



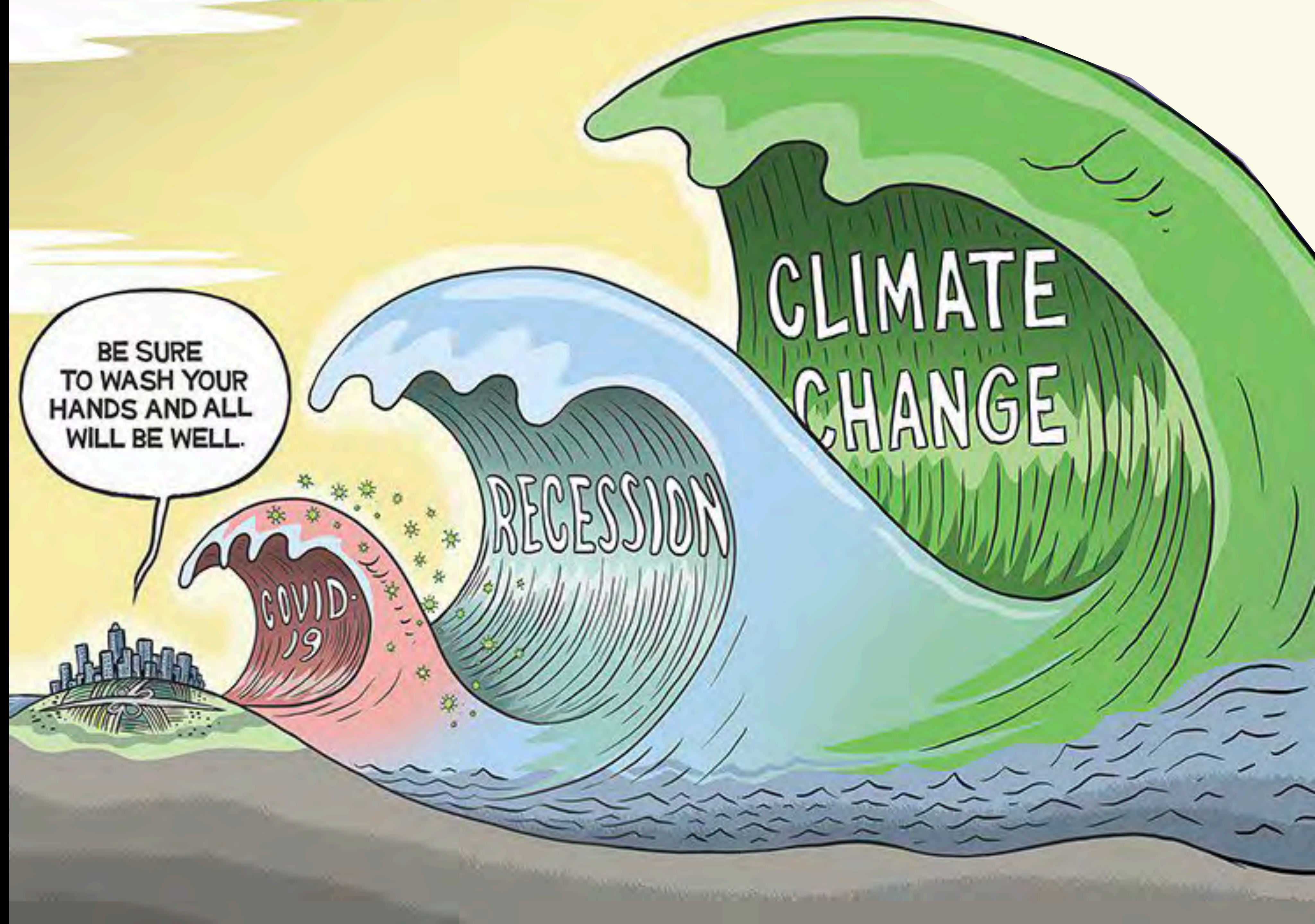
AUFBRUCH IN EINE NACHHALTIGE KLIMANEUTRALITÄT

Prof. Dr. Kai Niebert

kai.niebert@uzh.ch

BE SURE
TO WASH YOUR
HANDS AND ALL
WILL BE WELL.





BE SURE
TO WASH YOUR
HANDS AND ALL
WILL BE WELL.

COVID-19

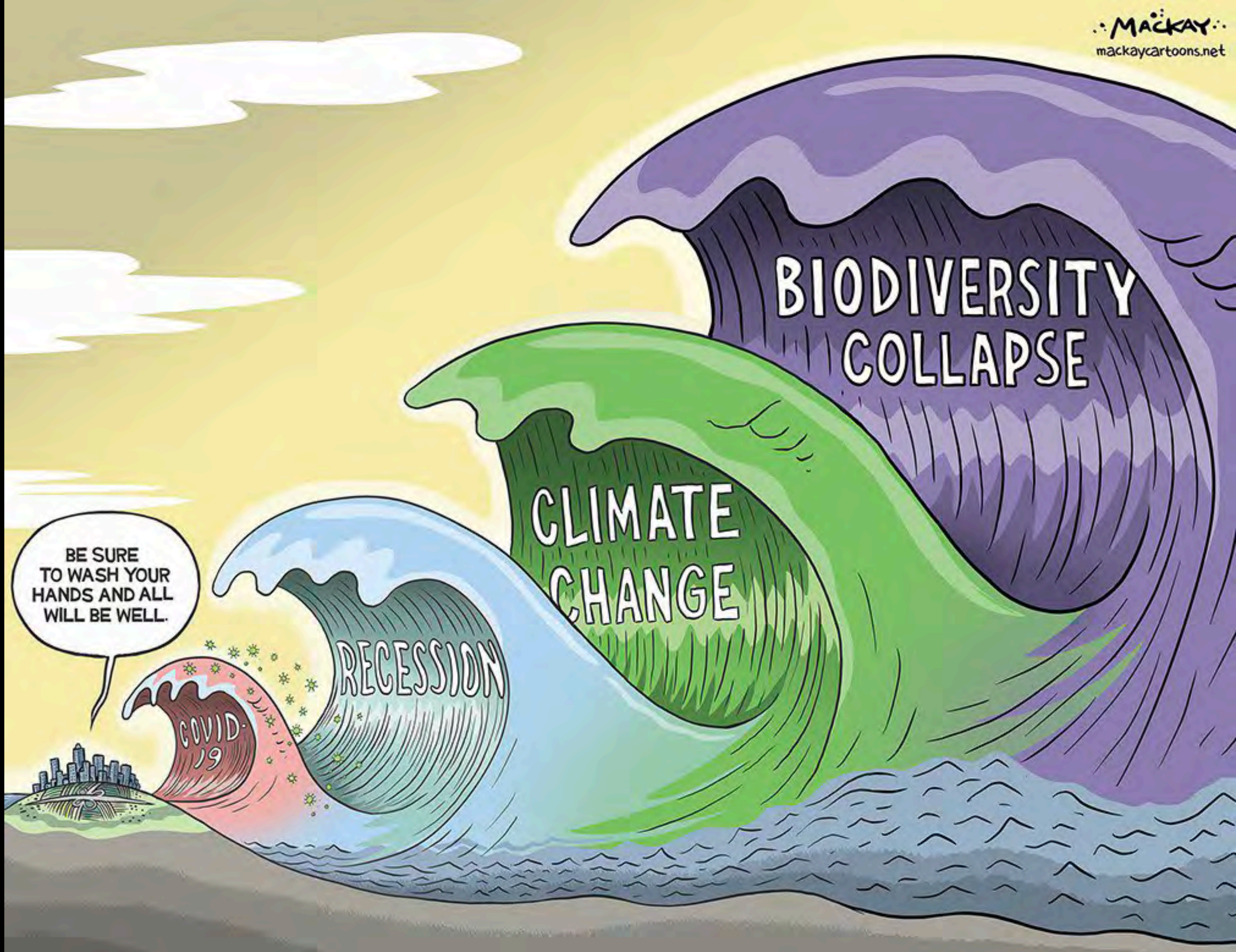
RECESSION

CLIMATE
CHANGE



<https://mackaycartoons.net>

.. MACKAY ..
mackaycartoons.net



BE SURE
TO WASH YOUR
HANDS AND ALL
WILL BE WELL.

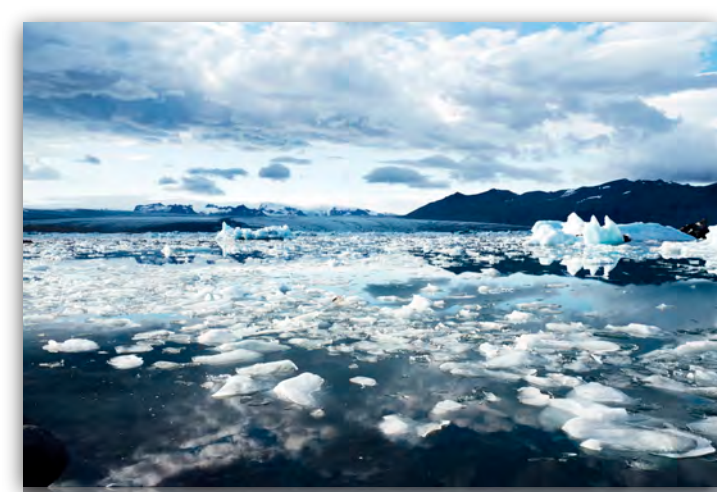
COVID-19

RECESSION

CLIMATE
CHANGE

BIODIVERSITY
COLLAPSE

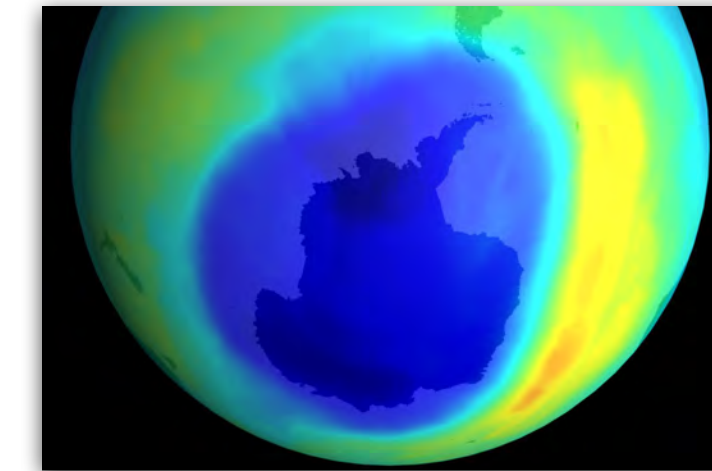




CLIMATE CHANGE



NOVEL ENTITIES



STRATOSPHERIC OZONE DEPLETION



ATMOSPHERIC AEROSOL LOADING
(Not yet quantified)

OCEAN ACIDIFICATION



FRESHWATER USE



P

N



LAND-SYSTEM CHANGE

BIOSPHERE INTEGRITY

E/MSY

BII

(Not yet quantified)

Safe operating space

Increasing risk



Steffen, W., Richardson, K., Rockstrom, J., Cornell, S. E., Fetzer, I., Bennett, E. M., et al. (2015). Sustainability. Planetary boundaries: guiding human development on a changing planet. *Science*, 347(6223), 1259855–1259855.

Persson, L., Carney Almroth, Collins, C.D., Cornell, S., de Wit, C. et.al. 2022. Outside the Safe Operating Space of the Planetary Boundary for Novel Entities *Environ. Sci. Technol.*, <https://doi.org/10.1021/acs.est.1c04158>

Wo stehen wir?











The Stages of the Anthropocene

Pre-Anthropocene events:

Fire-stick farming, megafauna extinctions, early forest clearing

Anthropocene Stage 1

(ca. 1800 - 1945). Internal combustion engine, fossil fuel energy, sci & tech

Anthropocene Stage 2

(1945 - 2010 or 2020). The Great Acceleration, new institutions and vast global networks

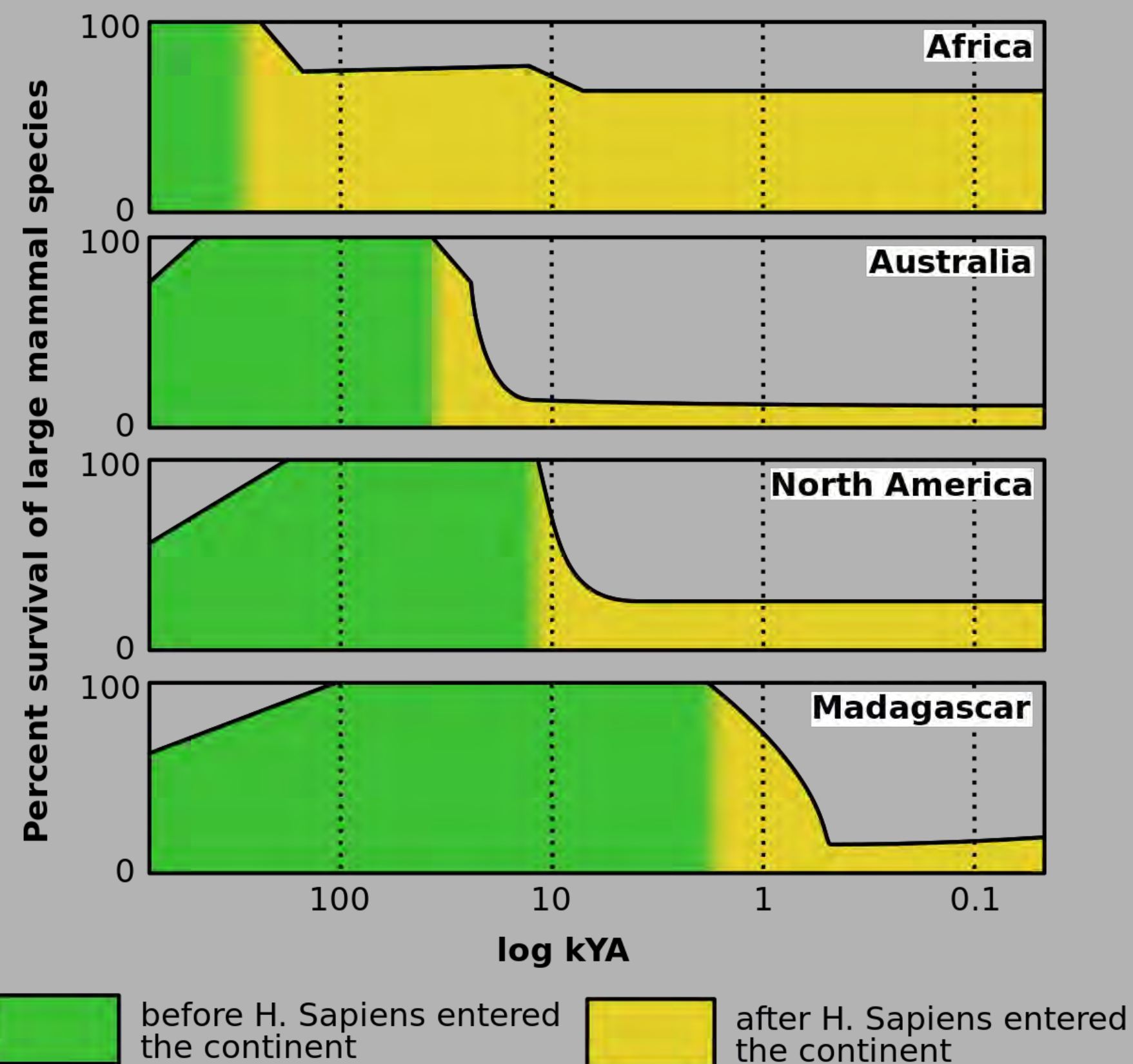
Anthropocene Stage 3

(2020 - ?). Business-as-usual, geo-engineering, or the Great Transition?

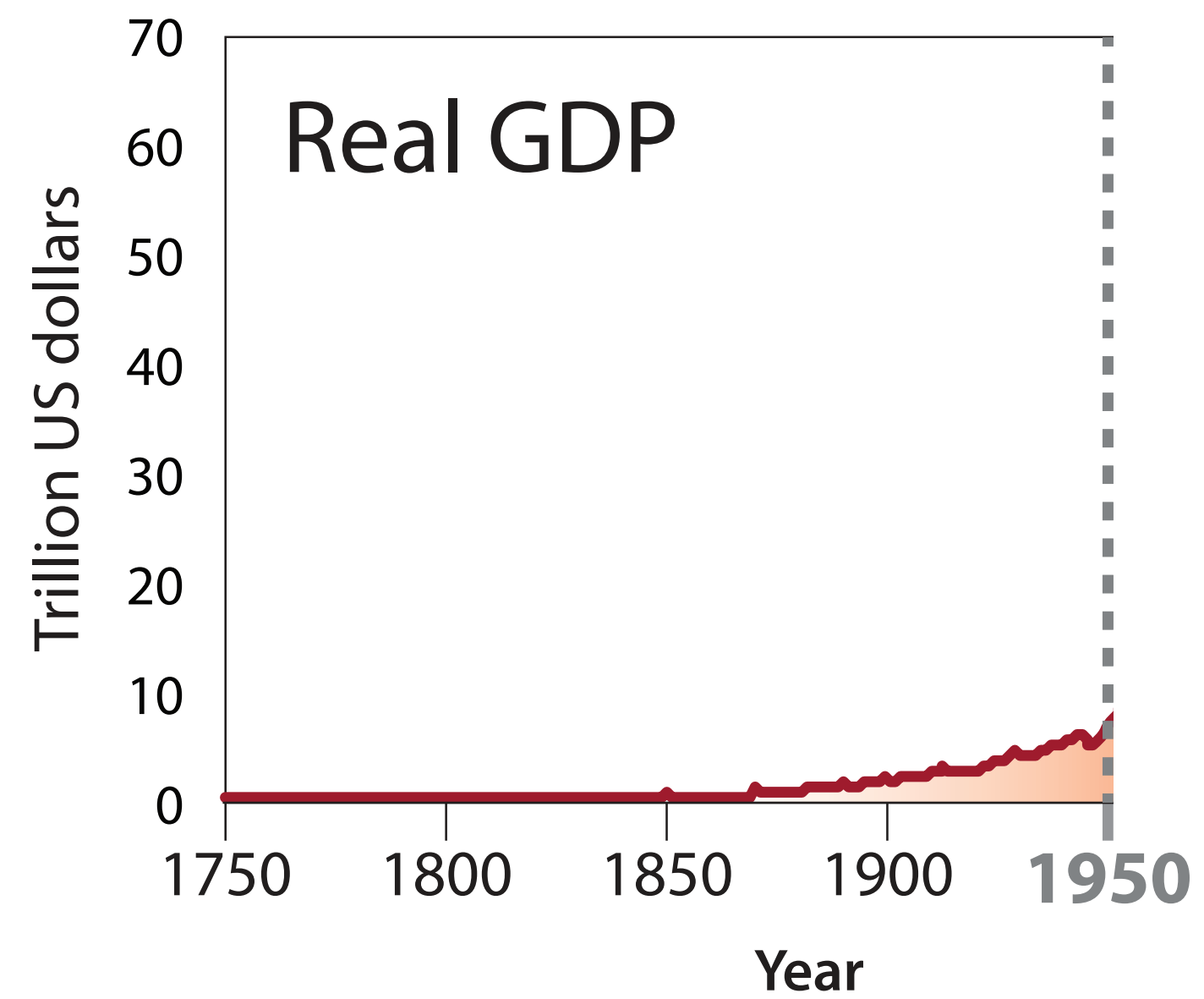
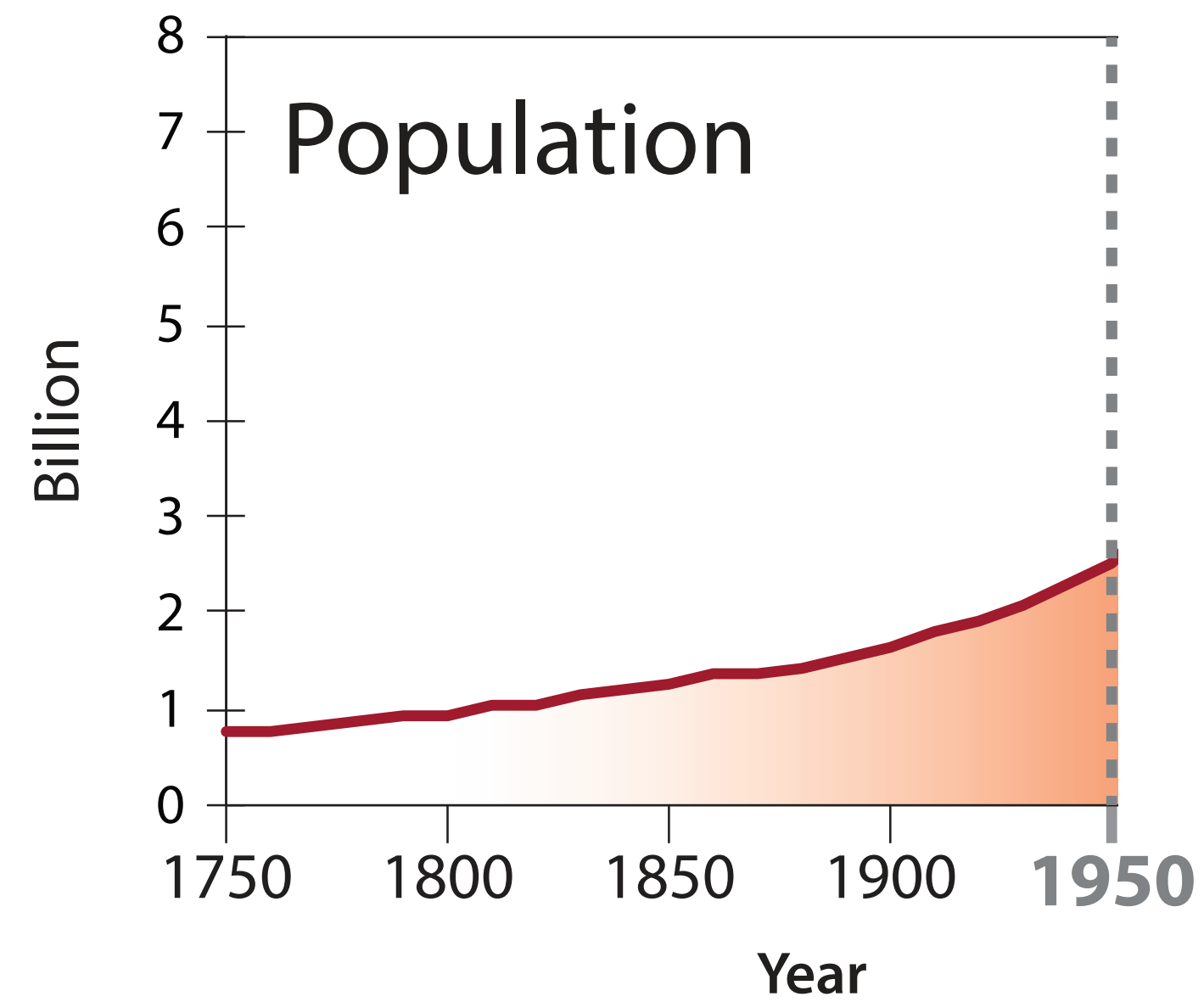
Pre-Anthropocene events



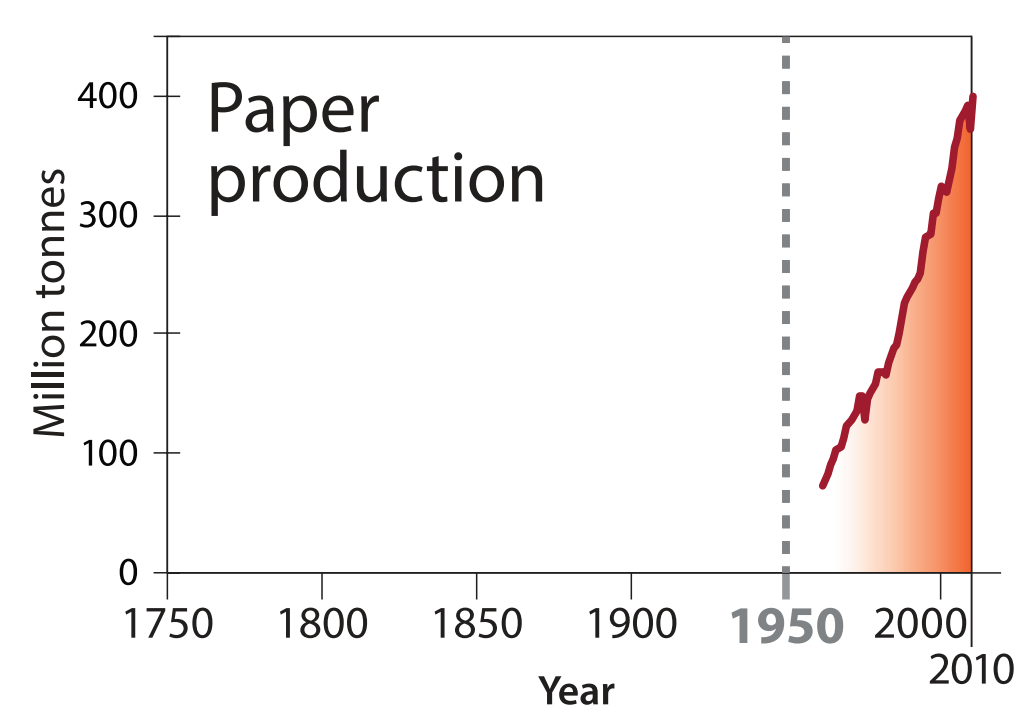
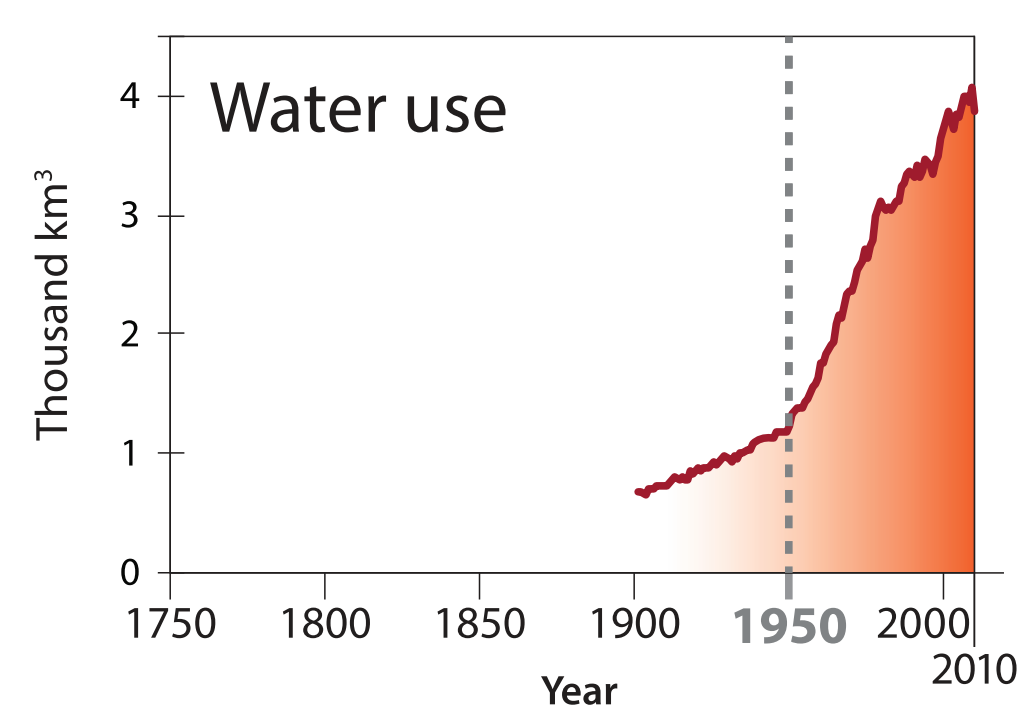
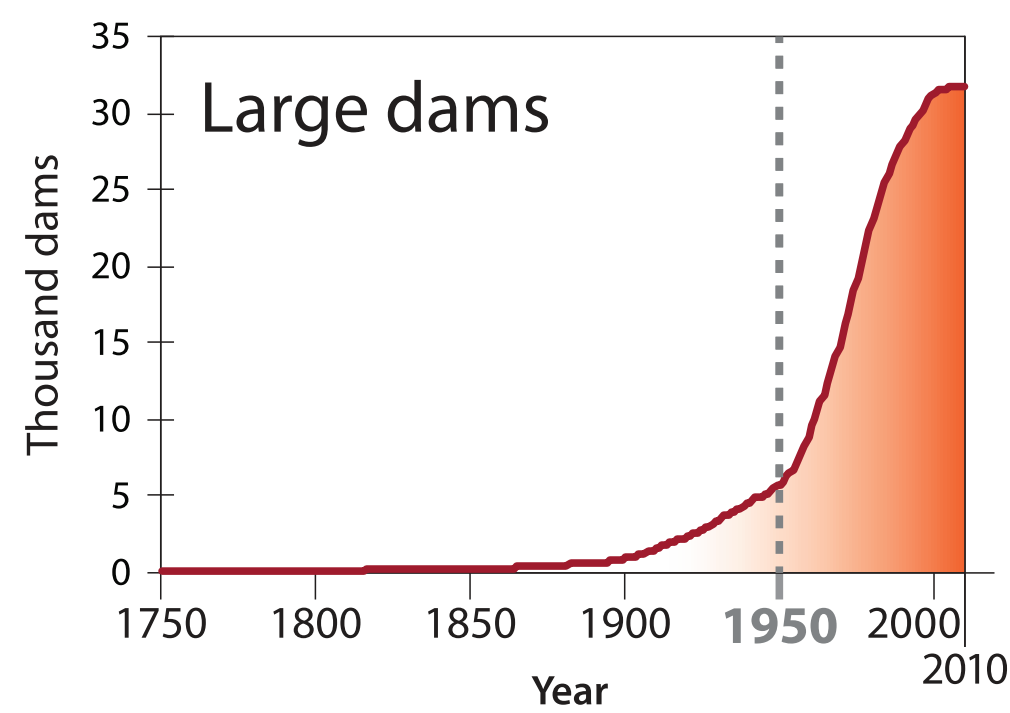
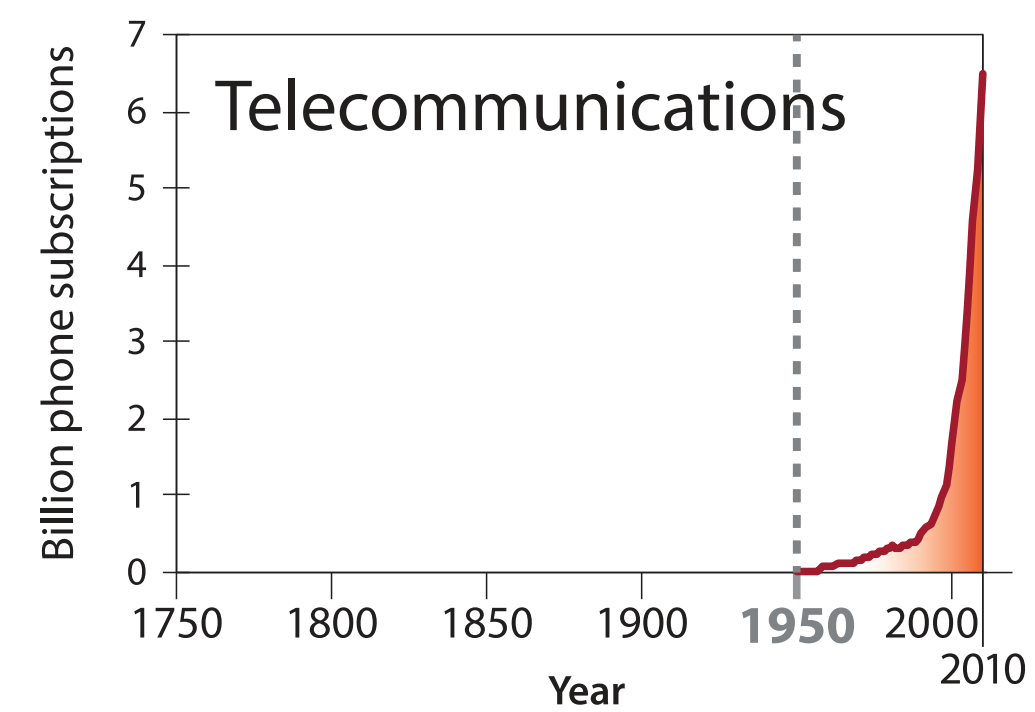
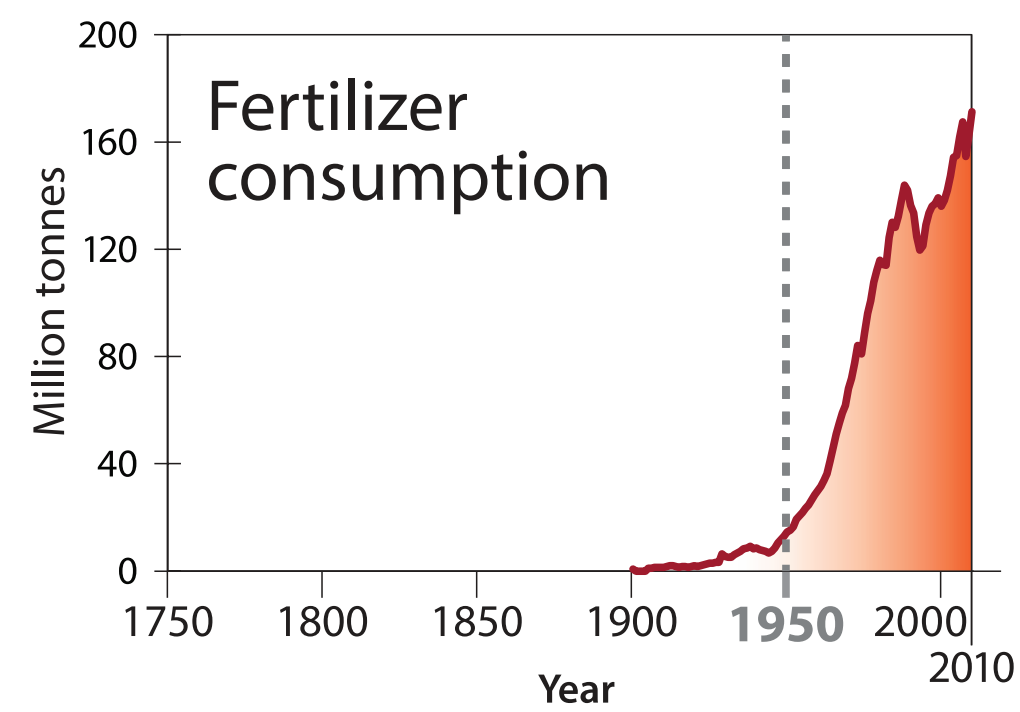
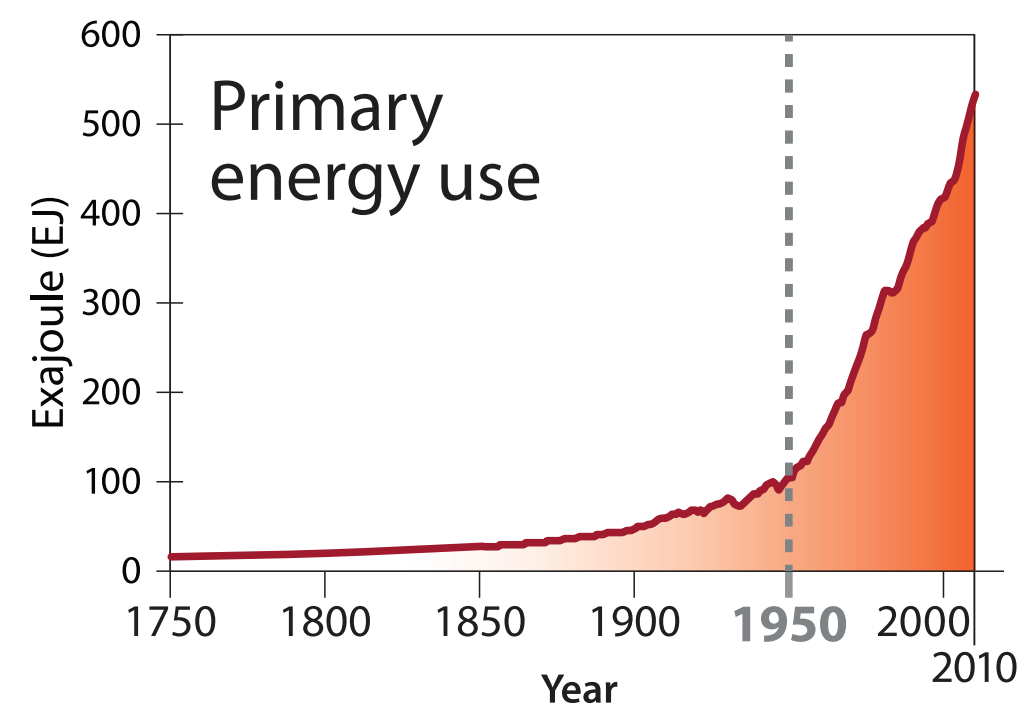
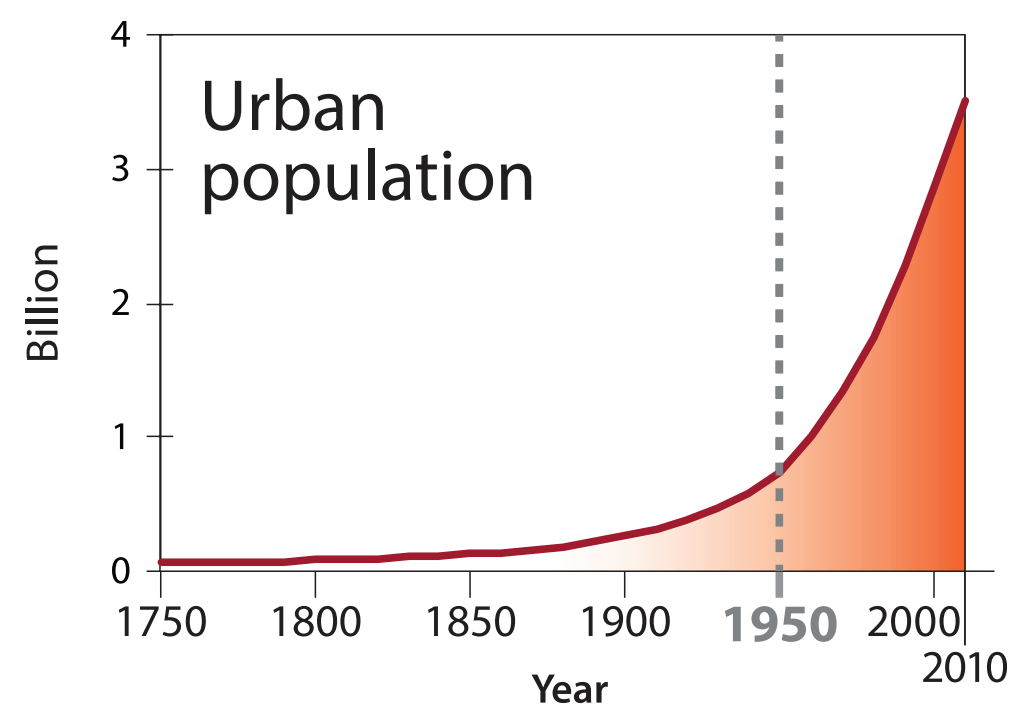
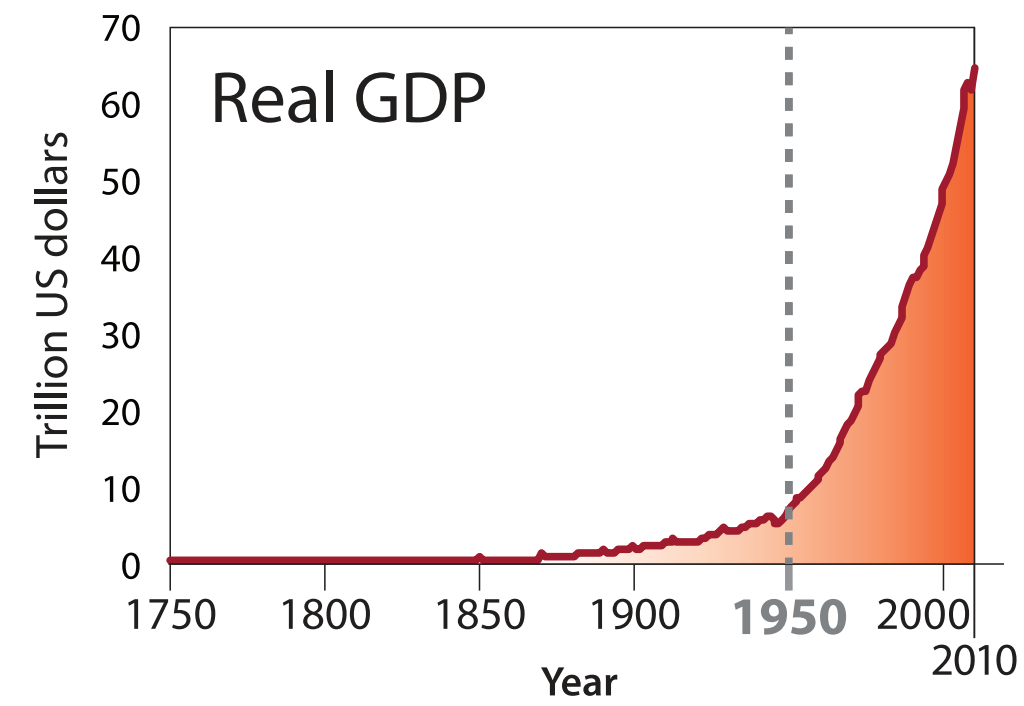
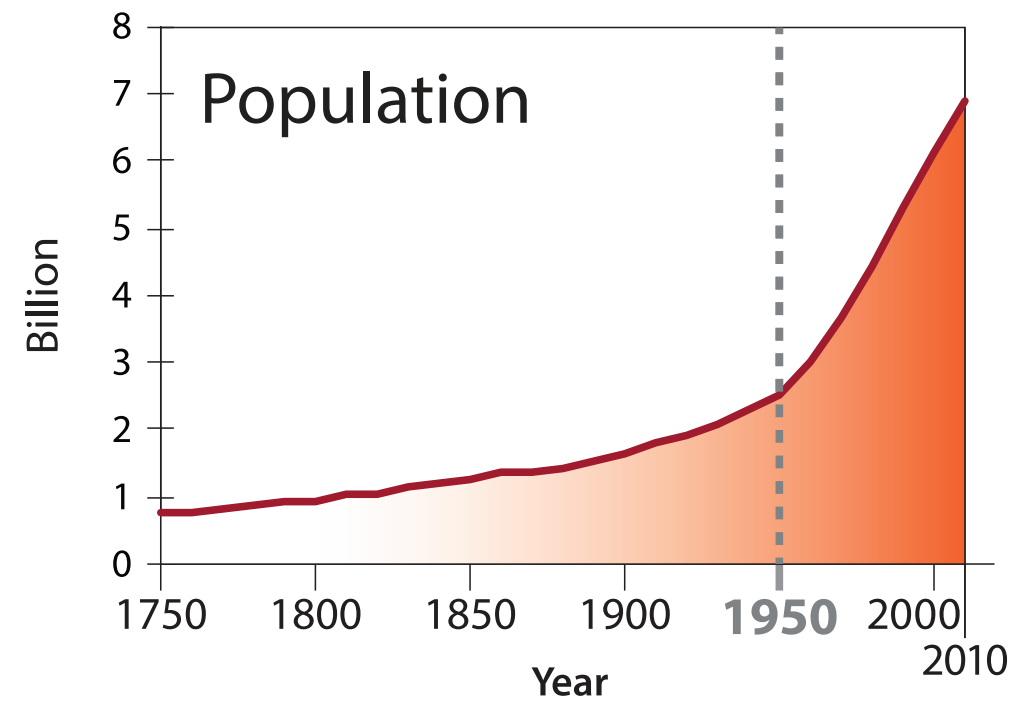
Large Mammal Populations of Selected Continents



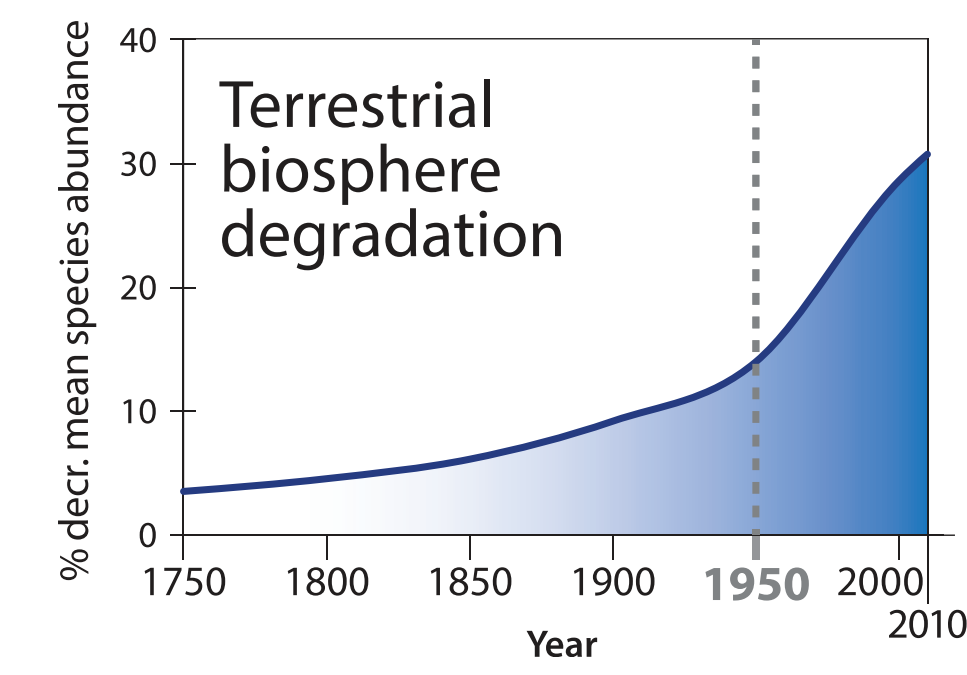
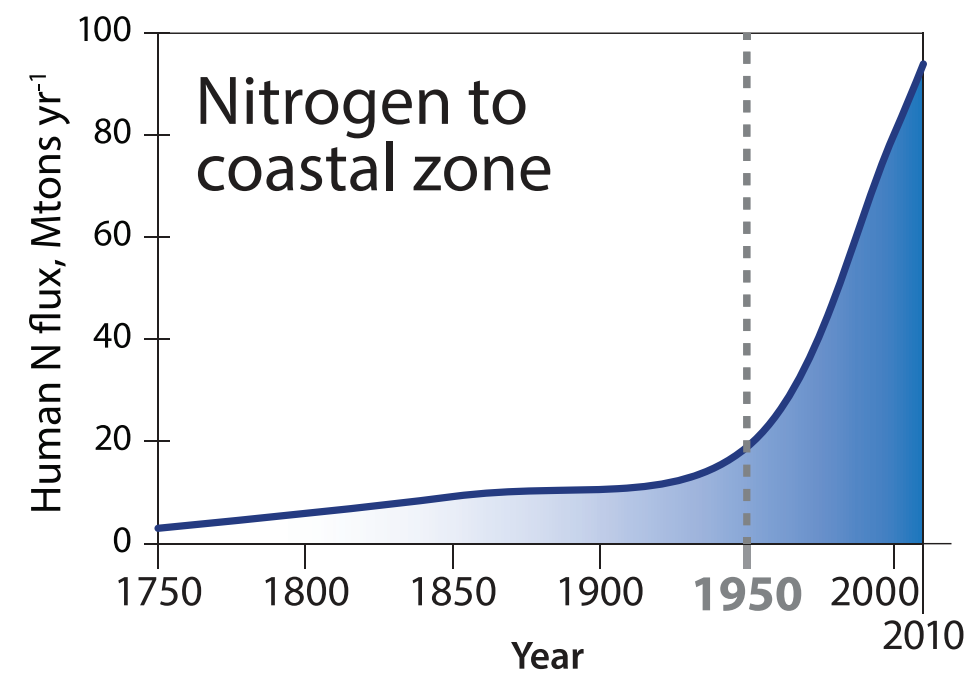
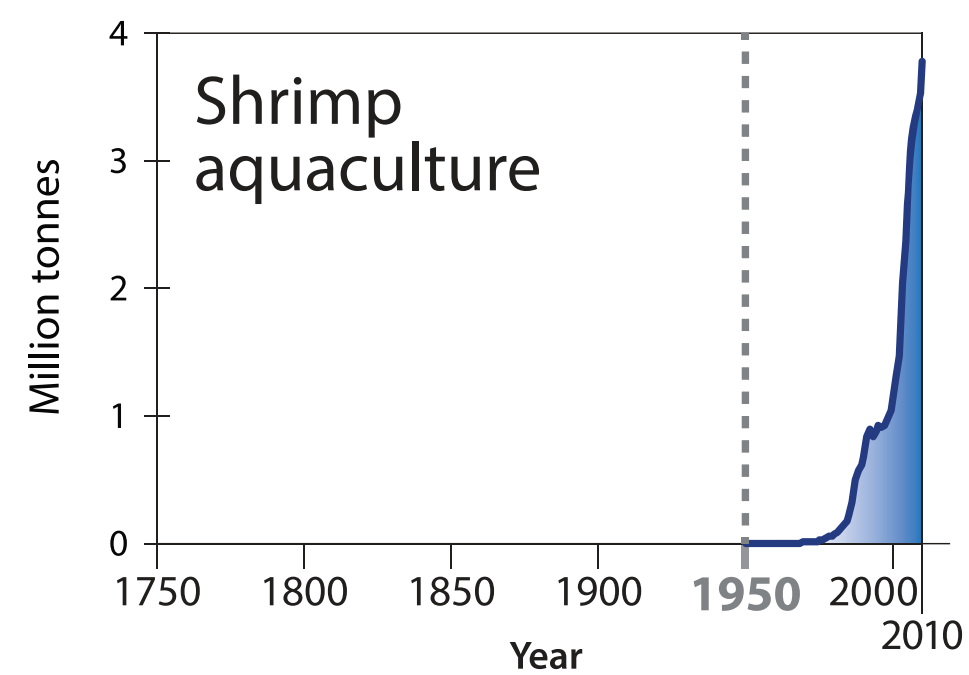
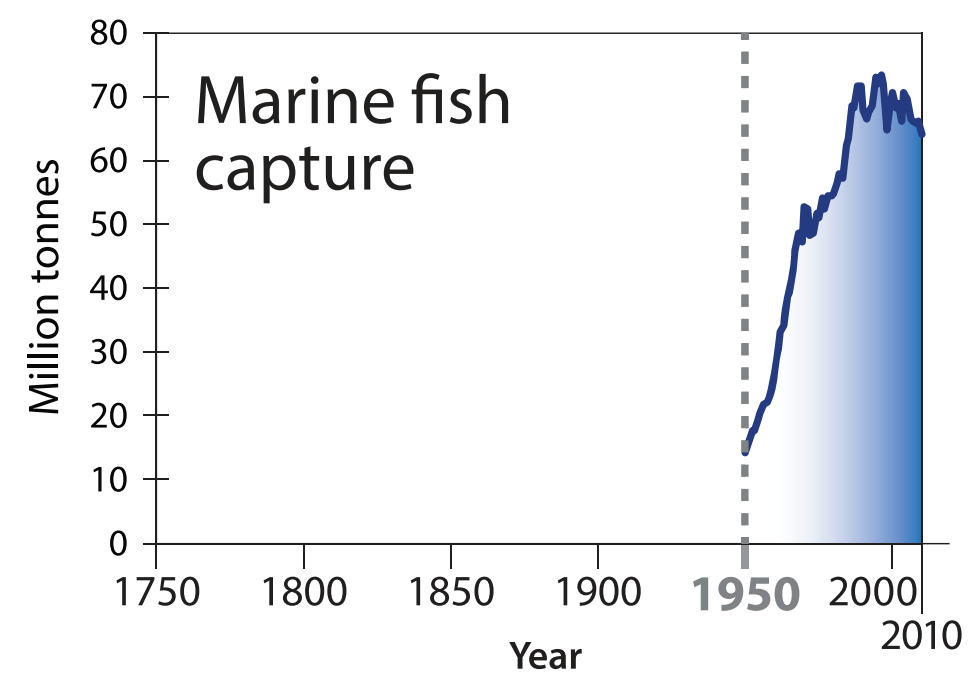
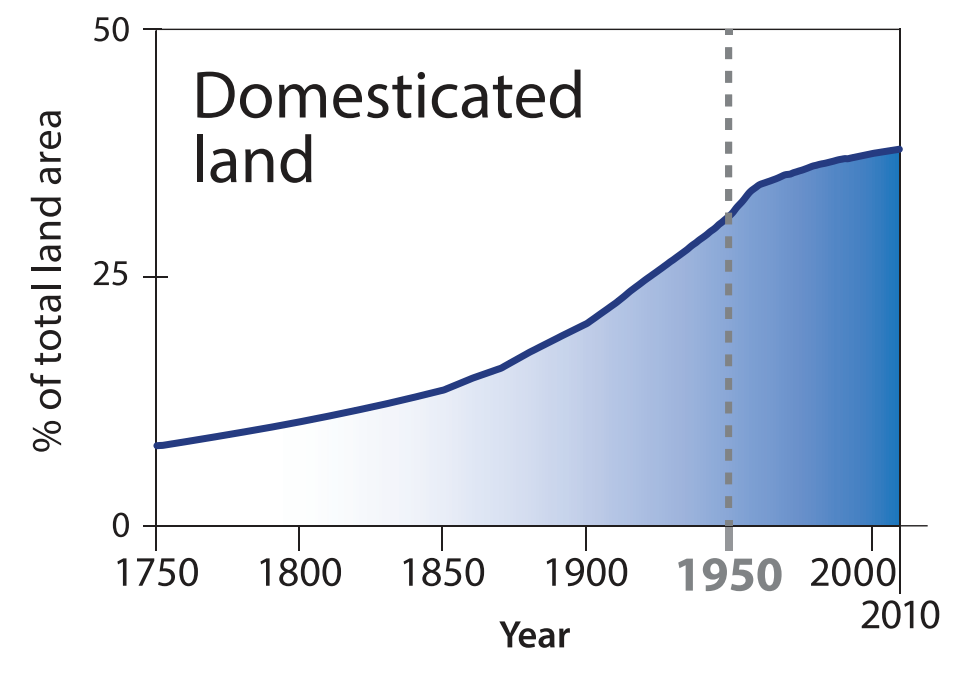
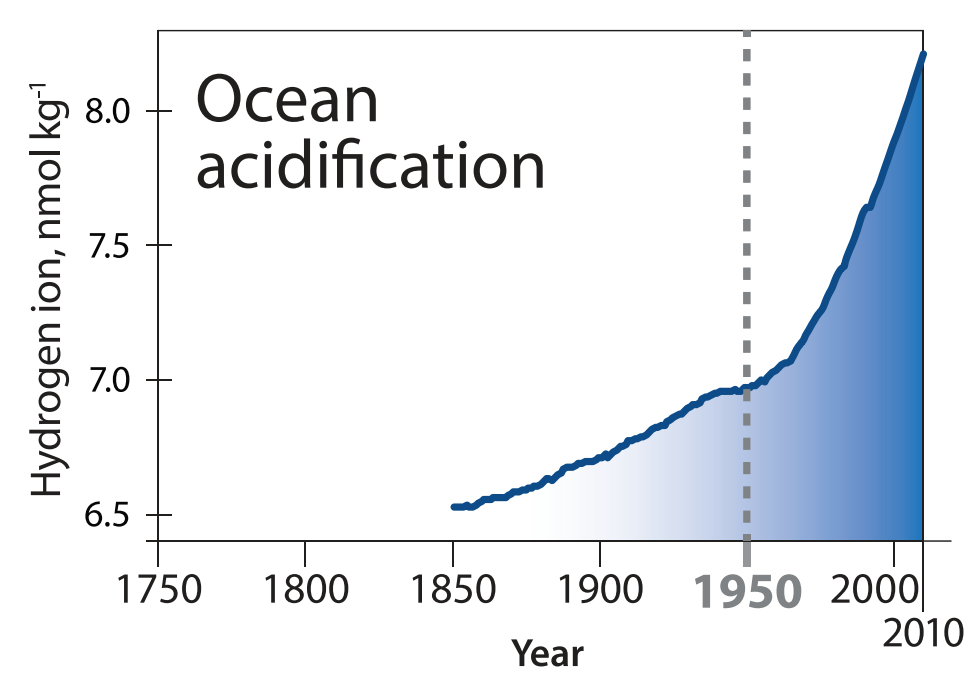
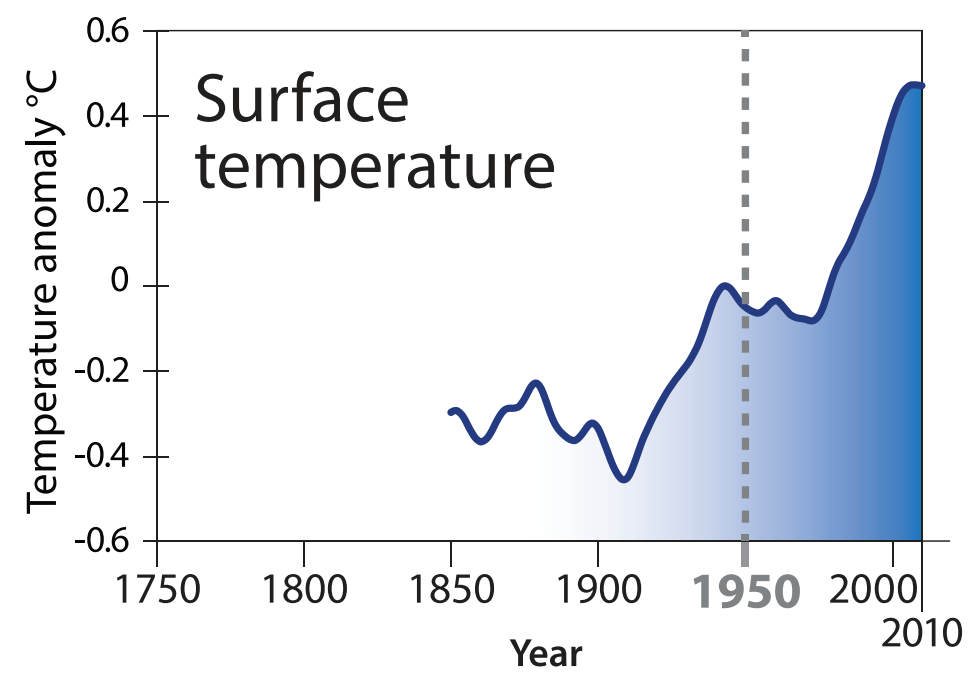
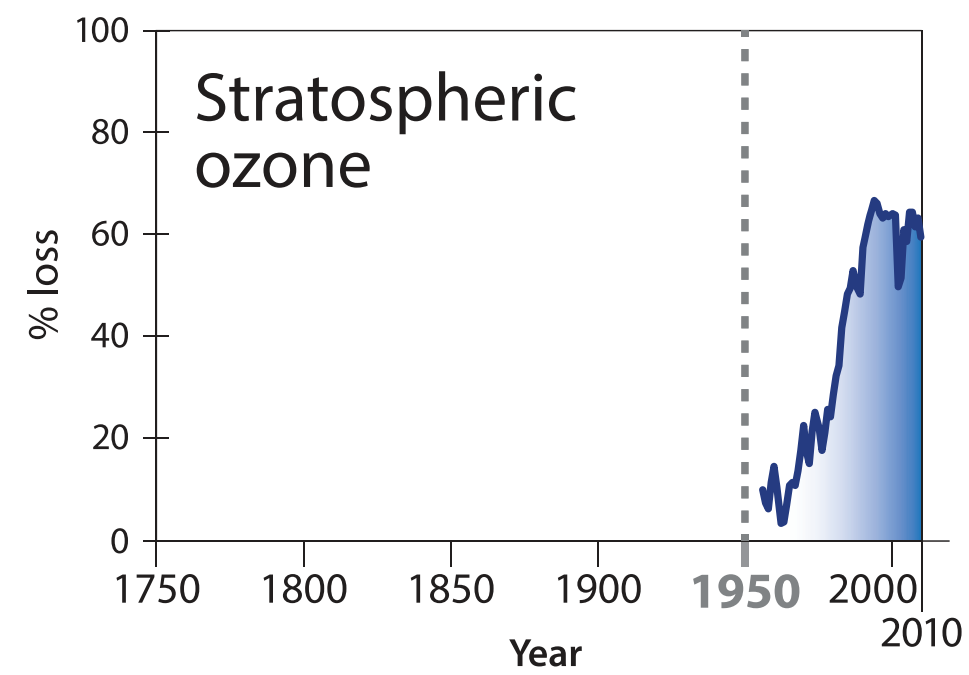
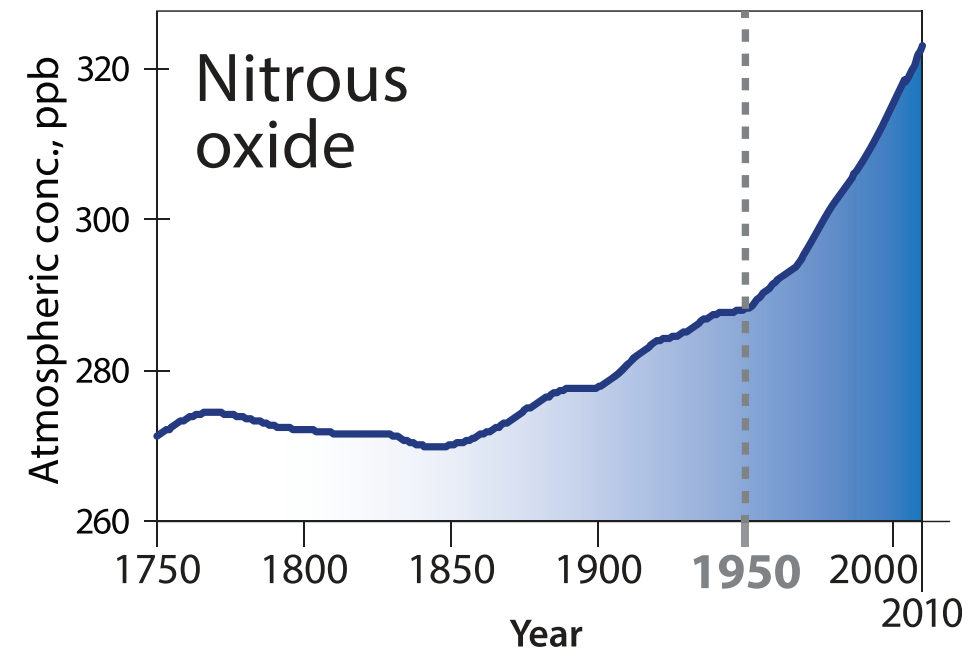
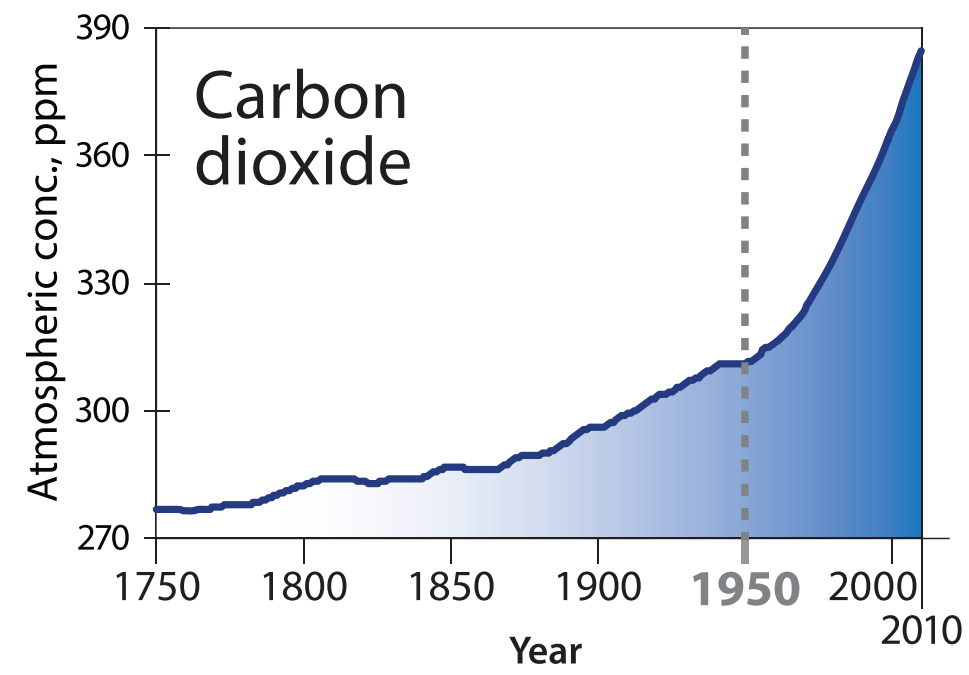
Anthropocene Stage 1: 1800 - 1945



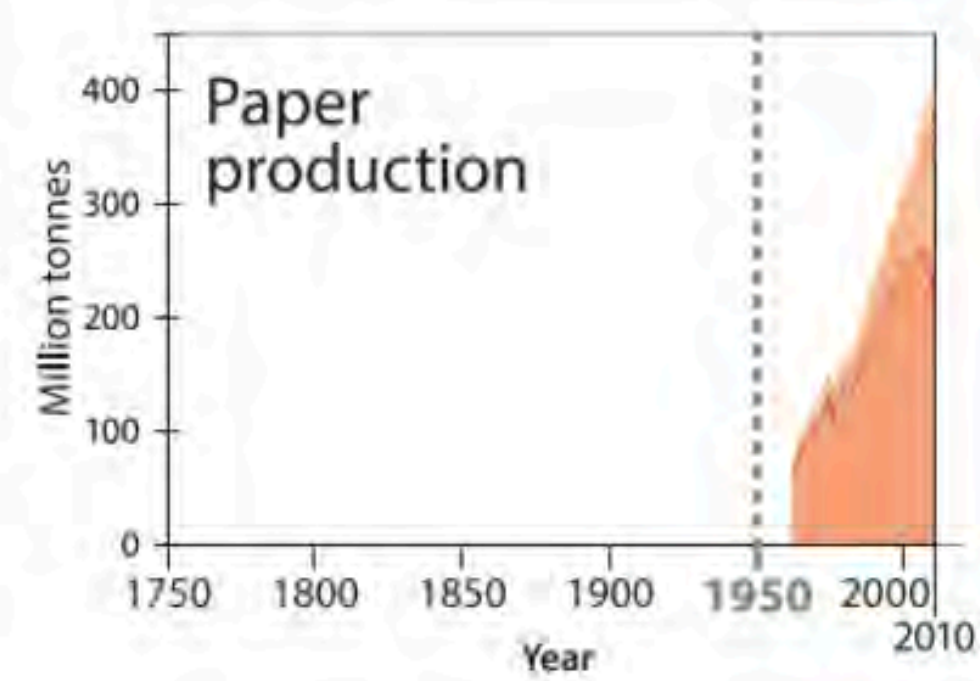
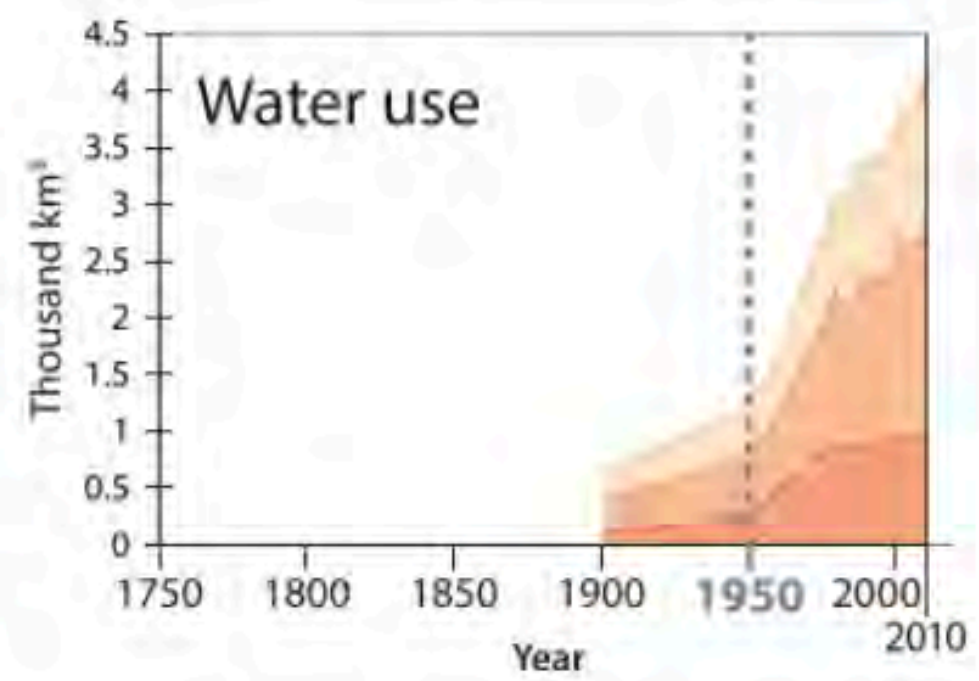
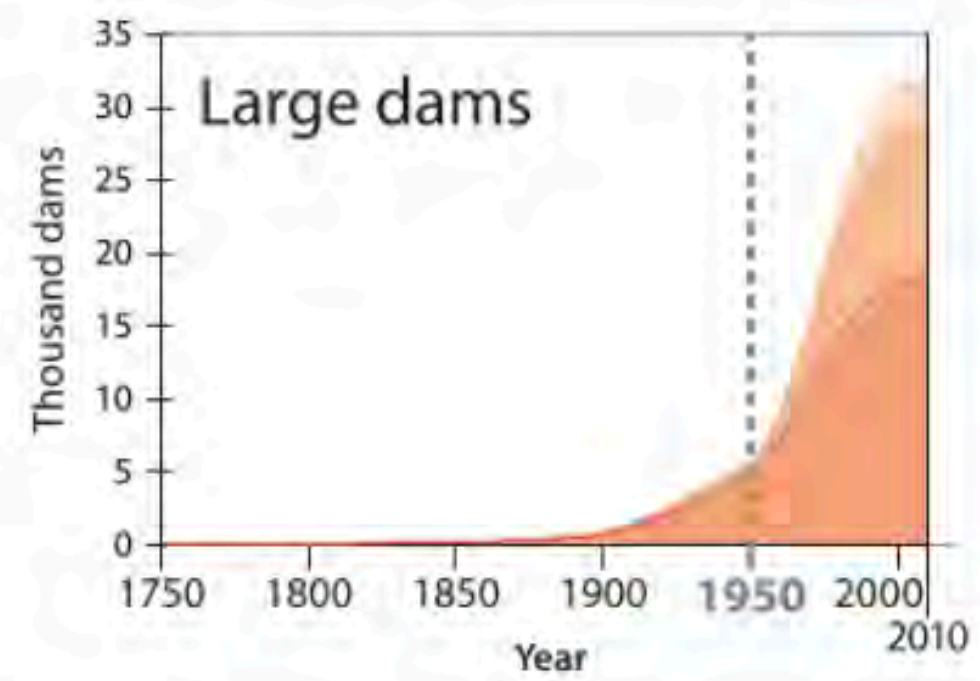
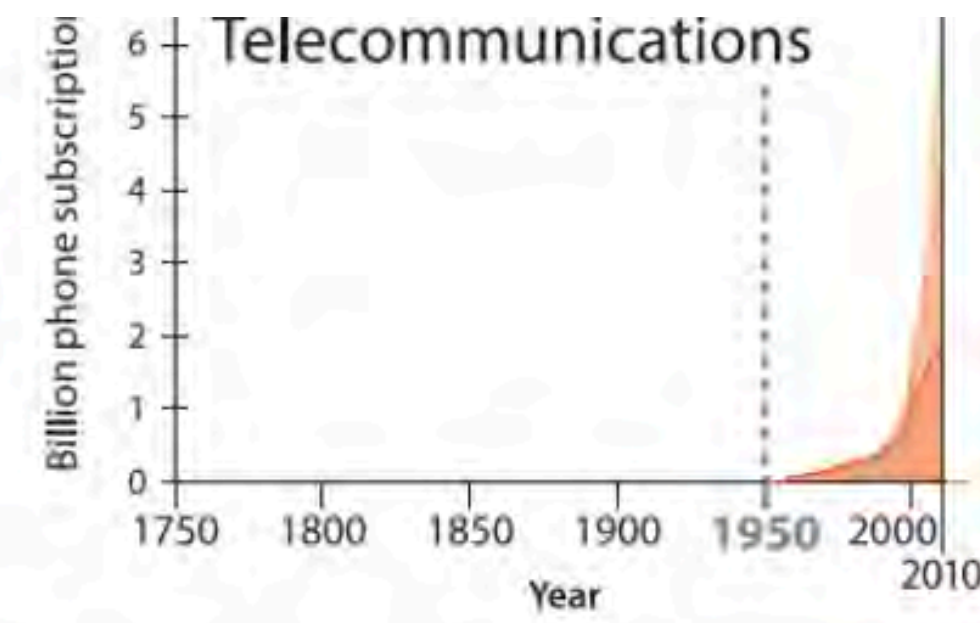
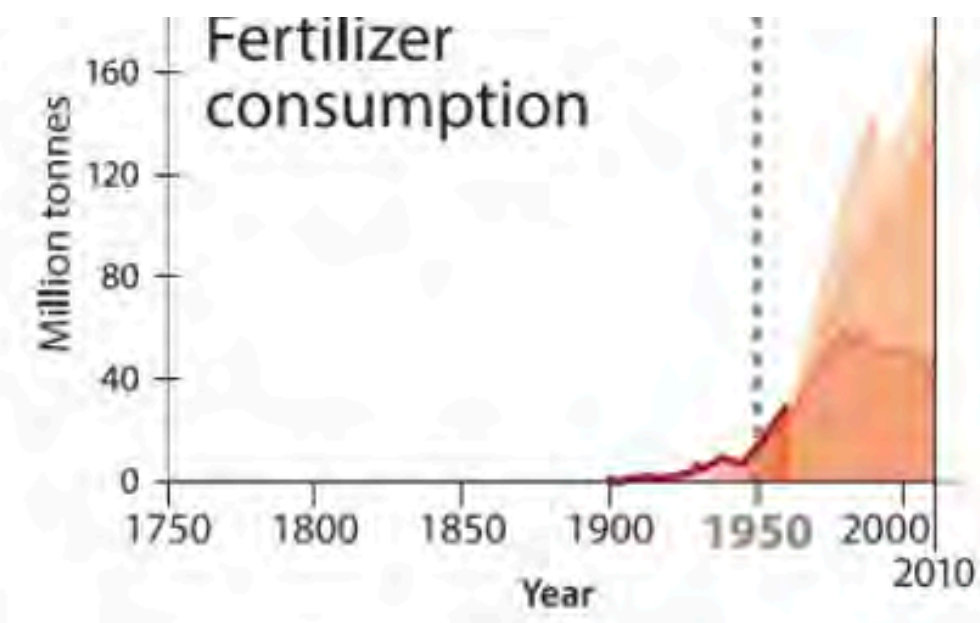
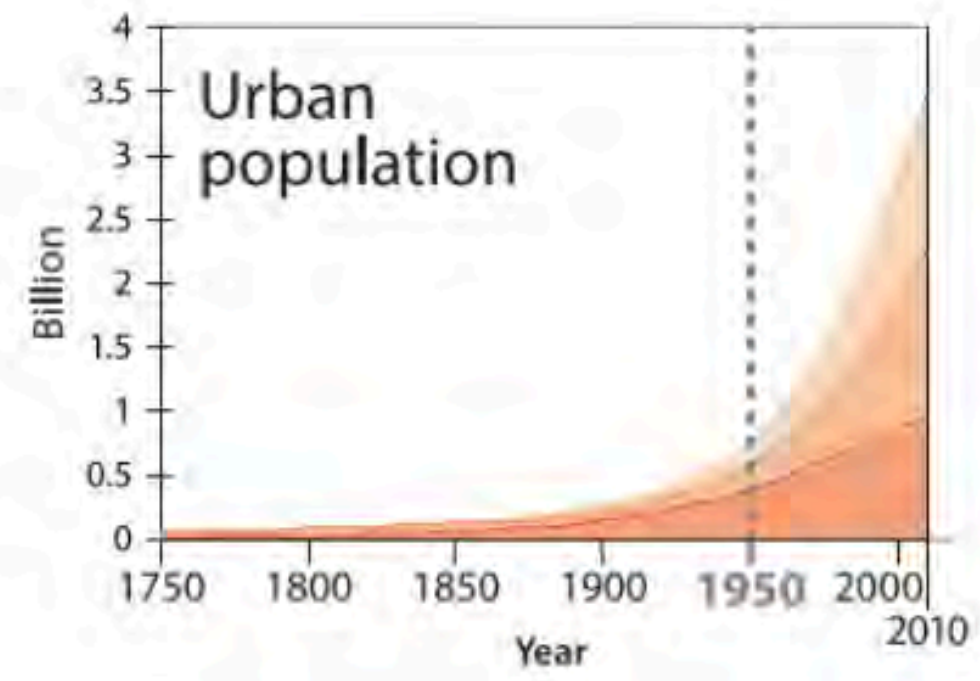
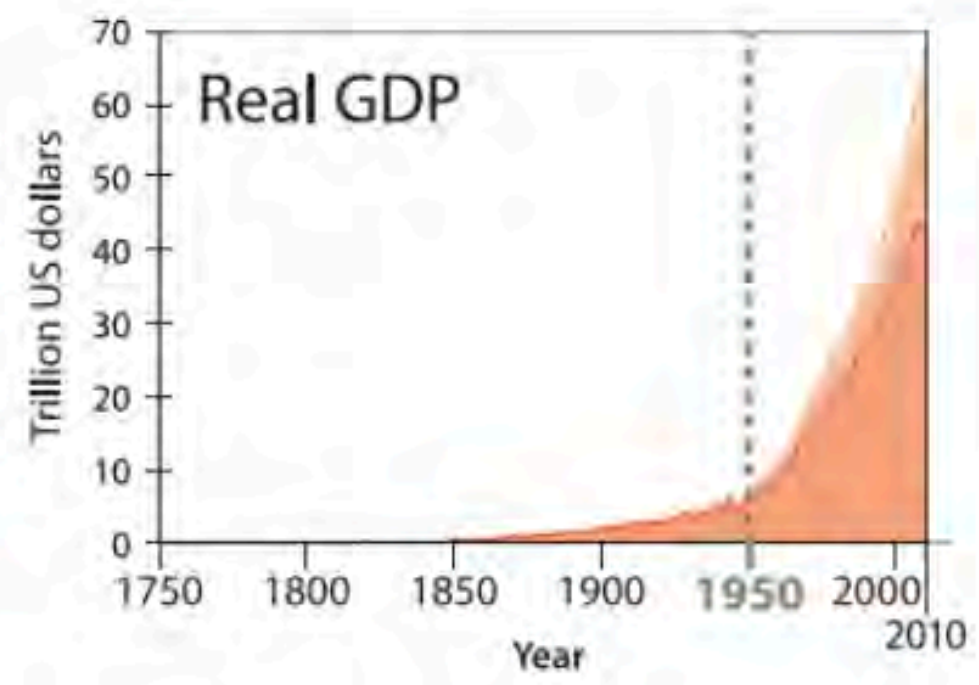
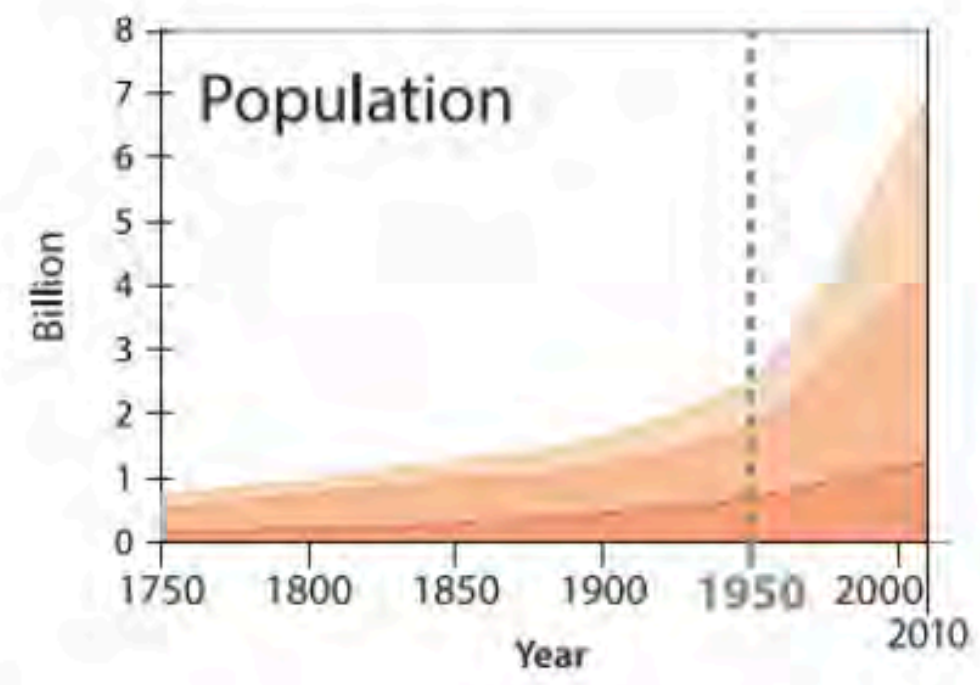
Anthropocene Stage 2: 1945 - 2020

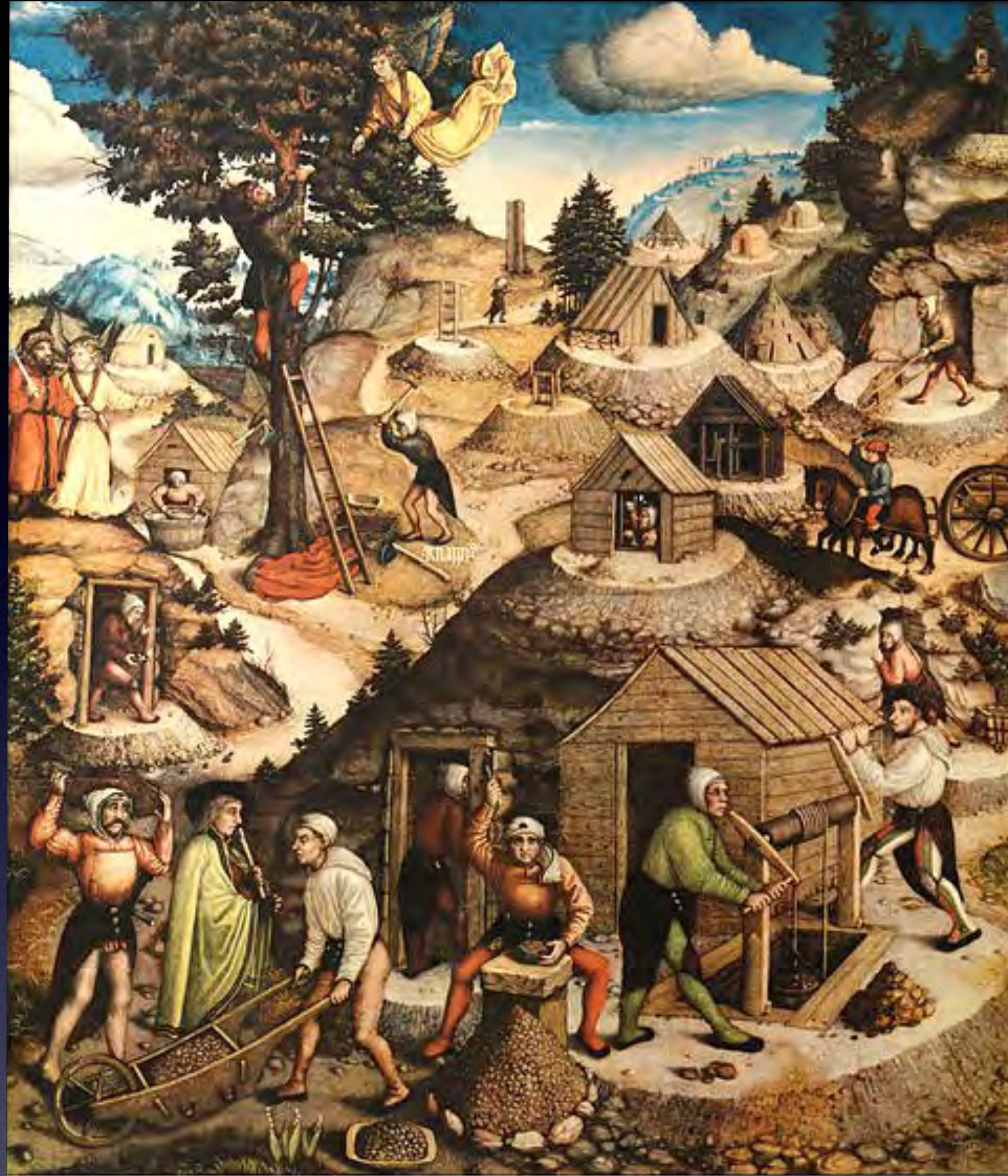
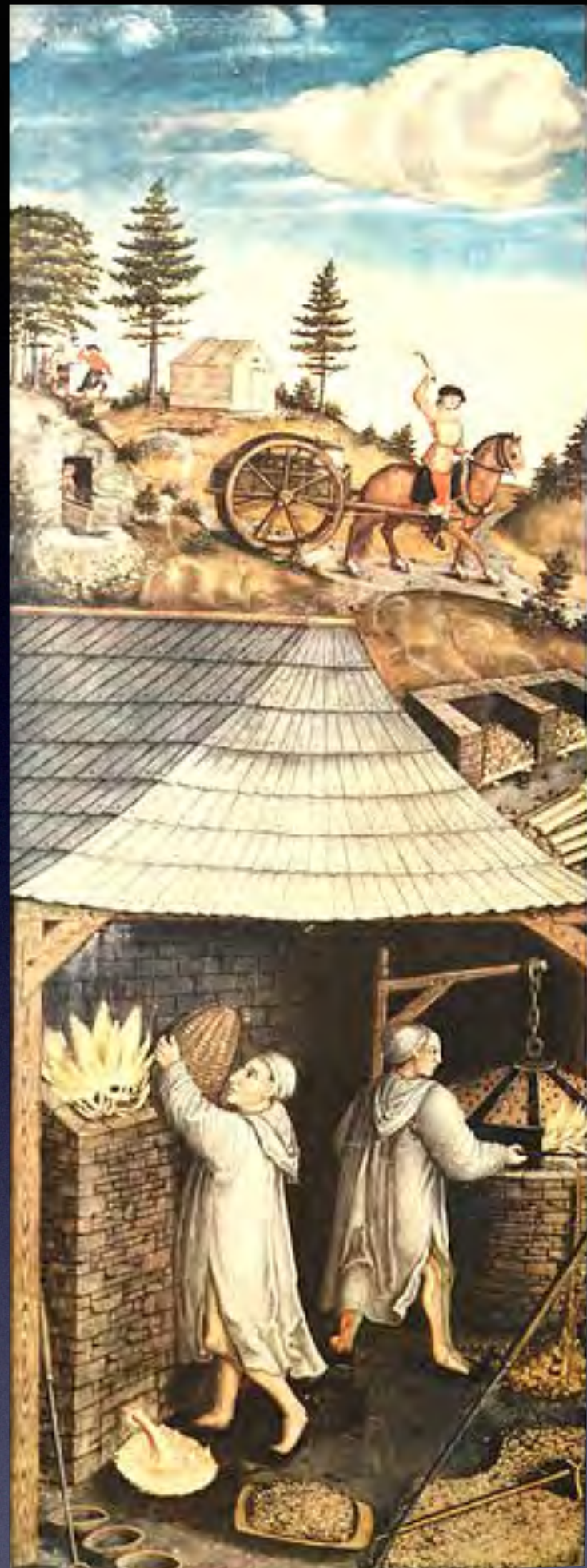


Steffen, W. et al. (2015). The trajectory of the Anthropocene:



Steffen, W. et al. (2015). The trajectory of the





1522

Annaberger Bergaltar, Hans Hesse, 1522, Dt. Fotothek

Scheinlösungen



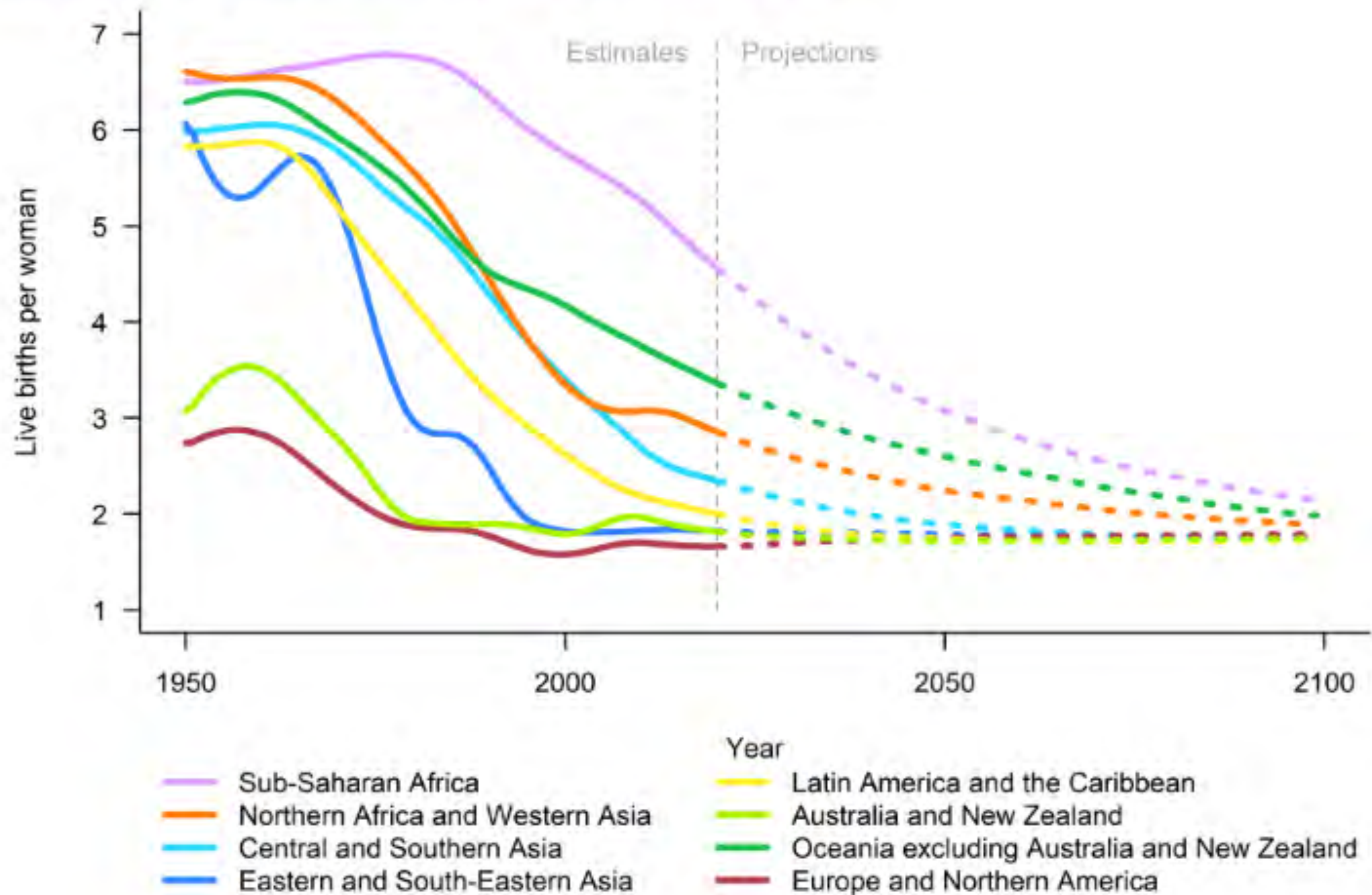
Club of Rome

Forscher fordern Belohnung für kinderlose Frauen

Seit Jahrzehnten warnt der Club of Rome vor ungebremstem Wachstum. Ein neuer Bericht versammelt nun Forderungen zum politischen Umsteuern. Eine davon: Kinderlose Frauen sollen mit 50 eine Prämie von 80.000 Dollar erhalten.

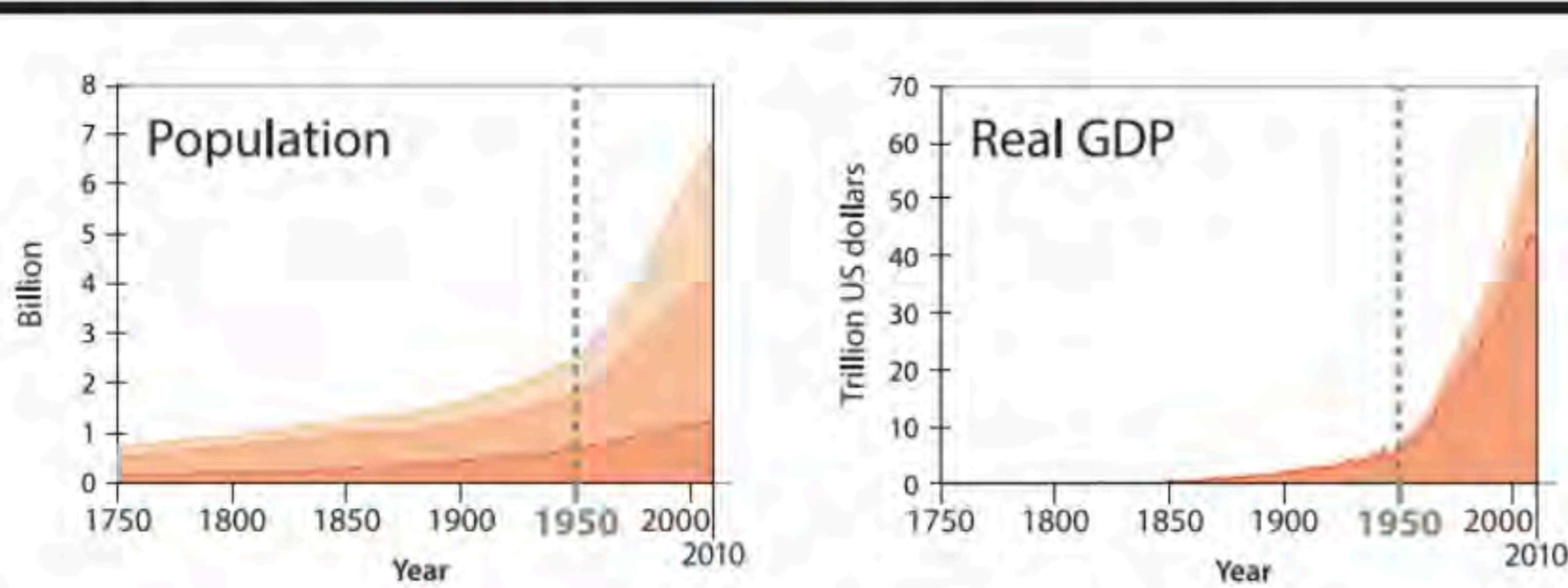


Total fertility rate by region, estimates and projections, 1950-2100



Source: United Nations Department of Economic and Social Affairs, Population Division (2019a). *World Population Prospects 2019*.

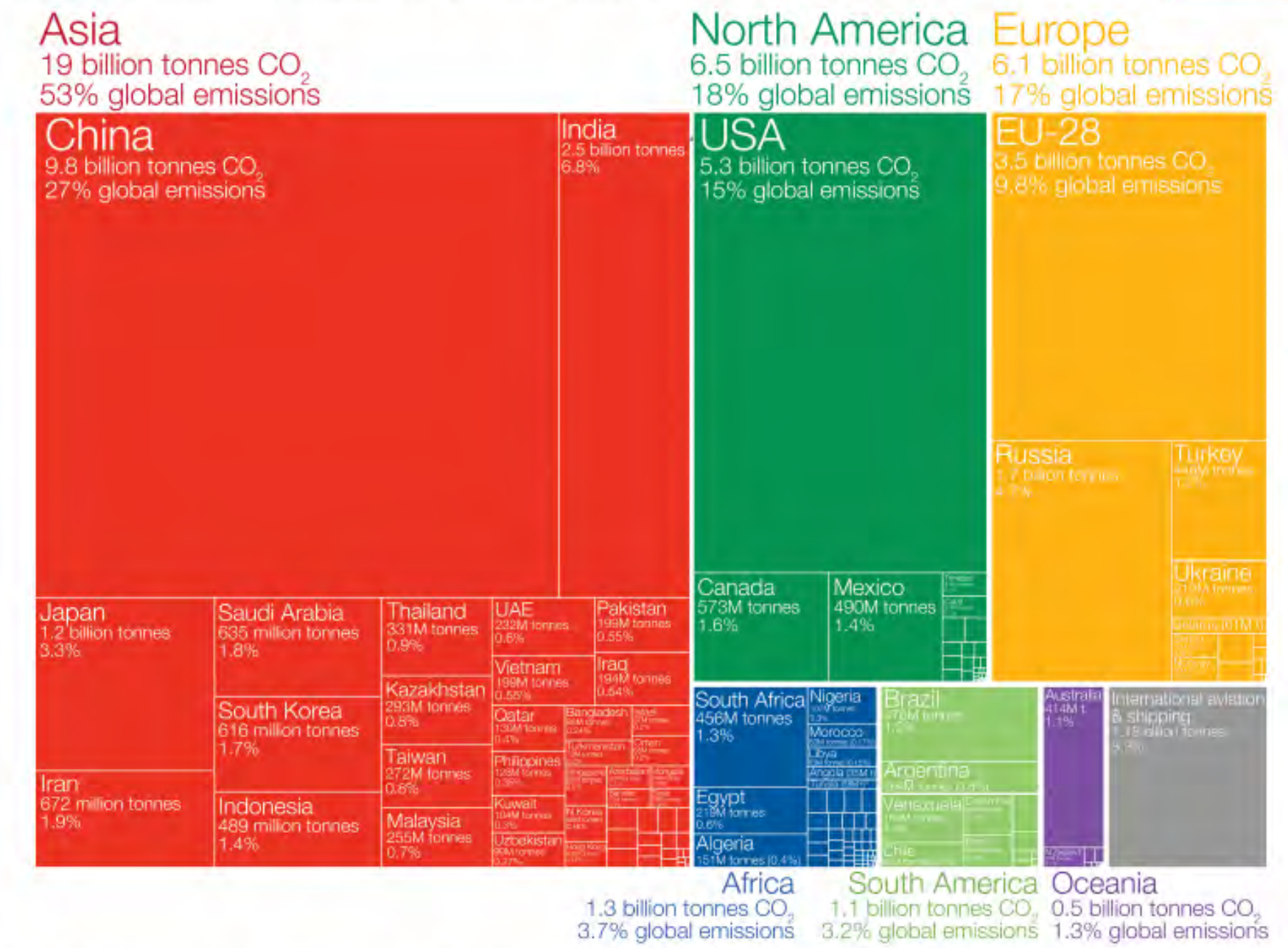
OECD
 BRICS
 Others



Who emits the most CO₂?

Global carbon dioxide (CO₂) emissions were 36.2 billion tonnes in 2017.

Our World in Data



Shown are national production-based emissions in 2017. Production-based emissions measure CO₂ produced domestically from fossil fuel combustion and cement, and do not adjust for emissions embedded in trade (i.e. consumption-based).

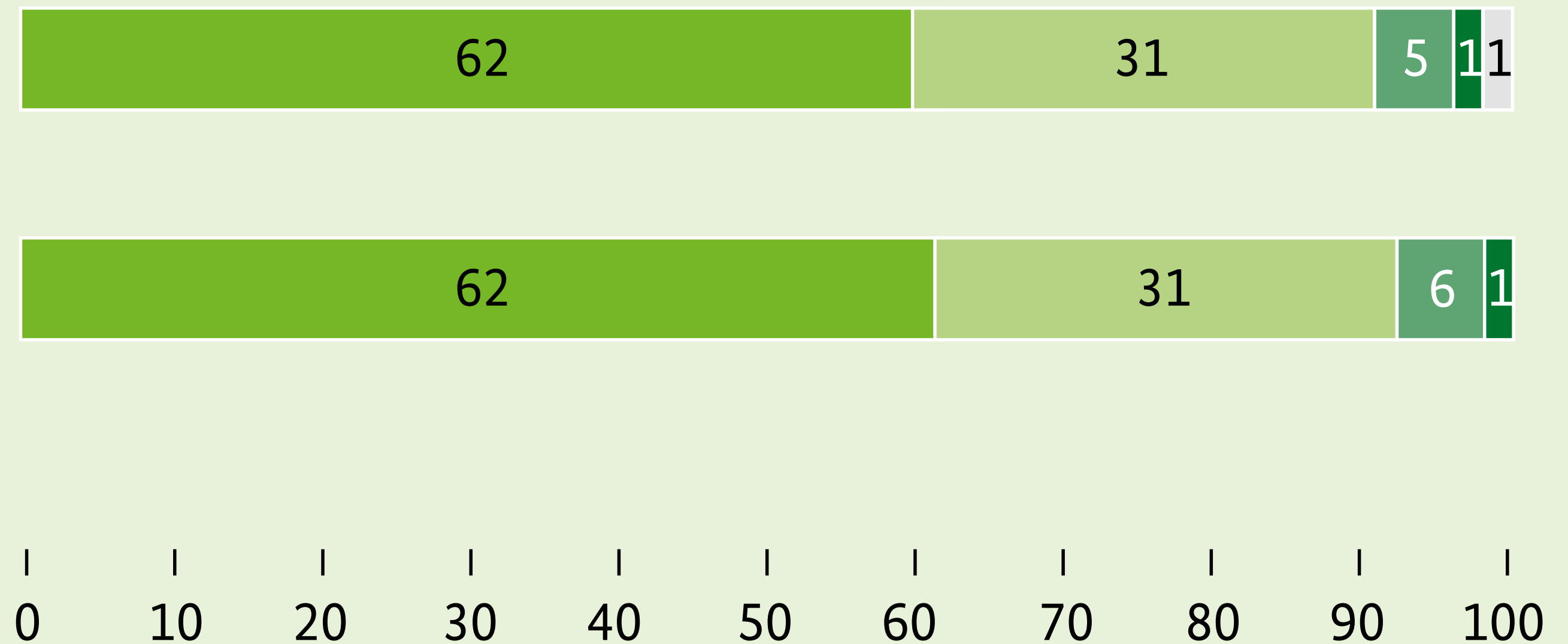
Figures for the 28 countries in the European Union have been grouped as the 'EU-28' since international targets and negotiations are typically set as a collaborative target between EU countries. Values may not sum to 100% due to rounding.

Data source: Global Carbon Project (GCP). This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing. Licensed under CC-BY by the author: Hannah Ritchie.

	Mainstream	Critical-creative	Precarious
positive attitudes to nature	0.92	1.20	0.87
Resource-consumption	1.01	1.11	0.82

Die Natur darf nur so genutzt werden, dass die Vielfalt der Pflanzen und Tiere sowie ihrer Lebensräume auf Dauer gesichert ist

Wir dürfen die Natur nur so nutzen, dass dies auch für kommende Generationen im gleichen Umfang möglich ist



trifft voll und ganz zu

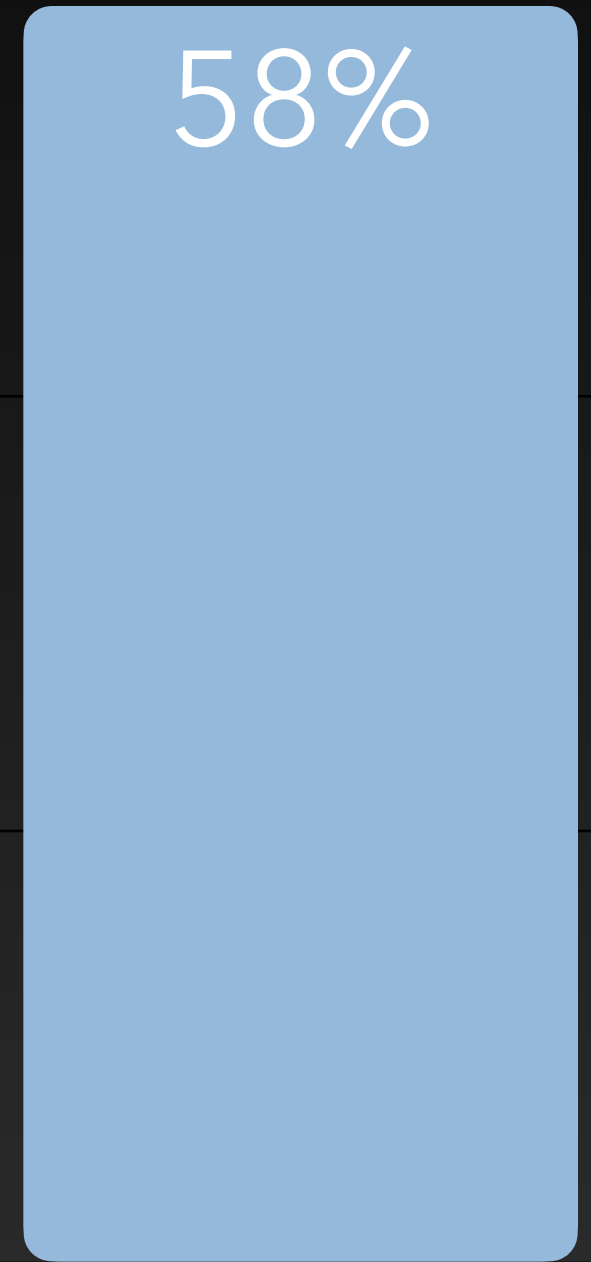
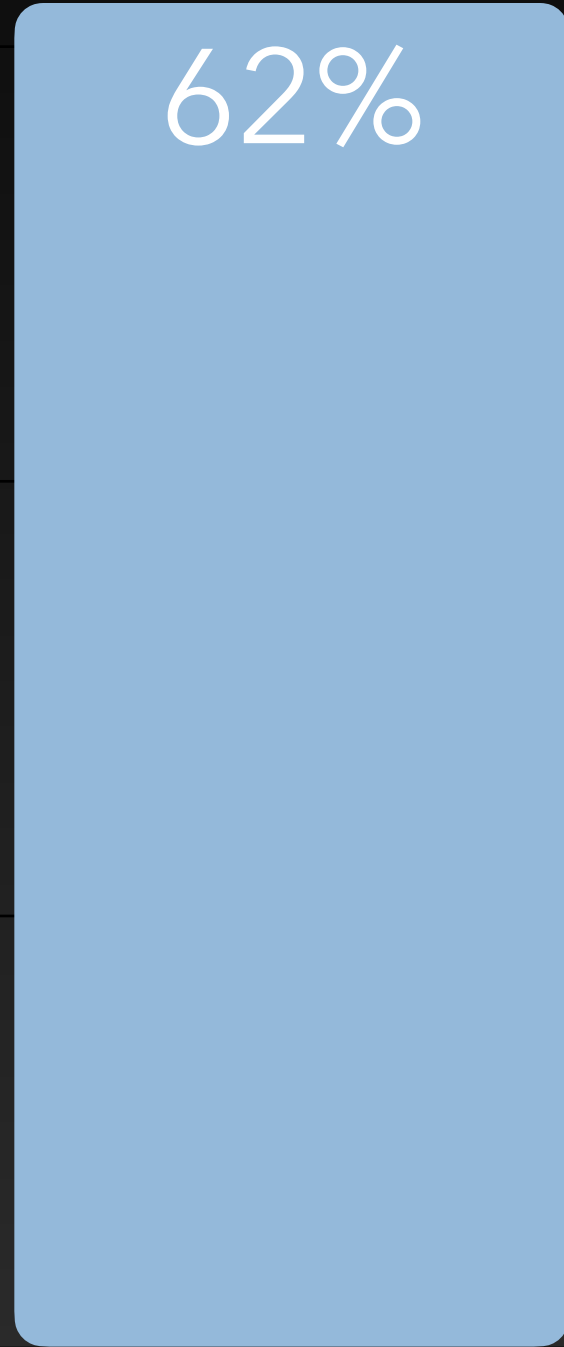
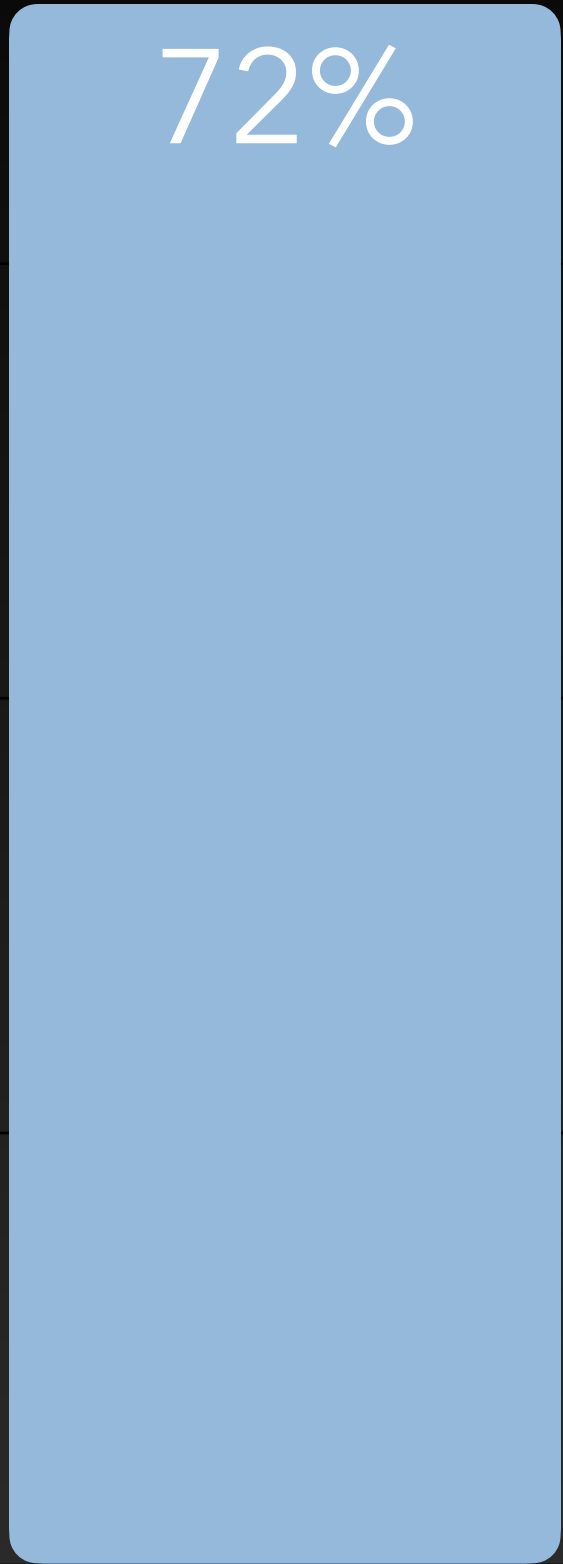
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weiß nicht/keine Angabe

trifft eher zu

trifft überhaupt nicht zu

Angaben in Prozent

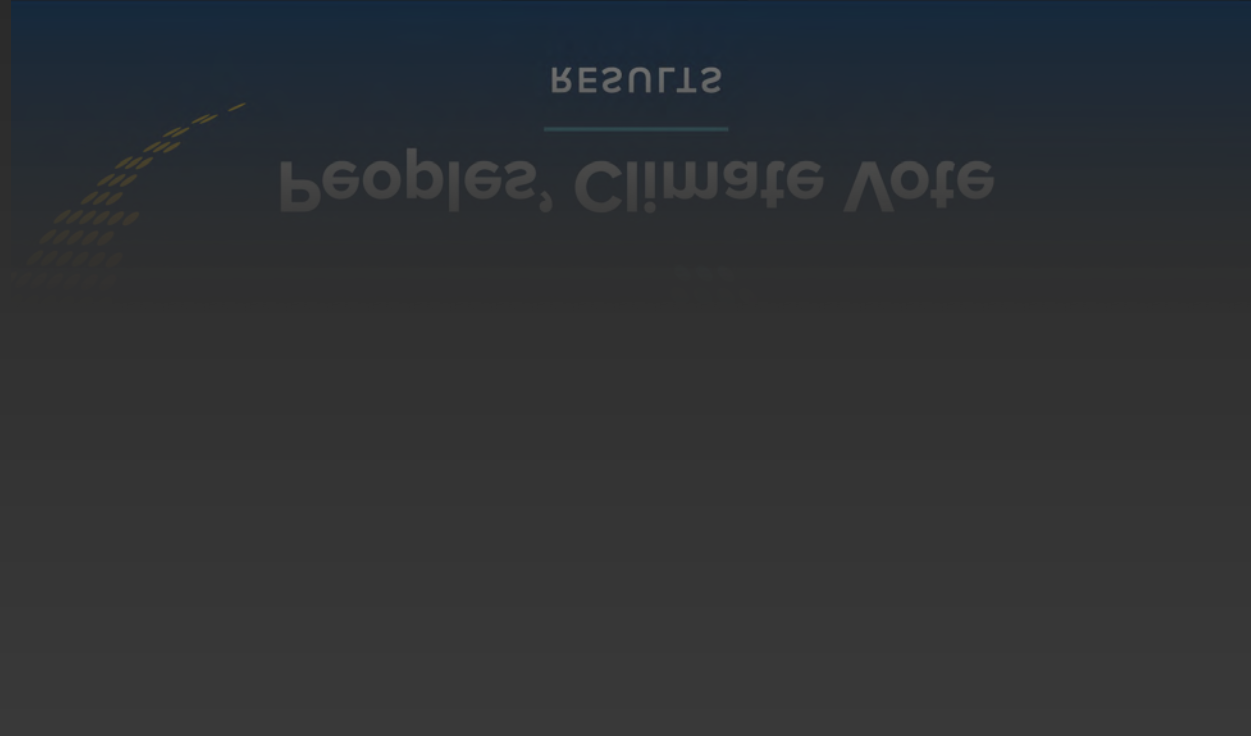


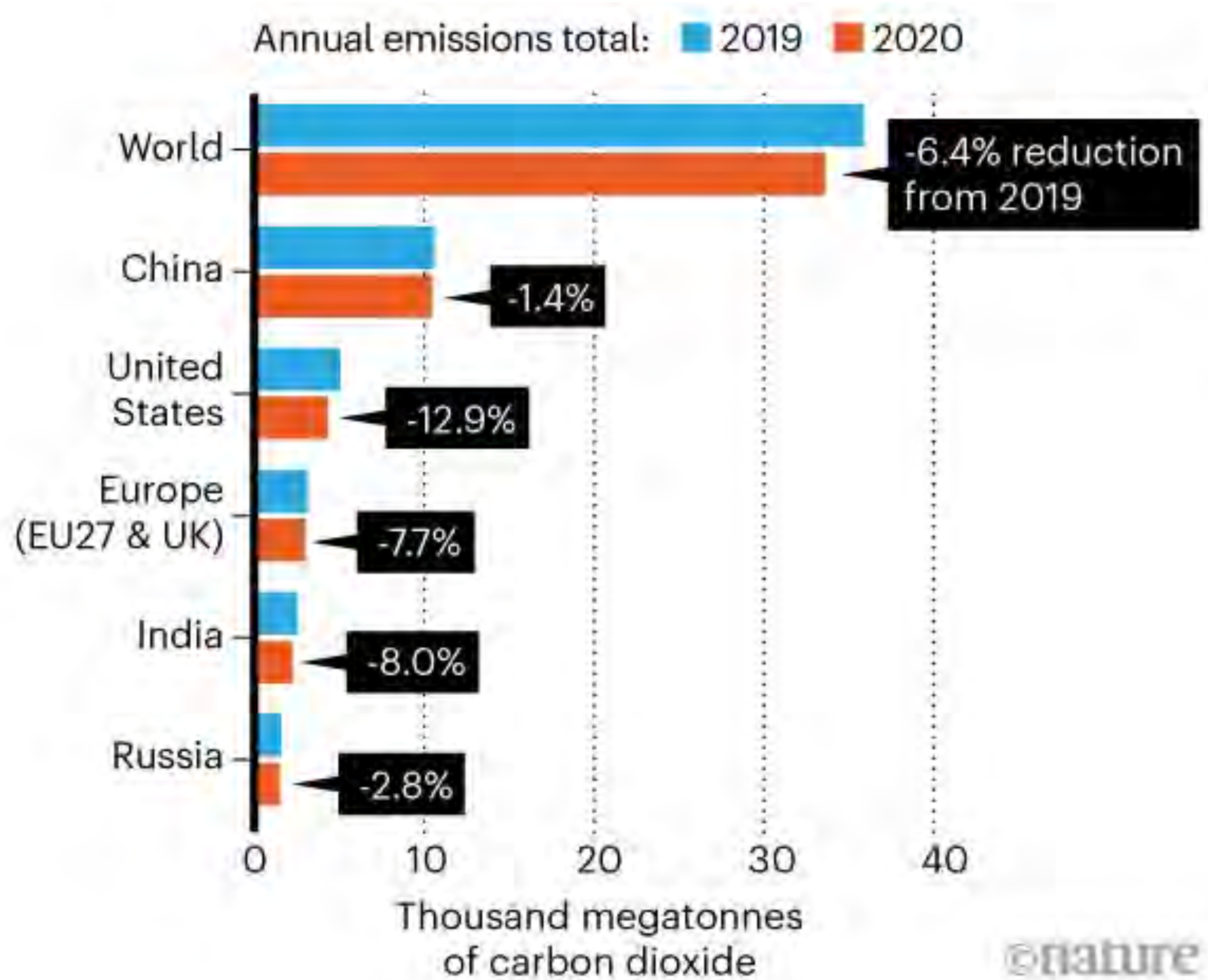
Small Islands
Developing States

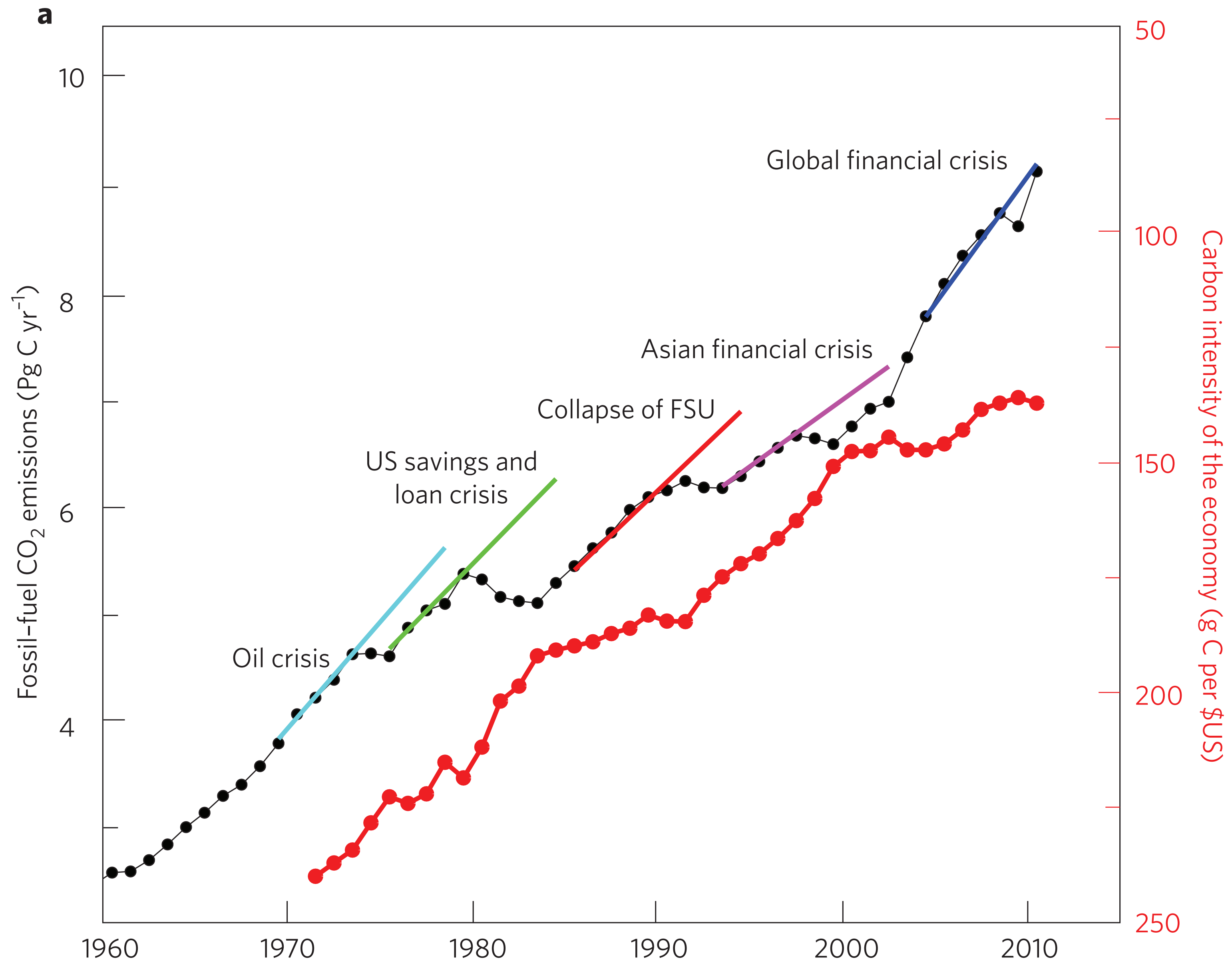
High Income
Countries

Middle Income
Countries

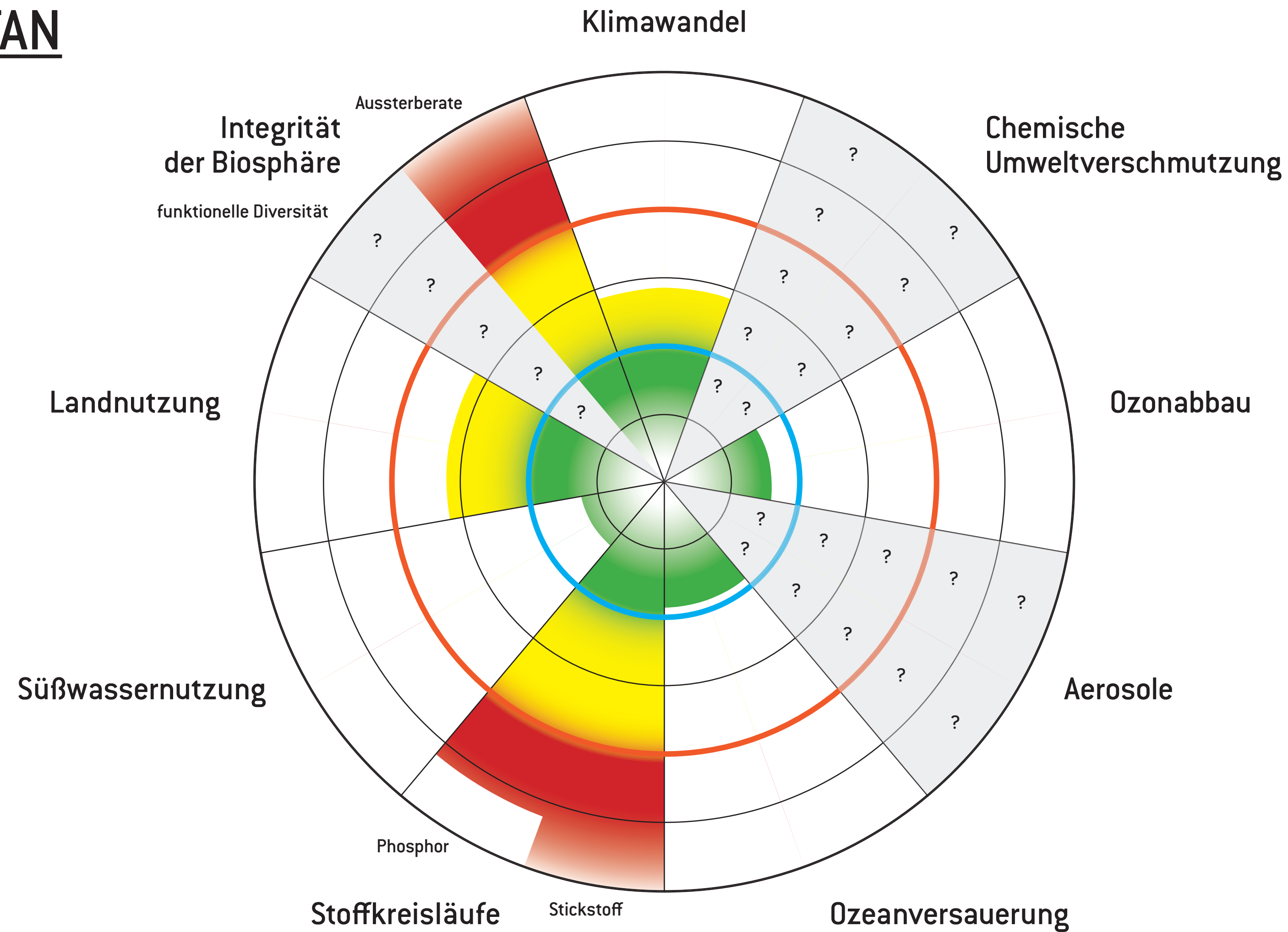
Least Developed
Countries



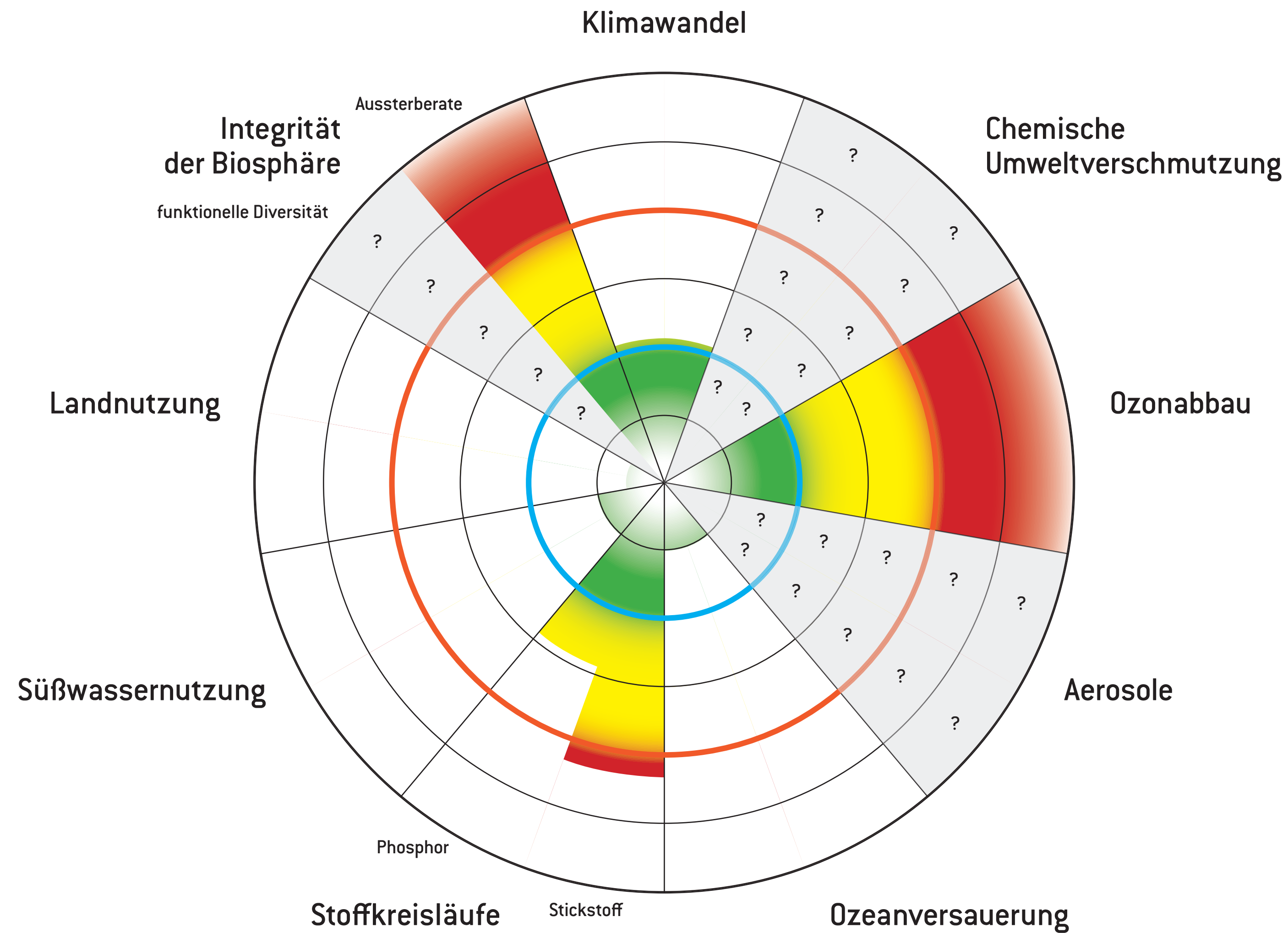




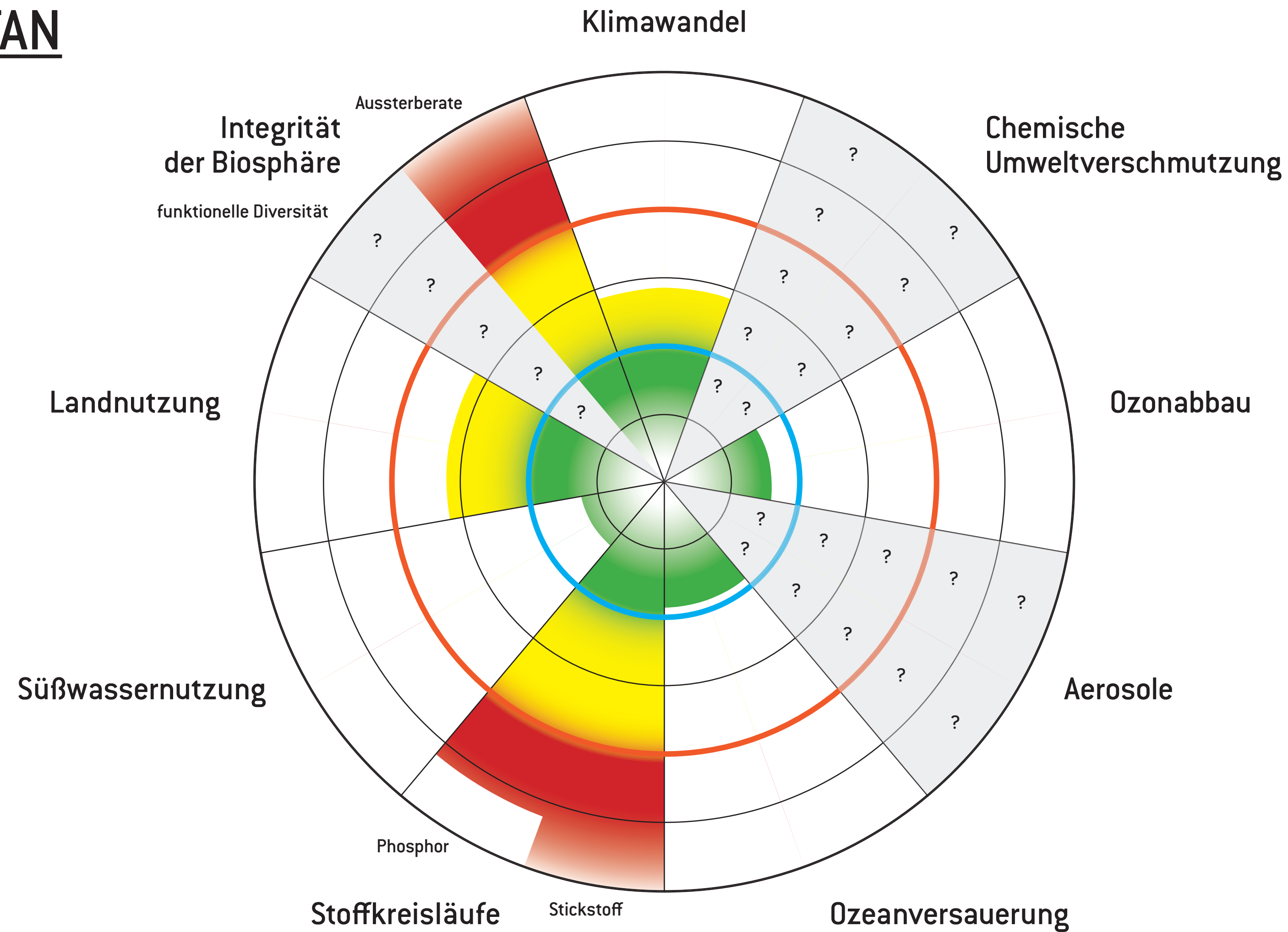
MOMENTAN



1990



MOMENTAN





28th Meeting of the Parties to the Montreal Protocol
10 - 14 October 2016, Kigali, Rwanda



DUBAI PATHWAY
CFCs HFCs

MEETING OF THE PARTIES TO THE MONTREAL PROTOCOL

UNDP

SRI LANKA

ZIMBABWE

RWANDA

ZAMBIA

WORLD BANK



20%
SALE

20%
SALE

20%
SALE

NEU

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bac

Fa
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MY DRY
BLACK ESPRESSO

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CO₂-Ausstoß pro Liter Wasser



202,74g



0,35g



65 Mrd. Euro

Umweltschädliche
Subventionen



Umweltschädliche
Subventionen

2,6 Mrd.
Euro



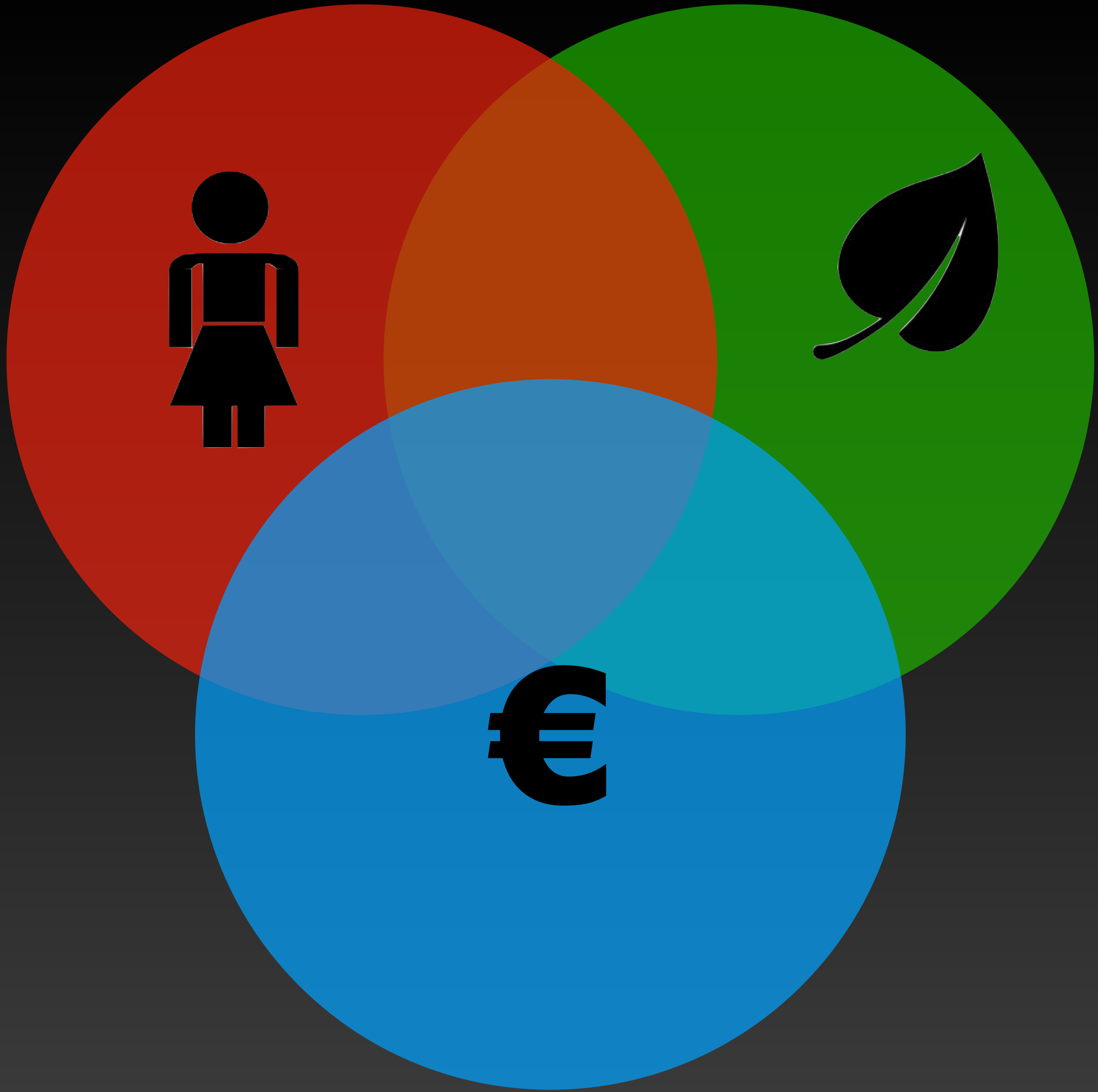
BMUV

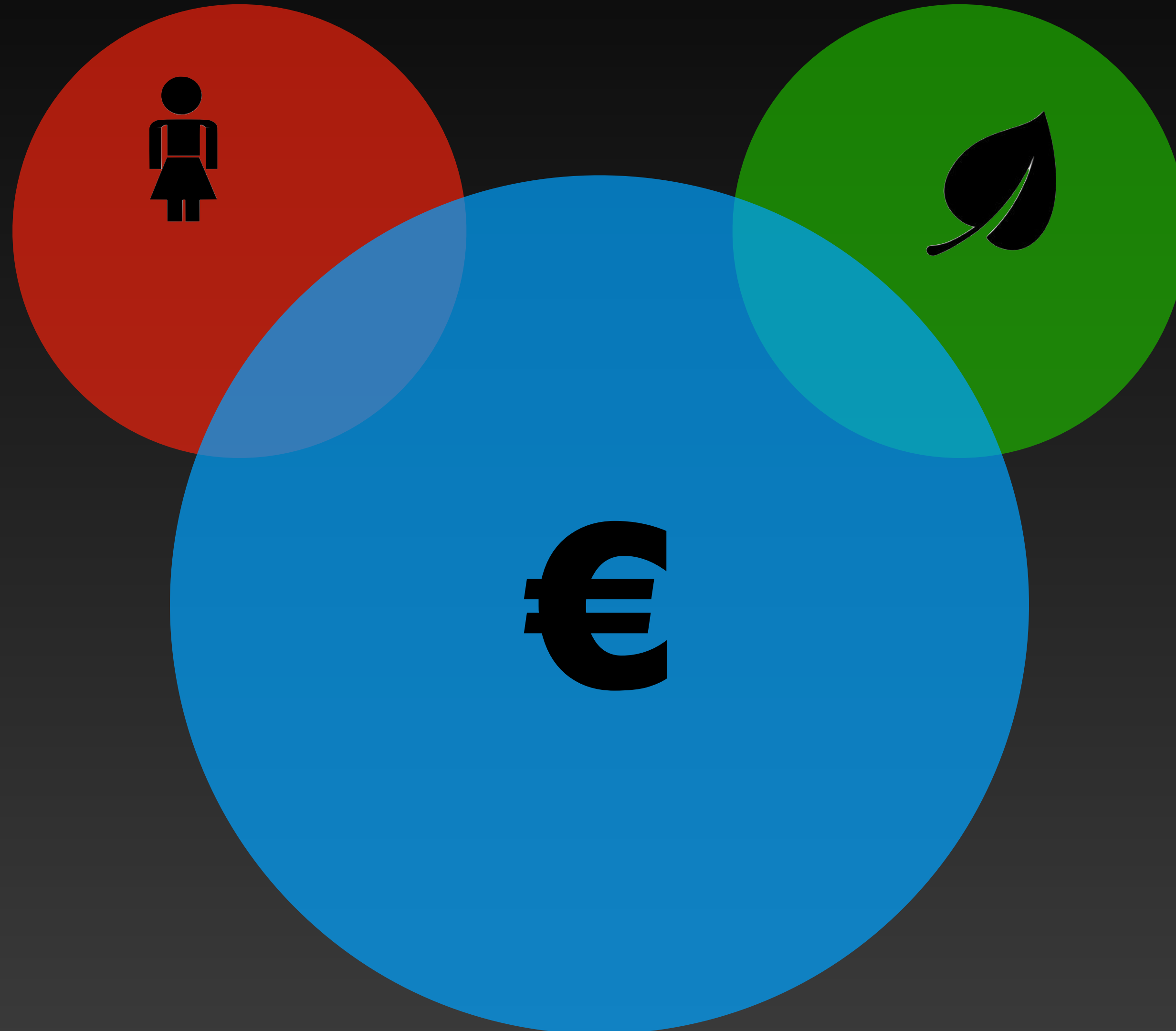


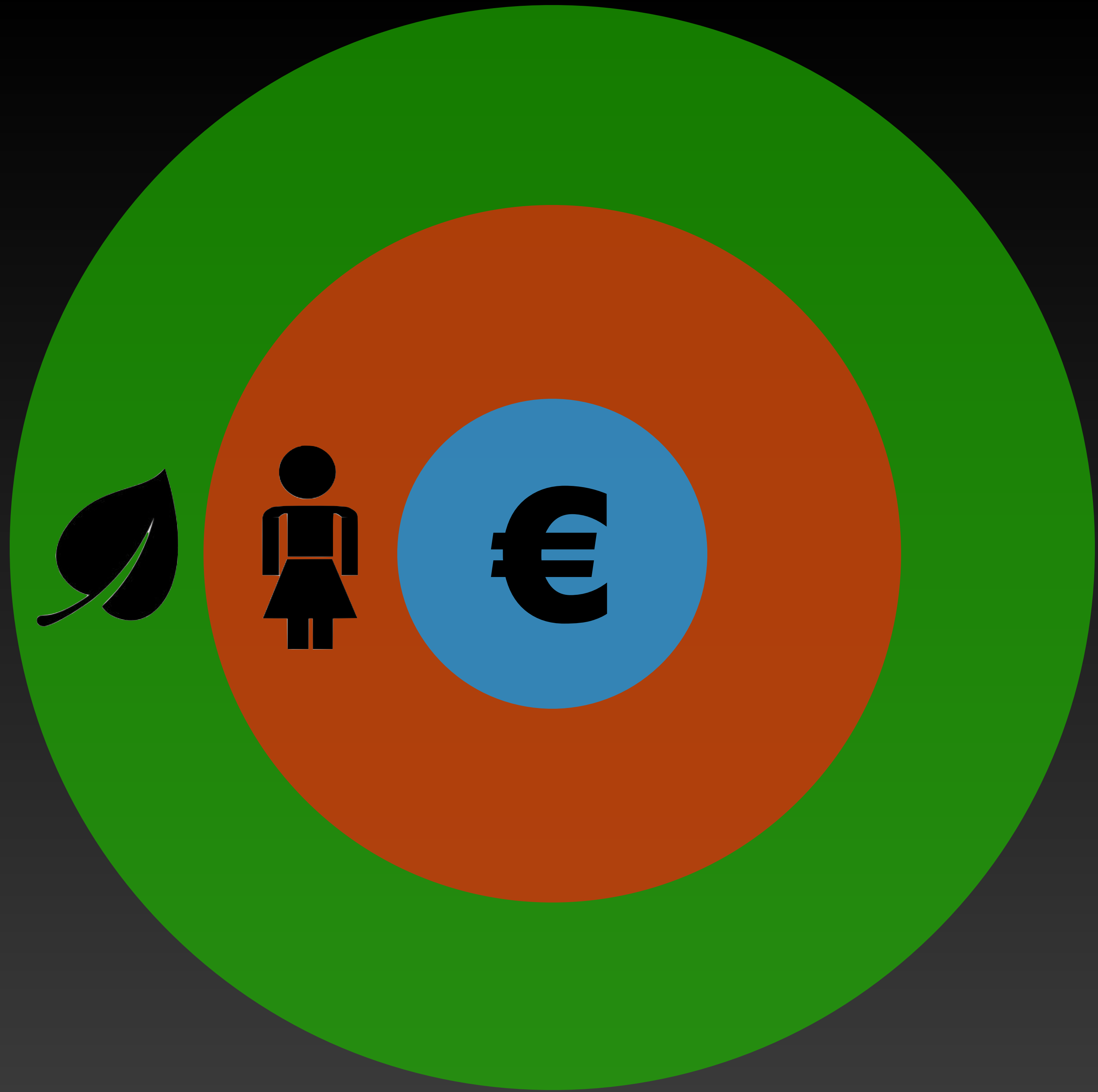
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Willkommen im Anthropozän – Ein How To

- ▶ Auf den folgenden Seiten finden Sie die Folien zum Vortrag.
- ▶ **Auf nahezu allen Folien ist weiterführende Literatur bzw. Quellen verlinkt.** Diese kann Ihnen helfen, sich in Teilaspekten zu vertiefen.
- ▶ Nach der Vorlesung sollten Sie eine Vorstellung von folgenden Konzepten haben: **starke vs. schwache Nachhaltigkeit, Anthropozän, planetaren Belastungsgrenzen, Great Acceleration, Umweltschädliche Subventionen, Globale Nachhaltigkeitsziele (SDGs).** Diese werden in den folgenden Wochen aufgegriffen und vertieft.

Weiterführende Literatur

- Niebert, K. (2018). Das Anthropozän ist kein Schicksal, sondern eine Herausforderung. In C. Seige (Ed.), Dossier Anthropozän (pp. 1–14). bpb: Berlin. [Download](#)
- Niebert (2022): Nachhaltigkeitsdilemmata: Ausreden, alte Fehler und neue Aufbrüche [Download](#).
- Diverse Infografiken zum Thema: [Download](#); weiterführende Texte: www.movum.info