Parlamentarisches Frühstück,
Berlin, 15 Juni 2023

Die Große Transformation der Gebauten Umwelt

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

Direktor Emeritus, Potsdam-Institut für Klimafolgenforschung (PIK);
Initiator, Gründer und Co-Geschäftsführer, Bauhaus Erde gGmbH

BAUHAUS EARTH

ARCHITECTURE - 22 MAY 2023

BIENNALE ARCHITETTURA 2023: THE LABORATORY OF THE FUTURE

The 18th International Architecture Exhibition, curated by Lesley Lokko, is open from 20 May to 26 November at the Giardini, Arsenale and Forte Marghera.

Re-watch the event here

#NewEuropeanBauhaus #BiennaleArchitettura2023

Experience La Biennale

The New European Bauhaus Collateral Event of the **18th International Architecture Exhibition of La Biennale di Venezia - 25 and 26 May 2023** titled"Radical yet possible future space solutions."

For the first time, the European Union will be present with an event at the International Architecture Exhibition - La Biennale di Venezia EN. Following the central theme of the Biennale Architettura 2023, “Laboratory of the Future”, and in line with the mission of the New European Bauhaus, the conference has been designed as a **radical, intellectual and practical laboratory of the future**.
The event will allow experts, students, and visitors to **experiment**, **discover** and **design the future** with the power of their minds.

The participants will reflect on radical, yet possible, human actions leading to a better use of space and resources. In particular, they will discuss **new ways of living, and how to go beyond the conviction that the future of the humankind is bound to already existing solutions.**

Check here the complete programme.

Reconstructing the Future for People and Planet – a New Bauhaus Initiative

PAS Conference, 9-10 June 2022

© Gabriella Clare Marino

Das Pariser Abkommen

Weltklimarat ≤ 1.5°C !

Beschränkung der Erderwärmung auf “weit unter” 2 Grad Celsius

---

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

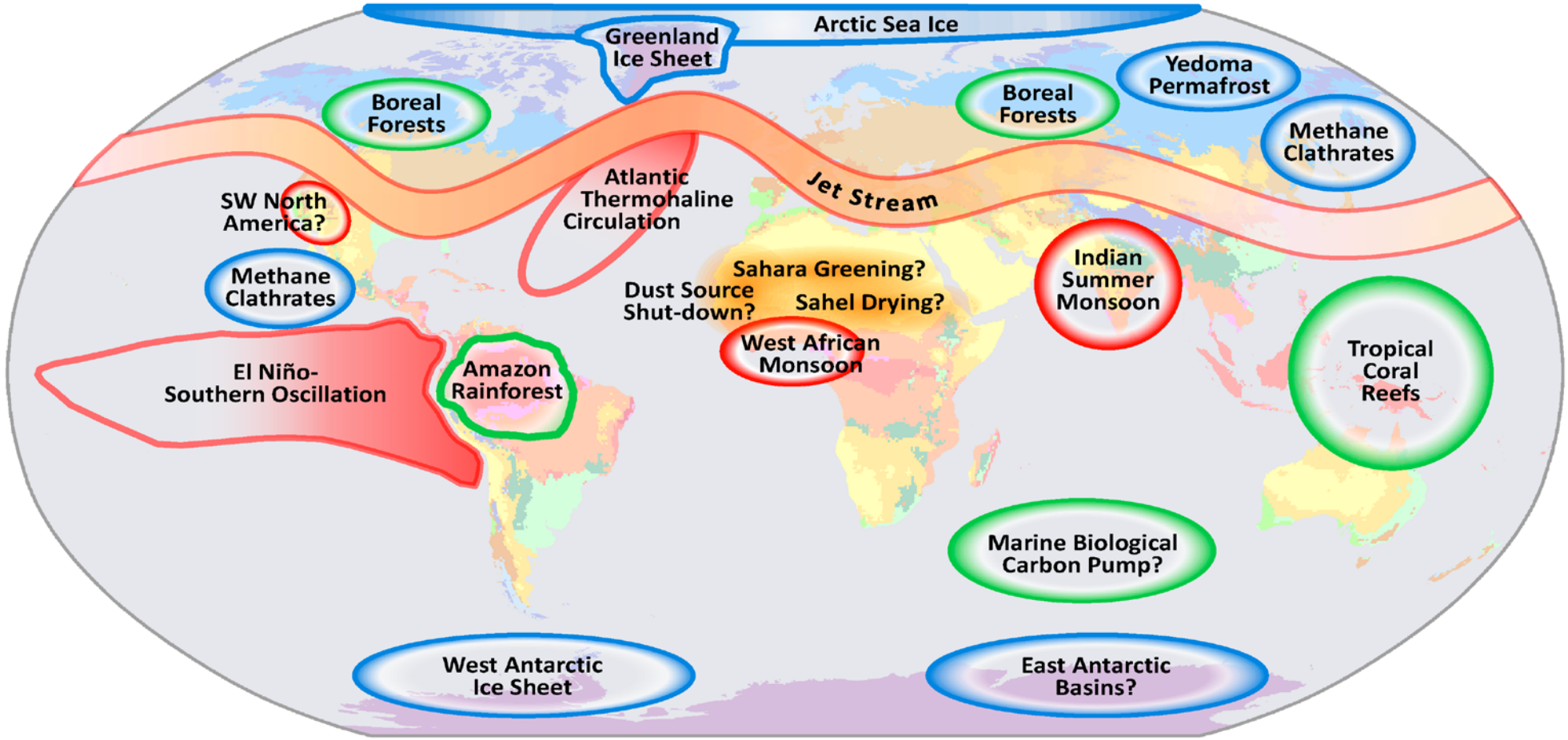
---

Nationale Emissionsziele regelmäßig überprüft und verschärft

Industrieländer stellen von 2020-2025 jährlich 100 Milliarden USD bereit

Bildquelle: https://www.wmo.int/media/

Kippelemente im Erdsystem



Cryosphere Entities

Circulation Patterns

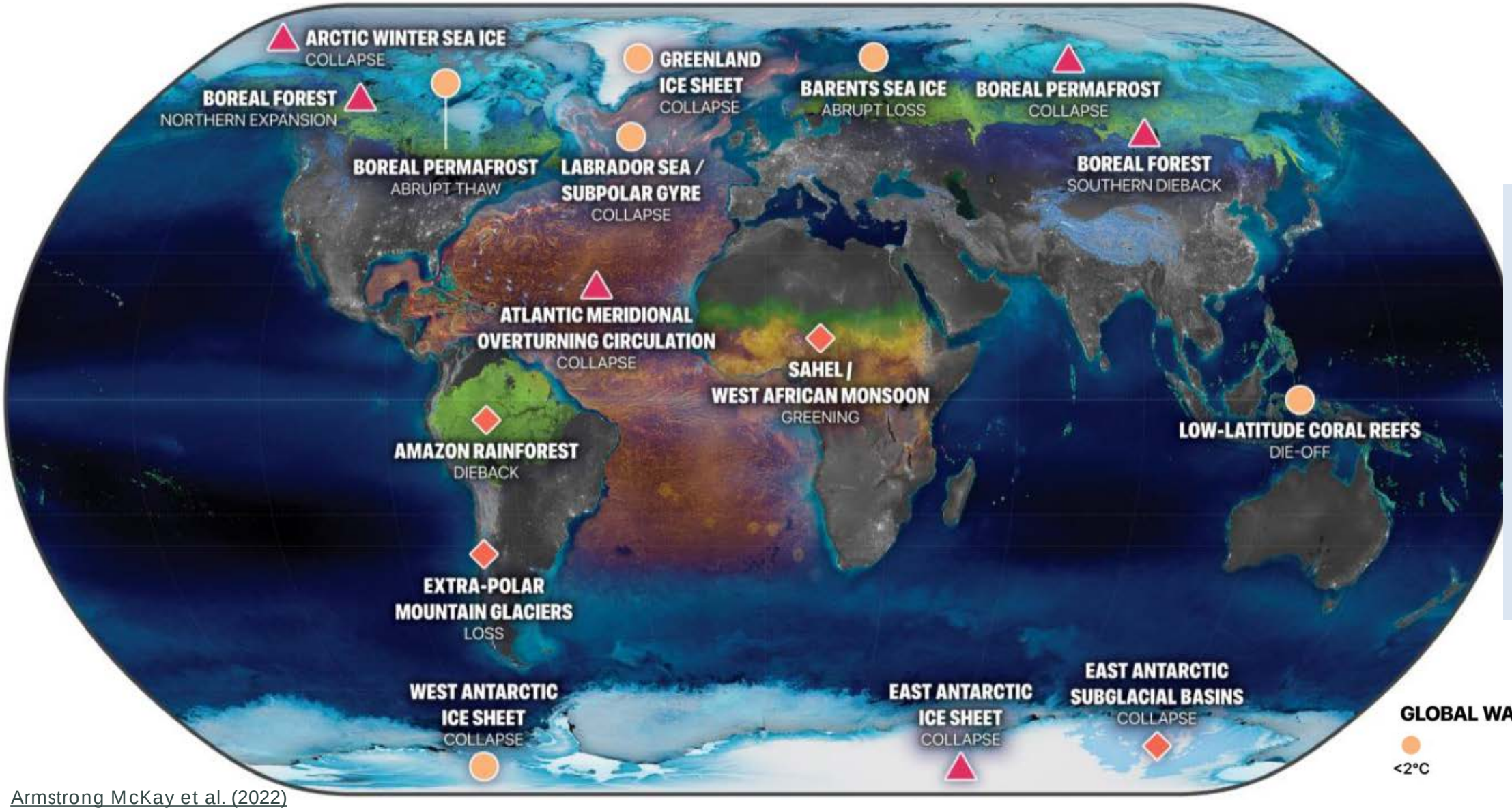
Biosphere Components

Köppen Climate Classification

Ar Am Aw As BS BW Cr Cs Cw Do Dc Eo Ec FT FI

PIK 2017, nach Lenton et al. 2008

Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points

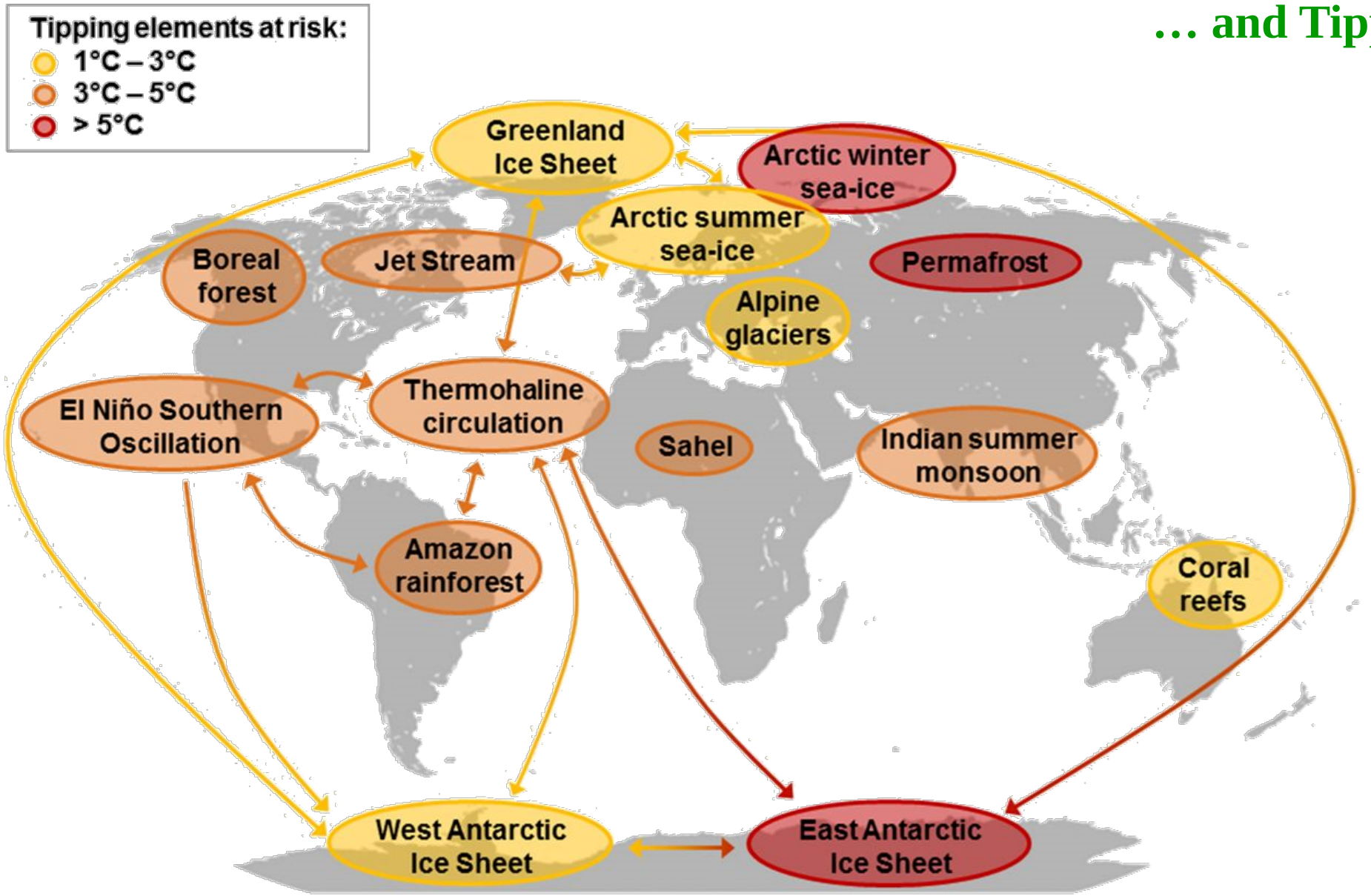


The location of climate tipping elements in the **cryosphere** (blue), **biosphere** (green) and **ocean/atmosphere** (orange), and global warming levels their tipping points will likely be triggered at.

Armstrong McKay et al. (2022)

Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points

… and Tipping Cascades



Steffen et al. 2018

Full paper: here

22 May 2023

nature sustainability

Quantifying the human cost of global warming

Timothy M. Lenton ✉, Chi Xu ✉, Jesse F. Abrams, Ashish Ghadiali, Sina Loriani, Boris Sakschewski, Caroline Zimm, Kristie L. Ebi, Robert R. Dunn, Jens-Christian Svenning & Marten Scheffer

The Guardian

Global heating will push billions outside 'human climate niche'

World is on track for 2.7C and 'phenomenal' human suffering, scientists warn

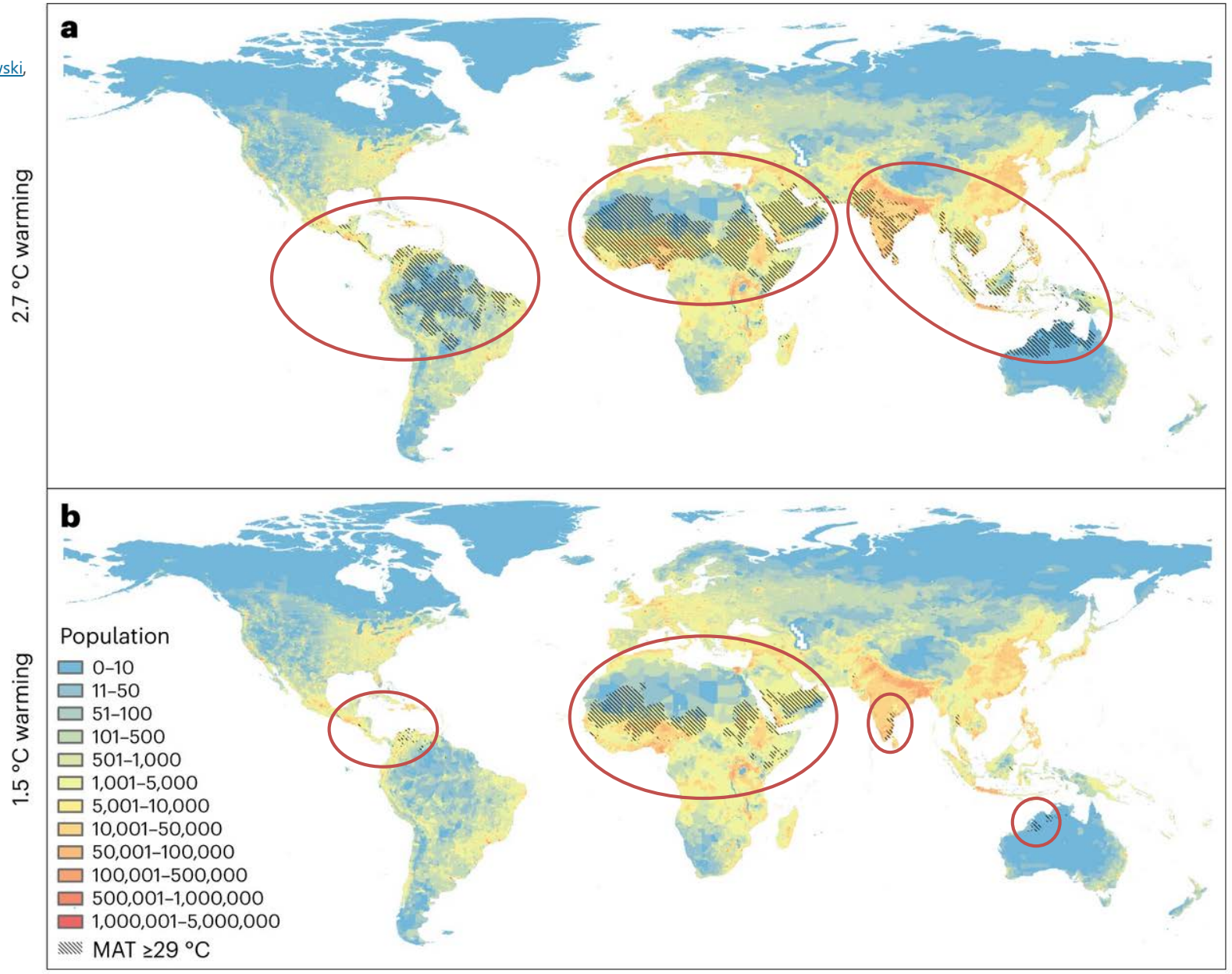
Damian Carrington
Environment editor
@dpcarrington
Mon 22 May 2023 16.00 BST

The world is on track for 2.7C of heating with current action plans and this would mean 2 billion people experiencing average annual temperatures above 29C by 2030, a level at which very few communities have lived in the past.

Up to 1 billion people could choose to migrate to cooler places, the scientists said, although those areas remaining within the climate niche would still experience more frequent heatwaves and droughts.

However, urgent action to lower carbon emissions and keep global temperature rise to 1.5C would cut the number of people pushed outside the climate niche by 80%, to 400 million.

Full article: here



Full paper: here

22 May 2023

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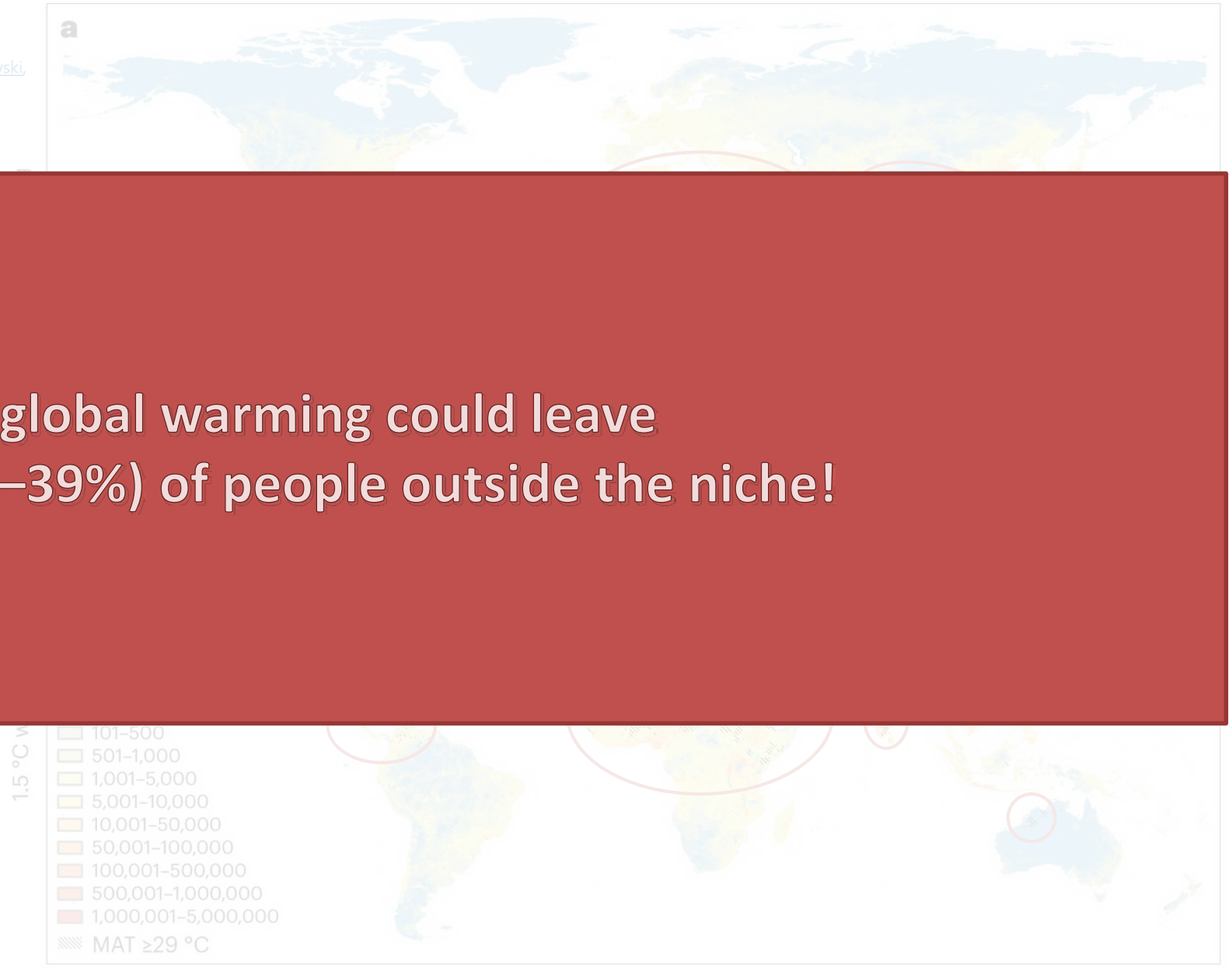
2.7 °C global warming could leave *one-third* (22–39%) of people outside the niche!

said, although those areas remaining within the climate niche would still experience more frequent heatwaves and droughts.

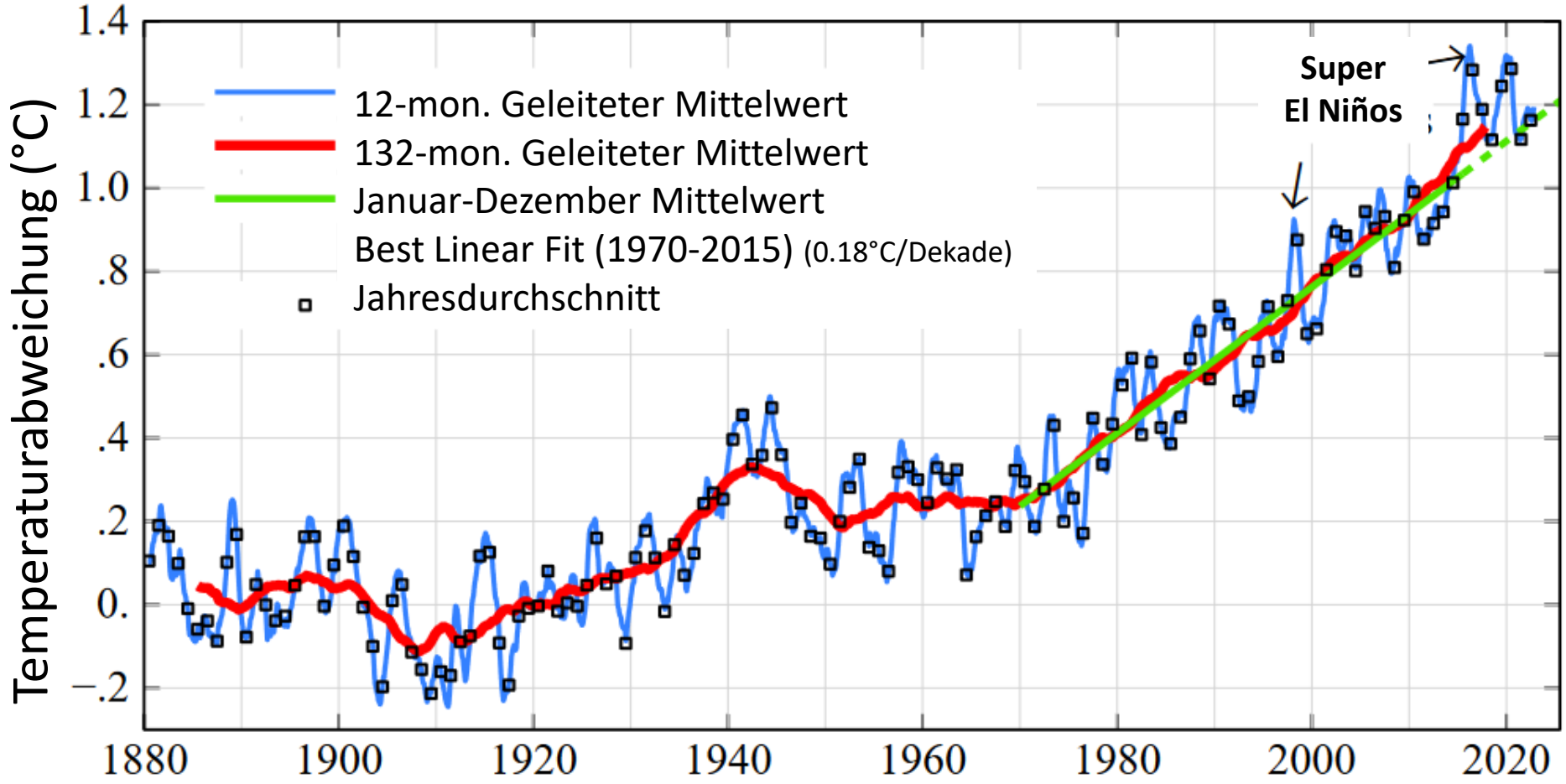
However, urgent action to lower carbon emissions and keep global temperature rise to 1.5C would cut the number of people pushed outside the climate niche by 80%, to 400 million.

Full article: here



Globale Durchschnittstemperatur

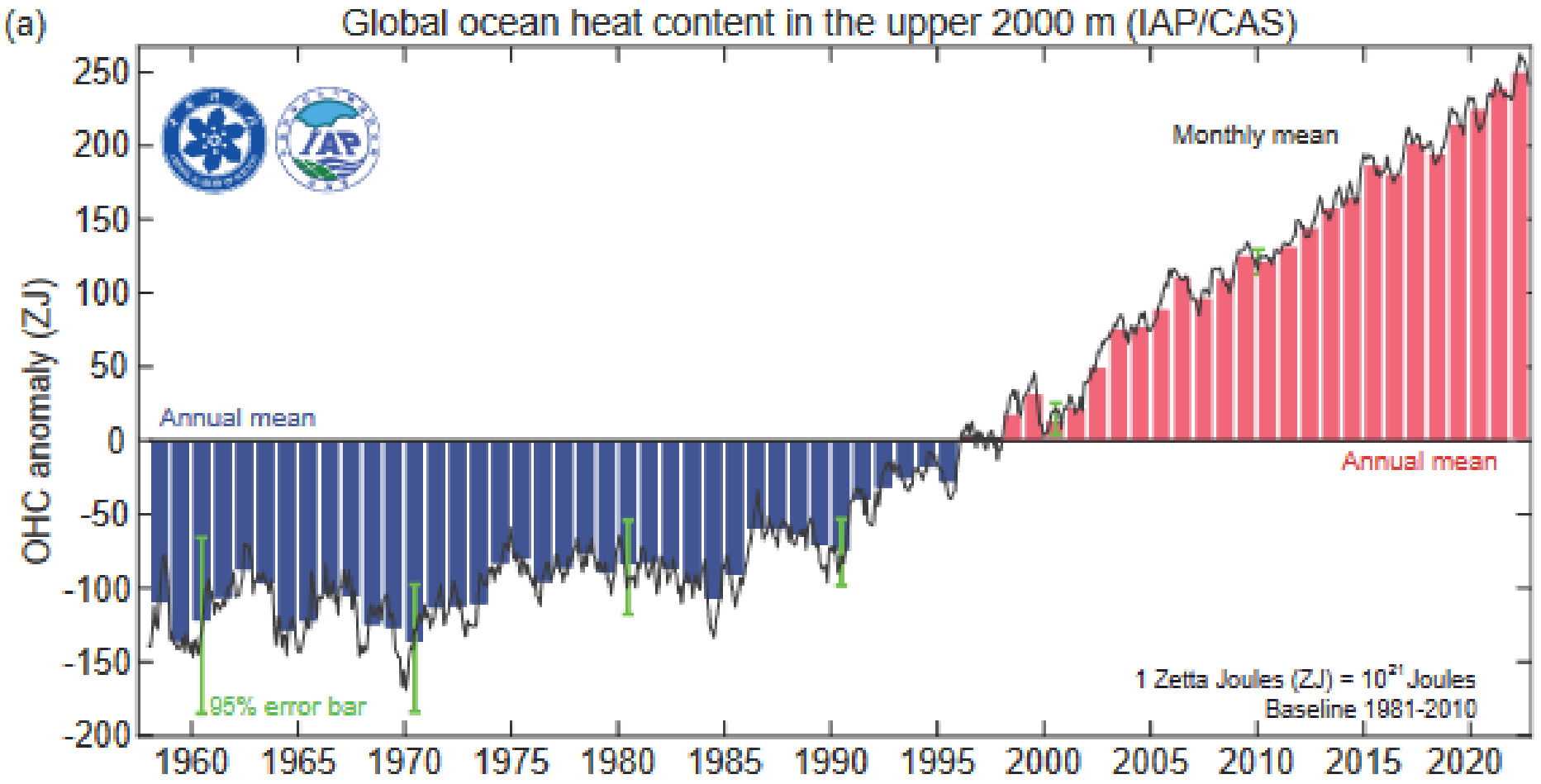
(im Vergleich zum Durchschnitt 1880-1920)



Columbia University 2023

Another Year of Record Heat for the Oceans

Lijing Cheng, John Abraham, Kevin E. Trenberth, John Fasullo, Tim Boyer, Michael E. Mann, Jiang Zhu, Fan Wang, Ricardo Locarnini, Yuanlong Li, Bin Zhang, Fujiang Yu, Liying Wan, Xingrong Chen, Licheng Feng, Xiangzhou Song, Yulong Liu, Franco Reseghetti, Simona Simoncelli, Viktor Gouretski, Gengxin Chen, Alexey Mishonov, Jim Reagan & Guancheng Li



Full paper: here

The Guardian

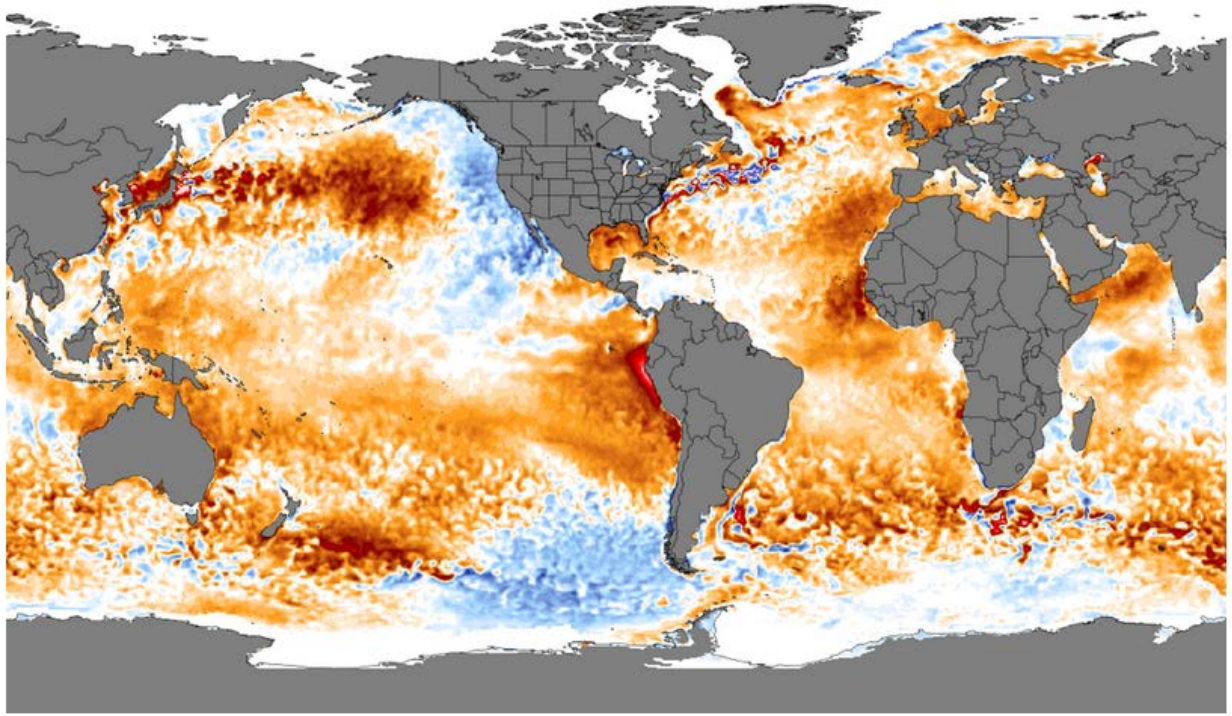
Full article: here

Graham Readfearn

8 Apr 2023

‘Headed off the charts’: world’s ocean surface temperature hits record high

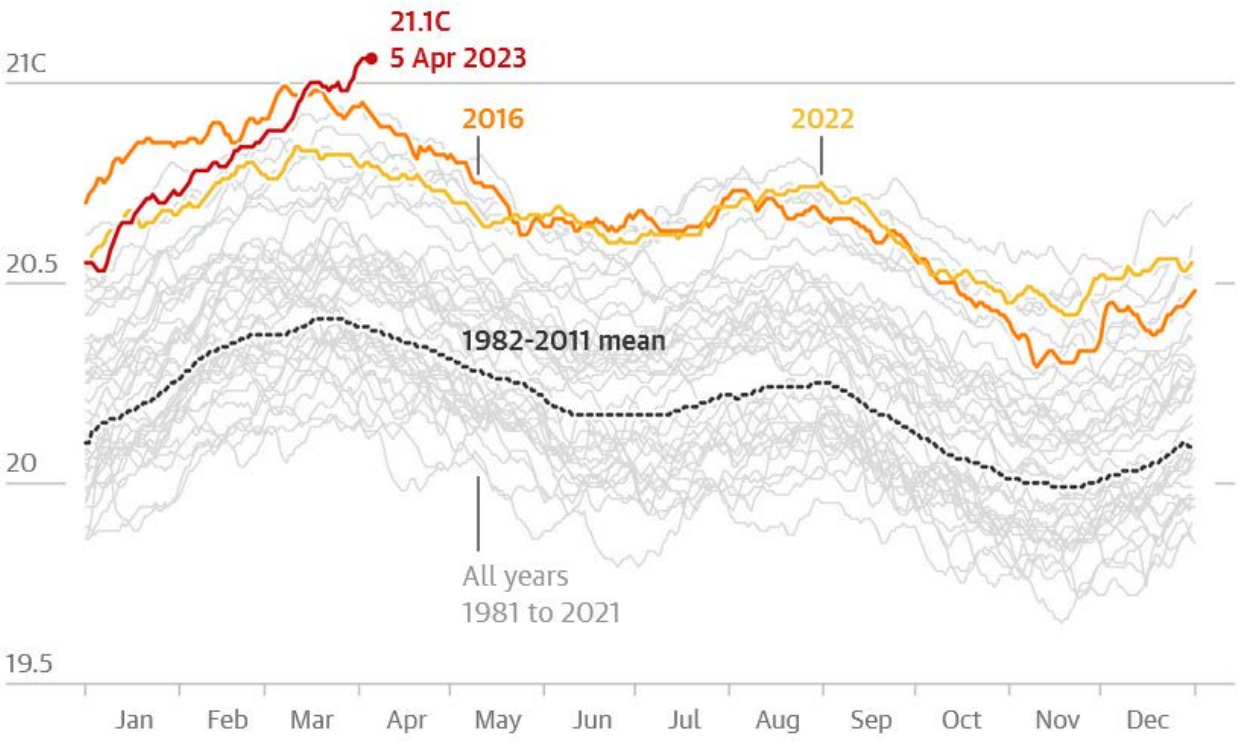
Scientists warn of more marine heatwaves, leading to increased risk of extreme weather



A global map using data from the National Oceanic and Atmospheric Administration showing areas in orange and red where temperatures have been above the long-term average. Photograph: University Of Maine

Ocean surface temperatures are at a record high

Average daily sea surface temperature, 60S to 60N



Guardian graphic. Source: Noaa, Maine Climate Office, Climate Change Institute, University of Maine

The Guardian

Full article: here

Graham Readfearn

‘Headed off the charts’: world’s ocean surface temperature hits record high

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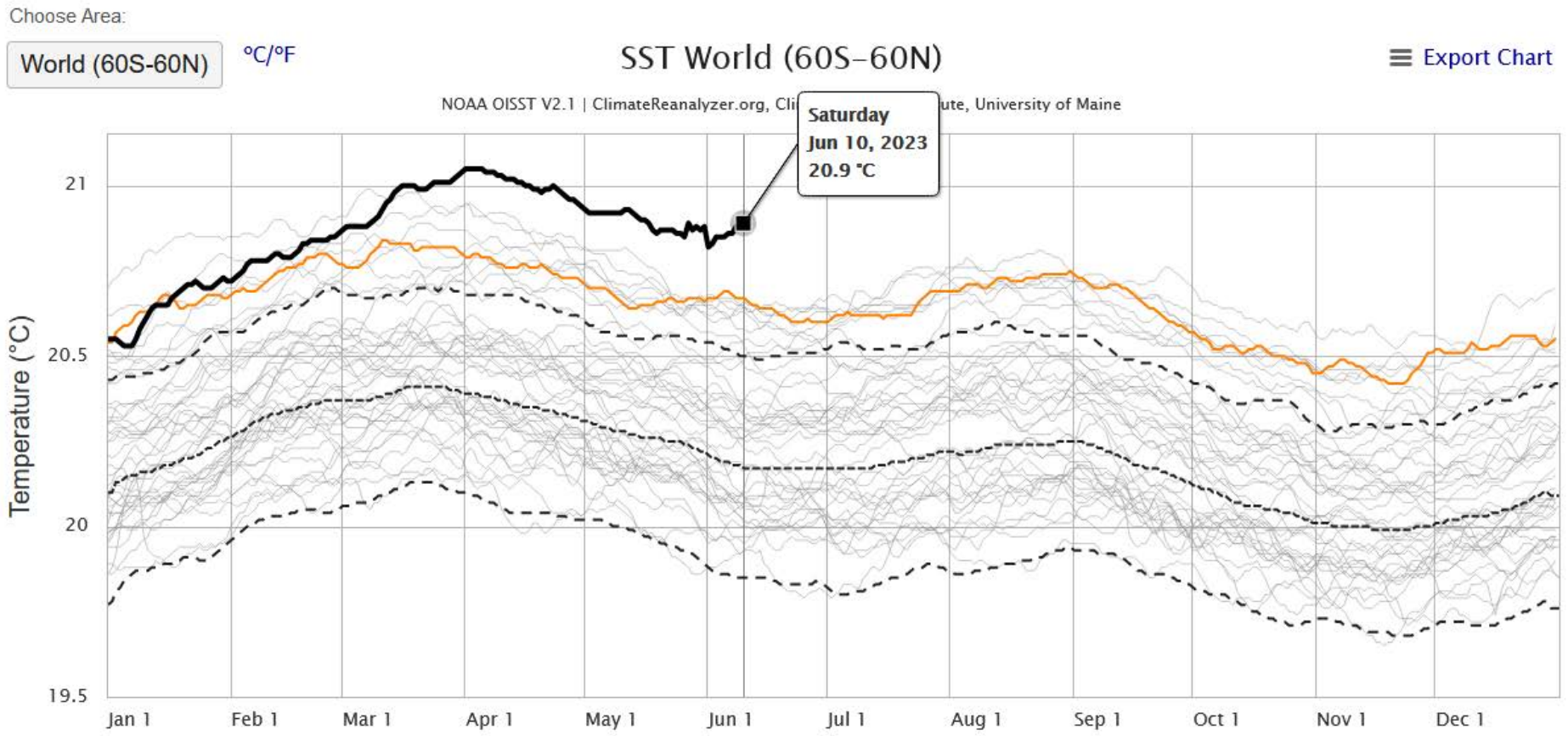
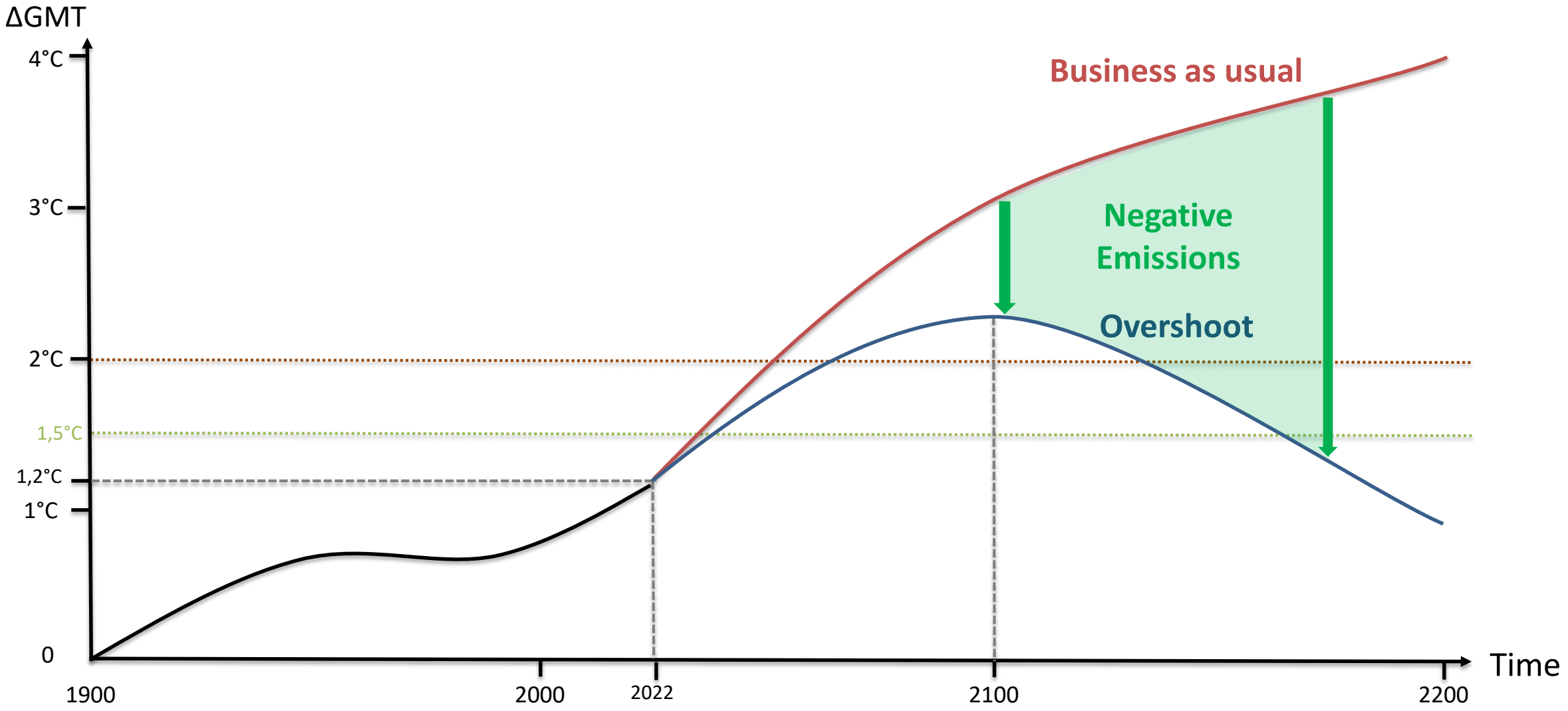


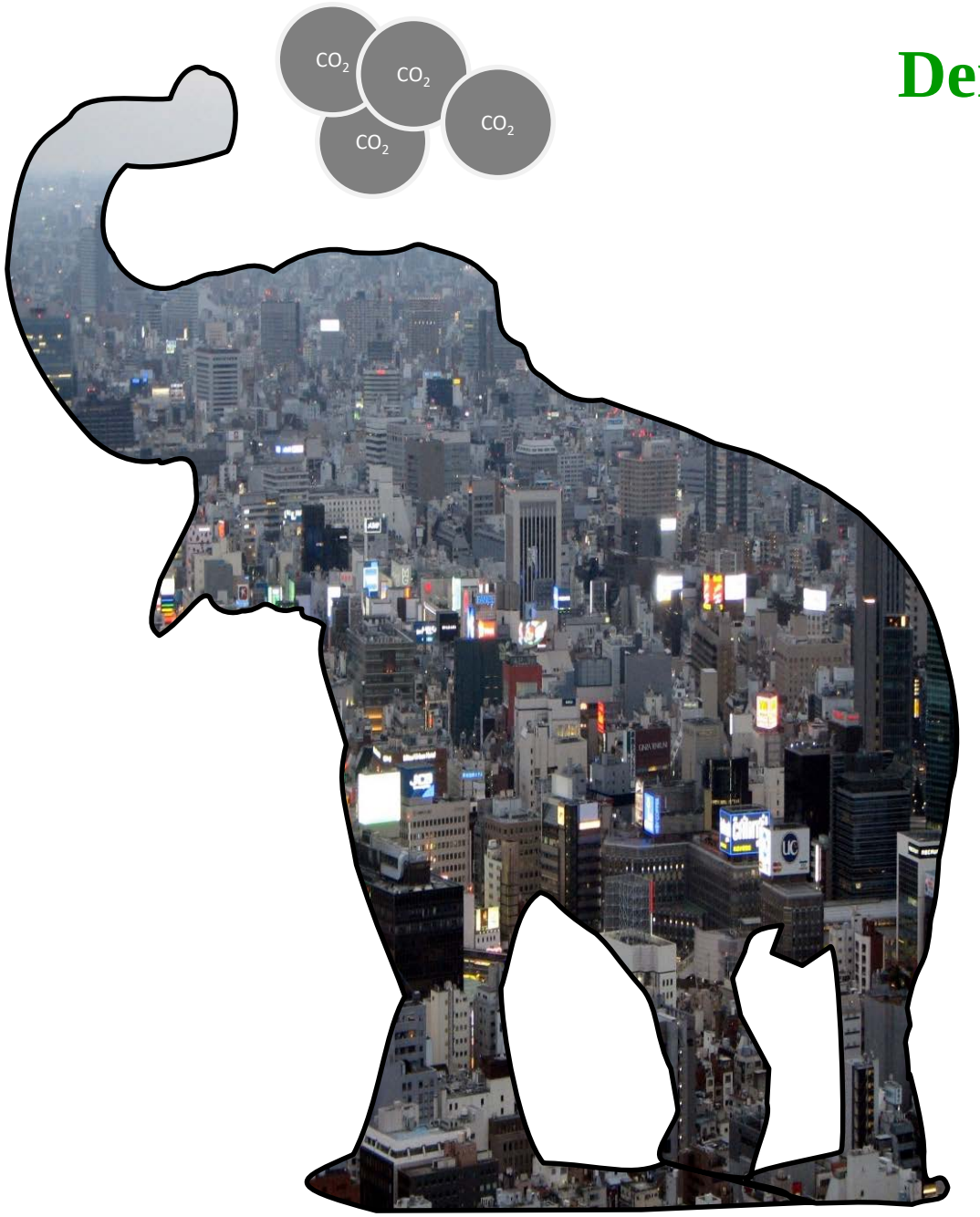
A global map using data from the National Oceanic and Atmospheric Administration showing areas in orange and red where temperatures have been above the long-term average. Photograph: University Of Maine

Guardian graphic. Source: Noaa, Maine Climate Office, Climate Change Institute, University of Maine

Klimareparatur:
Repair or Despair!



Schellnhuber & Köllner 2022 (unpublished)



Der Elefant im Klimaraum:

Gebaute Umwelt

~ 40 %
der globalen Treibhausgasemissionen

~ 55 %
der Abfälle in den entwickelten Ländern

~ 90 %
der mineralischen Ressourcen in Deutschland

IEA 2019

How and why do spectacular buildings get commissioned and procured? What are their visible urban effects? What can urban planners, architects, and policymakers learn in order to engage in more successful citymaking?

In recent years, media and critical attention has been lavished on famous architects, and the contributions of their designs to the branding of cities. The post-"Bilbao effect" global landscape is one where cities compete for the highest-profile skyscrapers, cultural projects, and high-profile developments designed by star architects whom even casual readers know by first name: Frank Gehry, Bjarke Ingels, Jean Nouvel, Zaha Hadid, Norman Foster, Rem Koolhaas.

Far less is known about the decision-making processes behind these projects and their subsequent urban effects. A unique combination of urban studies and photography, Starchitecture investigates projects designed by star architects in cities including Paris, New York, Abu Dhabi, Bilbao, and the architectural microcosm of the Vitra campus in Weil am Rhein, Germany. Author Davide Ponzini and photographer Michele Nastasi seek to explain and critique a growing global condition by revealing how starchitecture has been and continues to be deployed in cities around the world. The arguments they raise are vital to understanding the urban landscapes of today, and tomorrow.

Contemporary Cairo: Sustainable, Inclusive, Beautiful?

Städte in der Evolution des Kohlenstoffkreislaufes

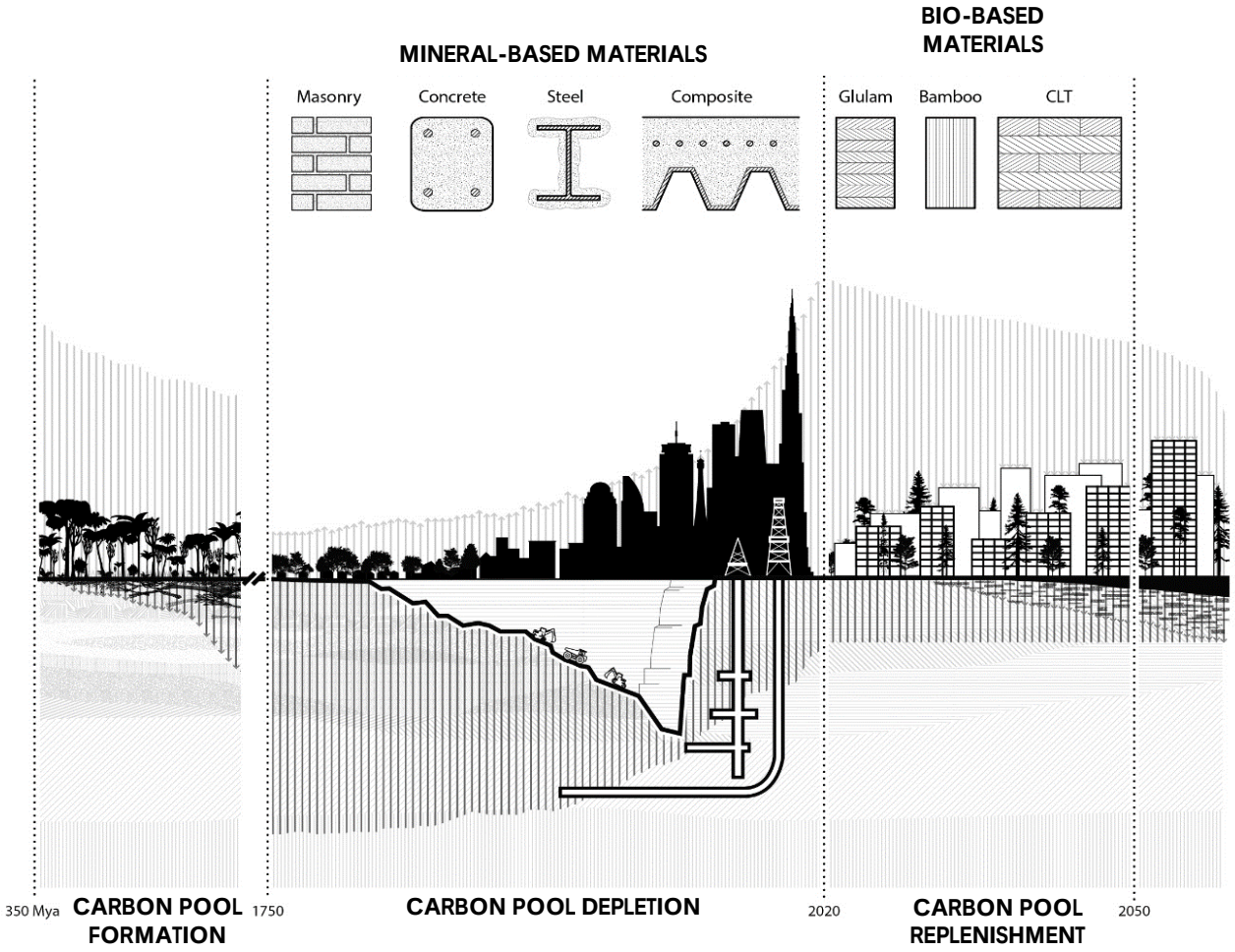
nature sustainability

Perspective | Published: 27 January 2020

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

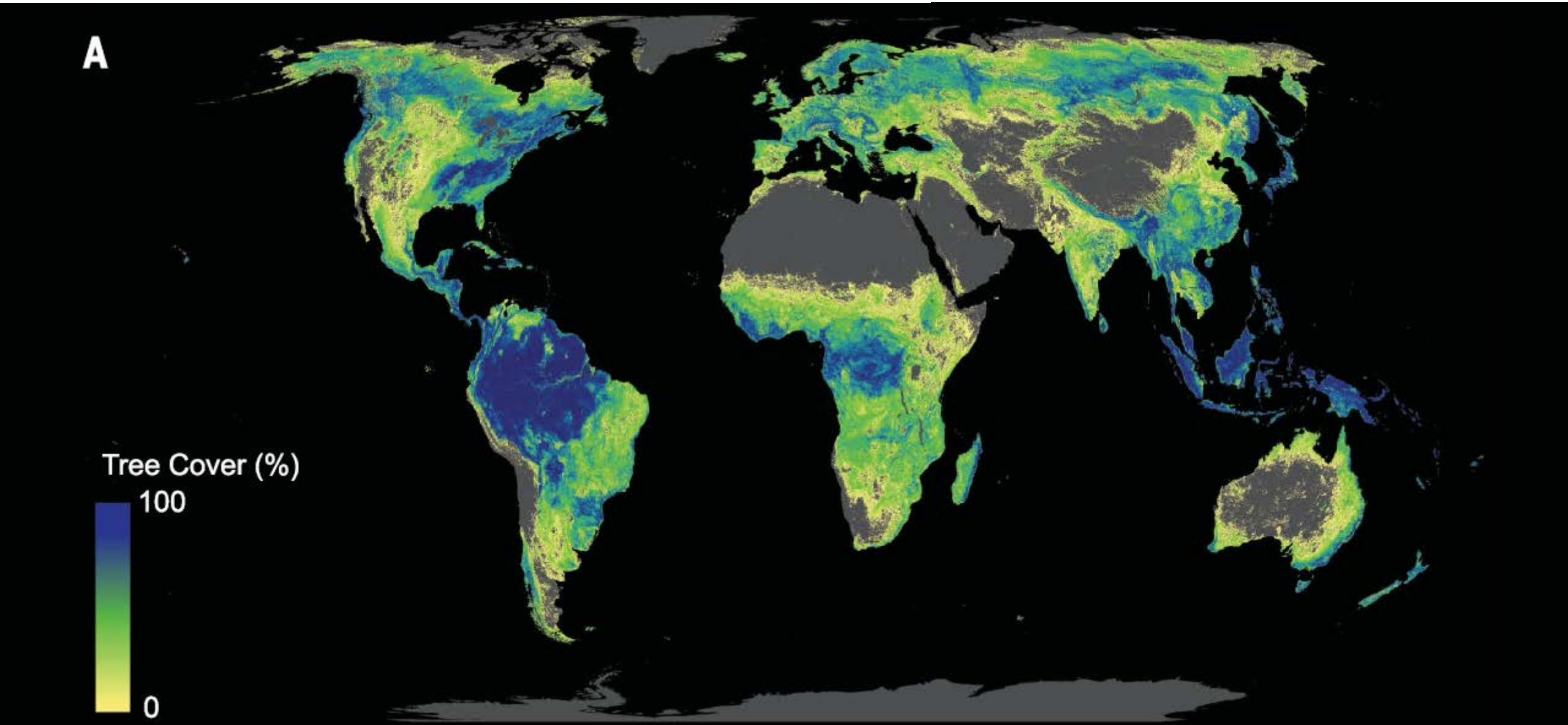
https://doi.org/10.1038/s41893-019-0462-4



The global tree restoration potential

Jean-Francois Bastin[1]*, Yelena Finegold[2], Claude Garcia[3,4], Danilo Mollicone[2], Marcelo Rezende[2], Devin Routh[1], Constantin M. Zohner[1], Thomas W. Crowther[1]

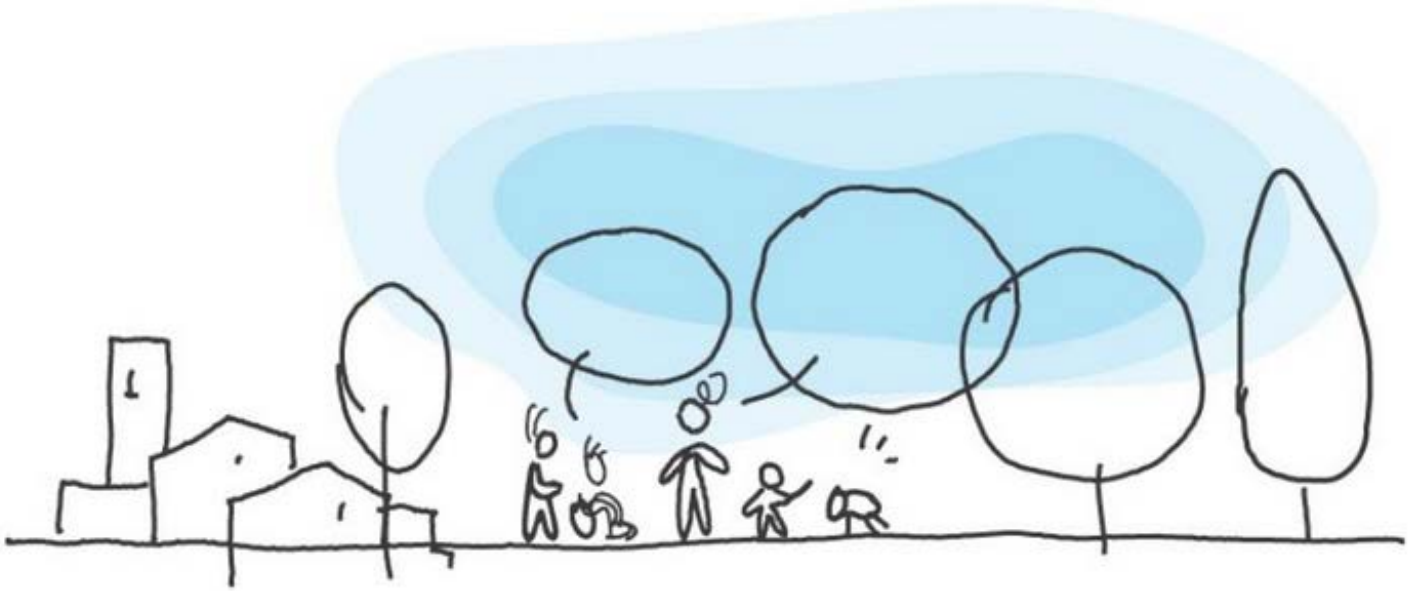
Full paper: here



Original Bauhaus

Original Bauhaus

The New European Bauhaus



New European Bauhaus

beautiful | sustainable | together

Original Bauhaus

The New European Bauhaus

New European Bauhaus

beautiful | sustainable | together

Bauhaus Earth

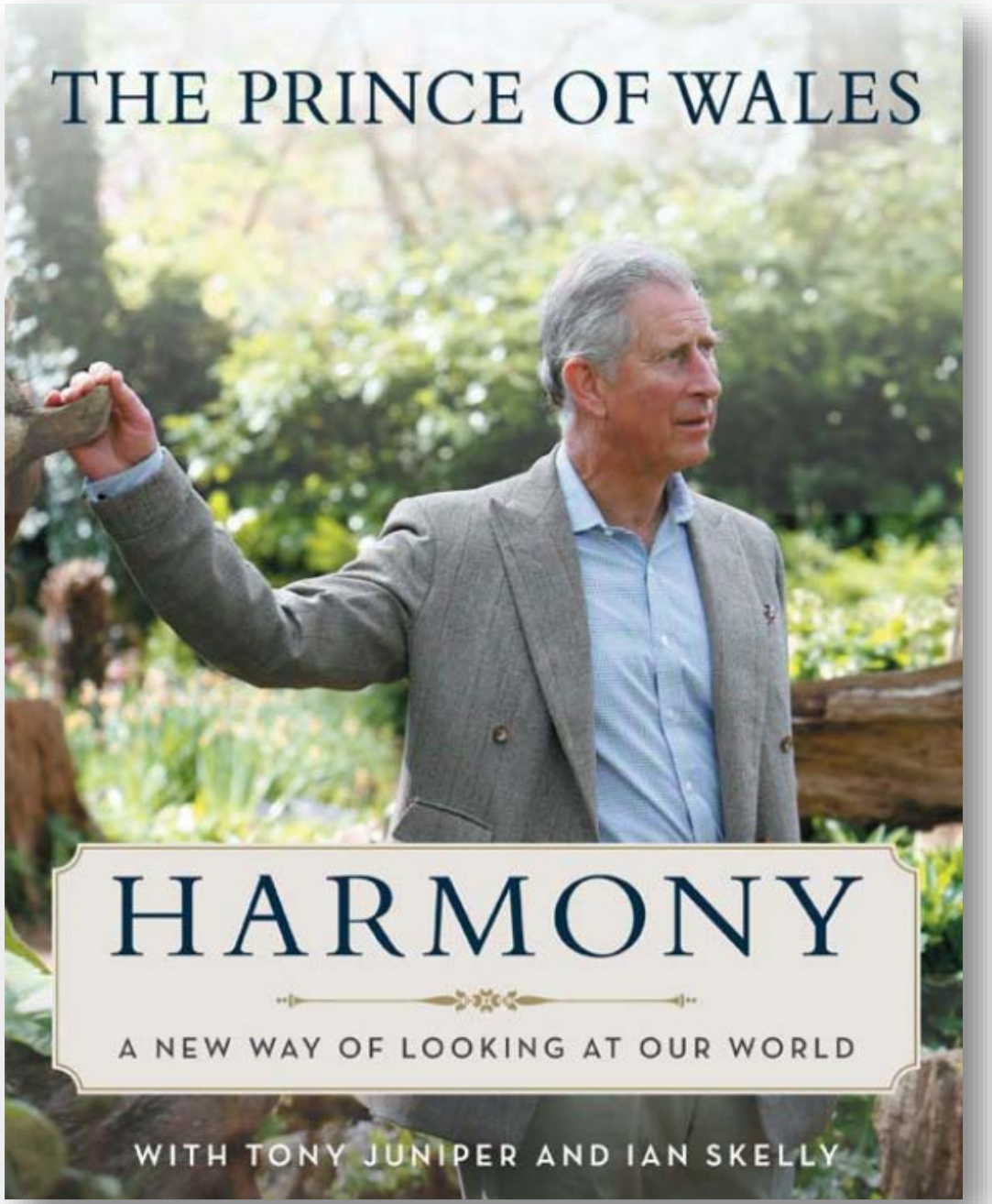
BUGA 2019 Pavillon Heilbronn

BUGA 2023 Pavillon Mannheim

BUGA pavilion | Heilbronn, Germany | ICD / ITKE University of Stuttgart

Credit: ICD / ITKE University of Stuttgart

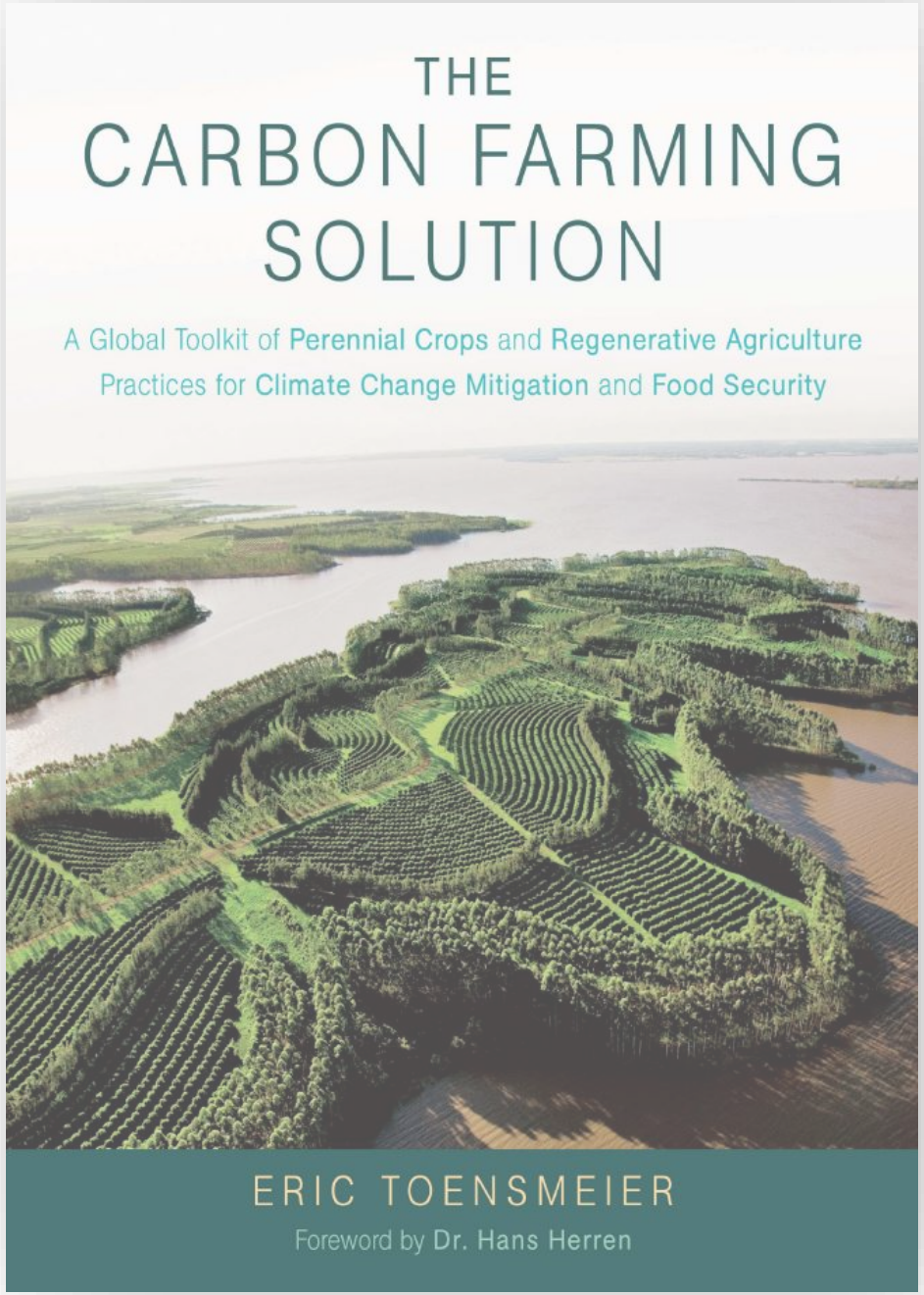
The New Nobel Center, Stockholm



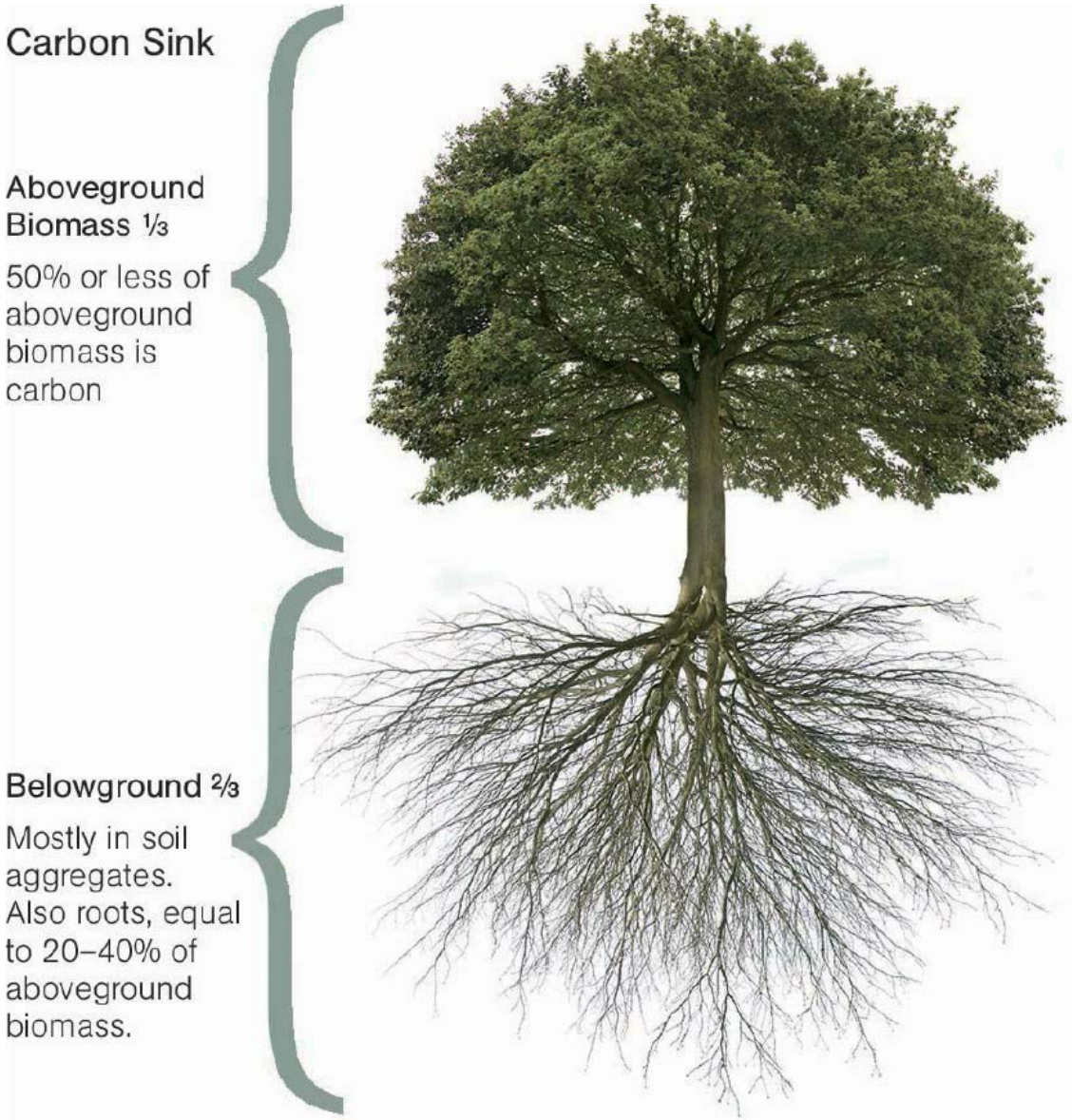
This is a call to revolution. The Earth is under threat. It cannot cope with all that we demand of it. It is losing its balance and we humans are causing this to happen.

'Revolution' is a strong word and I use it deliberately. The many environmental and social problems that now loom large on our horizon cannot be solved by carrying on with the very approach that has caused them. If we want to hand on to our children and grandchildren a much more durable way of operating in the world, then we have to embark on what I can only describe as a 'Sustainability Revolution' – and with some urgency. This will involve our taking all sorts of dramatic steps to change the way we consider the world and act in it, but I believe we have the capacity to take these steps. All we have to see is that the solutions are close at hand.

The Earth's alarm bells are now ringing loudly and so we cannot go on endlessly prevaricating by finding one sceptical excuse after another for avoiding the need for the human race to act in a more environmentally benign way – which really means only one thing: putting Nature back at the heart of our considerations once more. But that is only the start of it. We must go much further. 'Right action' cannot happen without 'right thinking' and in that simple truth lies the deeper purpose of this book.



Full book: here



Klima-Hotspot Moorböden

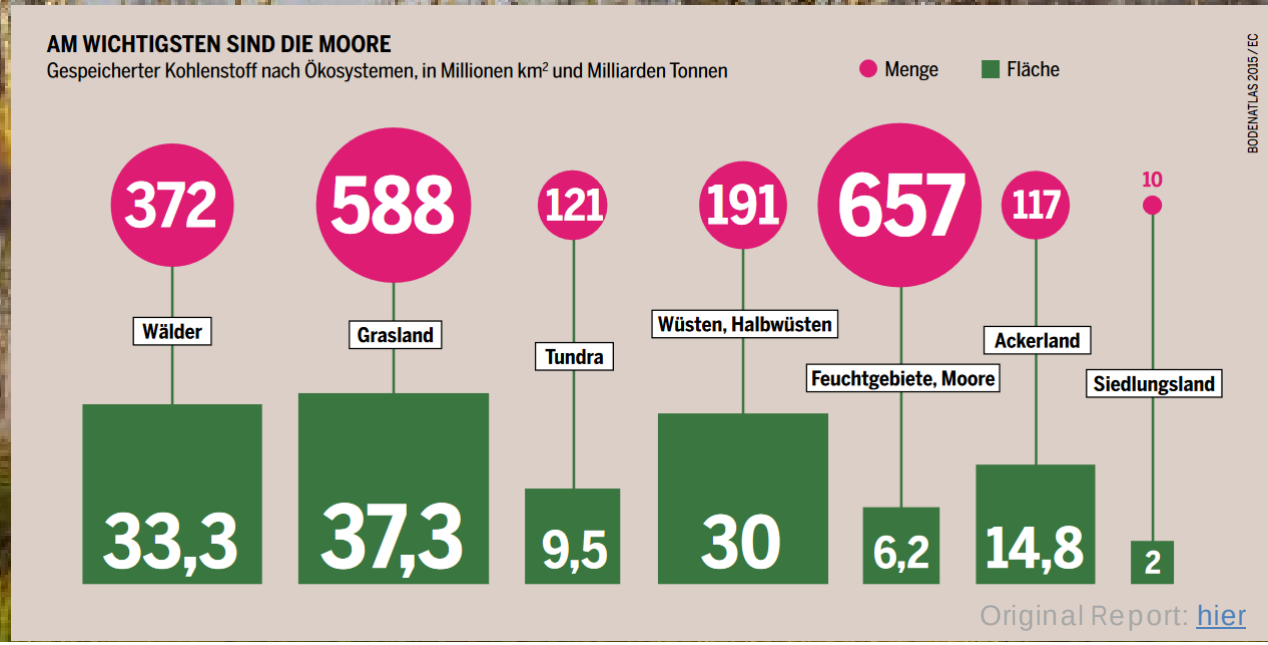
IOPscience

Original Artikel: hier

Peatland protection and restoration are key for climate change mitigation

Florian Humpenöder[1], Kristine Karstens[1,2], Hermann Lotze-Campen[1,2], Jens Leifeld[3], Lorenzo Menichetti[4], Alexandra Barthelmes[5] and Alexander Popp[1]

Published 9 October 2020 • © 2020 The Author(s). Published by IOP Publishing Ltd



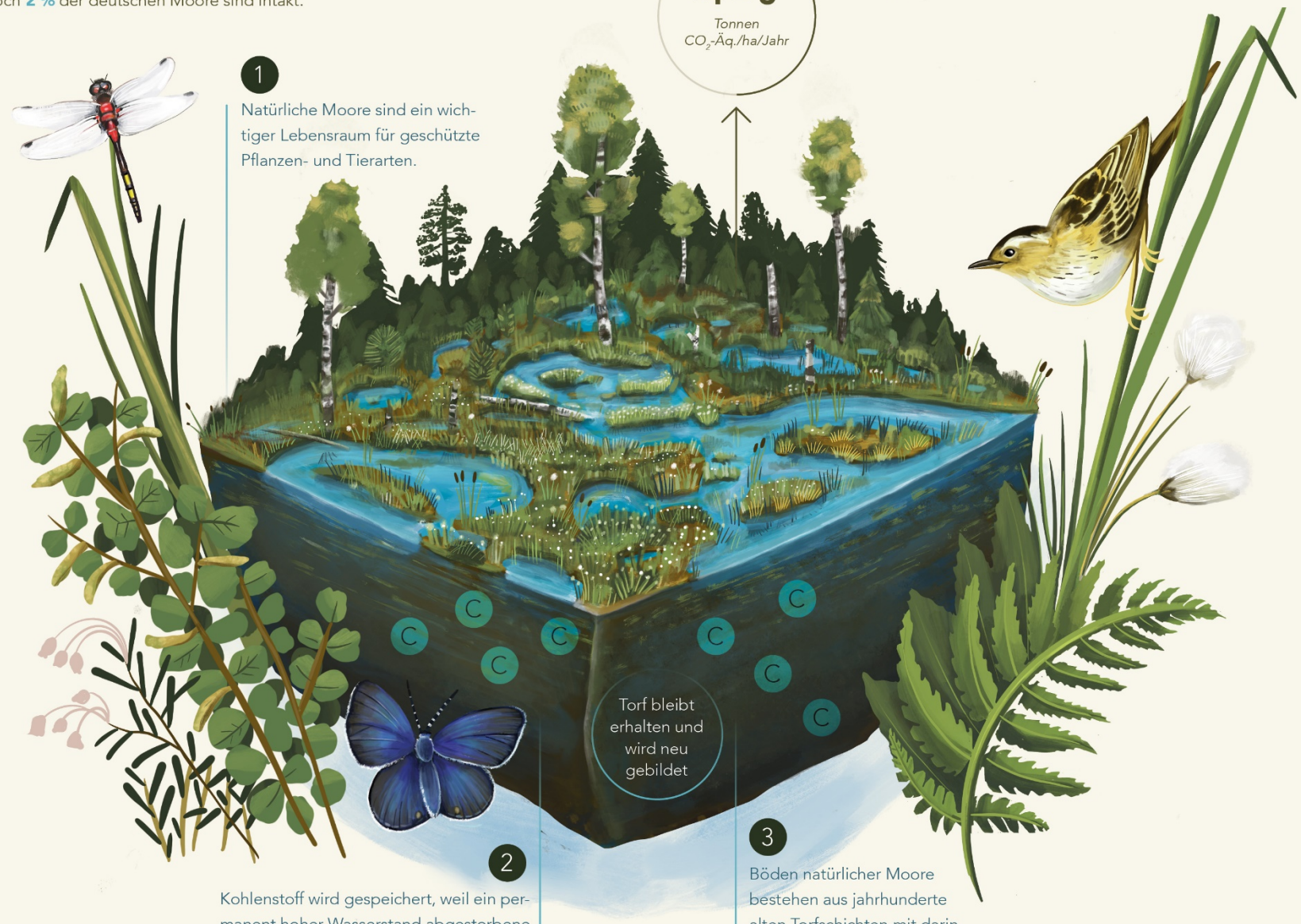
Original Report: hier

NATÜRLICHE MOORE

Nur noch **2 %** der deutschen Moore sind intakt.

GREIFSWALD MOOR CENTRUM

-4 – 8
Tonnen CO_2-Äq./ha/Jahr



1 Natürliche Moore sind ein wichtiger Lebensraum für geschützte Pflanzen- und Tierarten.

2 Kohlenstoff wird gespeichert, weil ein permanent hoher Wasserstand abgestorbene Pflanzenreste im Boden konserviert.

3 Böden natürlicher Moore bestehen aus jahrhunderte alten Torfschichten mit darin gespeichertem Kohlenstoff.

Illustration: www.sarah-heuzeroth.de

hier

ENTWÄSSERTE MOORE

7 % der landwirtschaftlichen Fläche (17.800 km²).
37 % der Treibhausgase aus der Landwirtschaft.

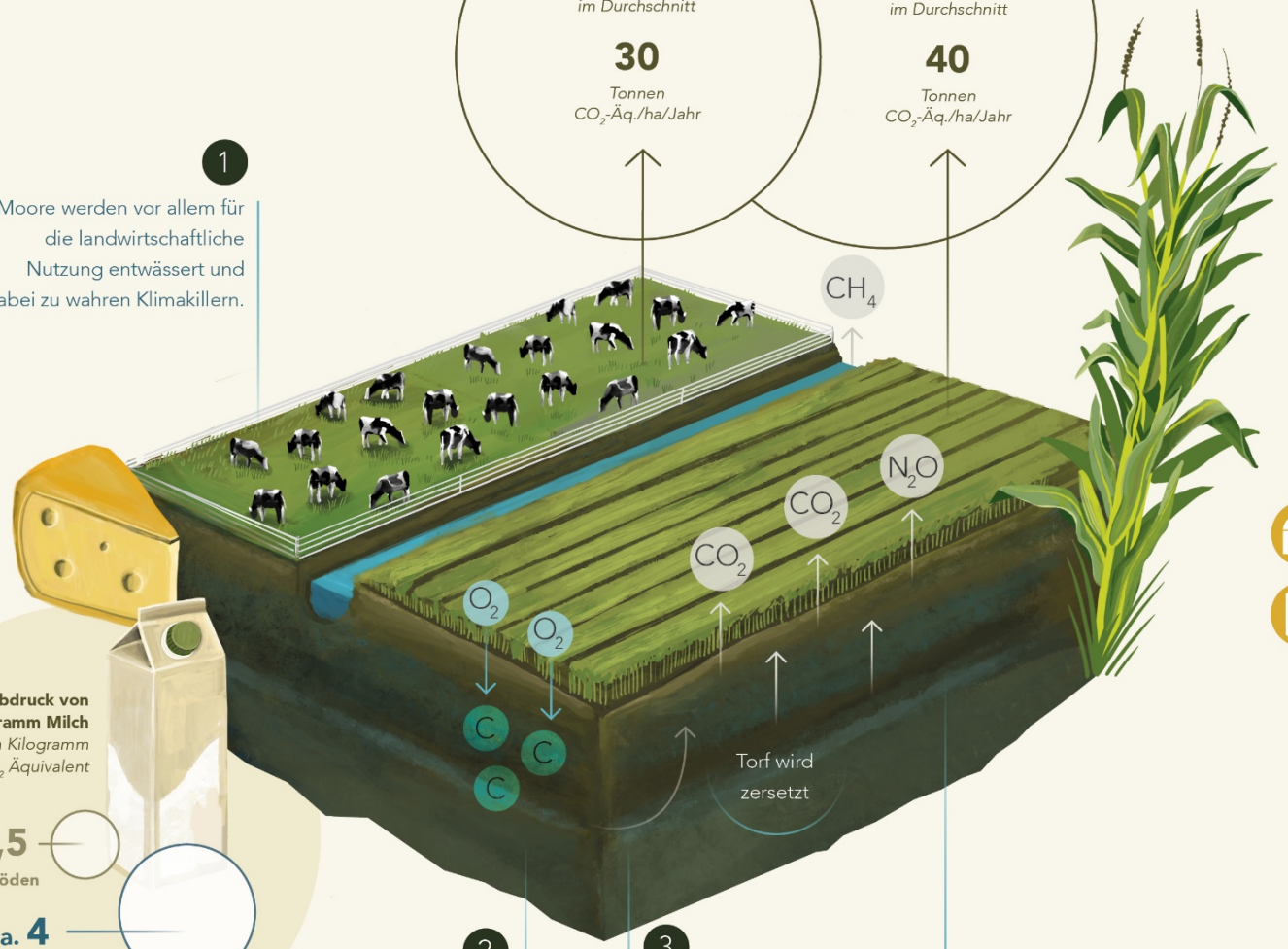
GREIFSWALD MOOR CENTRUM

Bodenemissionen Grünland
im Durchschnitt
30
Tonnen CO_2-Äq./ha/Jahr

Bodenemissionen Acker
im Durchschnitt
40
Tonnen CO_2-Äq./ha/Jahr

1 Moore werden vor allem für die landwirtschaftliche Nutzung entwässert und dabei zu wahren Klimakillern.

Nutzung von Weidelandschaft



Nutzung von Mais

Fußabdruck von 1 Kilogramm Milch
in Kilogramm CO_2 Äquivalent

0,6-1,5
von Mineralböden

ca. 4
von Moorstandorten

2 Im entwässerten Moor kommt es zur Durchlüftung des Torfbodens.

3 Dabei oxidiert der Kohlenstoff im Torf und entweicht als Kohlendioxid in die Atmosphäre.

4 Der Boden verliert jährlich 1-2 cm an Höhe.

hier

Illustration: www.sarah-heuzeroth.de

MOORE MIT PALUDIKULTUR

GREIFSWALD MOOR CENTRUM

0 – 8
Tonnen CO_2-Äq./ha /Jahr

1 Paludikultur ist klimaschonende Landwirtschaft auf nassem Moorboden.

Nutzung von Rohrkolben

Nutzung von Schilf

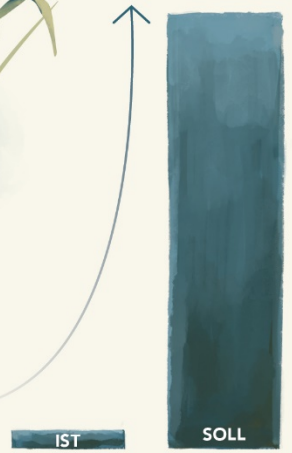
Alternative zum **Torfabbau:** *Der Anbau von Torfmoos zur Nutzung als Substratausgangsstoff.*

Torf bleibt erhalten und wird neu gebildet

2 Kohlenstoff bleibt im Boden gebunden.

3 Spezielle Maschinen ermöglichen die Ernte auf nassem Boden.

4 Lebensräume für bedrohte Arten bleiben erhalten oder können neu entstehen.



Um bis 2050 alle **CO_2-Emissionen in Deutschland** auf Netto-Null zu bringen, ist es erforderlich, ca. 50.000 ha jährlich wiederzuvernässen. Aktuell werden ca 2.000 ha jährlich wiedervernässt.

hier

Illustration: www.sarah-heuzeroth.de

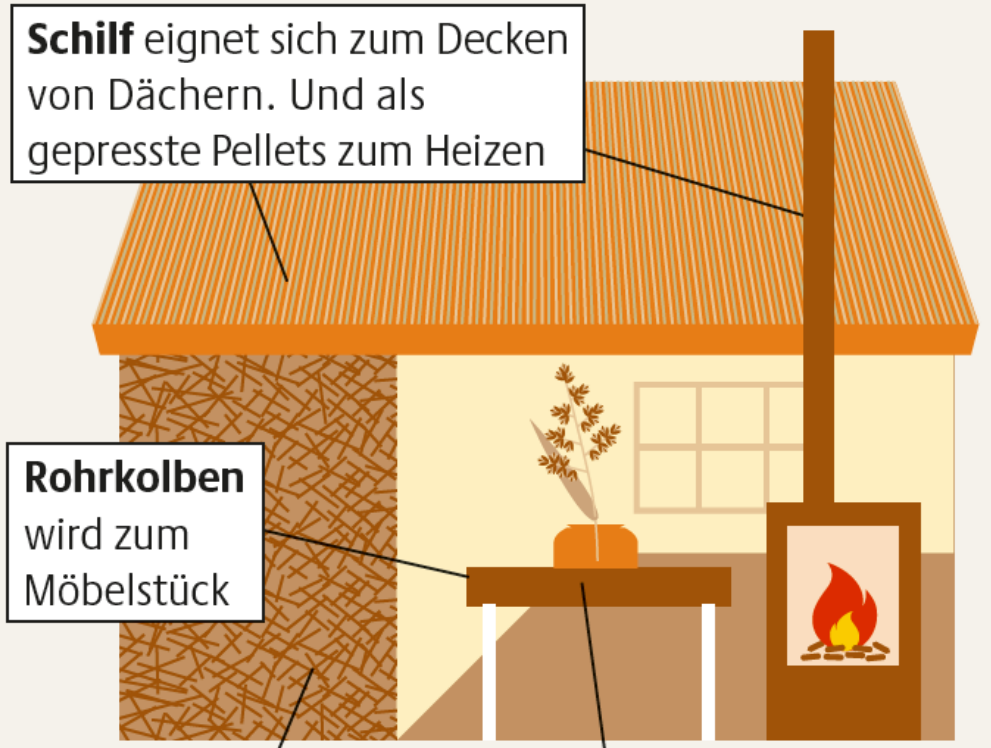
Biomasse aus Paludikultur

Paludikultur

Verwendung im Bau

HAUSMITTEL

Verwendung von Paludikultur-Produkten beim Häuserbau



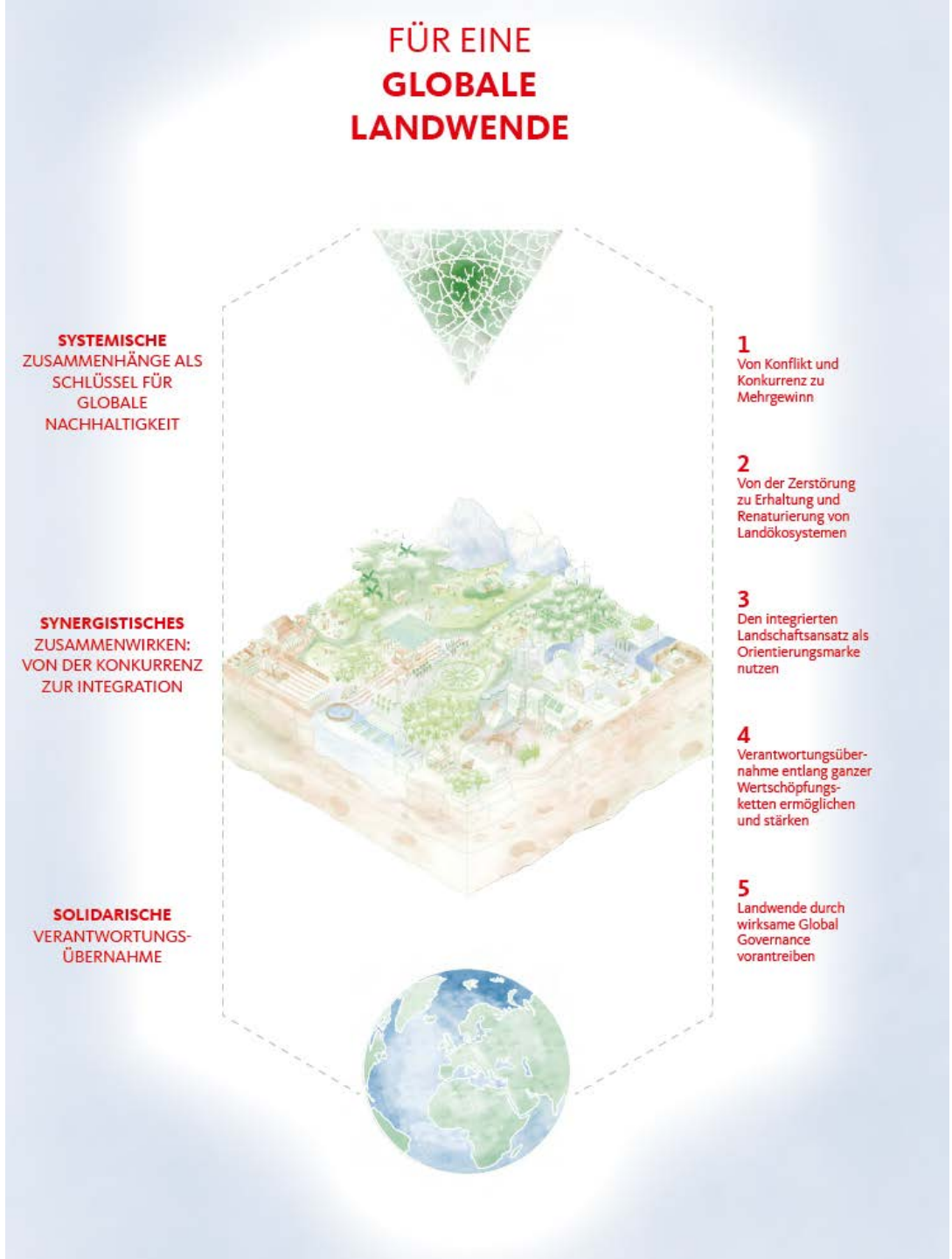
WBGU

German Advisory Council on Global Change

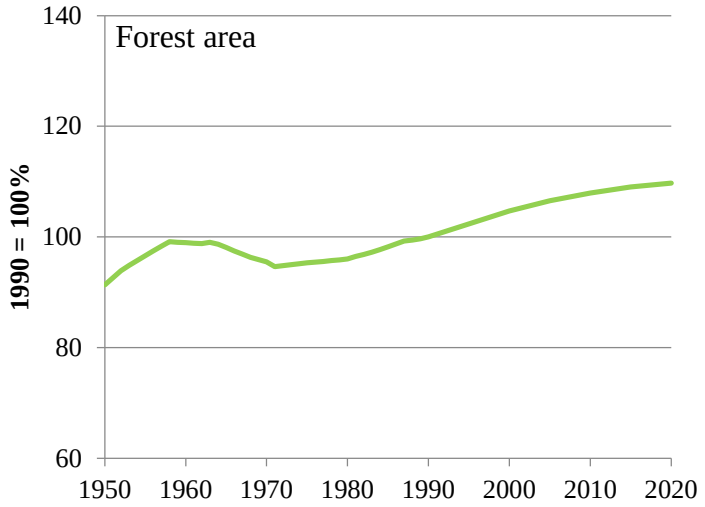
Landwende im Anthropozän:

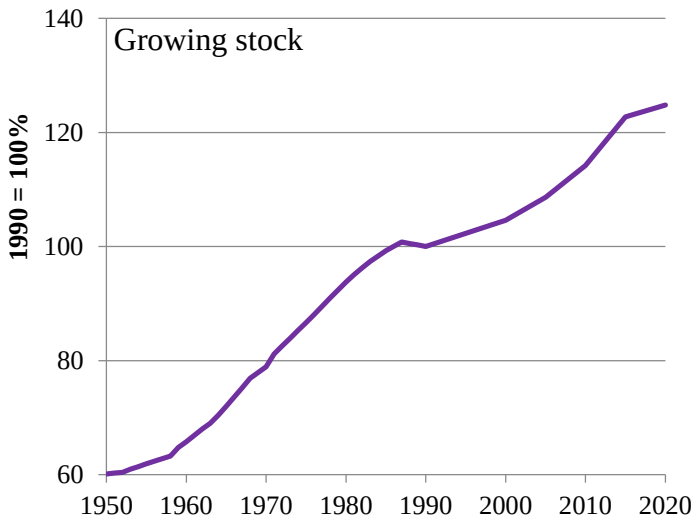
Von der Konkurrenz zur Integration

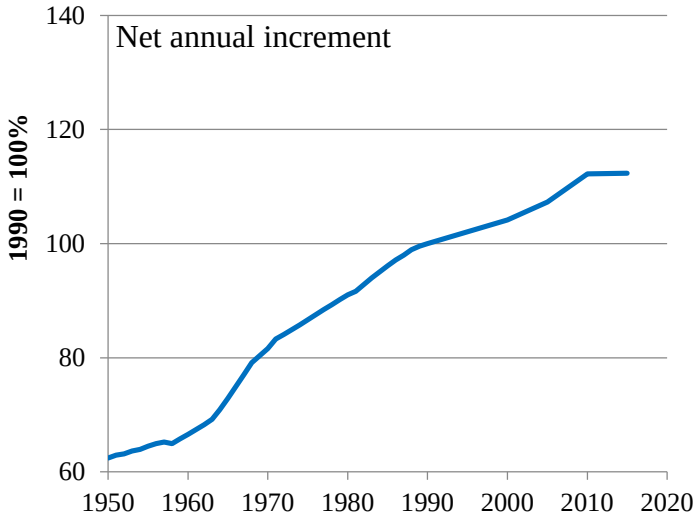
Gutachten: hier



Development of EU forest resources







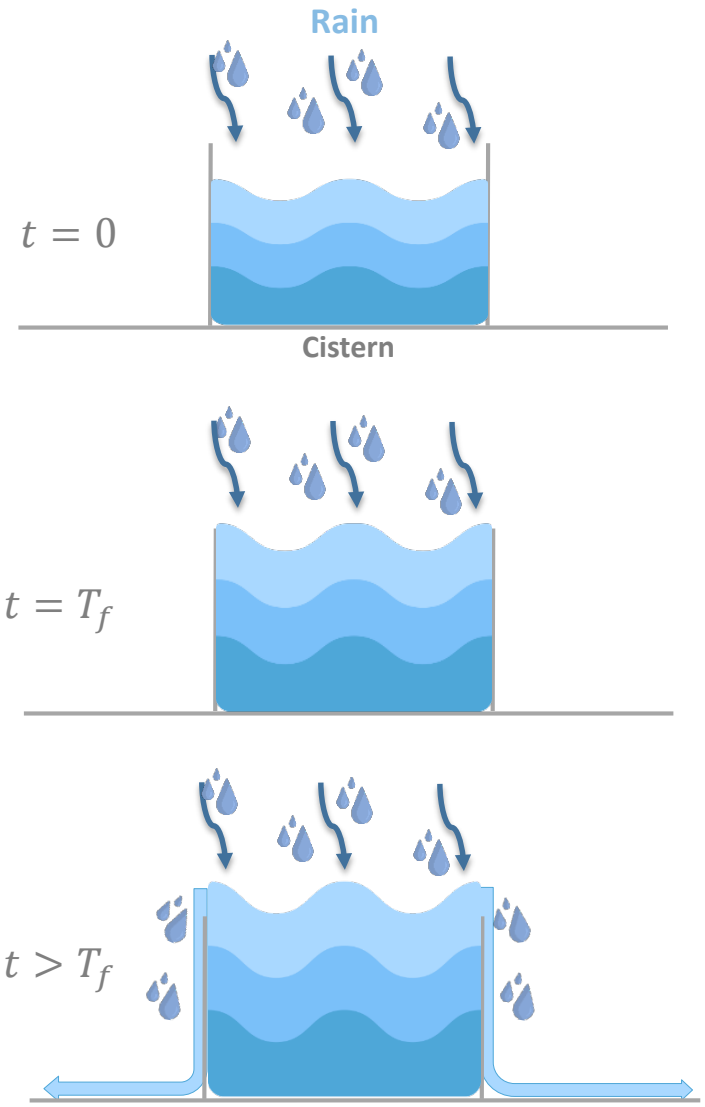
- Forest resources expanded significantly over the past 70 years
- Since 1950 steep increase in growing stock, annual increment and wood production can be observed.
- Changes since 1990 in EU + UK:
  - Forest area: +10%
  - Growing stock: +49%
  - Net annual increment: +24%
  - Wood production: +41%

*Long term trends in the graphs are only shown for 21 EU Member States (16 for net annual increment) due historic data availability.

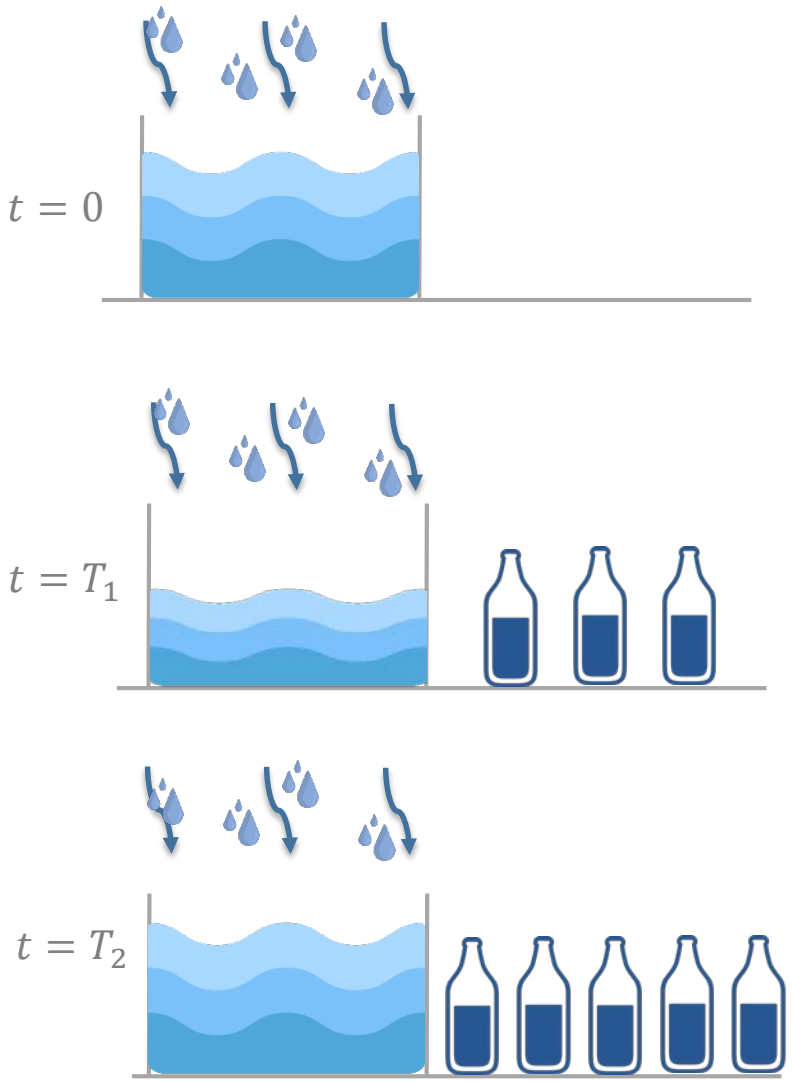
Source: Forest Europe, 2021; Kuusela, 1994; Gold, 2003; Gold, 2006; FAOSTAT, 2022.

Wasser/Kohlenstoff – ein Gleichnis

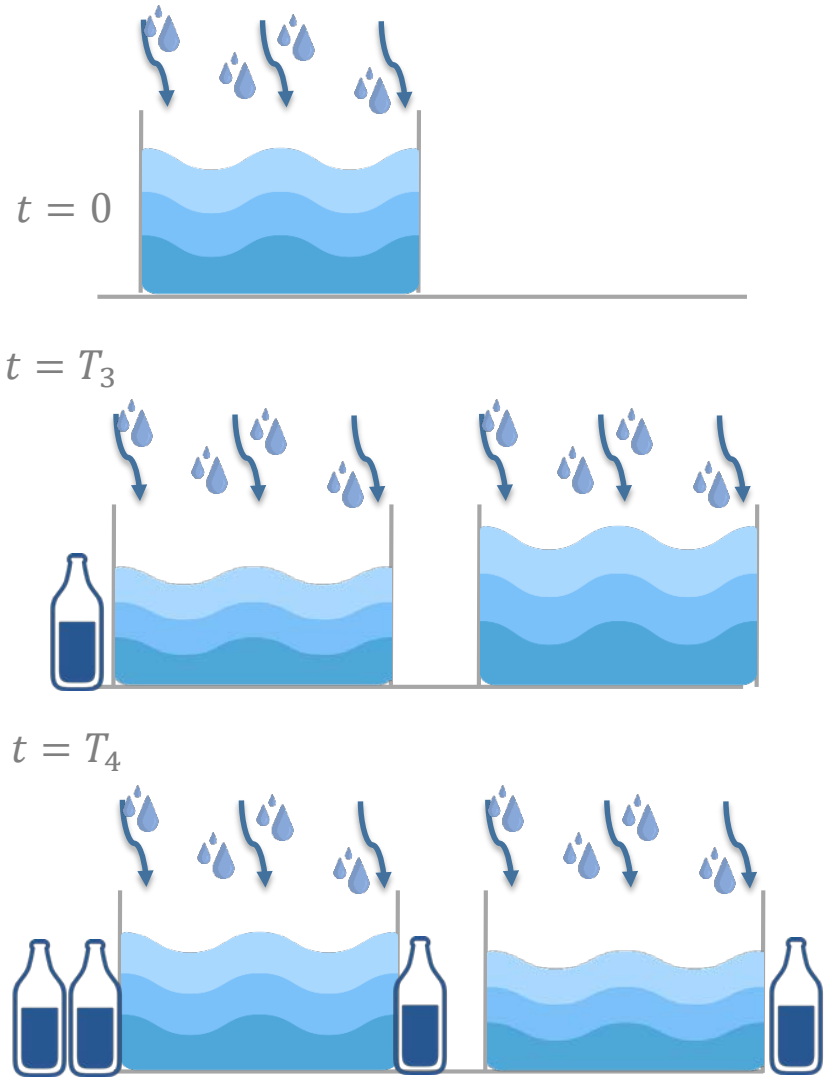
1) Nur Auffangen/Schutz



2) Auffangen & Abfüllen/Nachhaltige Forstwirtschaft & Ökologisches Bauen

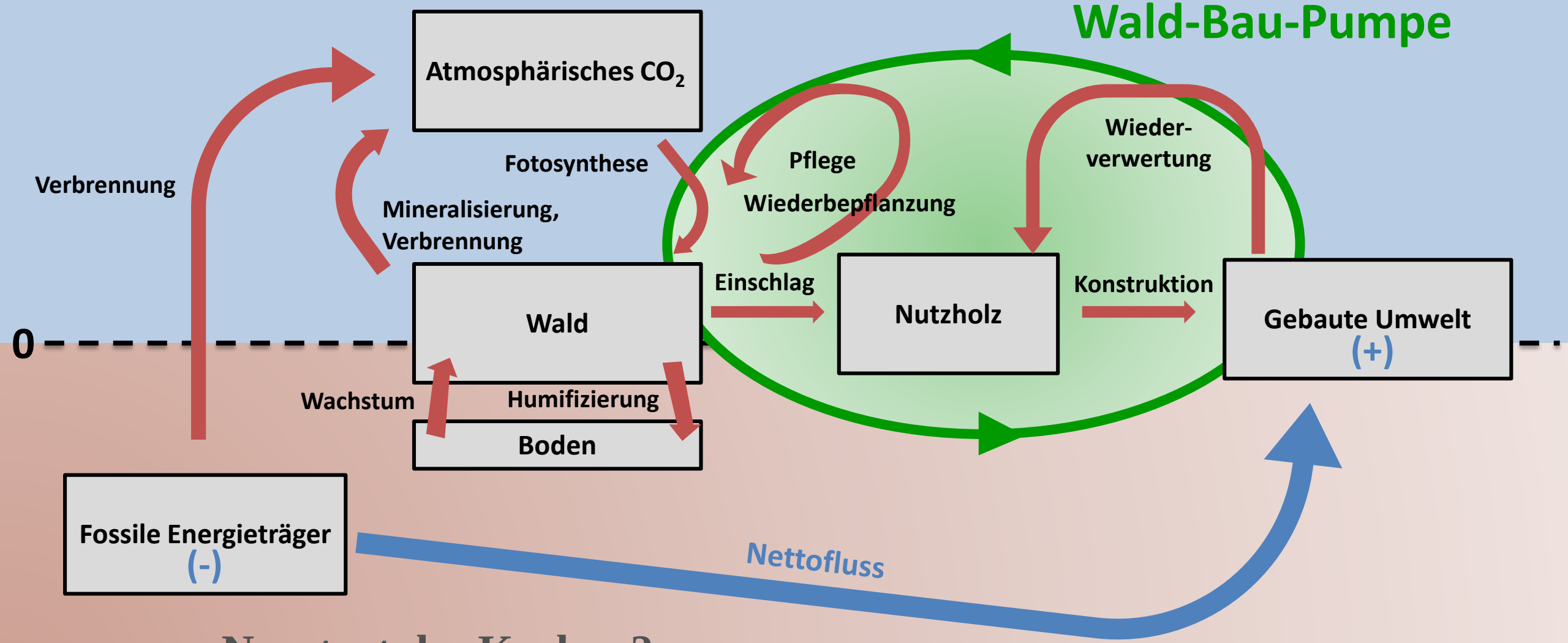


3) Erweitertes Auffangen & Abfüllen/Aufforsten & Nachhaltige Forstwirtschaft & Ökologisches Bauen



Die Wald-Bau-Pumpe

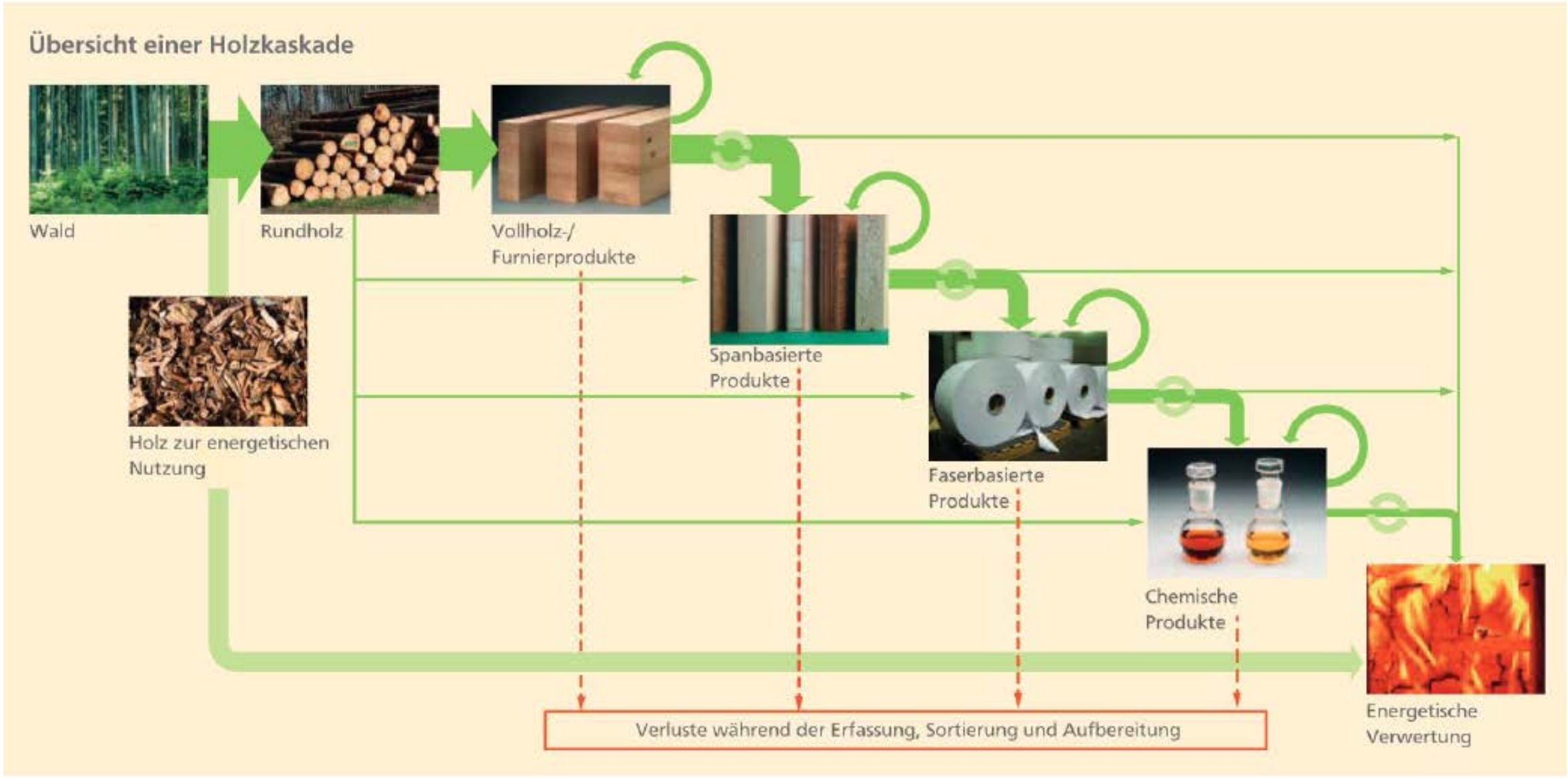
Anthropogen gestörtes / gesteuertes System



Neustart des Karbon?

Schellnhuber, Köllner 2020 (unveröffentlicht)

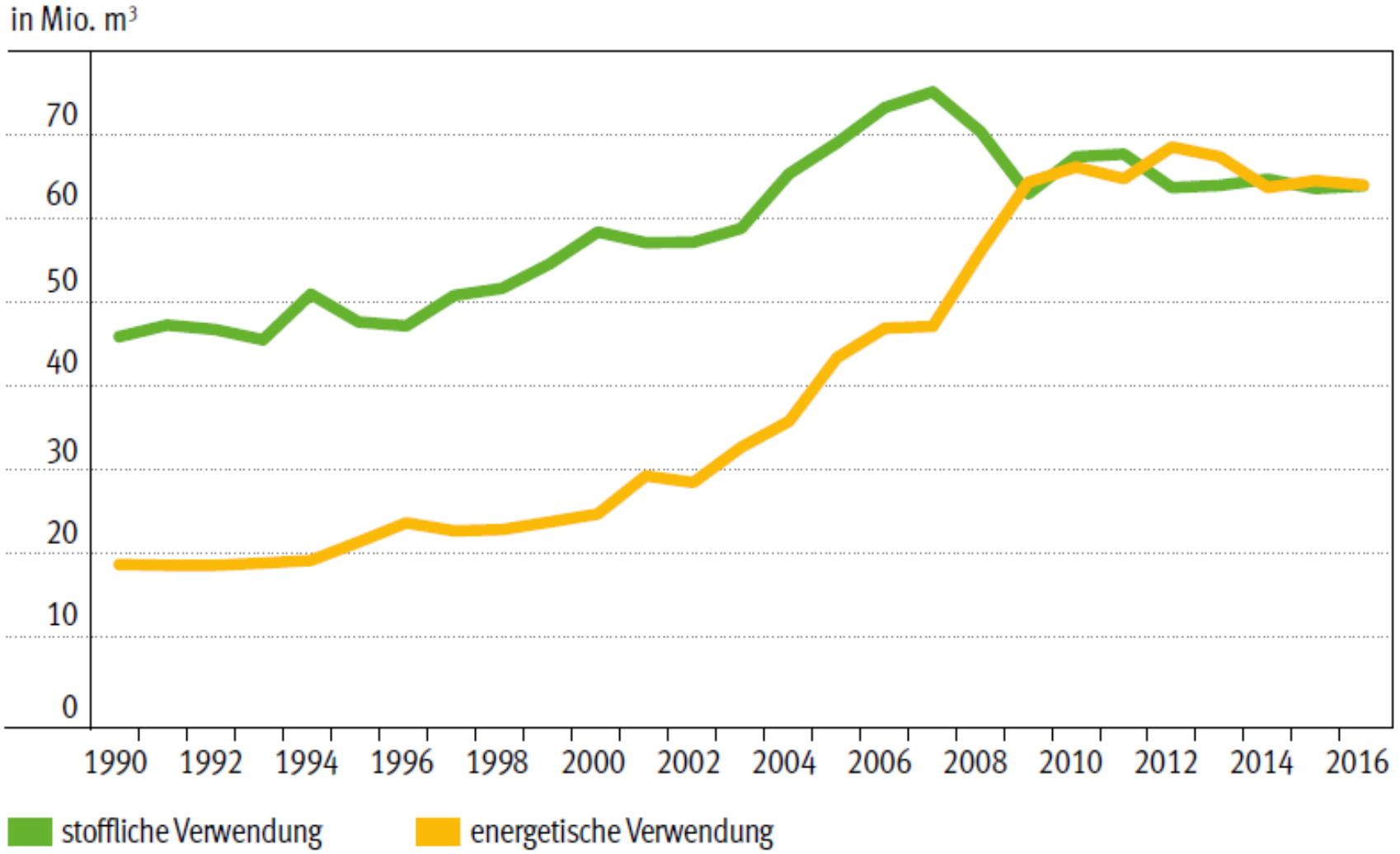
Kaskadennutzung von Holz



Quelle: Höglmeier, K., Weber-Blaschke, G., Richter, K. (2016)

Original Artikel: hier

Entwicklung der der stofflichen und energetischen Nutzung von Holz in Deutschland bis 2016



Quelle: INFRO e.K.

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ENVIRONMENTAL RESEARCH
LETTERS

11 April 2023

Can future cities grow a carbon storage equal to forests?

Ilmari Talvitie[2,1], Antti Kinnunen[1], Ali Amiri[1] and Seppo Junnila[1]

As cities expand into forests and agricultural land, what can be done to maintain the area's carbon storage capacity? Credit: Mikko Raskinen / Aalto University

Full paper: here

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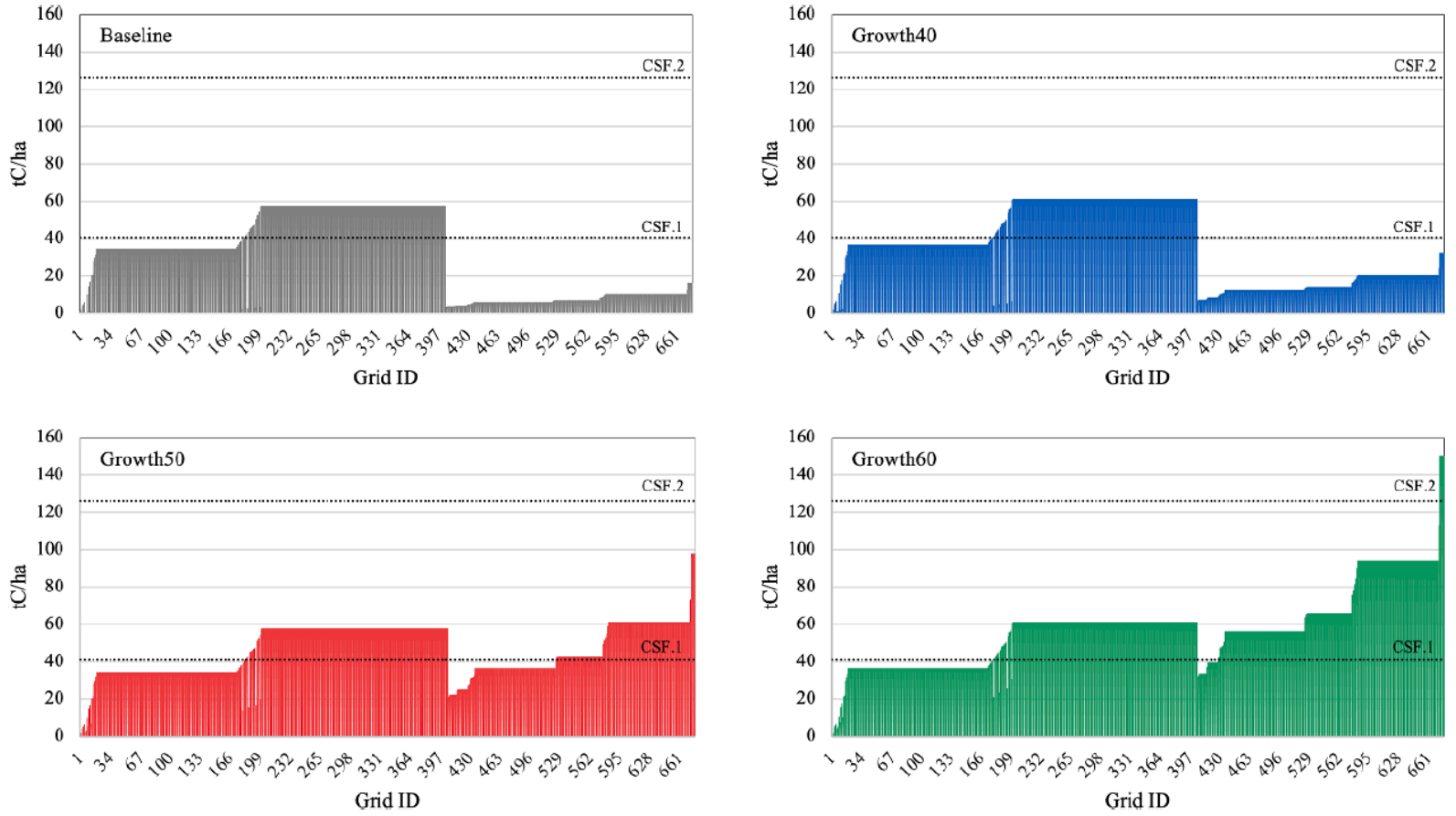

Figure 3. Carbon storage potential and CS-Factors of new residential areas with Building 100.

Full paper: here

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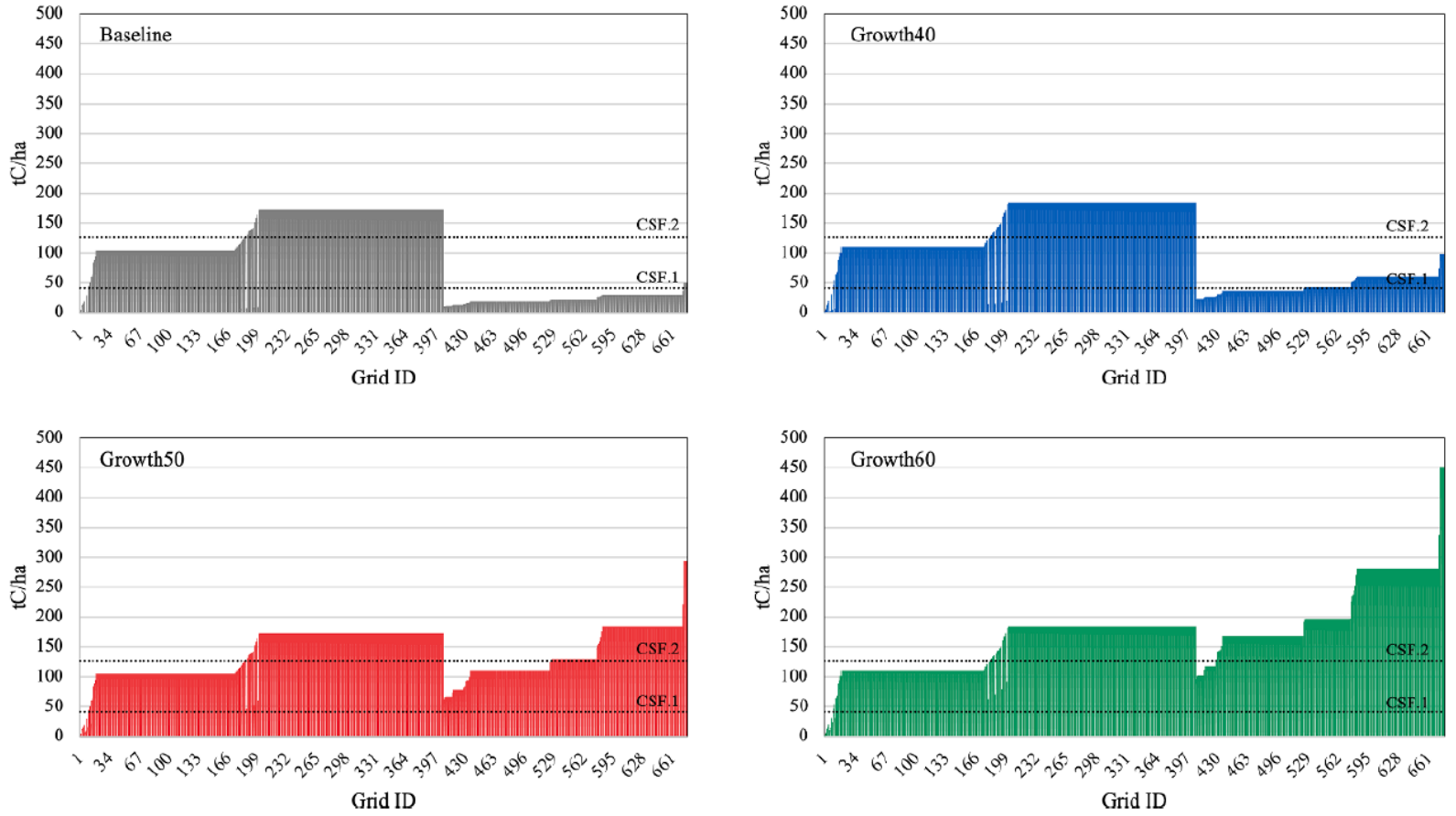

Figure 4. Carbon storage potential and CS-Factors of new residential areas with building 300.

Full paper: here

buildings

Timber Construction as a Solution to Climate Change: A Systematic Literature Review

Laura Tupenaite [1,*], Loreta Kanapeckiene [1], Jurga Naimaviciene [1], Arturas Kaklauskas [1] and Tomas Gecys [2]

Abstract: The built environment significantly contributes to climate change. There is pressure on the construction industry to find and use alternative sustainable environmentally friendly building materials to reduce the climate impact. Timber is increasingly being considered in the literature and used as a viable alternative for steel and concrete in both residential and non-residential building projects as it is a renewable material and has multiple benefits for reducing carbon (CO_2) emissions and consequently climate change. This study aims to research the benefits of sustainable timber construction in terms of climate change. To achieve this aim, a systematic literature review was performed based on the research conducted between 1998 and 2022. For this purpose, research papers were searched from the Web of Science database and screened by applying a combination of keywords and the criteria for academic publication selection, including climate change, timber or wooden building, renewable material, sustainable material, carbon sink, carbon reduction, embodied energy, lifecycle assessment, and the circular economy. Further, a quantitative analysis of publications was performed using a science mapping approach, and qualitative content analysis was then conducted in three areas of research: timber as a sustainable construction material, the carbon storage of and reduction in GHG/CO_2 emissions, and the circular economy. Research trends, general findings, and knowledge gaps were identified, and future research directions were indicated. The literature review proves that timber construction is a potential solution to reduce climate change.

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PNAS RESEARCH ARTICLE | ENGINEERING

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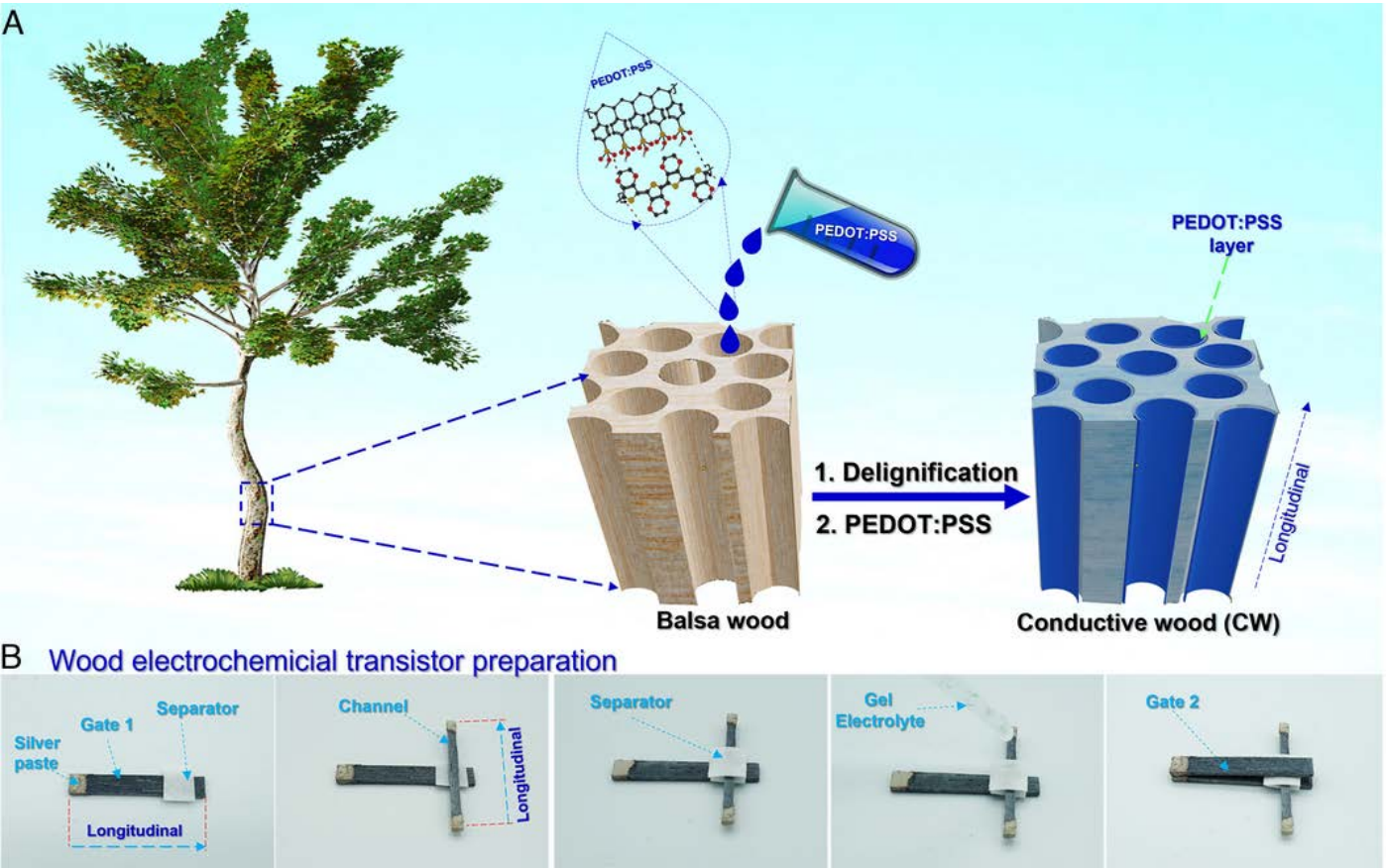
Electrical current modulation in wood electrochemical transistor

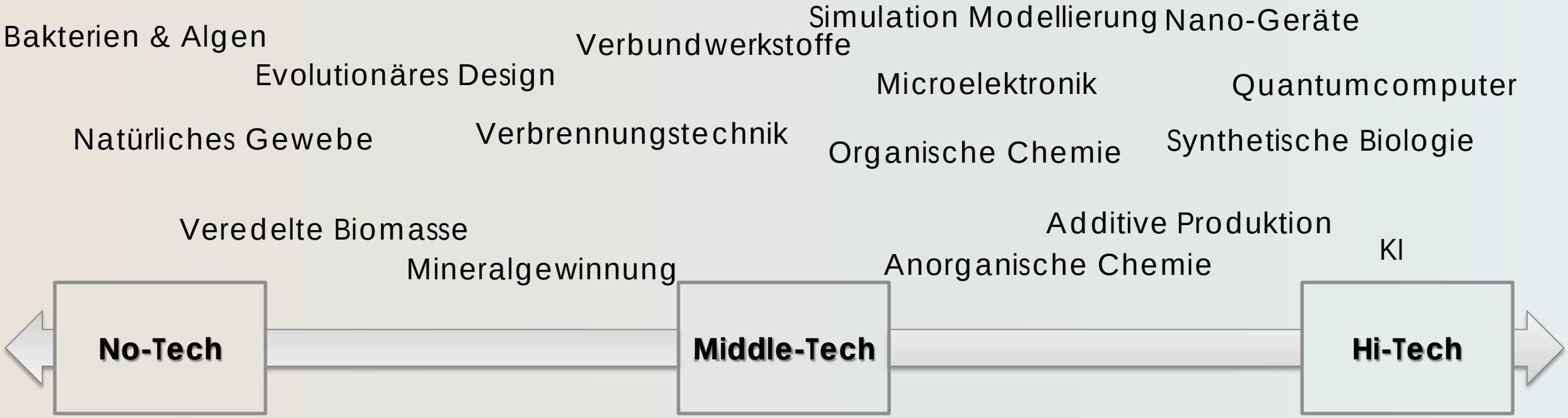
Van Chinh Tran[a,b], Gabriella G. Mastantuoni[c,d], Marzieh Zabihipour[a], Lengwan Li[d], Lars Berglund[d], Magnus Berggren[a,b], Qi Zhou[c,d], and Isak Engquist[a,b,1]

Edited by Peter Fratzl, Max-Planck-Institut fur Kolloid und Grenzflachenforschung, Potsdam, Germany; received October 31, 2022; accepted March 1, 2023 by Editorial Board Member Joanna Aizenberg



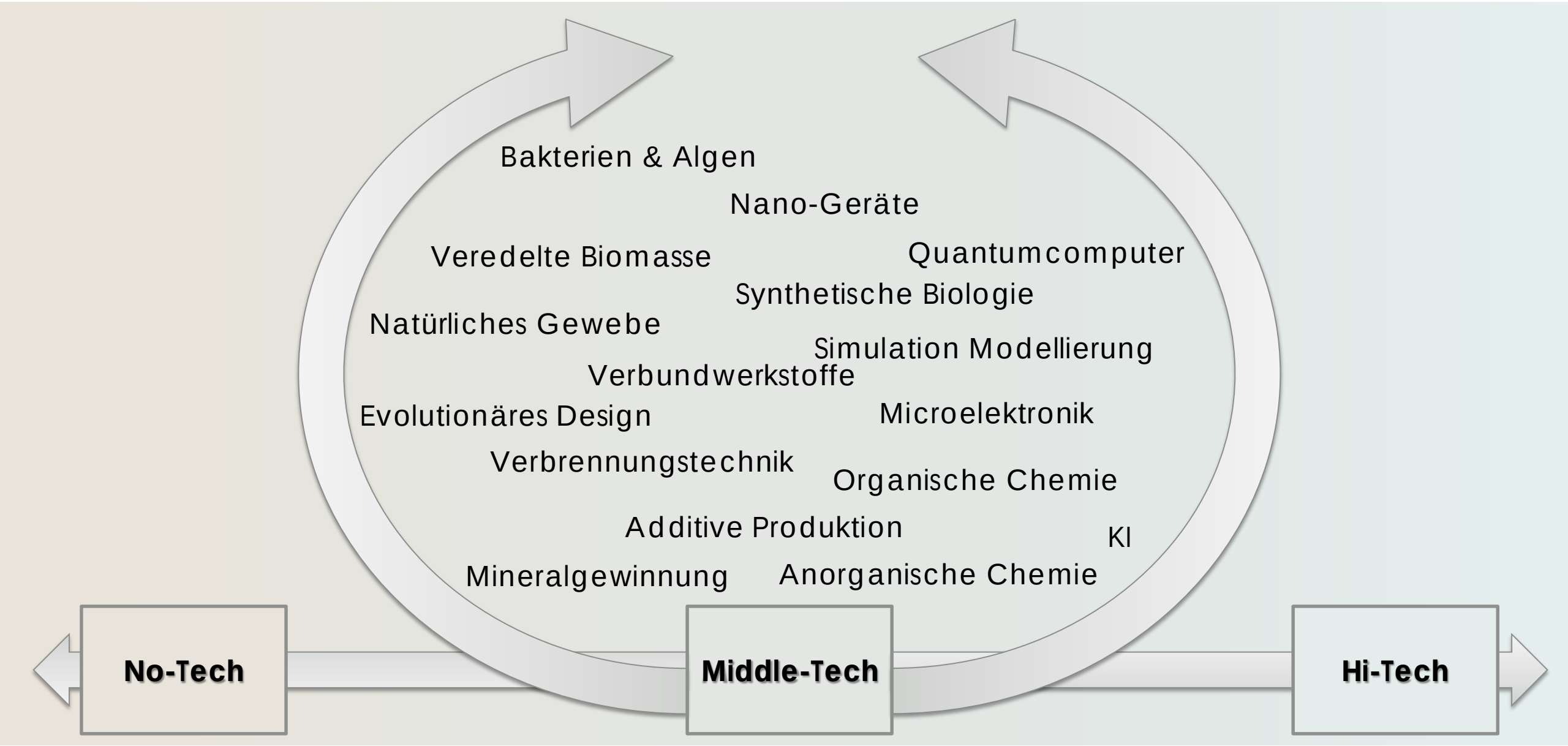
In this work, we present an approach to preparing conductive wood (CW), in which the electrical conductivity can be modulated using an external potential. This has resulted in a transistor where all three terminals are made of conductive wood and which can be operated continuously at the selected conductivity without being limited by, e.g., saturation effects.

We expect this device and concept will be a stepping stone for the development of wood-based electrical components.



Mittel & Methoden für Zivilisation

No-Tech trifft Hi-Tech!



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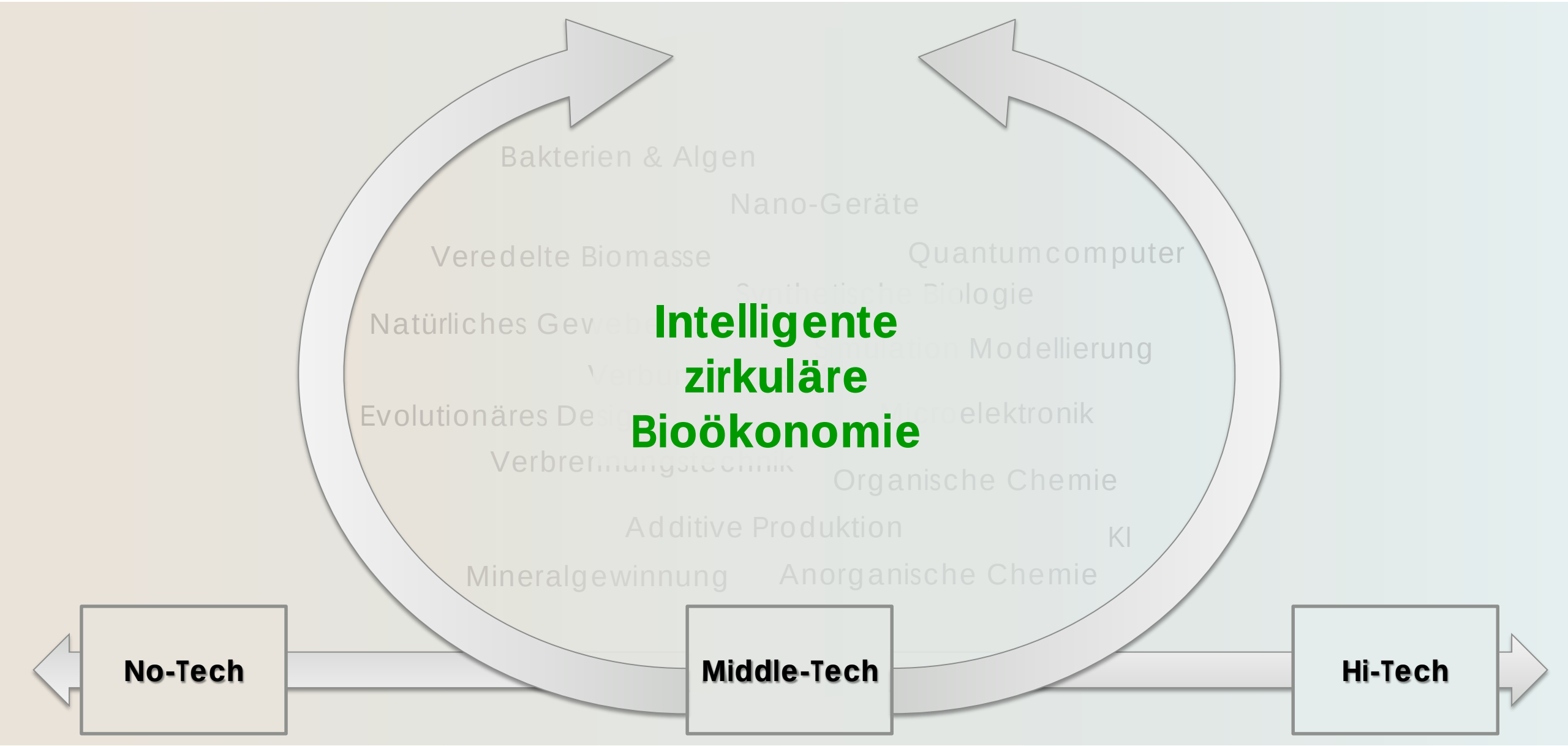

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