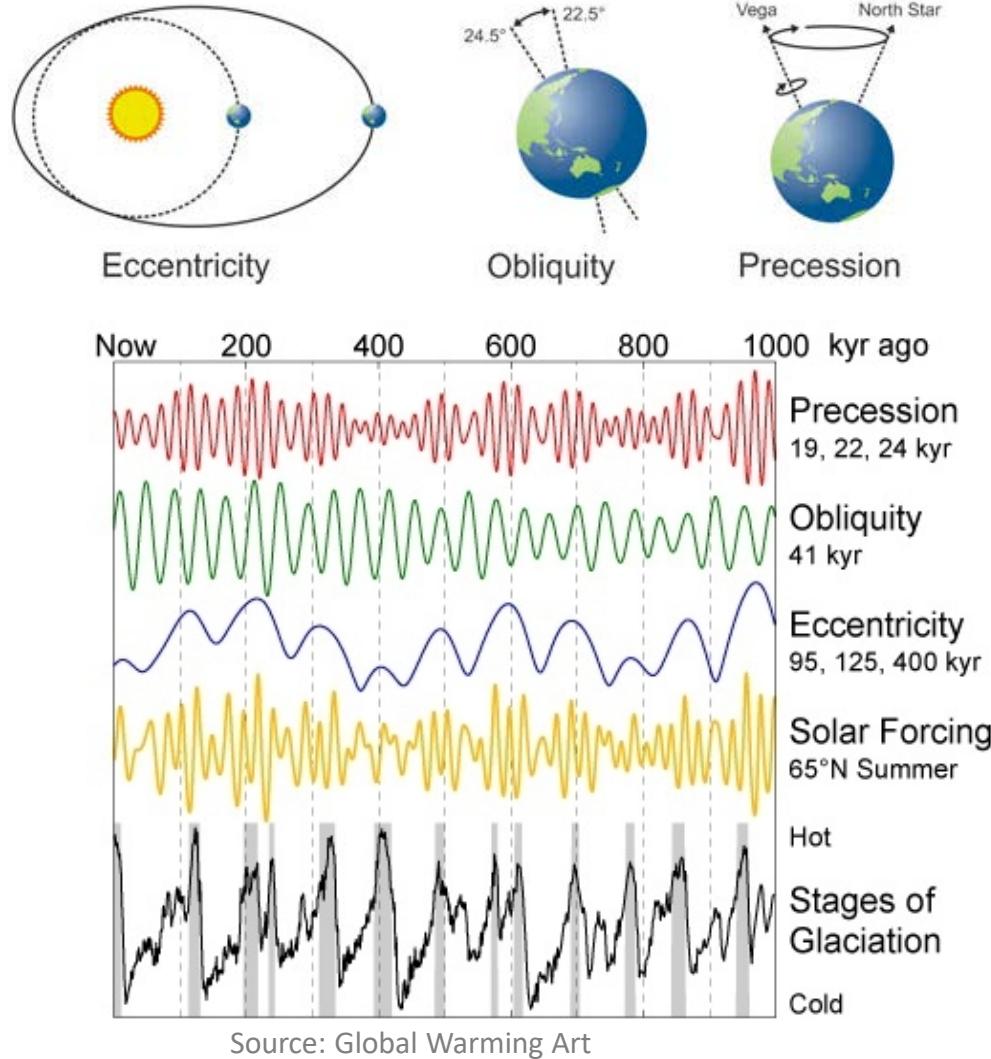
Kann man sich mit Holz aus der Klimakrise bauen?

Prof. Dr. Dr. h.c. Hans Joachim Schellnhuber

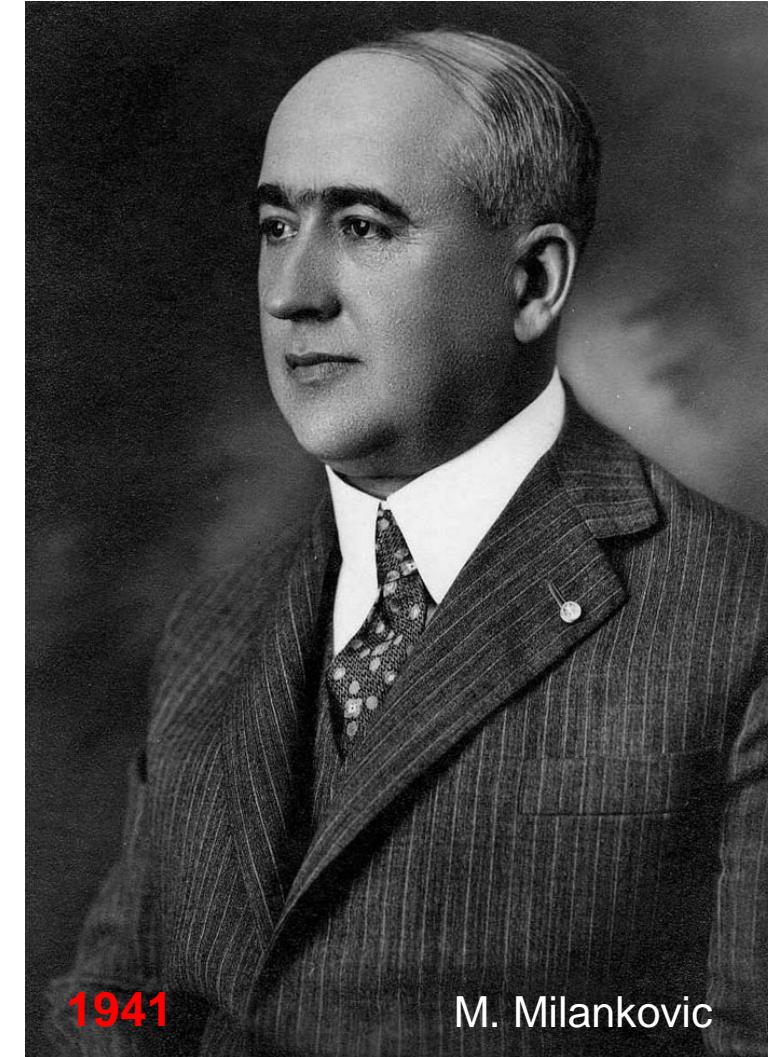
*Direktor Emeritus, Potsdam Institut für Klimafolgenforschung (PIK);
Mitglied, Päpstliche Akademie der Wissenschaften*



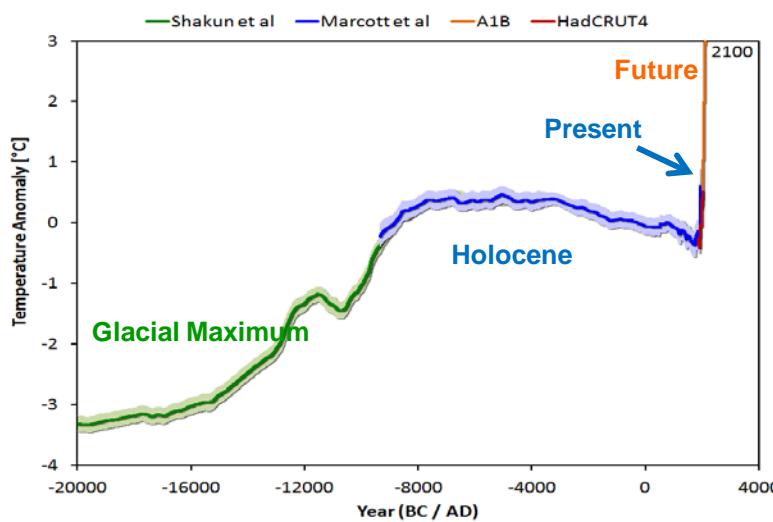
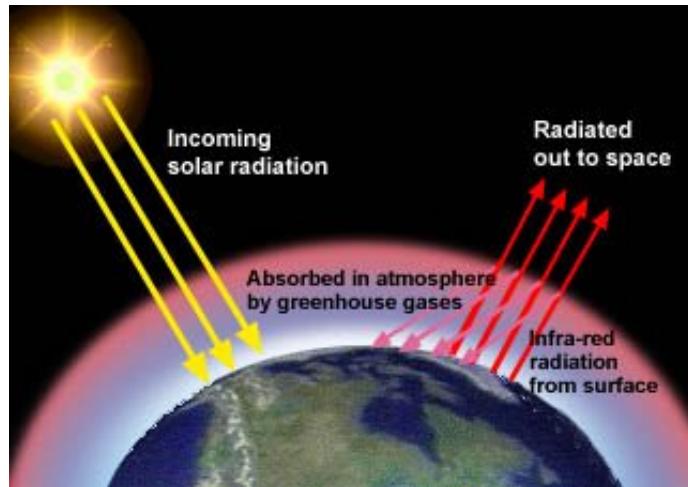
Warum sich das Klima ändert – längerfristige Faktoren:



Milankovic Cycles



Warum sich das Klima ändert – längerfristige Faktoren:



The Greenhouse Effect

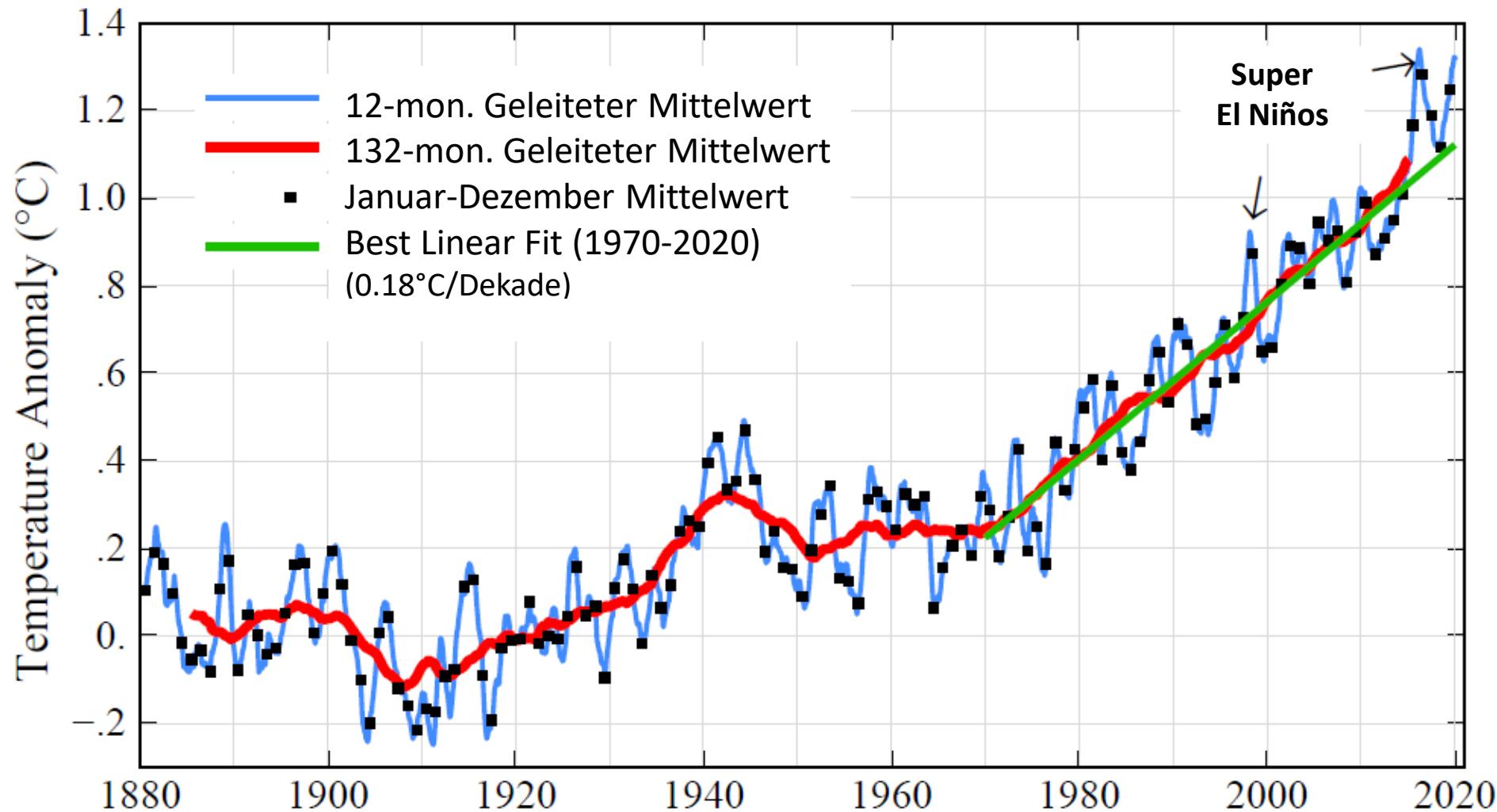


Greta Thunberg (Fridays for Future)



Foto: Anders Hellberg/Wikimedia Commons

Globale Durchschnittstemperatur



Das Pariser Abkommen

Nations Unies
Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris, France



Weltklimarat $\leq 1.5^{\circ}\text{C}$!

Beschränkung der
Erderwärmung auf
“weit unter” 2 Grad Celsius

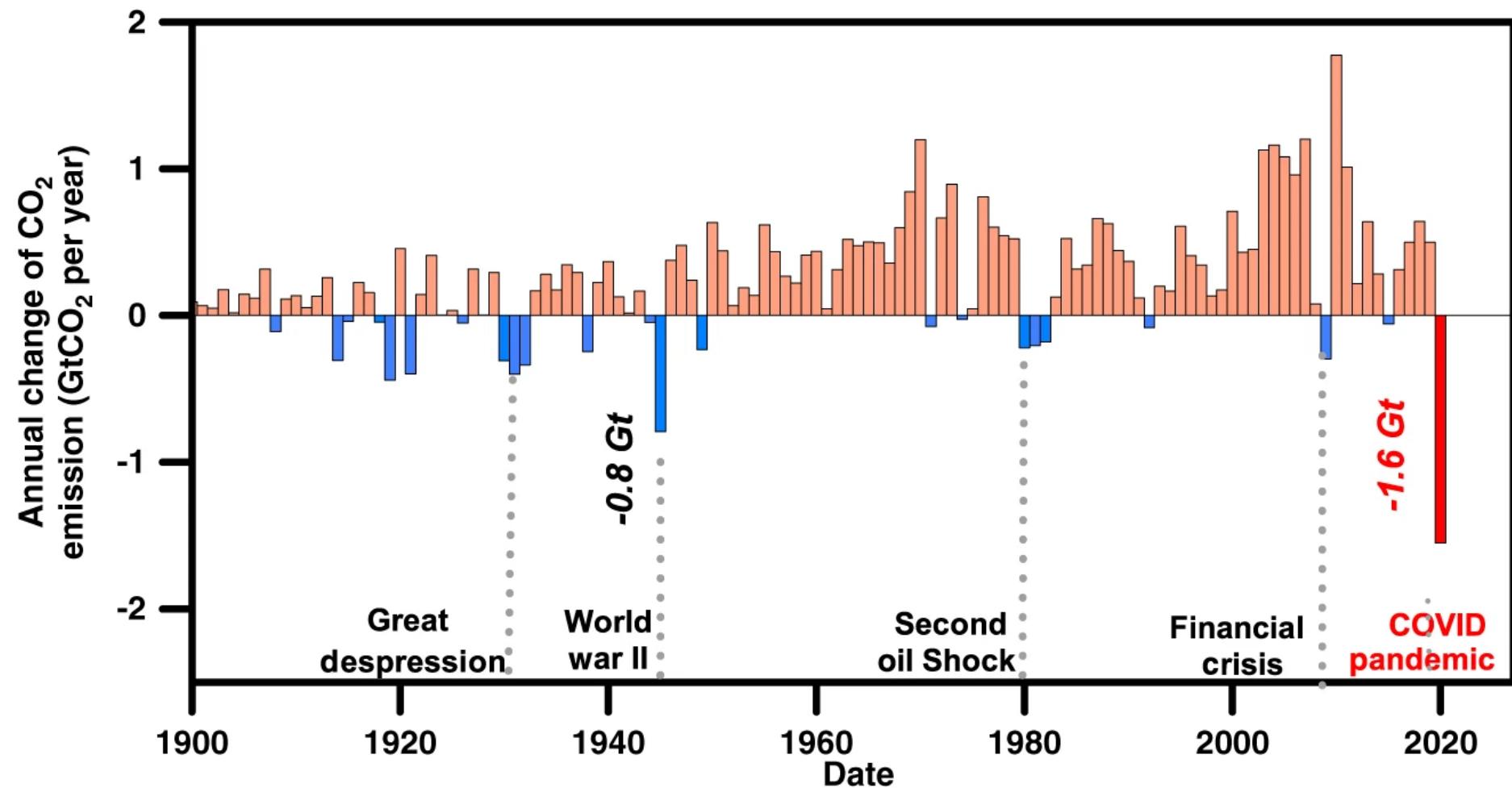
Netto-Null Emissionen von
Treibhausgasen nach Mitte des
21. Jahrhunderts

Nationale Emissionsziele
regelmäßig überprüft und
verschärft

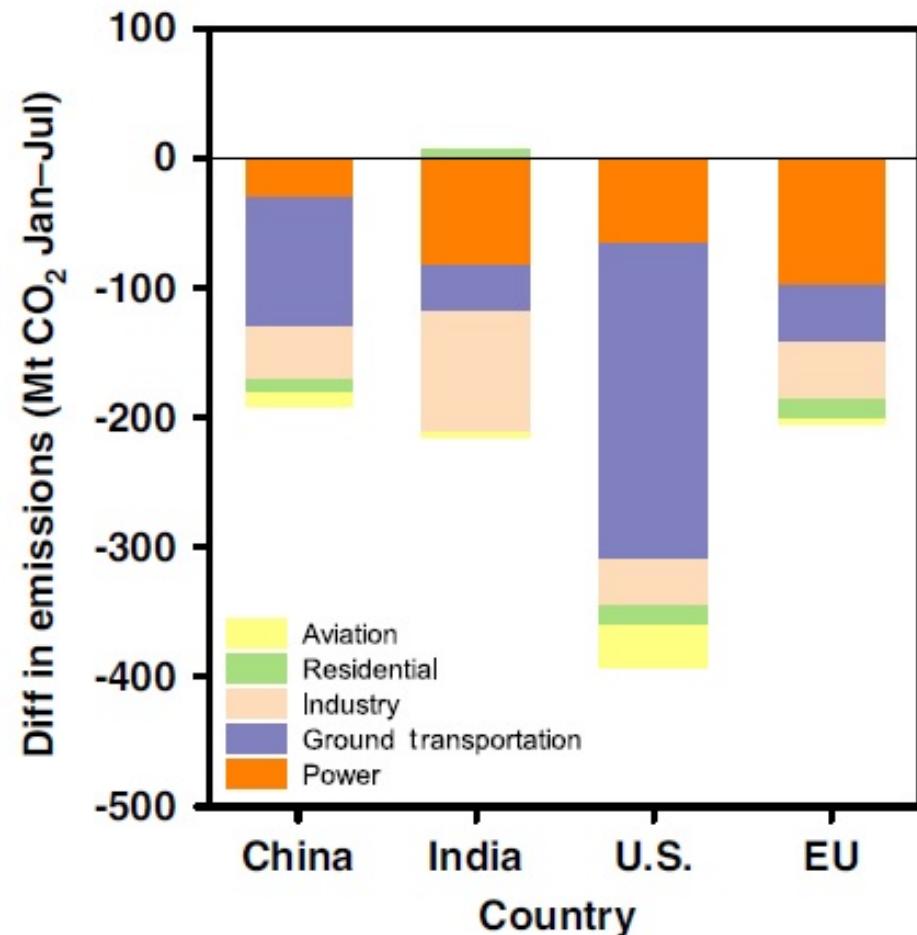
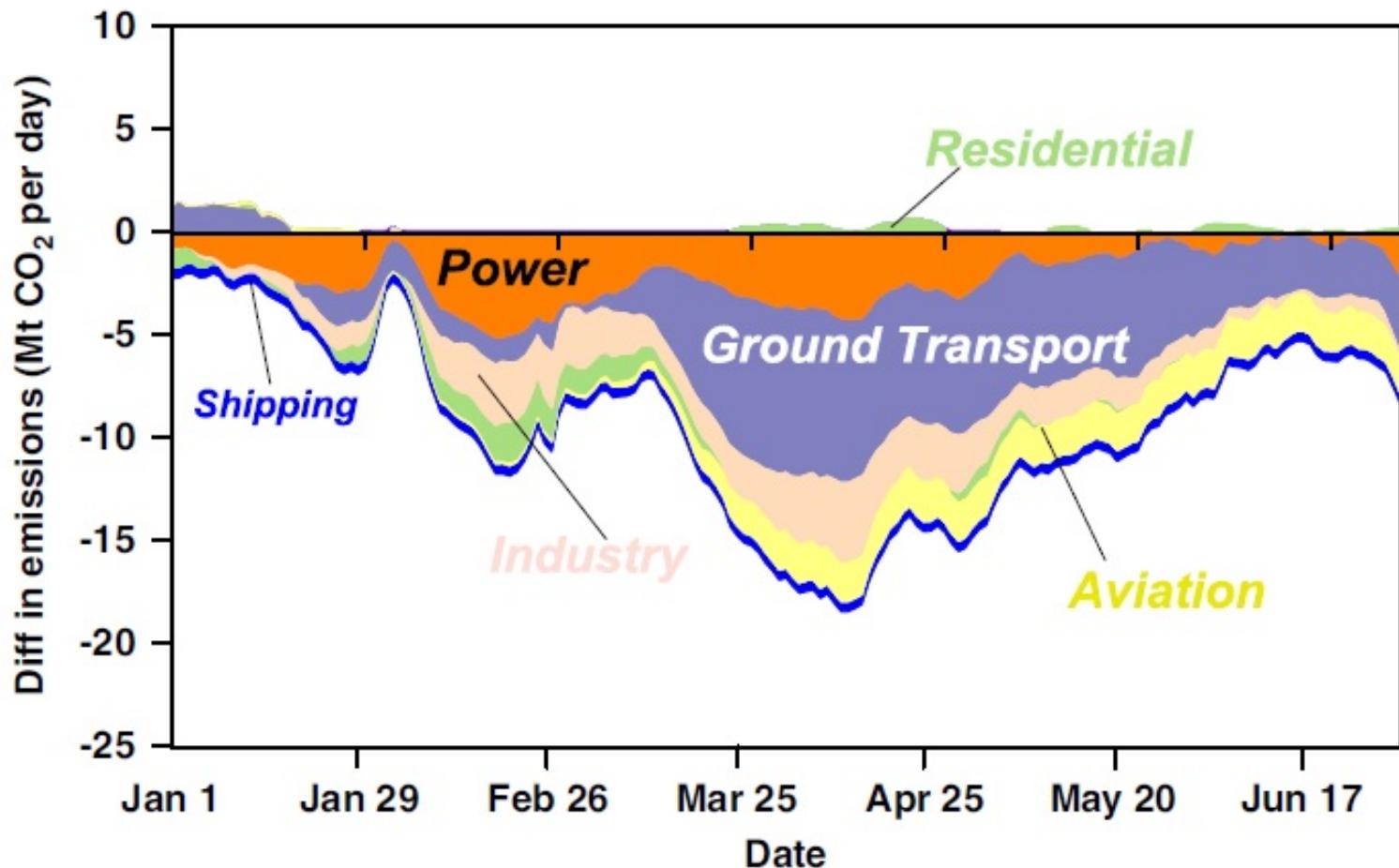
Industrieländer stellen von
2020-2025 jährlich
100 Milliarden USD bereit

Near-real-time monitoring of global CO₂ emissions reveals the effects of the COVID-19 pandemic

-8,8%
**CO₂-Emissionen
im ersten
Halbjahr 2020**



Near-real-time monitoring of global CO₂ emissions reveals the effects of the COVID-19 pandemic





Atmospheric CO₂ continues to rise rapidly in 2020

CO₂ levels (ppm)

420

Hawaii: 411.3 ppm

(+3 ppm compared to 2019)

400

380

360

340

320

300

1960

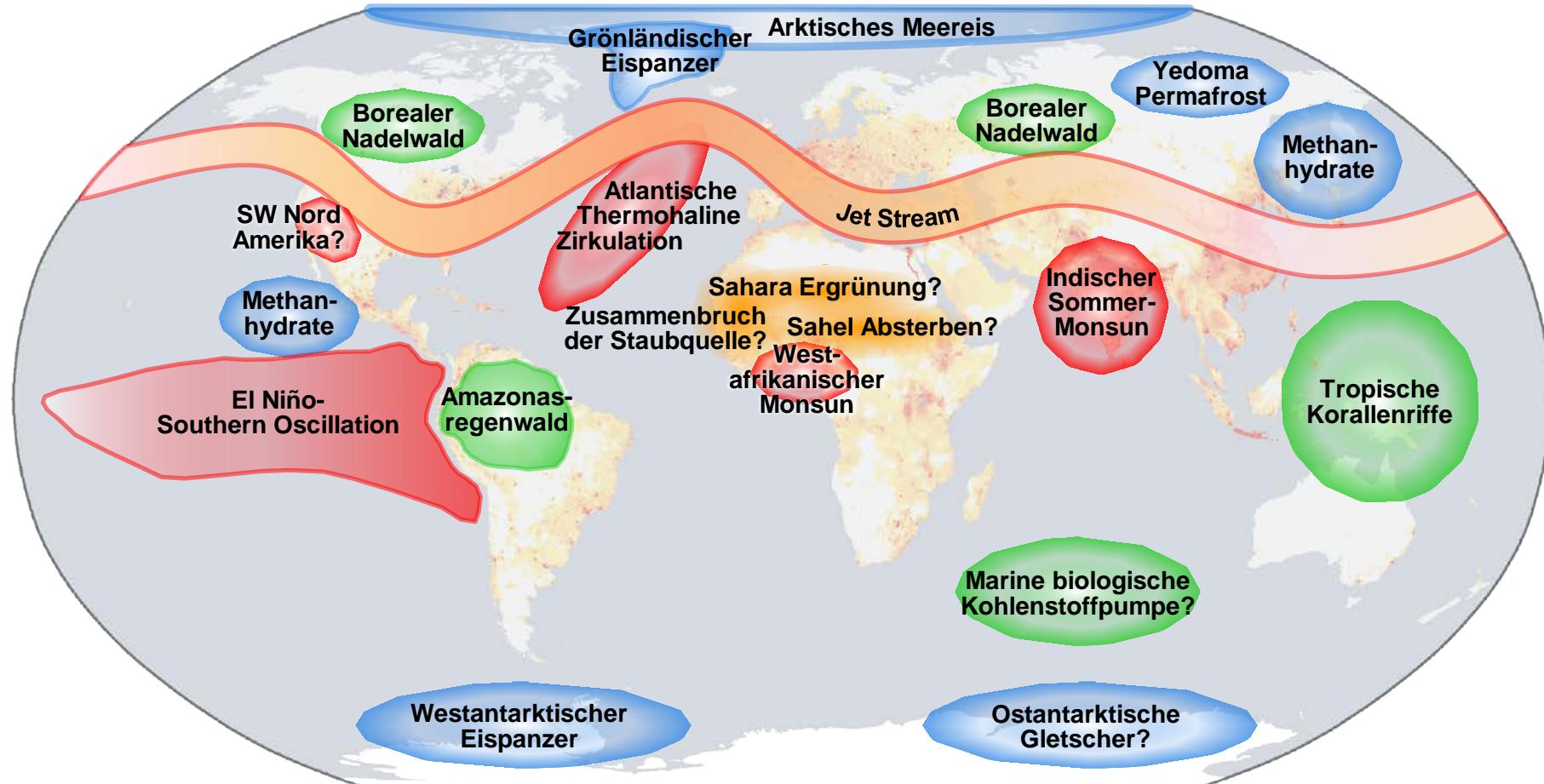
1980

2000

2020

Guardian graphic. Source: US Earth System Research Laboratory, measurements from Mauna Loa, Hawaii. Note: CO₂ levels are being driven up by human activities but vary with the season

Risiken am Horizont: Kippelemente im Erdsystem

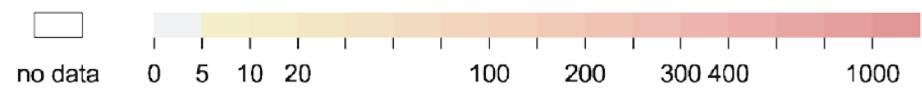


■ Elemente der Kryosphäre

■ Zirkulationsmuster

■ Elemente der Biosphäre

Bevölkerungsdichte [Personen pro km²]

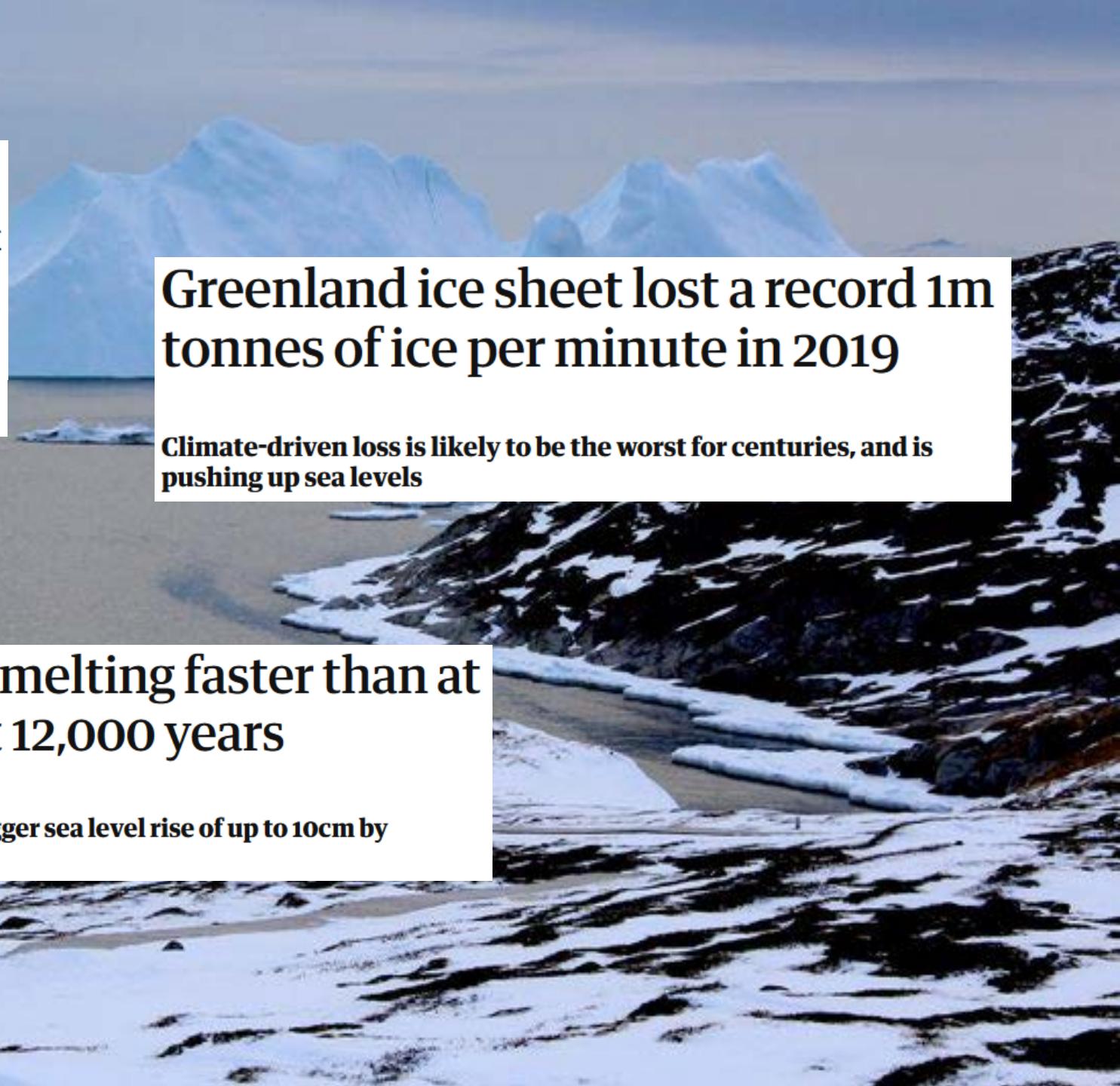




Dynamic ice loss from the Greenland Ice Sheet driven by sustained glacier retreat

Michalea D. King^{1✉}, Ian M. Howat¹, Salvatore G. Candela¹, Myoung J. Noh¹, Seongsu Jeong², Brice P. Y. Noël³, Michiel R. van den Broeke^{1,3}, Bert Wouters^{3,4} & Adelaide Negrete¹

<https://www.nature.com/articles/s43247-020-0001-2>



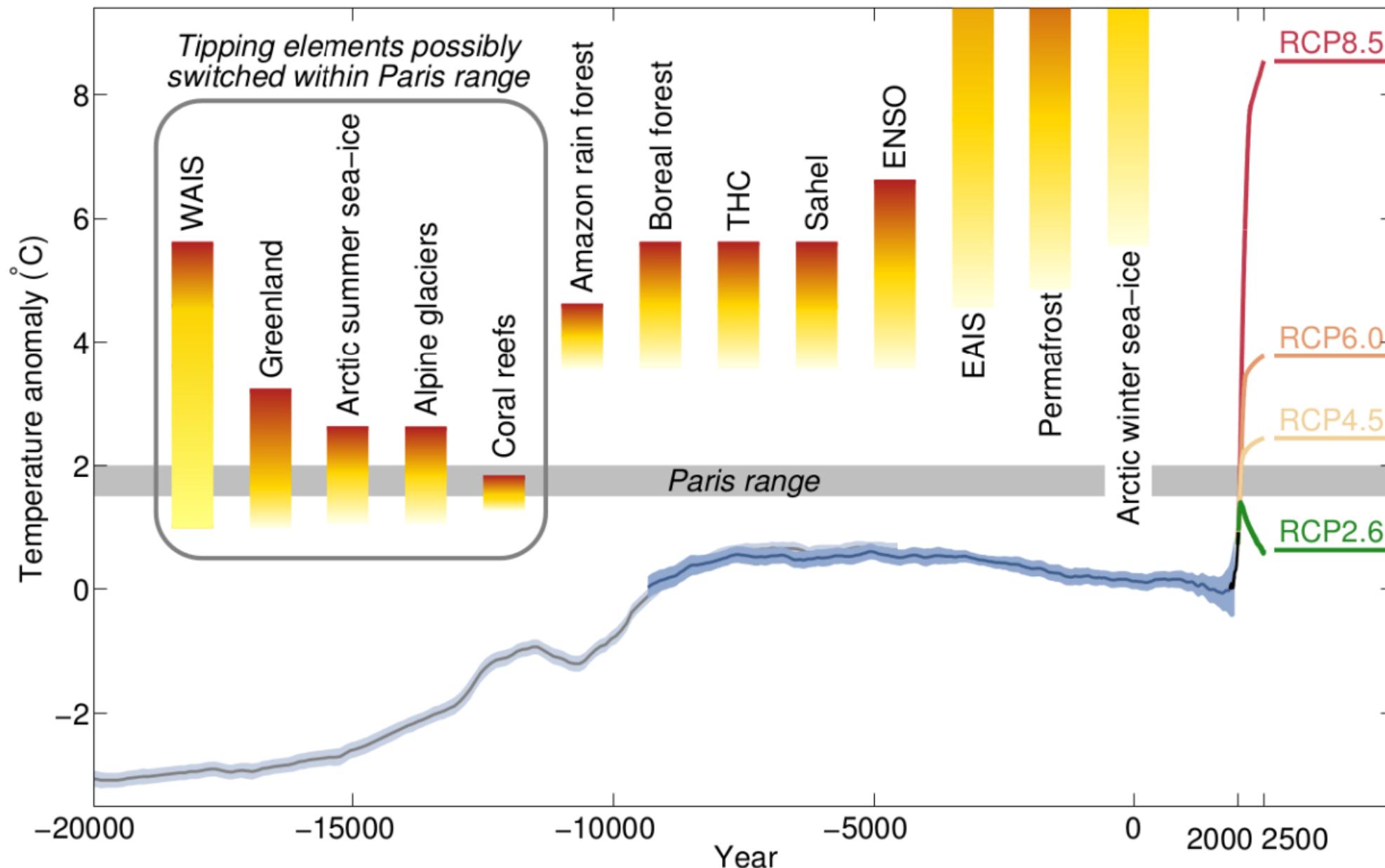
Greenland ice sheet lost a record 1m tonnes of ice per minute in 2019

Climate-driven loss is likely to be the worst for centuries, and is pushing up sea levels

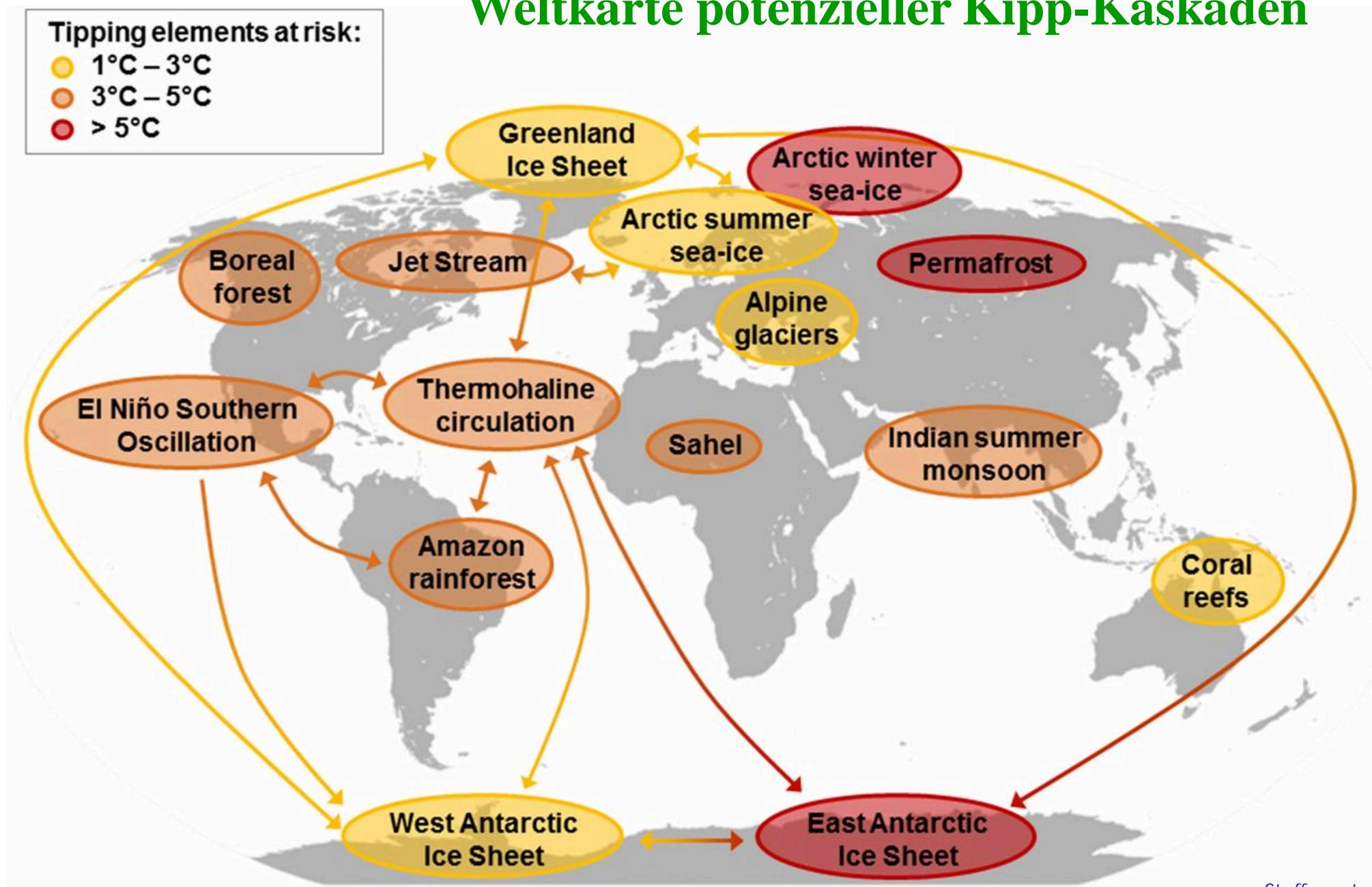
Greenland's ice melting faster than at any time in past 12,000 years

Increased loss of ice could trigger sea level rise of up to 10cm by end of century

Kipp-Punkte relativ zur 2°C-Leitplanke



Weltkarte potenzieller Kipp-Kaskaden



Wenn das ganze Eis schmilzt



Wenn das ganze Eis schmilzt



Wenn das ganze Eis schmilzt



POLICY FORUM



CLIMATE POLICY

A roadmap for rapid decarbonization

Emissions inevitably approach zero with a “carbon law”

By **Johan Rockström**,¹ **Owen Gaffney**,^{1,2}
Joeri Rogelj,^{3,4} **Malte Meinshausen**,^{5,6}
Nebojsa Nakicenovic,⁴ **Hans Joachim Schellnhuber**^{1,5}

pose framing the decarbonization challenge in terms of a global decadal roadmap based on a simple heuristic—a “carbon law”—of halving gross anthropogenic carbon-dioxide (CO₂) emissions every decade. Comple-

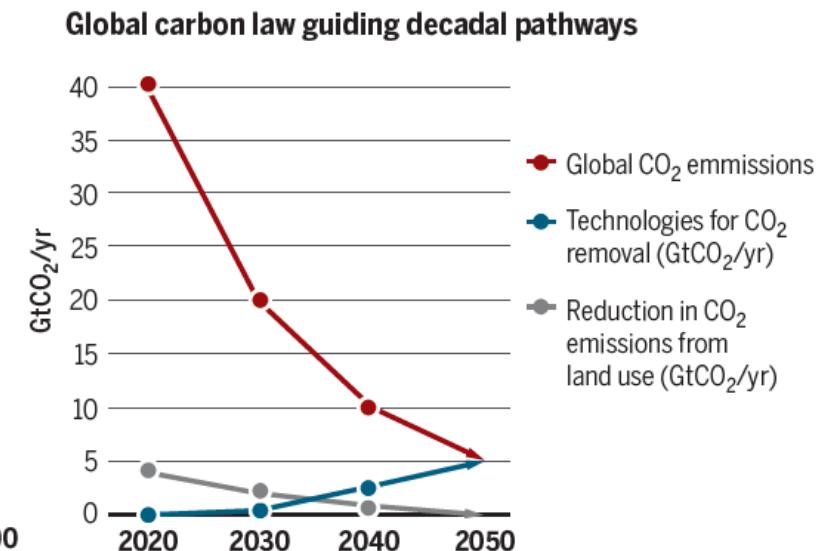
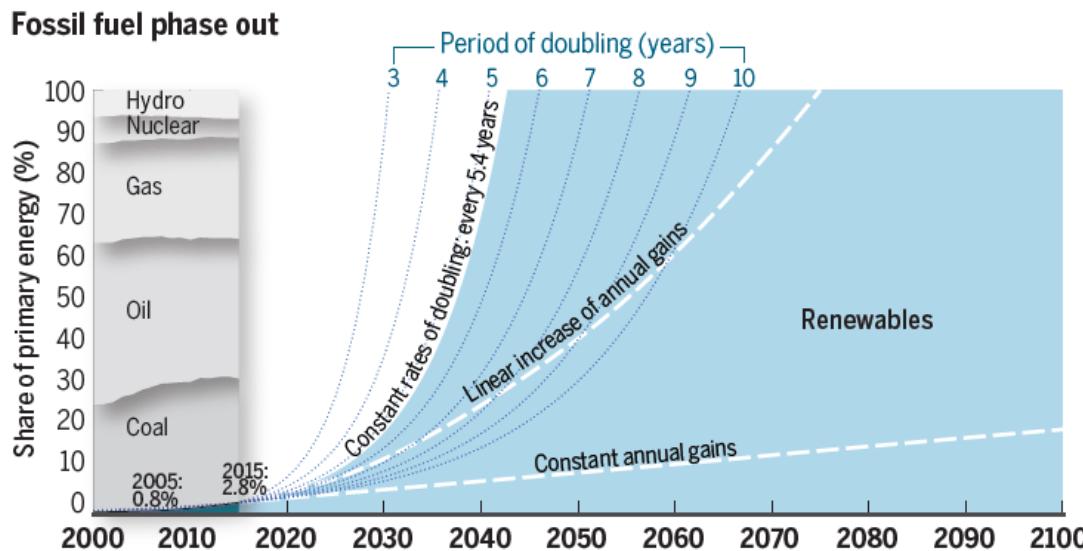
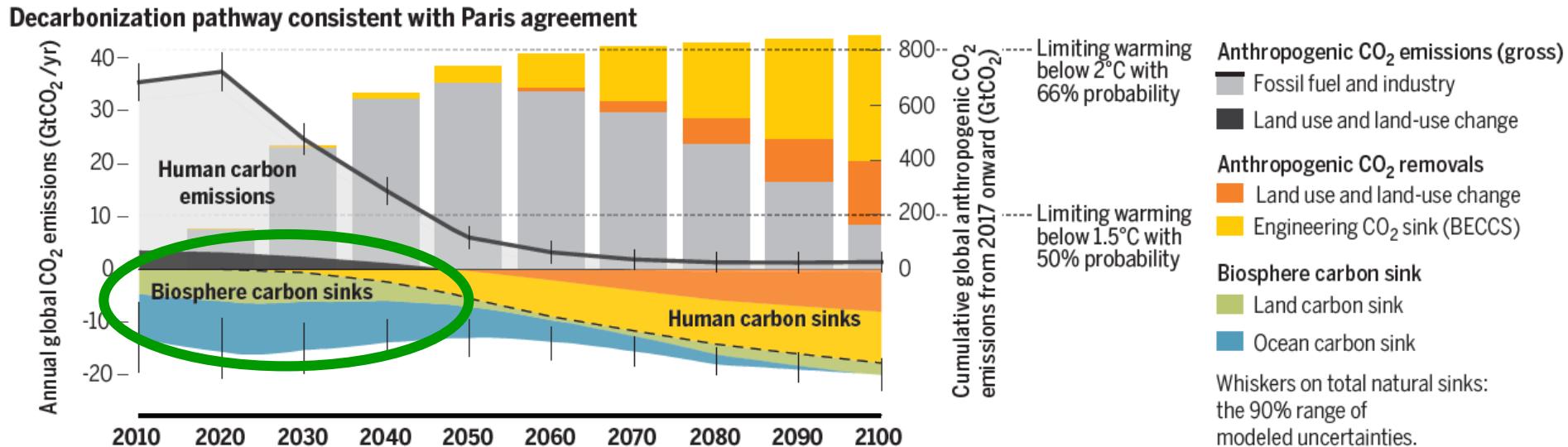
The road to global decarbonization must involve renewable energy, as from these wind turbines in Germany, and improved transportation technologies.

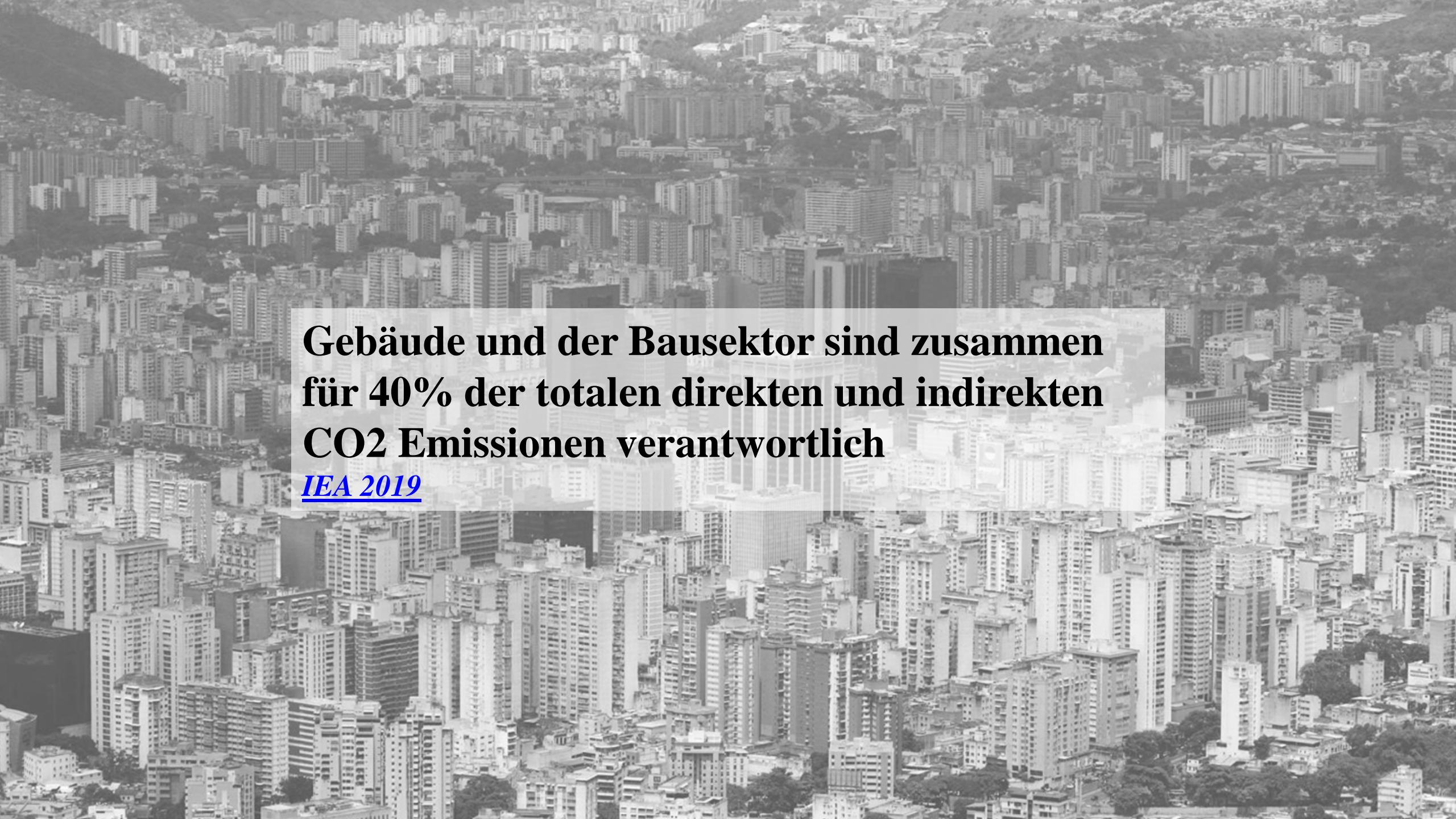
sistent with the trajectory of the past decade (see the figure, bottom left). All sectors (e.g., agriculture, construction, finance, manufacturing, transport) need comparable transformation pathways. In addition, in the absence of viable alternatives, the world must aim at rapidly scaling up CO₂ removal by technical means from zero to at least 0.5 GtCO₂/year by 2030, 2.5 by 2040, and 5 by 2050. CO₂ emissions from land-use must decrease along a nonlinear trajectory from 4 GtCO₂/year in 2010, to 2 by 2030, 1 by 2040, and 0 by 2050 (see the figure, bottom right). The endgame is for cumulative CO₂ emissions since 2017 to be brought back from around 700 GtCO₂ to below 200 GtCO₂ by the end of the century (see the figure, top) and atmospheric CO₂ concentrations to return to 380 ppm by 2100 (currently at 400 ppm).

Roadmaps are planning instruments, linking shorter-term targets to longer-term goals. They help align actors and organizations to instigate technological and institutional breakthroughs to meet a collective challenge. An explicit carbon roadmap for halving anthropogenic emissions every decade, codesigned by and for all industry sectors, could help promote disruptive, nonlinear technological advances toward a zero-emissions world. The

<https://science.scienmag.org/content/355/6331/1269.full>

Der Fahrplan für die Transformation



The background of the image is a black and white aerial photograph of a dense urban cityscape, likely São Paulo, showing a high concentration of buildings of various heights.

**Gebäude und der Bausektor sind zusammen
für 40% der totalen direkten und indirekten
CO₂ Emissionen verantwortlich**

[IEA 2019](#)

Unsichtbare Kosten: Bauwesen und Beton

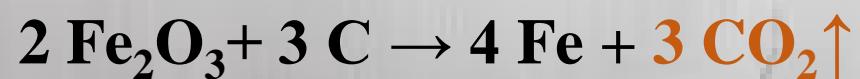


© Omar Chatriwala/flickr

- Das globale Bauwesen wird bis 2050 so viel neue Infrastruktur benötigen wie bereits seit 1850 errichtet wurde.
- Dadurch wird der größte Teil des CO₂ Budgets (1.5°C) aufgebraucht, wenn konventionelle Materialien wie Beton verwendet werden.
- Allein in China wurde zwischen 2008 und 2010 so viel Beton verbaut, wie im gesamten 20. Jahrhundert in den USA

→ Klimaschutz wird in den Städten entschieden.

CO₂ EMISSIONEN KÖNNEN NICHT AUF NULL REDUZIERT WERDEN, AUCH WENN AUSSCHLIEßLICH ENERGIE AUS ERNEUERBAREN QUELLEN VERWENDET WIRD

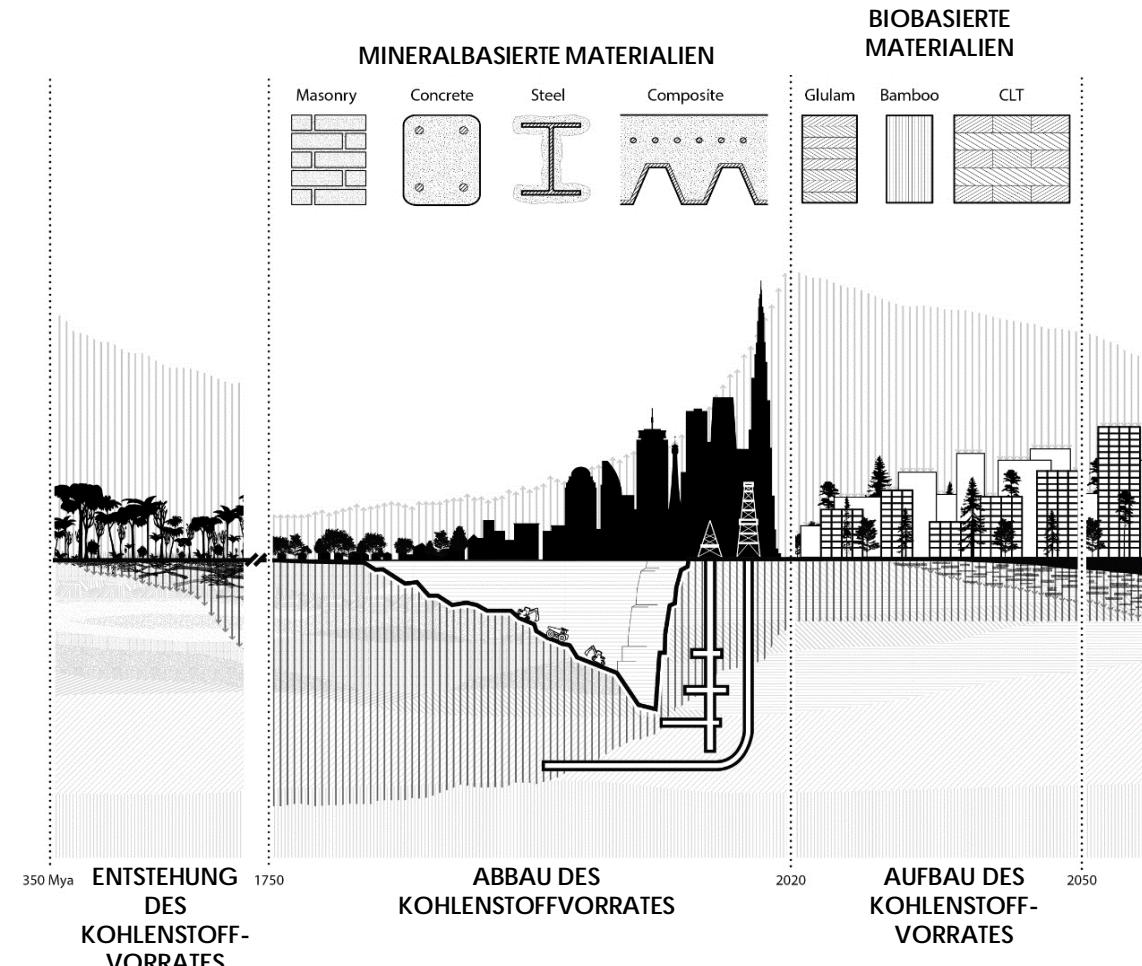


Städte in der Evolution des Kohlenstoffkreislaufes

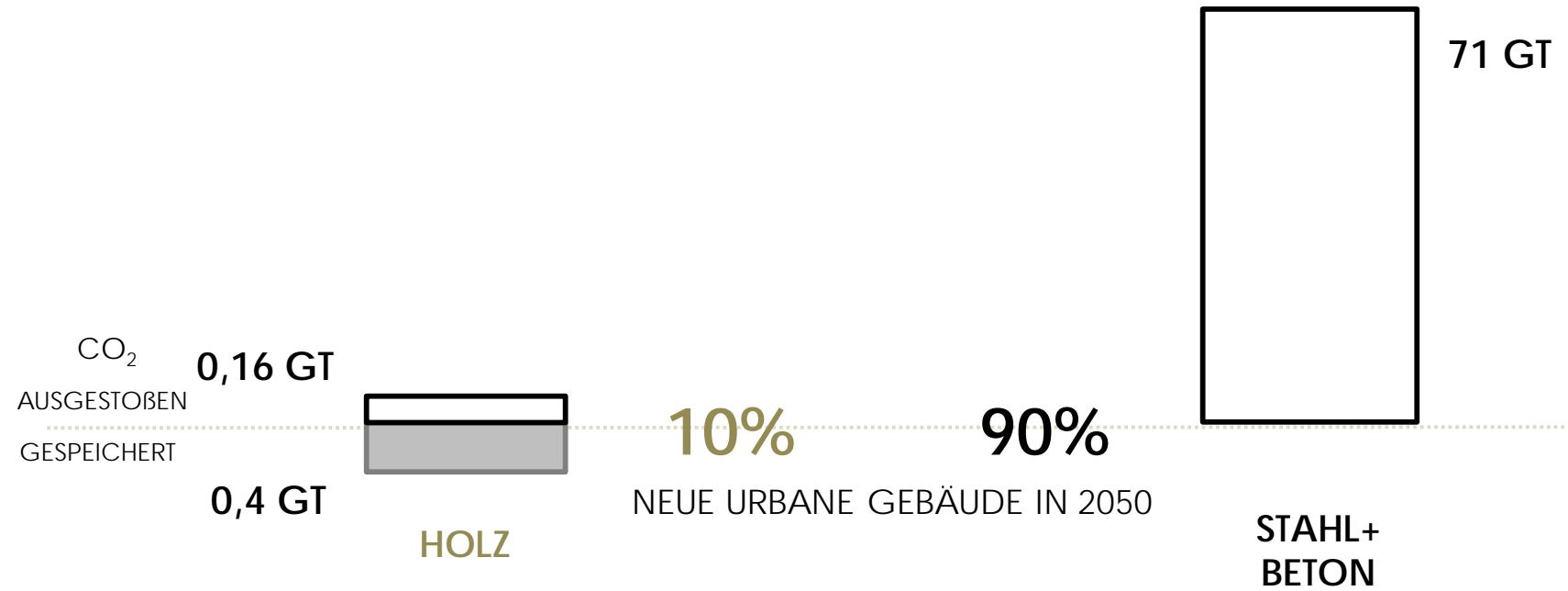
Buildings as a global carbon sink

Galina Churkina , Alan Organschi, Christopher P. O. Reyer, Andrew Ruff, Kira Vinke,

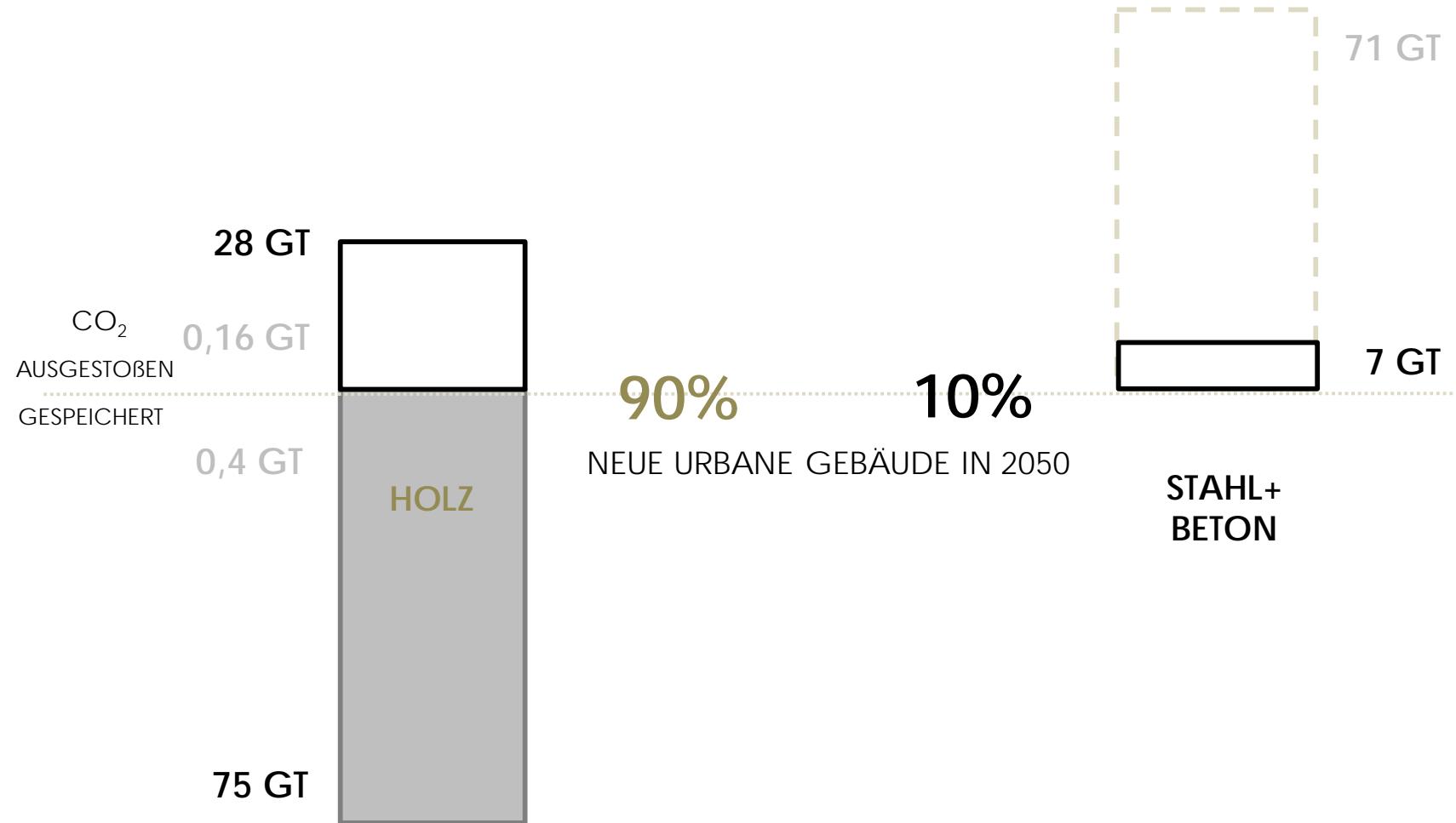
Zhu Liu, Barbara K. Reck, T. E. Graedel & Hans Joachim Schellnhuber



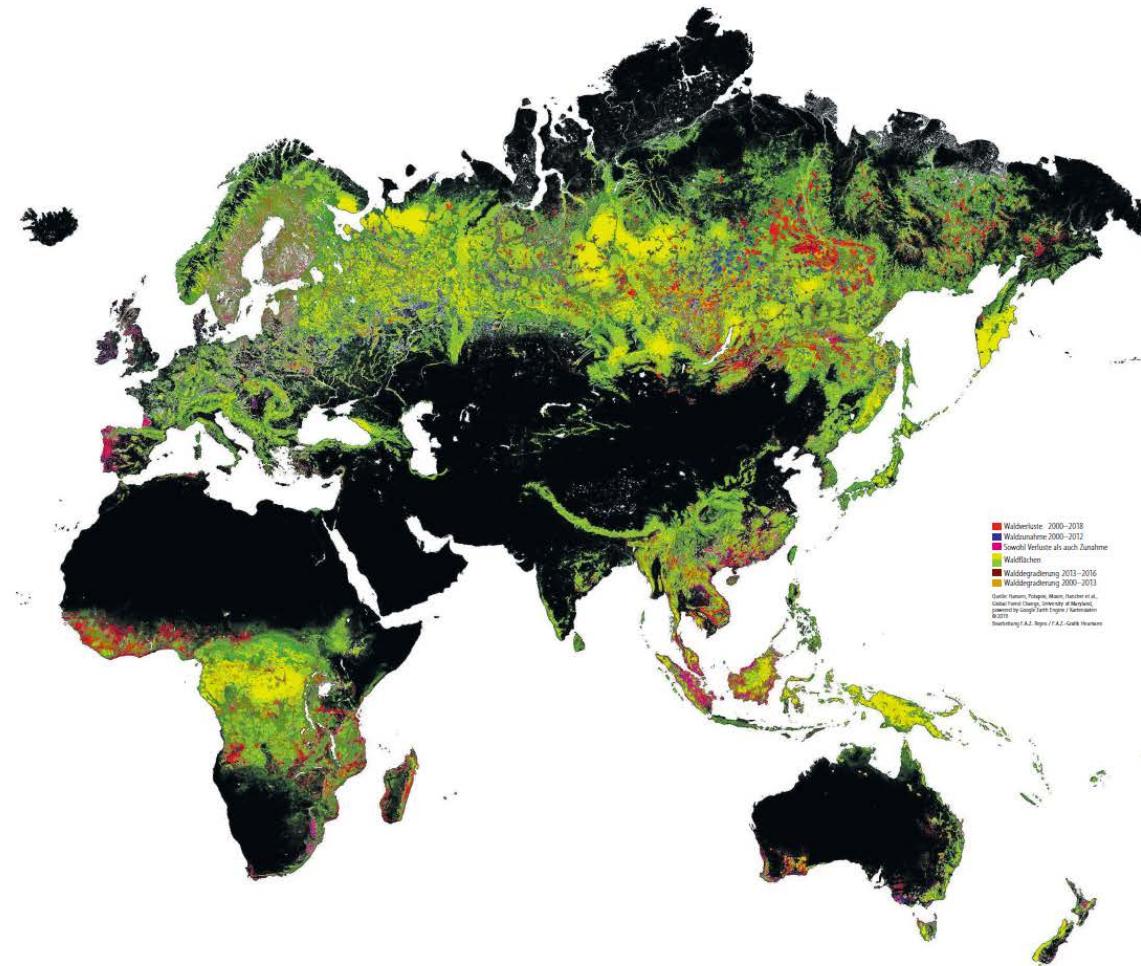
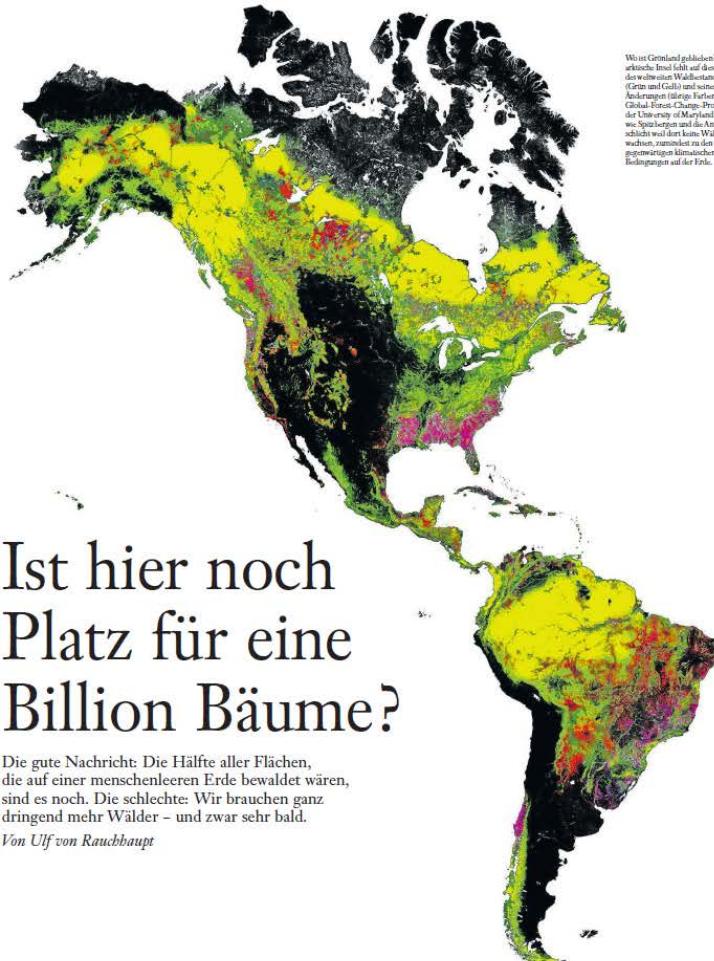
Gebäude als globale Kohlenstoffsenke



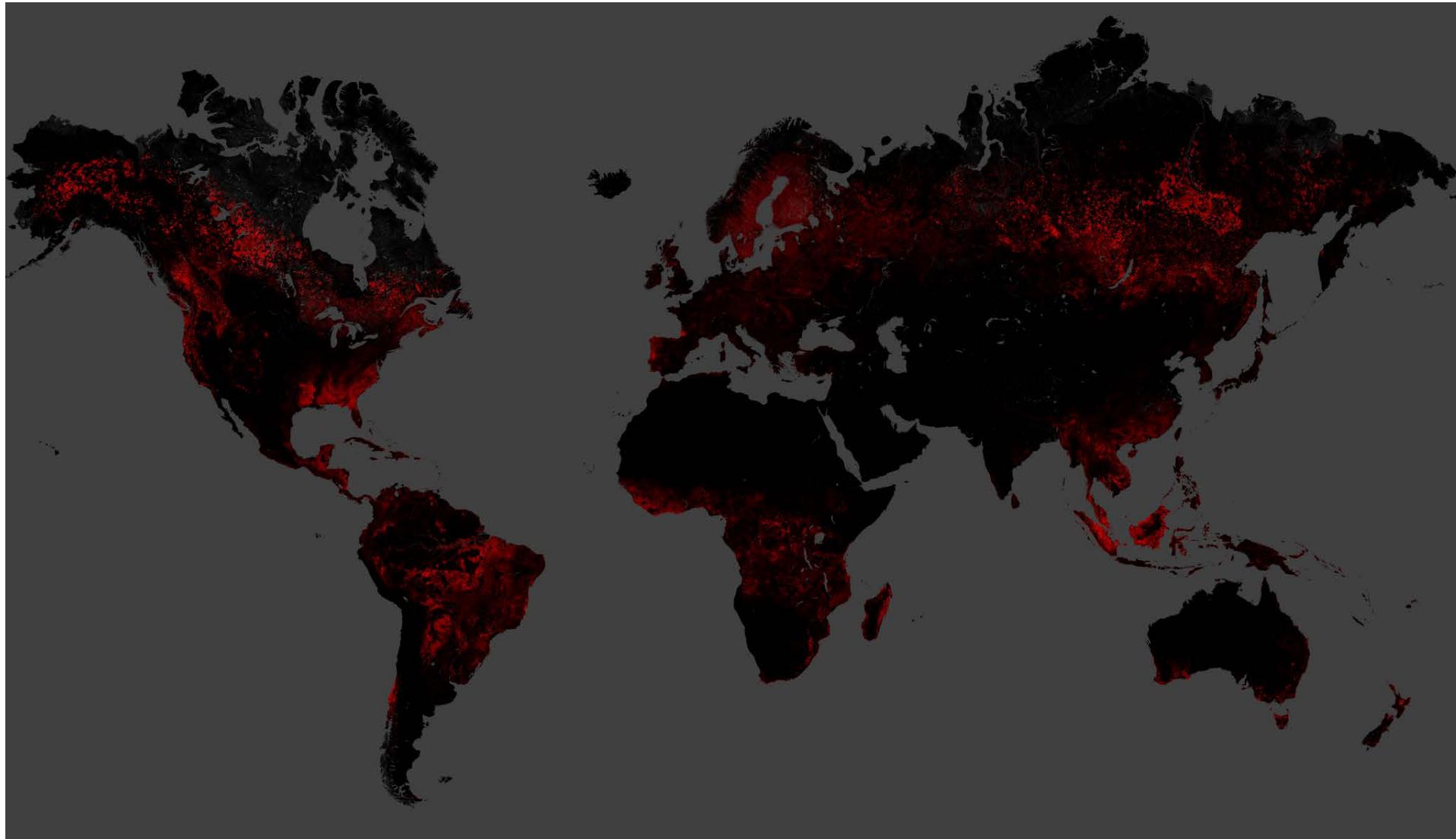
Gebäude als globale Kohlenstoffsenke



Globaler Verlust der Waldfläche



Globaler Verlust der Waldfläche



[Global Forest Change Project](http://www.globalforestchange.org)

Ist der Kippunkt im Amazonas Regenwald bereits erreicht?

The
Guardian



Amazon near tipping point of switching from rainforest to savannah - study

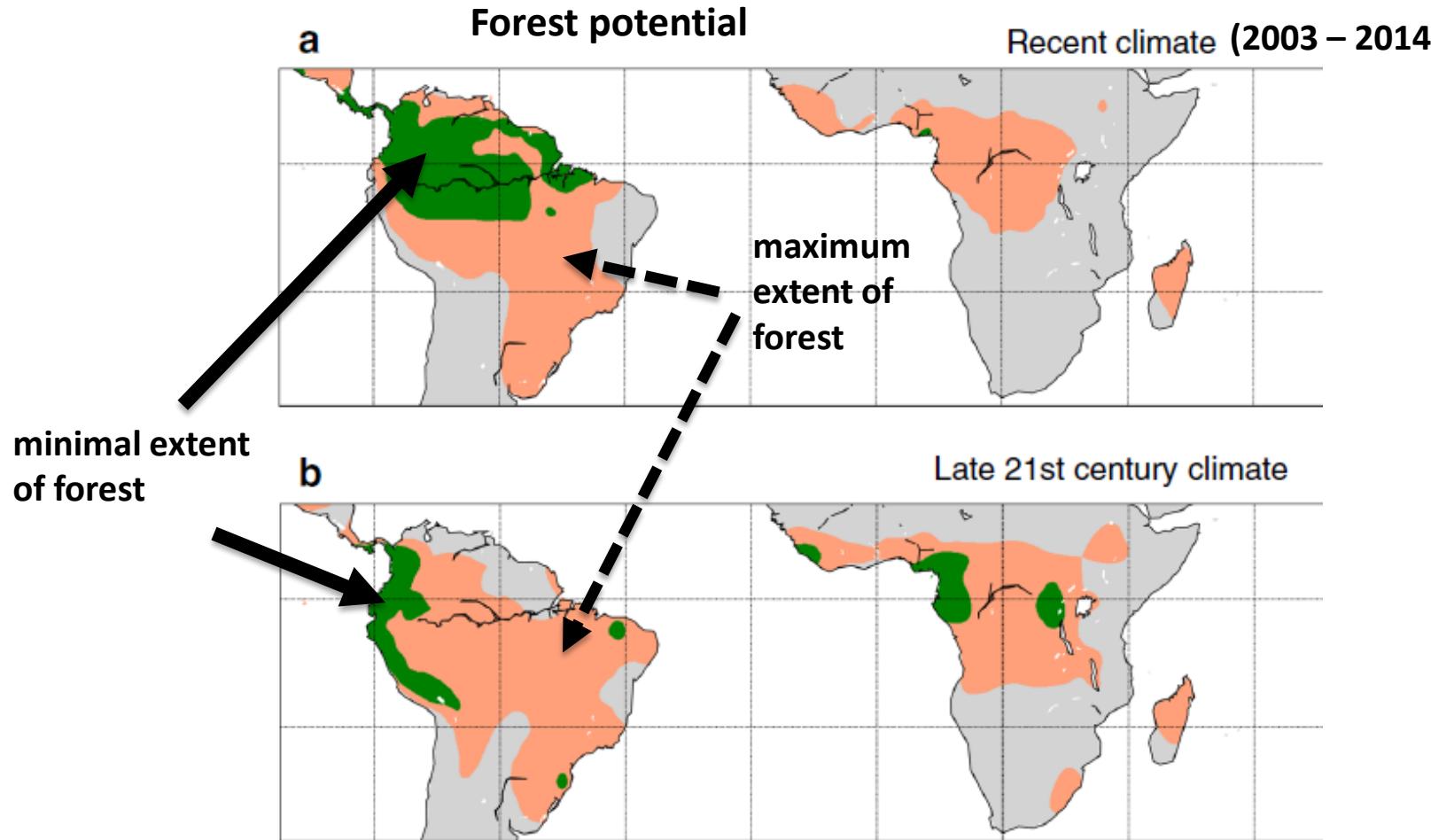
Climate crisis and logging is leading to shift from canopy rainforest to open grassland

▲ Smoke rises from an illegally lit fire in the Amazon rainforest reserve, south of Novo Progresso in Pará State, Brazil. Photograph: Carl de Souza/AFP/Getty

Hysteresis of tropical forests in the 21st century

Arie Staal^{1,2✉}, Ingo Fetzer¹, Lan Wang-Erlandsson¹, Joyce H. C. Bosmans³, Stefan C. Dekker^{1,2}, Egbert H. van Nes⁴, Johan Rockström^{1,5} & Obbe A. Tuinenburg^{1,2}

Bis heute haben 40% der existierenden Waldfläche im Amazonas den Kippunkt hin zu einem permanenten Savanna Ökosystem erreicht.



Fichtensterben im Harz

Borkenkäfer treffen auf dürregeschädigte Fichten

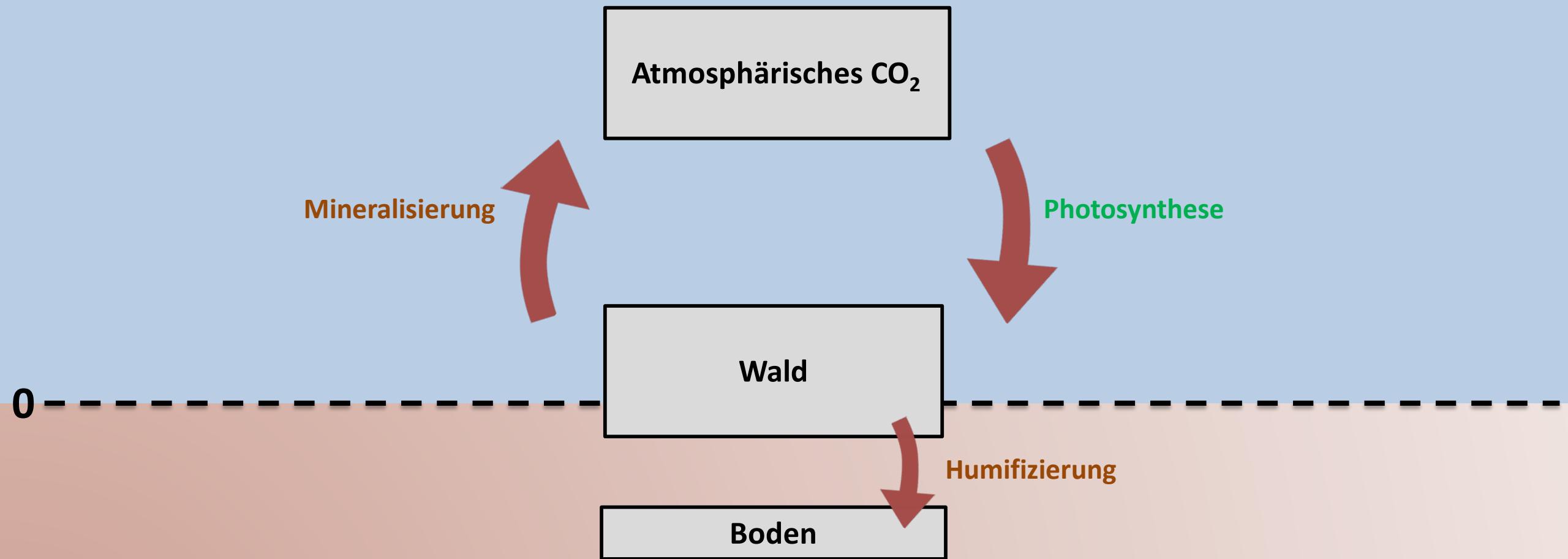


Quelle: rtl.de

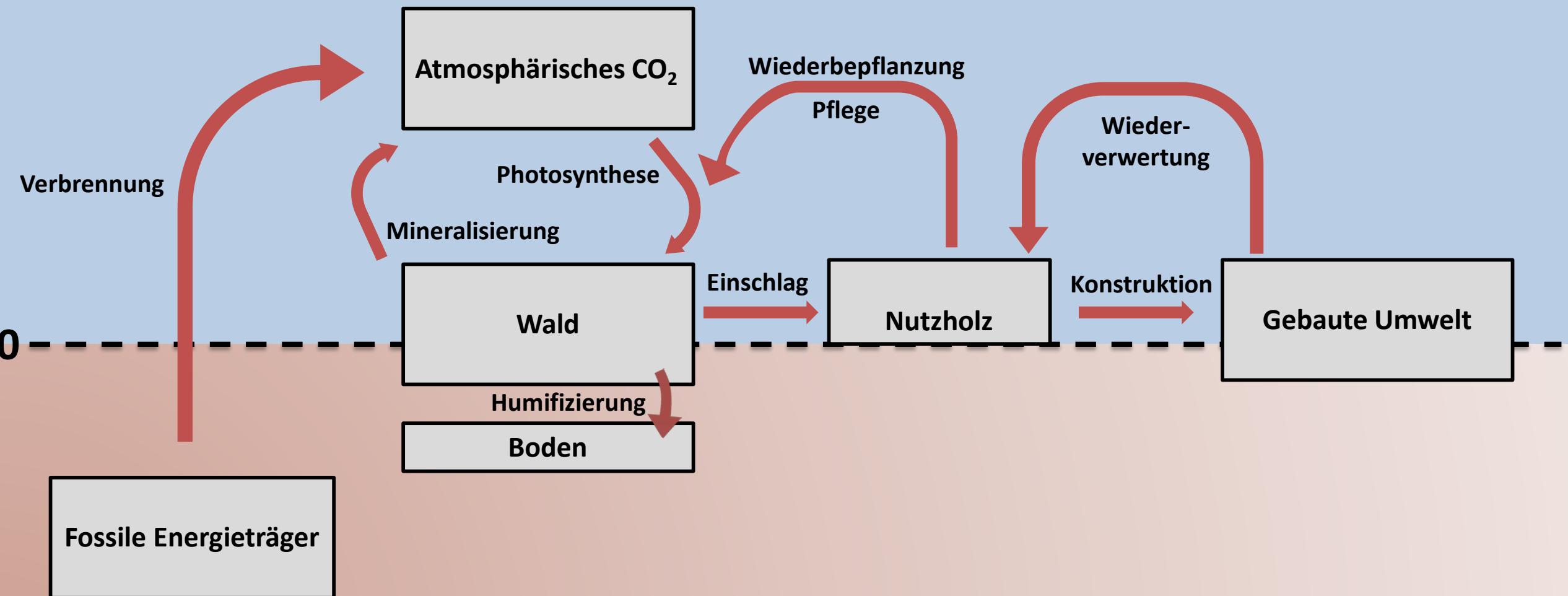


Ist der Kippunkt zum Buchen-Mischwald erreicht?

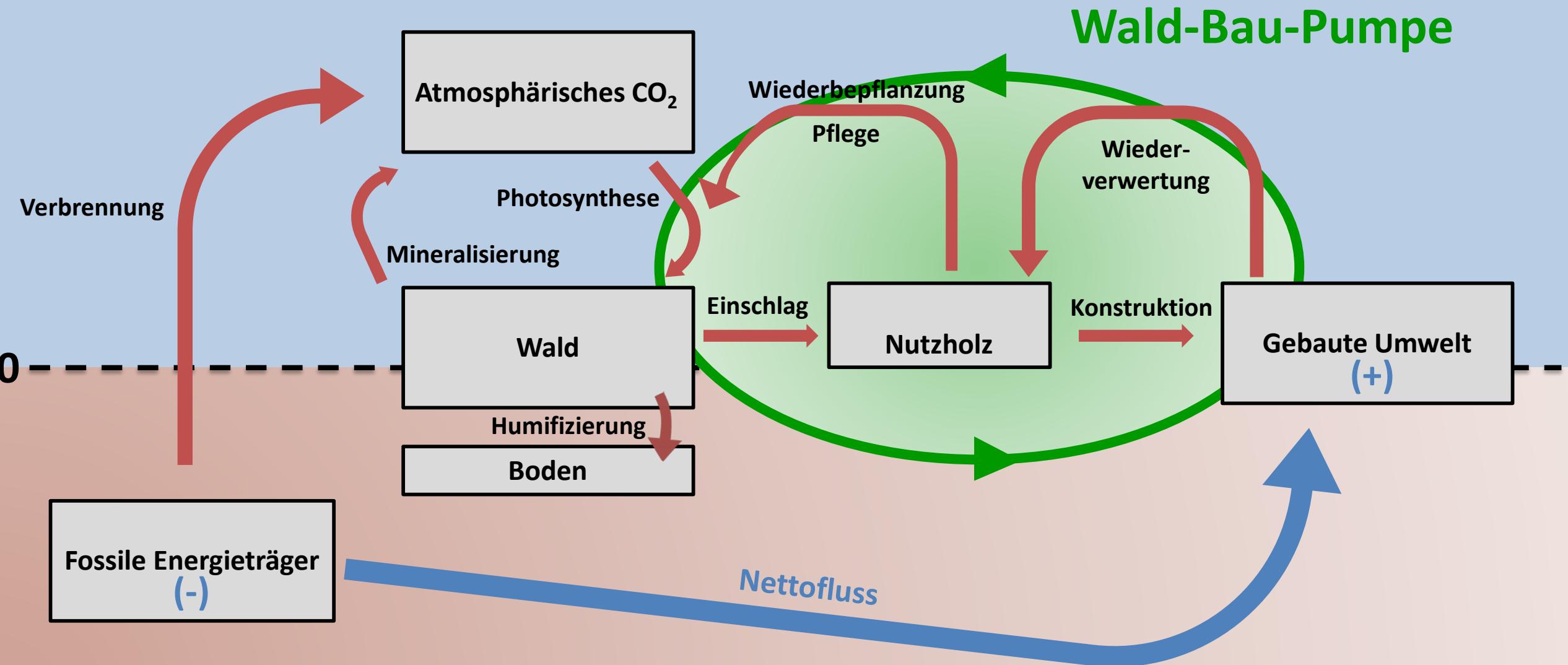
A: Quasi-Gleichgewicht

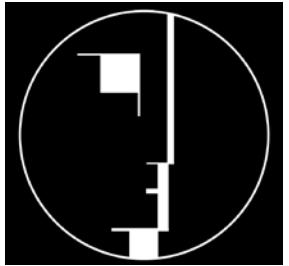


B: Anthropogen gestörtes / gesteuertes System



B: Anthropogen gestörtes / gesteuertes System





Bauhaus-Logo
(entworfen 1922 von
Oskar Schlemmer)

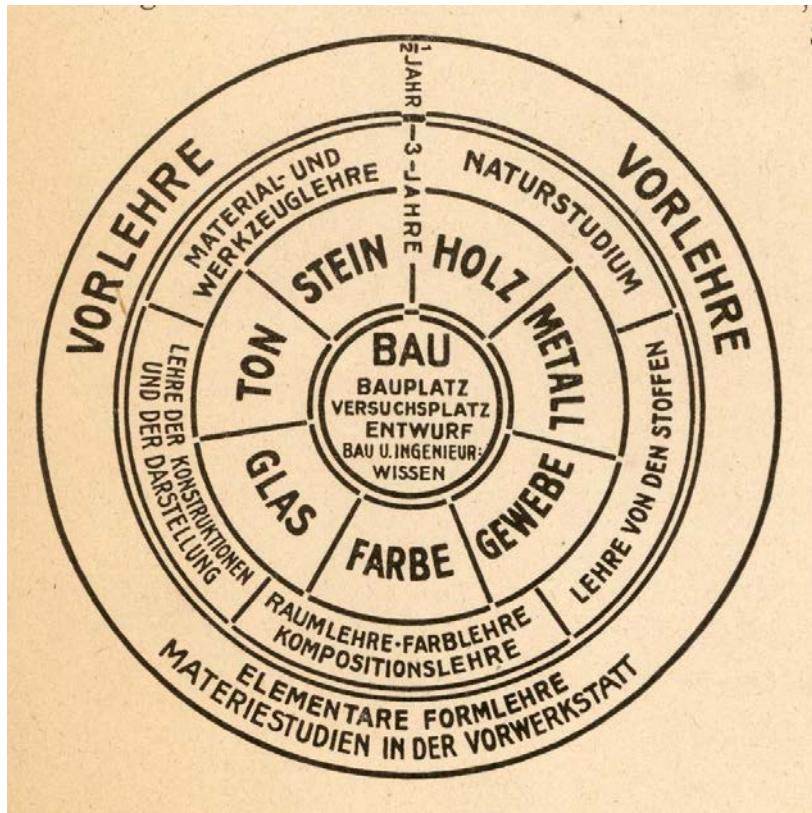
Das Original: Bauhaus (1919 – 1933)

- Gegründet von Walter Gropius in Weimar; später Dessau und Berlin.
- Ein Experimentierfeld der freien und angewandten Kunst, der Gestaltung, der Architektur und der Pädagogik.
- Revolutioniert in knapp 14 Jahren Architektur, Kunst und Handwerk.



Foto: Lucia Moholy, 1926

Unter einem Dach: Leben, Handwerk & Kunst



Schema zum Aufbau der Lehre am Bauhaus, Gestaltung:
Walter Gropius, 1923. © VG Bild-Kunst Bonn, 2016.



Foto (Zuschnitt): © picture alliance akg images

Die Bauhausmeister: Josef Albers, Hinnerk Scheper, Georg Muche, László Moholy-Nagy, Herbert Bayer, Joost Schmidt, Walter Gropius, Marcel Breuer, Wassily Kandinsky, Paul Klee, Lyonel Feininger, Gunta Stölzl, Oskar Schlemmer, 1926



European Commission - Speech



State of the Union Address by President von der Leyen at the European Parliament Plenary

Brussels, 16 September 2020

Building the world we want to live in:

A Union of vitality in a world of fragility

https://ec.europa.eu/commission/presscorner/detail/ov/SPEECH_20_1655



https://ec.europa.eu/commission/presscorner/detail/ov/SPEECH_20_1655