IST DIE KLIMAPOLITIK

GUT GENUG FÜR DAS KLIMA?

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Klimaänderung heute

Wo stehen wir und was ist in Zukunft zu erwarten
1,5°C oder 2°C – macht es einen Unterschied?
Kurz- und langfristige Veränderungen und die Rolle der Ozeane

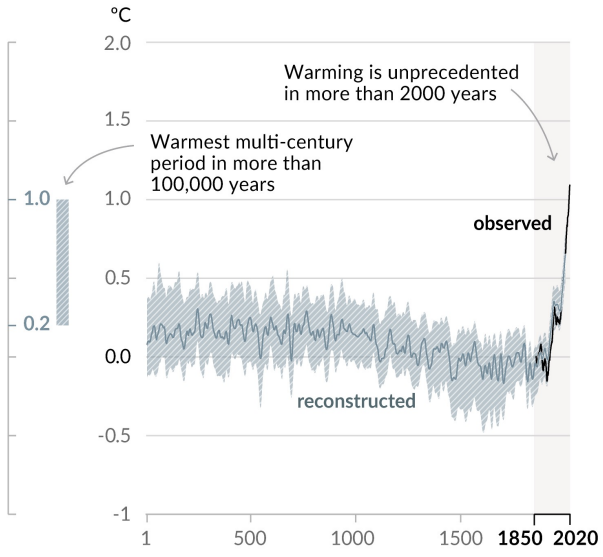
Emissionspfade Richtung 1,5°C

Emissionsentwicklung und Klimapolitik

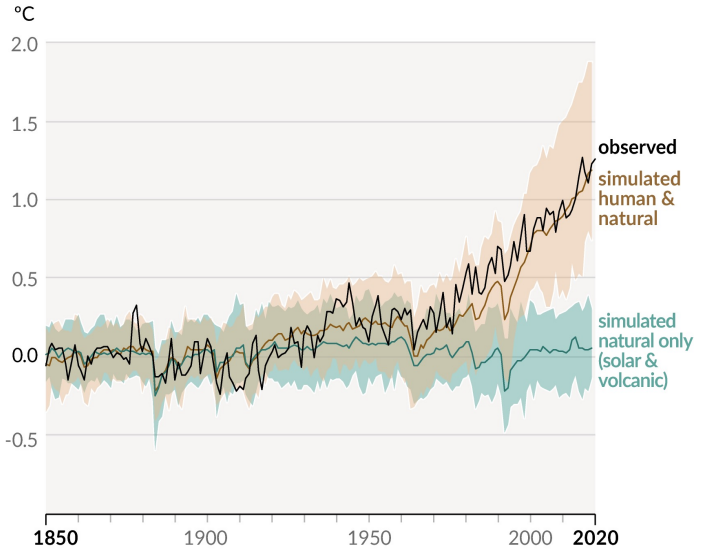
Die durch den Menschen verursachte Erwärmung ist beispiellos seit 2000 Jahren

Höhere Temperaturen im letzten Interglazial vor 125.000 Jahren

a) Change in global surface temperature (decadal average) as reconstructed (1-2000) and **observed** (1850-2020)

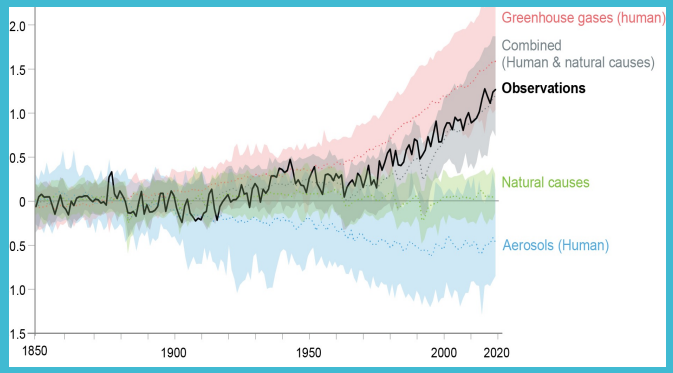


b) Change in global surface temperature (annual average) as **observed** and simulated using human & natural and only natural factors (both 1850-2020)



IPCC AR6 WGI 2021 – Figure SPM.1 and FAQ 3.1

Die Wirkung der Treibhausgase wird zum Teil durch Aerosole überlagert



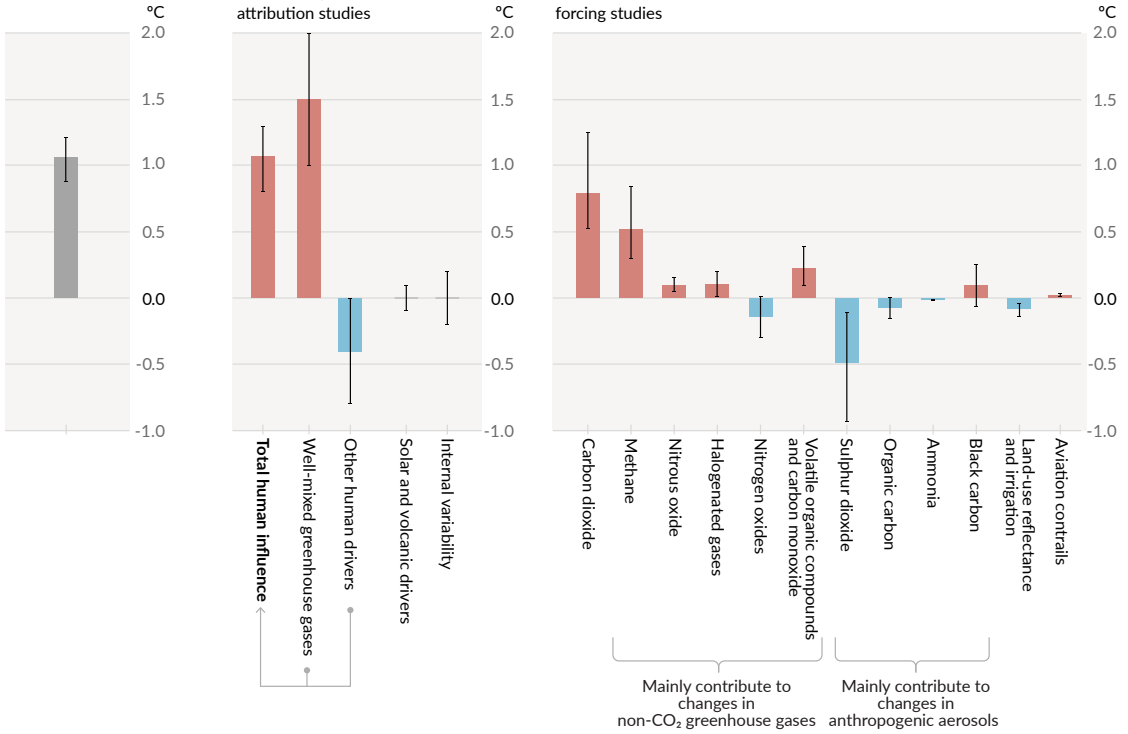
Observed warming

Contributions to warming based on two complementary approaches

a) Observed warming 2010-2019 relative to 1850-1900

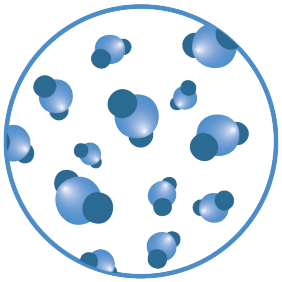
b) Aggregated contributions to 2010-2019 warming relative to 1850-1900, assessed from attribution studies

c) Contributions to 2010-2019 warming relative to 1850-1900, assessed from radiative forcing studies



Jüngste klimatische Veränderungen sind weitreichend, rapide, werden immer intensiver und beeinträchtigen alle Regionen.

CO_2 concentration



Highest

in at least

2 million years

Sea level rise

Fastest rates

in at least

3000 years

Arctic sea ice area

Lowest level

in at least

1000 years

Glaciers retreat

Unprecedented

in at least

2000 years

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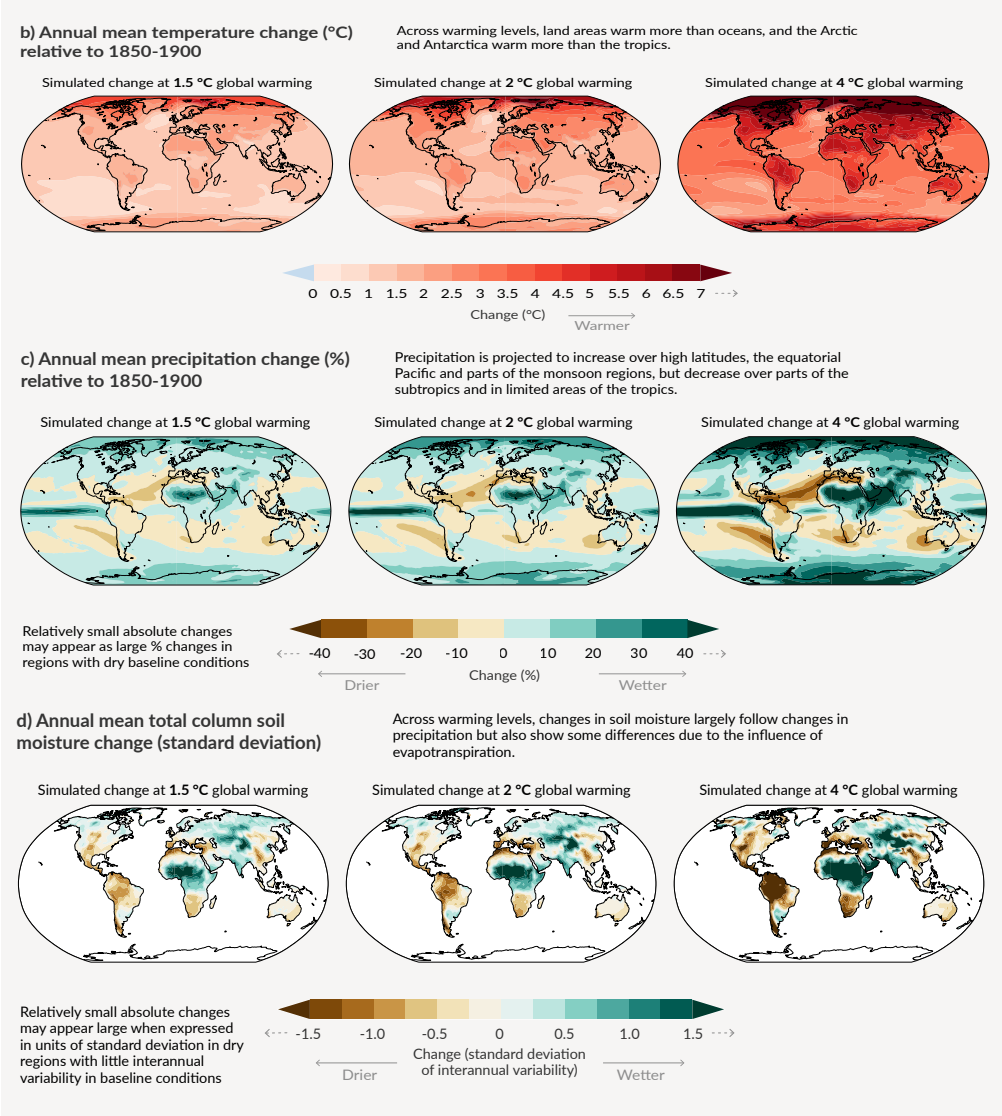
Mit jeder weiteren Erwärmung werden Änderungen im Klimasystem stärker



IPCC AR6 WGI 2021 – Figure SPM.5

FAQ8.3: **Climate change and droughts**

In some regions, drought is expected to increase under future warming

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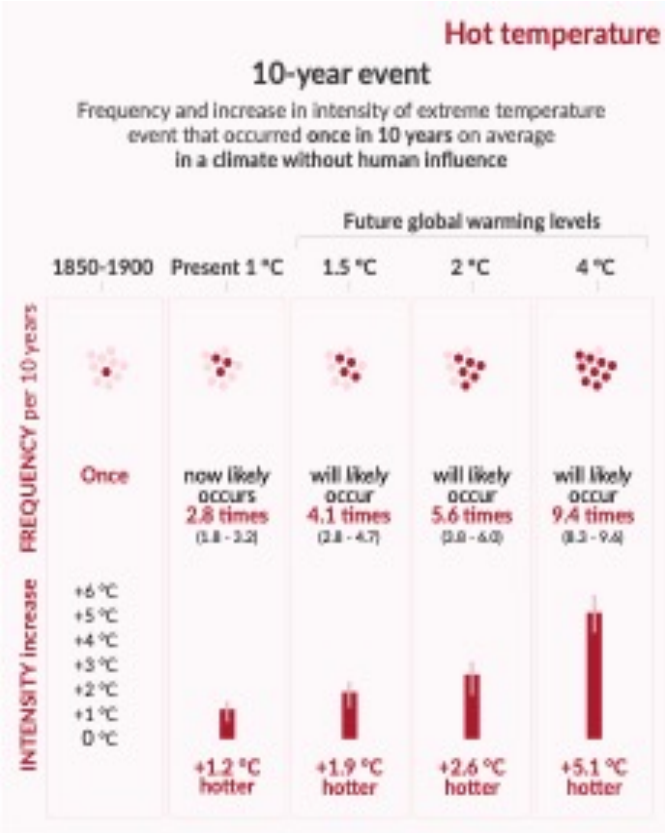
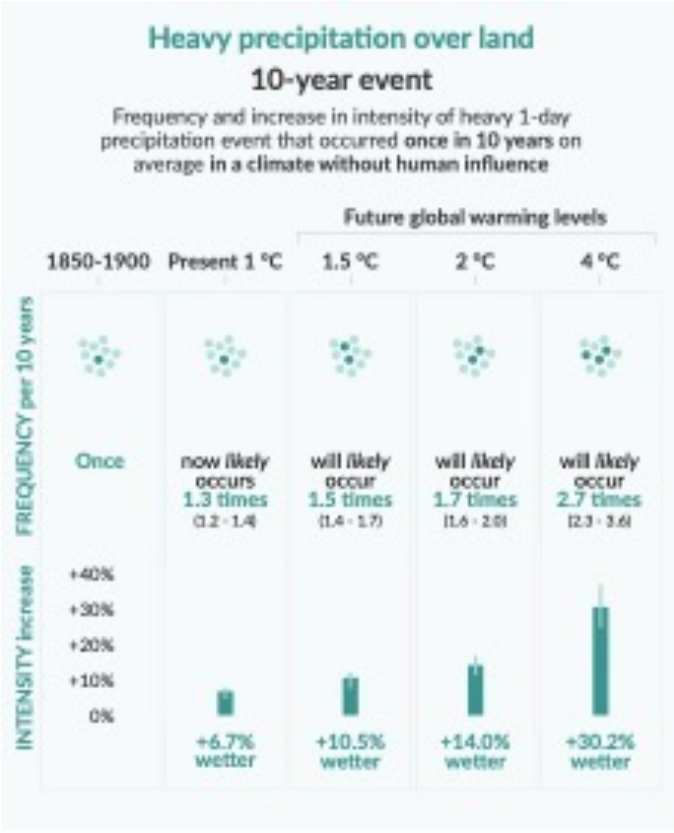
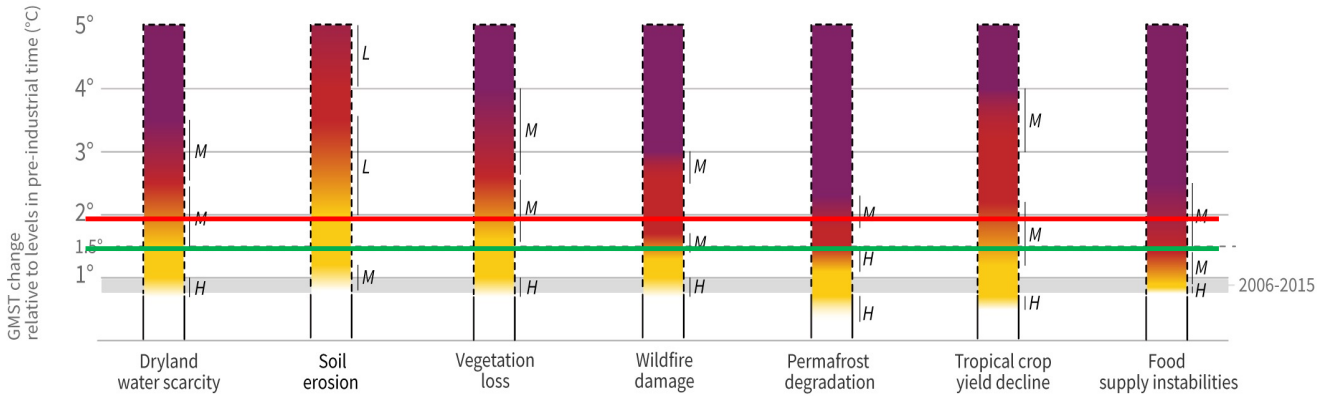
Es steht ausser Zweifel, dass Extrem-ereignisse wie Hitzewellen, Starkregen und Dürre heftiger und häufiger werden.



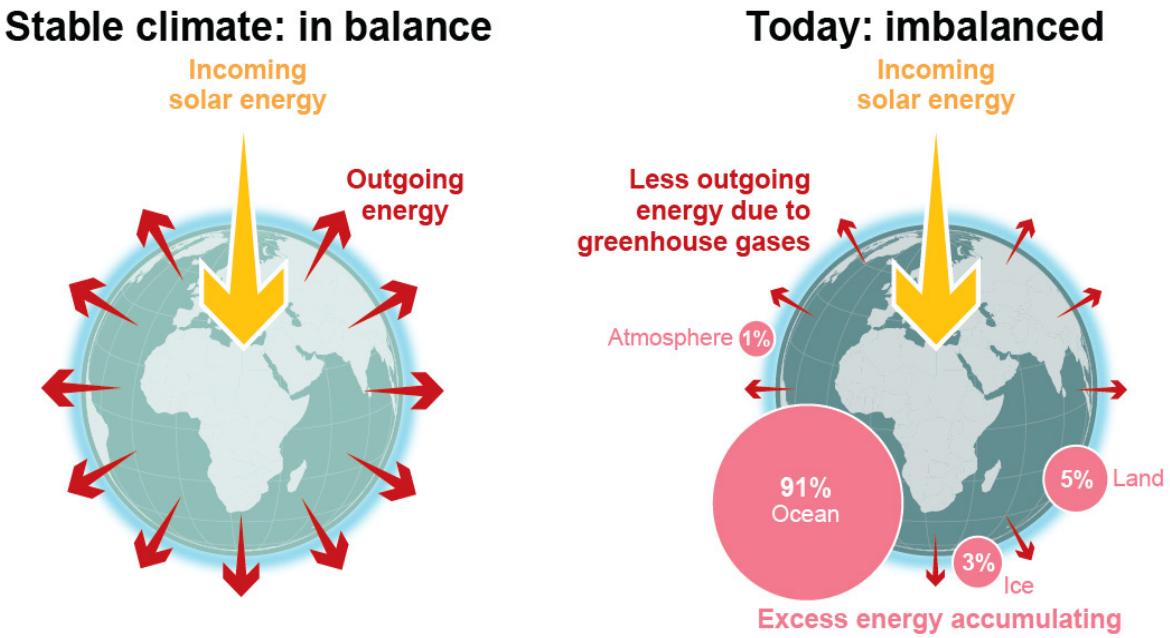


Begrenzung auf 1,5°C verringert Risiko



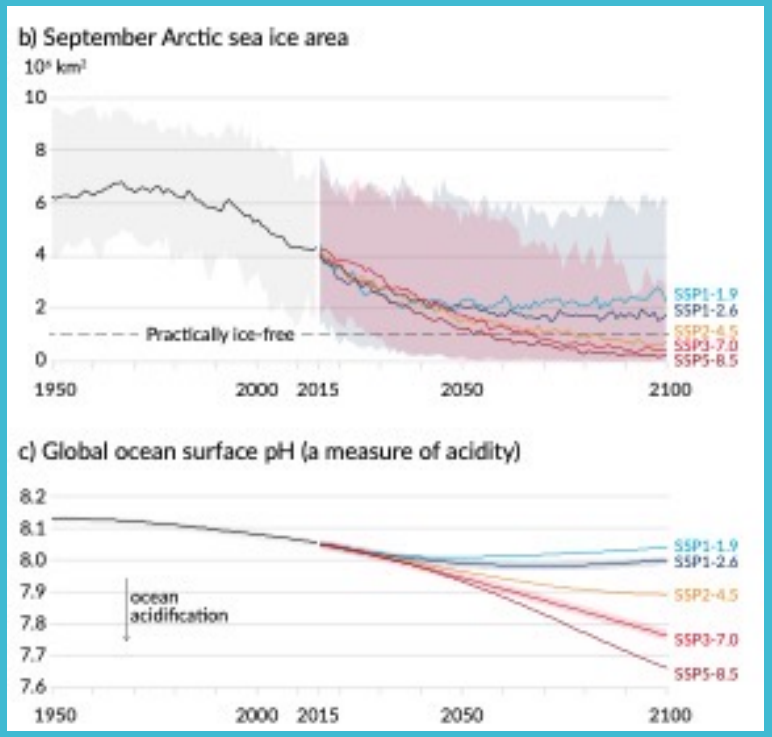
Energiebilanz der Erde und Klima-änderung

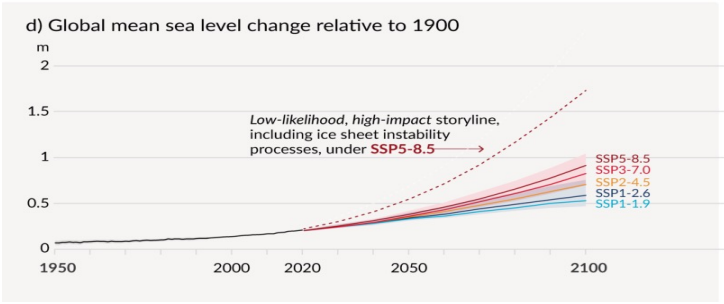
Zumindest seit 1970 außer Balance 91% der Energie in Ozeanen akkumuliert

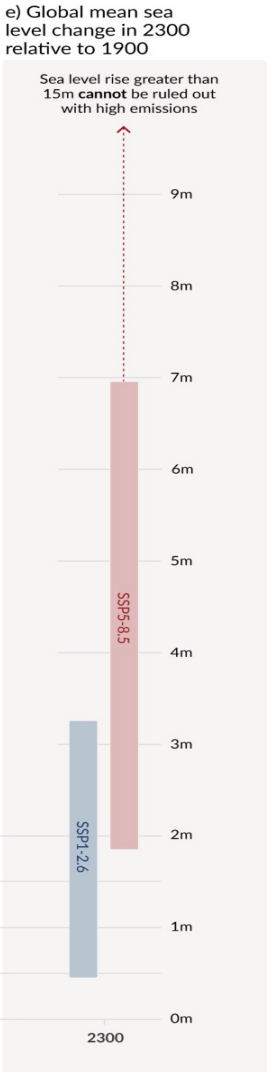


IPCC 2021 AR6 WGI FAQ 7.1

Auswirkungen zum Teil über Jahrtausende irreversibel







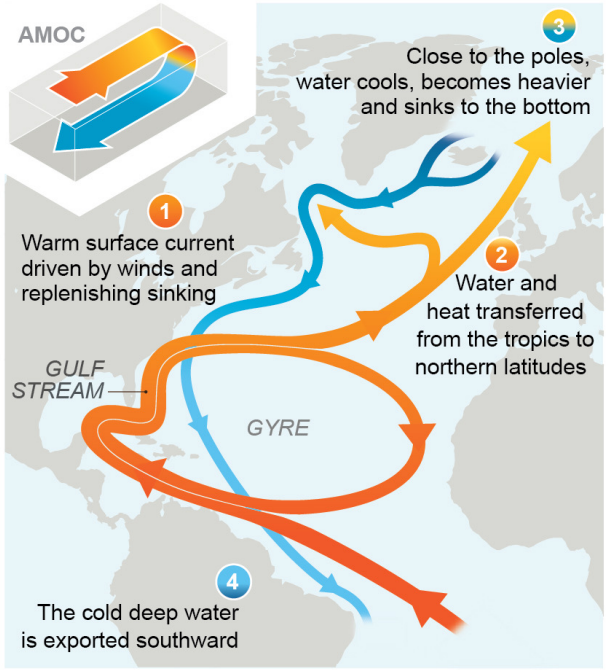
IPCC AR6 WGI Figure SPM.8 b,c,d,e

Was passiert mit dem Golfstrom?

The Gulf Stream, a warm current, is expected to weaken but not cease. This slowdown will affect regional weather and sea level.

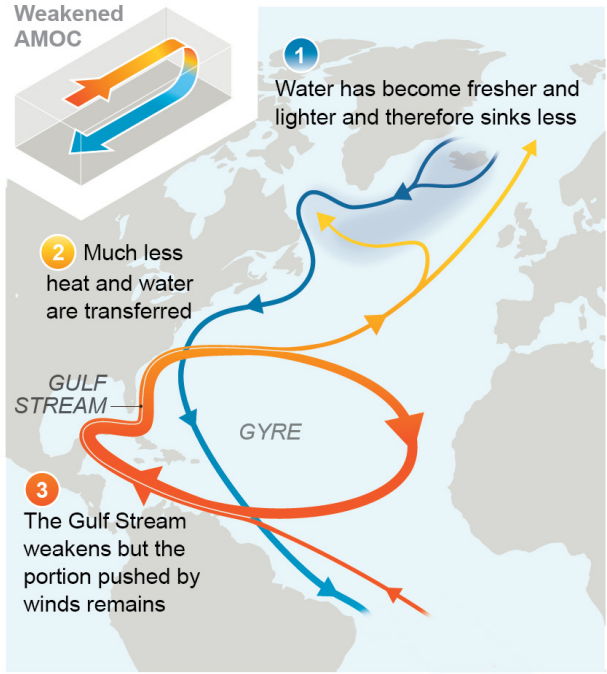
Today

The Gulf Stream is part of both the horizontal, subtropical gyre and the vertical, Atlantic Meridional Overturning Circulation (AMOC)



In a warmer world

Climate change weakens the AMOC, which slows the Gulf Stream down



IPCC 2021 AR6 WGI FAQ 9.3

Klimaänderung heute

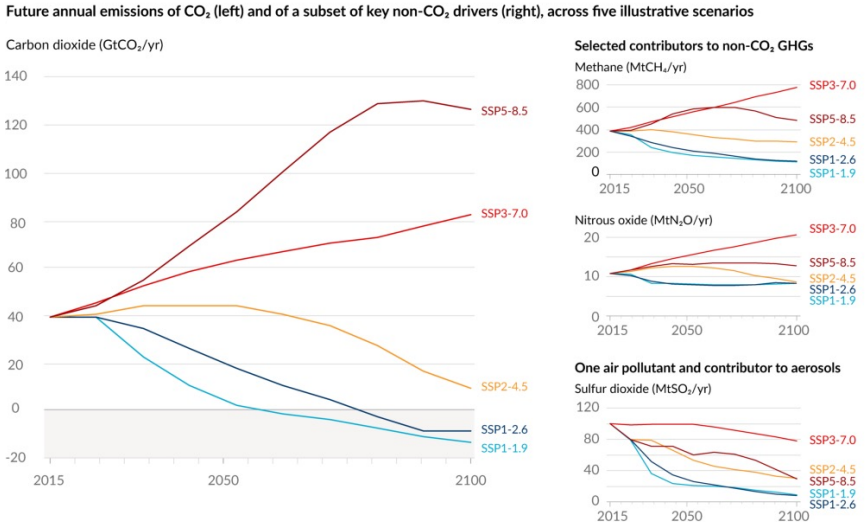
Emissionspfade Richtung 1,5°C

Net-Zero und das Carbon Budget
Negative Emissionen

Emissionsentwicklung und Klimapolitik

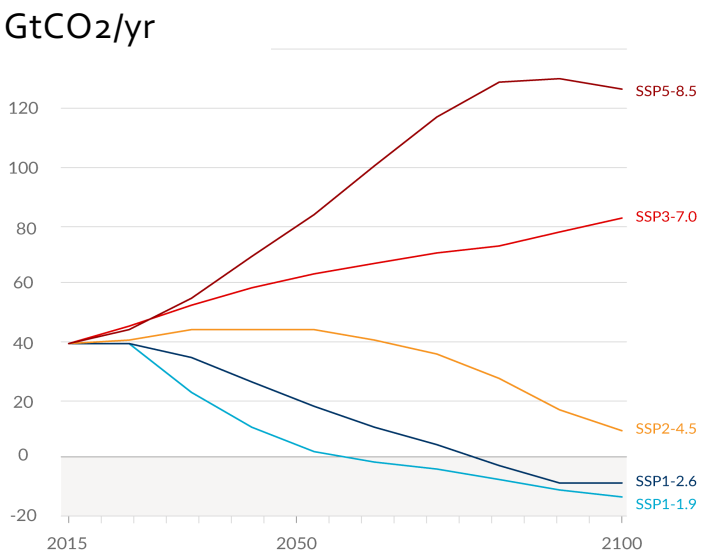
Zukünftige Emissionen verursachen weitere Erwärmung

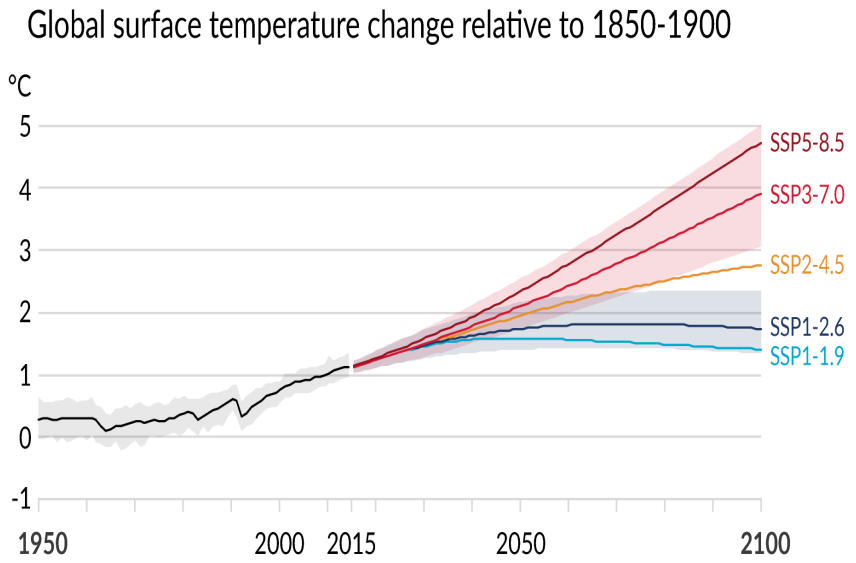
Vergangene und zukünftige CO2Emissionen dominieren die Gesamterwärmung



	Near term, 2021–2040		Mid-term, 2041–2060		Long term, 2081–2100	
Scenario	Best estimate (°C)	*Very likely* range (°C)	Best estimate (°C)	*Very likely* range (°C)	Best estimate (°C)	*Very likely* range (°C)
SSP1-1.9	1.5	1.2 to 1.7	1.6	1.2 to 2.0	1.4	1.0 to 1.8
SSP1-2.6	1.5	1.2 to 1.8	1.7	1.3 to 2.2	1.8	1.3 to 2.4
SSP2-4.5	1.5	1.2 to 1.8	2.0	1.6 to 2.5	2.7	2.1 to 3.5
SSP3-7.0	1.5	1.2 to 1.8	2.1	1.7 to 2.6	3.6	2.8 to 4.6
SSP5-8.5	1.6	1.3 to 1.9	2.4	1.9 to 3.0	4.4	3.3 to 5.7

IPCC AR6 WGI 2021 SPM Figure 4 und 8a, and Table 1



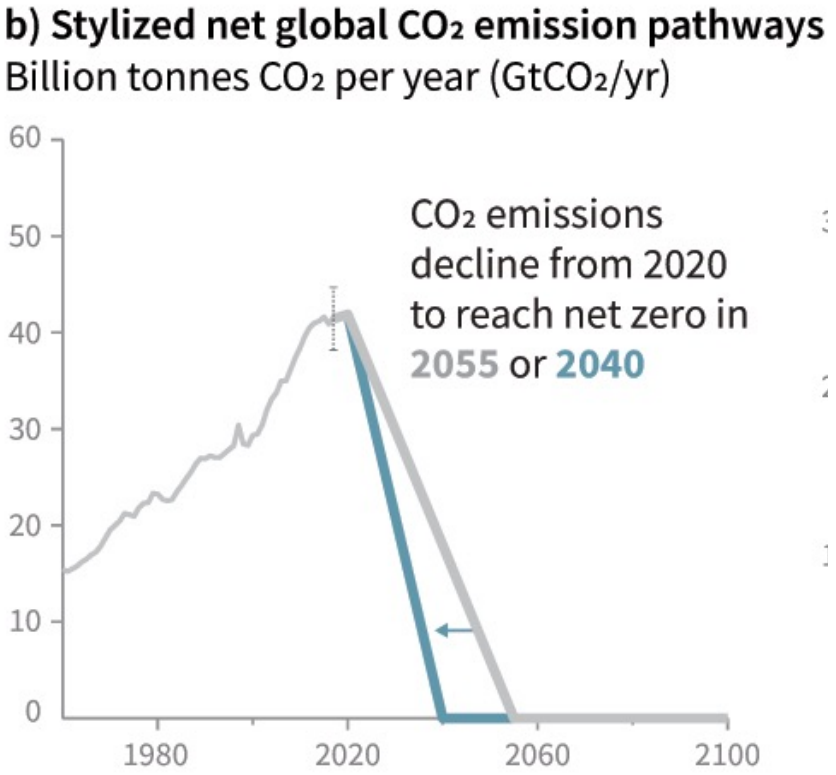


IPCC 2021 AR6 WGI Figure 4a, 8a

Um die Temperatur auf einem bestimmten Niveau zu stabilisieren müssen die CO2 Emissionen auf netto-Null sinken

Zur Stabilisierung der Temperatur auf 1,5°C müssen die globalen anthropogenen netto CO2 Emissionen bis 2030 um 45% im Vergleich zu 2010 sinken und bis 2050 netto-null erreichen

Für 2°C minus 25% und netto-null bis 2070



Source IPCC SR1.5, 2018, Fig. SPM 1 b

Netto-Null CO_2 oder Klimaneutralität?

Figure 3.1a Global greenhouse gas (GHG) emissions and times of achieving net zero for an illustrative pathway that keeps warming well below 2°C

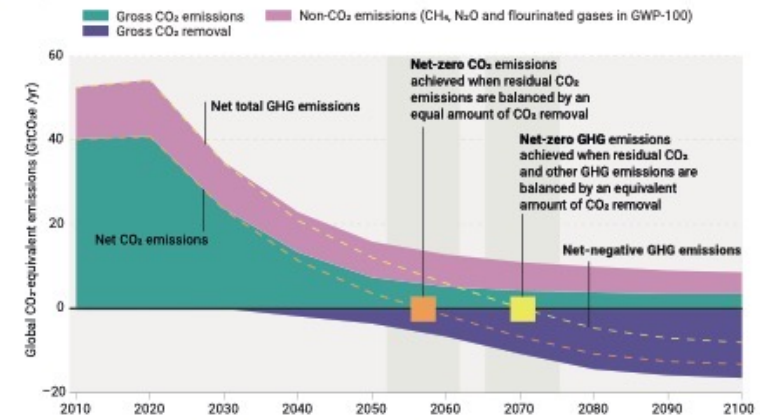
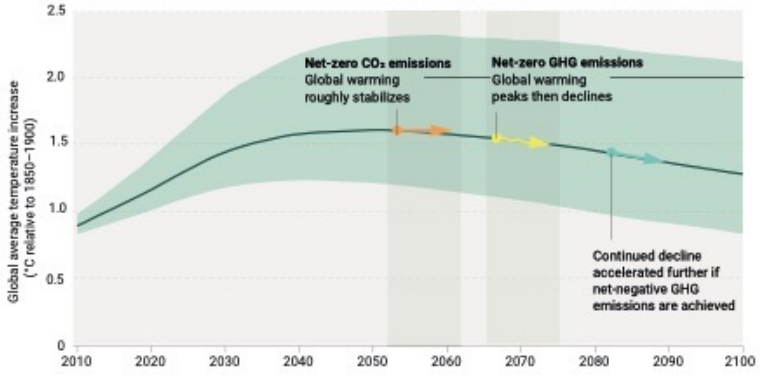
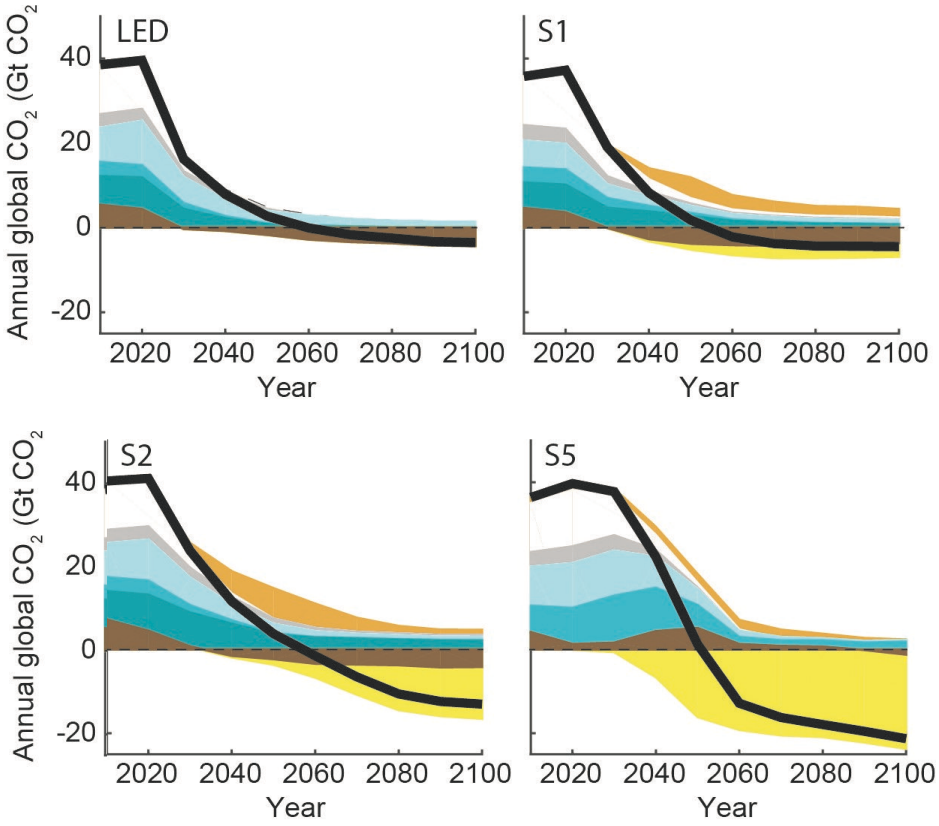


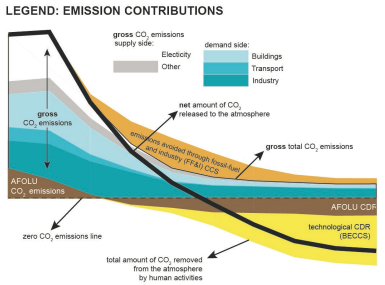
Figure 3.1b Global warming implications



UNEP EGR 2021 Figure 3.1

1,5°C kompatible Emissionspfade und die Rolle negativer Emissionen



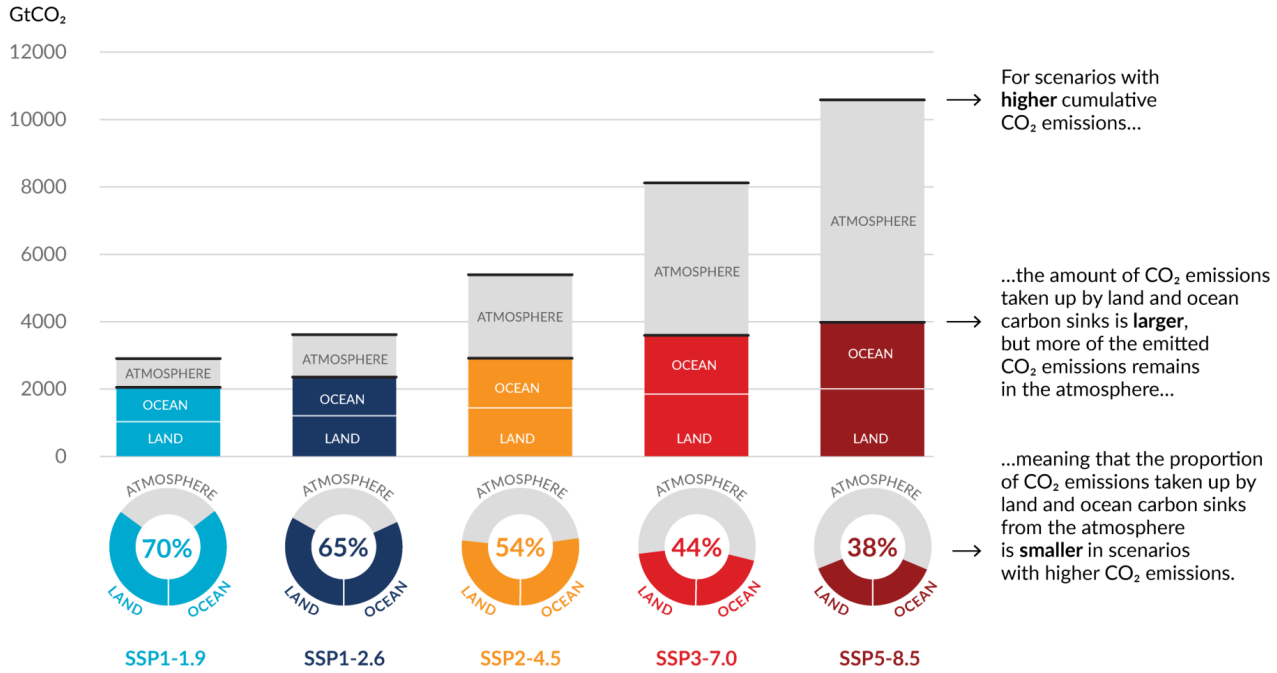


Realistic potential
BECCS <5 $GtCO_2yr^{-1}$
AF <3.6 $GtCO_2yr^{-1}$

Source IPCC SR1.5, 2018, Fig. 2.5

Die Aufnahme-kapazität von CO2 Senken verringert sich bei hohen Emissionen

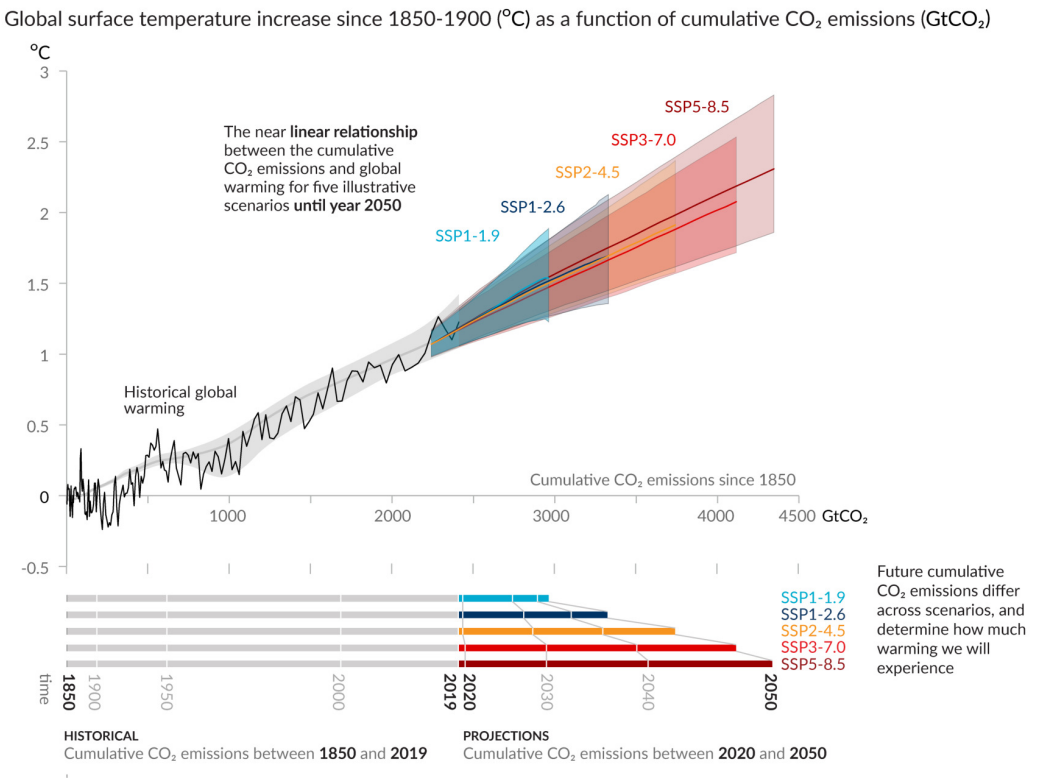
Total cumulative CO_2 emissions **taken up by land and oceans** (colours) and remaining in the atmosphere (grey) under the five illustrative scenarios from 1850 to 2100



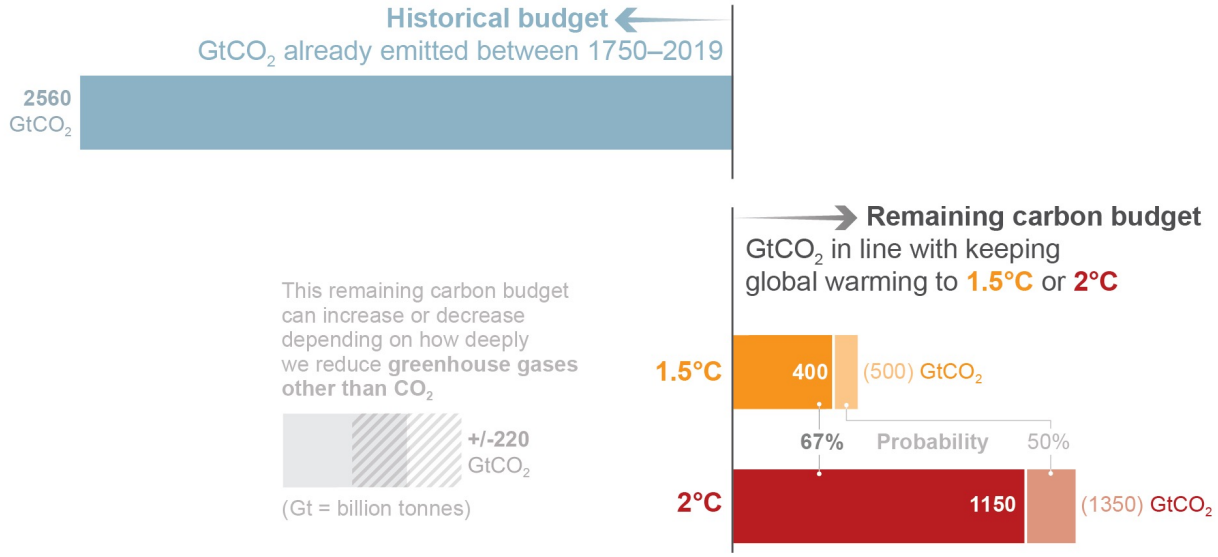
IPCC 2021 AR6 WGI – Figure SPM 7

Für jedes Temperaturlimit gibt es ein begrenztes CO2Budget

Jede Tonne CO2
führt zu weiterer Erwärmung
1000 Gt CO2 – ca. 0,45°C



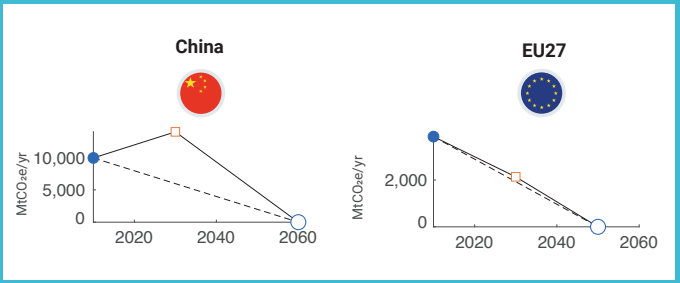
IPCC 2021 AR6 WGI – Figure SPM 10



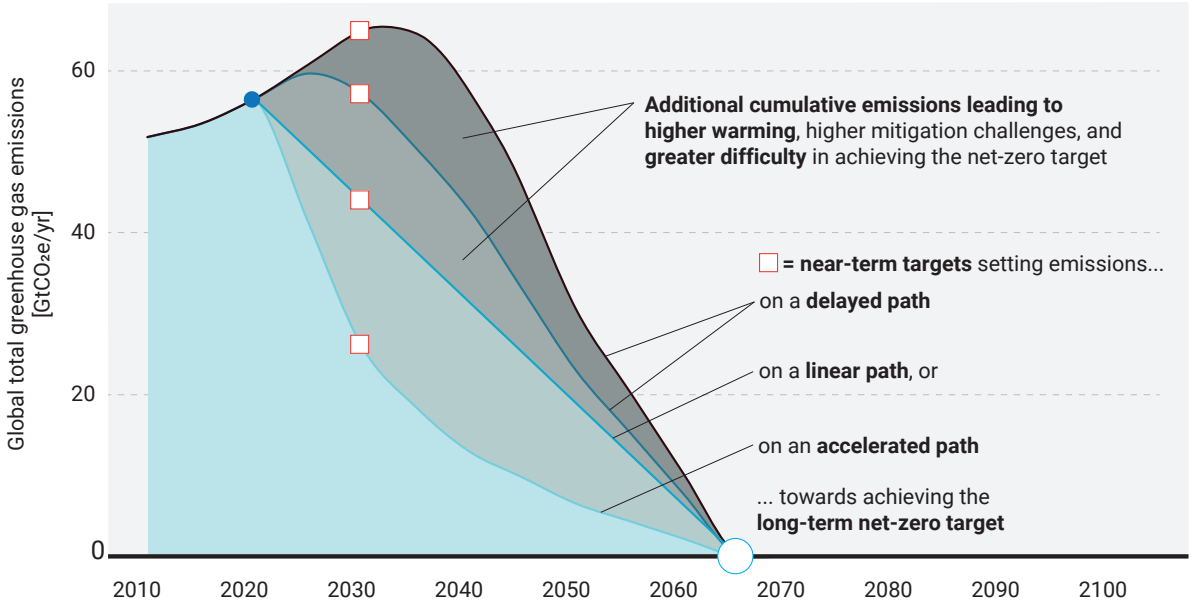
IPCC 2021 AR6 WGI FAQ 5.4

Historisches und verbleibendes Carbon Budget

Carbon Budget und "Race to Zero"



UNEP EGR 2021 Figure ES.5



UNEP EGR 2021 Figure ES.4

Klimaänderung heute

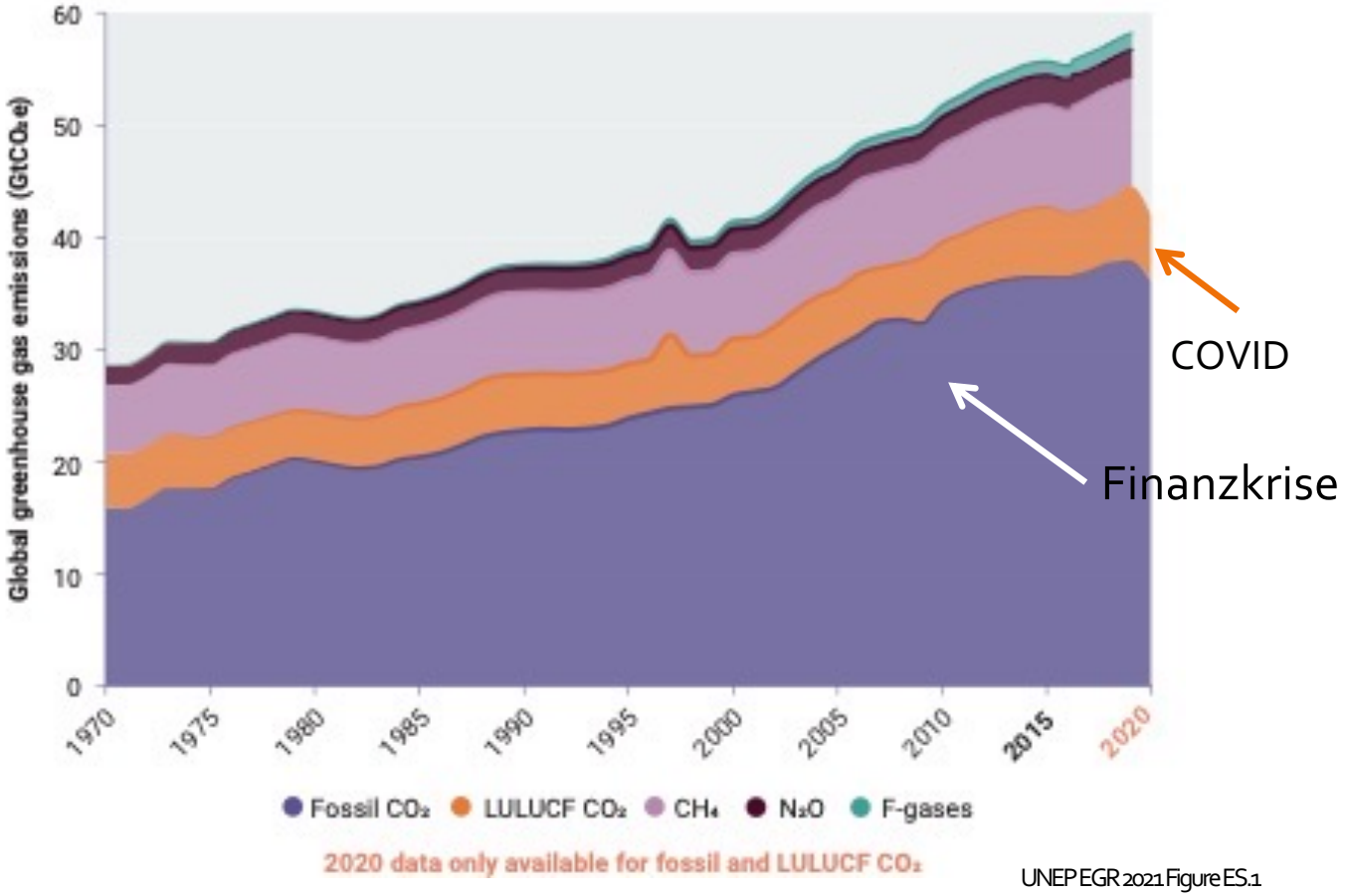
Emissionspfade Richtung 1,5°C

Emissionsentwicklung und Klimapolitik

Emissionstrends und COVID
Paris Abkommen und Glasgow Pakt
NDCs und Emissions Gap

GESAMT THG EMISSIONEN 1970-2020

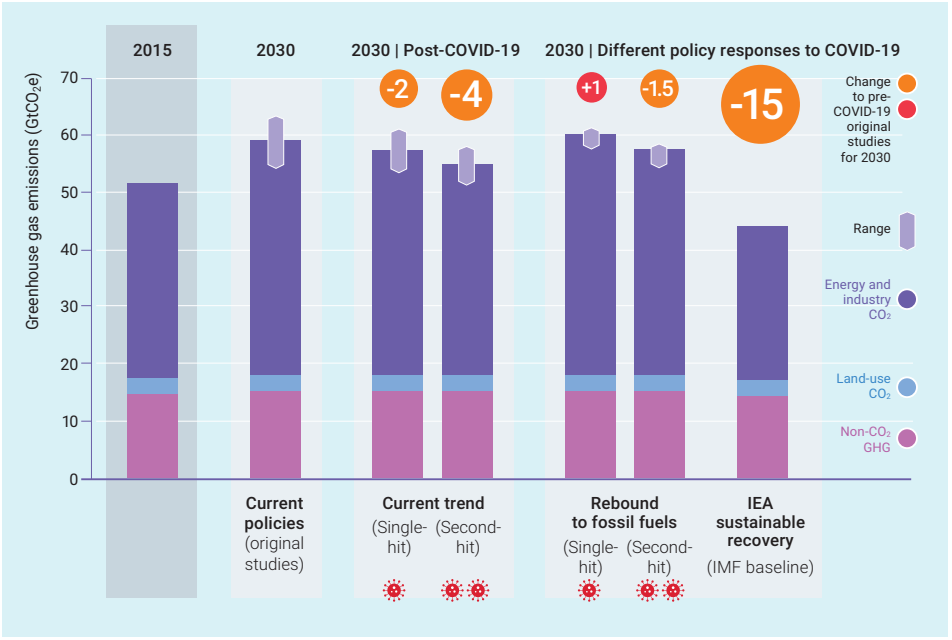
UNEP EGR 2021



UNEP EGR 2021 Figure ES.1

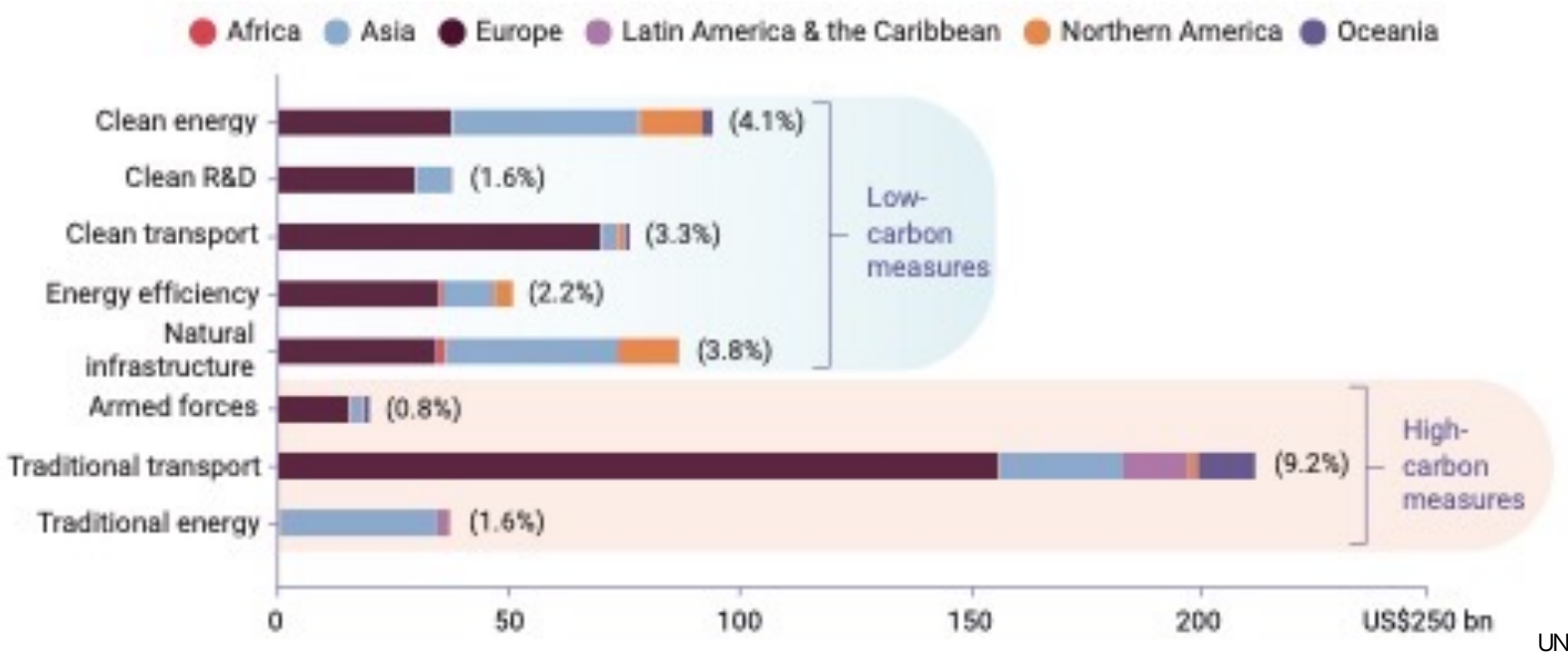
THG EMISSIONEN IN 2030 FÜR POST COVID SCENARIEN

Erstellt in 2020



UNEP EGR 2020 Fig. ES 4

Low carbon pandemic recovery could cut GHG emissions in 2030 by 25% and put world on 2°C track



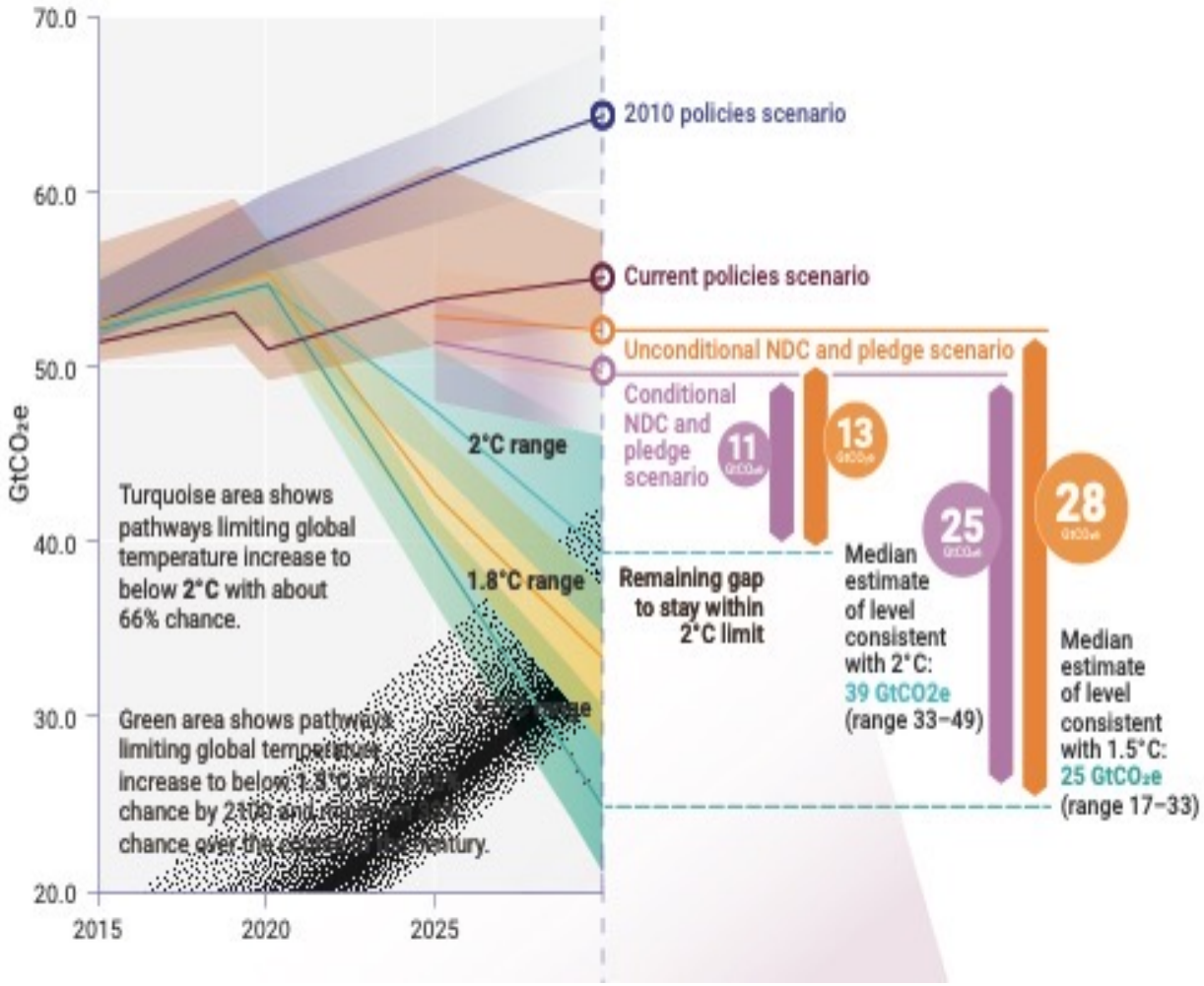
UNEP EGR 2021 Figure ES.7

POST COVID UNTERSTÜTZUNGEN GLOBAL

Stand Mai 2021

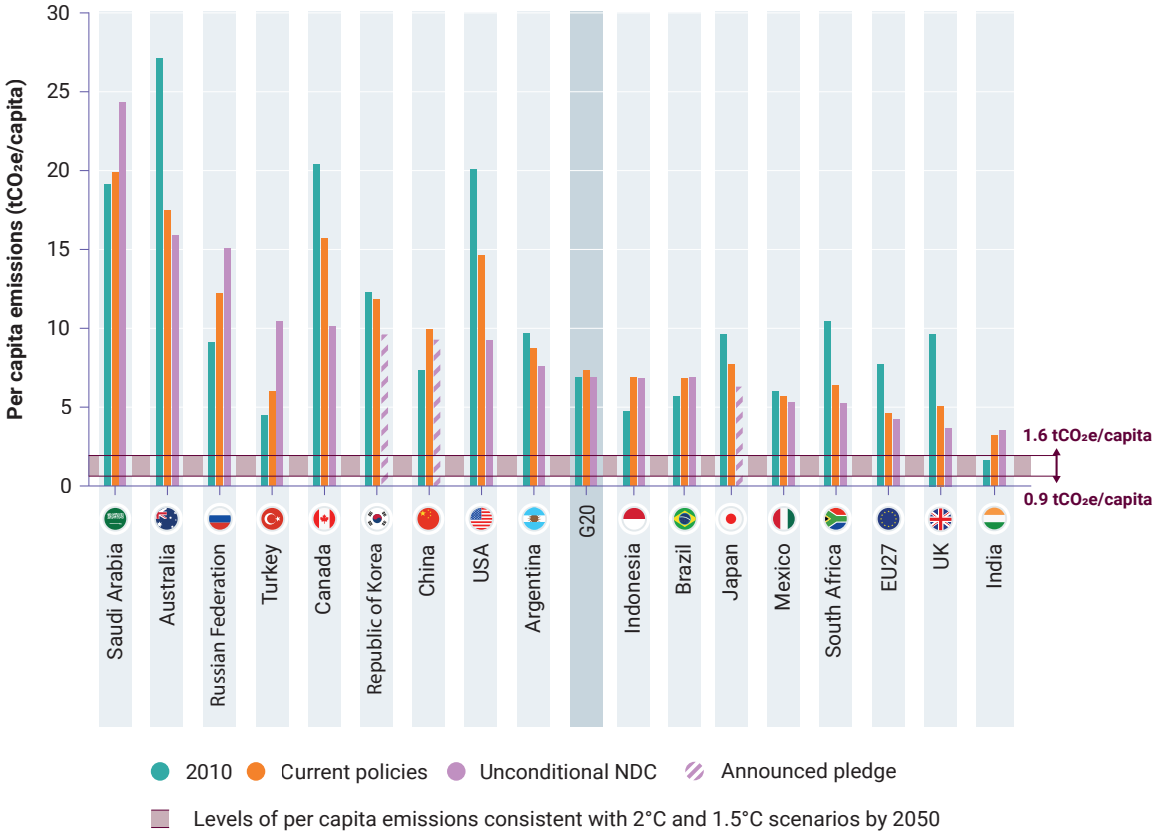
DERZEITIGE KLIMAPOLITIK UND WAS WIRKLICH NOTWENDIG IST

EMISSIONS GAP 2021



Politische Ankündigungen der G20 Staaten und daraus resultierende Pro-Kopf Emissionen

Stand September 2021



UNEP EGR 2021 Figure 2.6

Das KONSUM- und LIFESTYLE-PROBLEM

Pro-Kopf und absolute CO2 Emissionen für vier Einkommens-gruppen (Stand 2015)

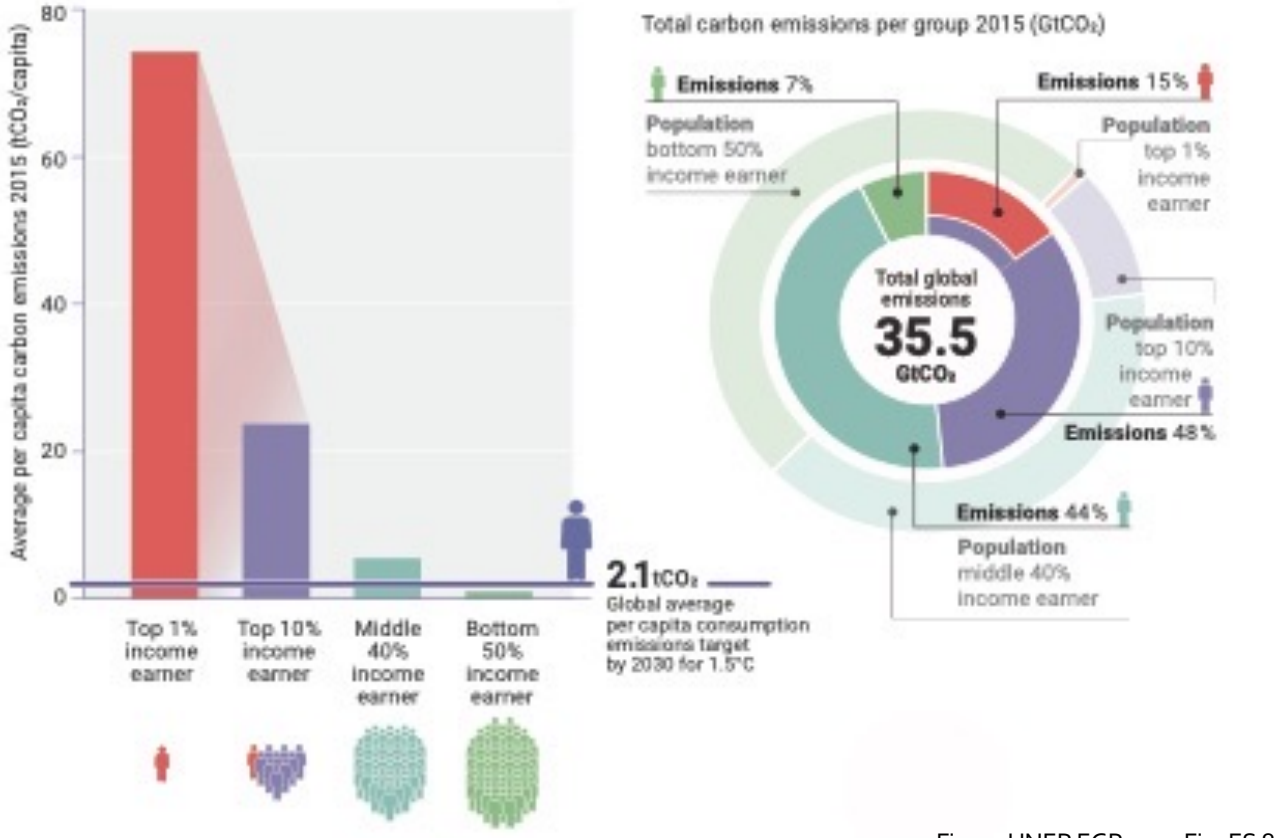


Figure UNEP EGR 2020 Fig. ES 8

REDUKTION VON LIFESTYLE EMISSIONEN

Avoid

Shift

Improve

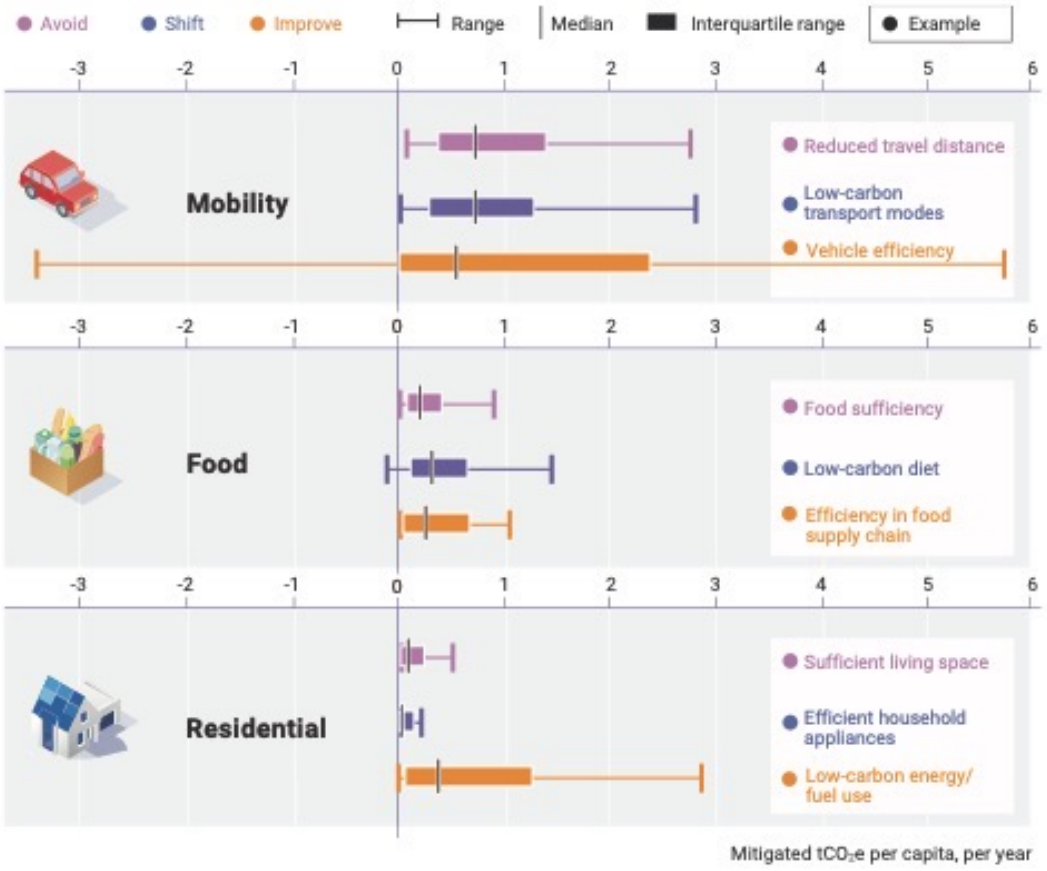
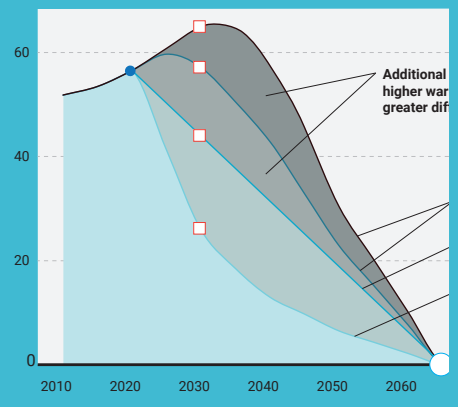


Figure UNEP EGR 2020 Fig. 6.2

Anspruch Wirklichkeit Offene Fragen



Notwendig für 1,5°C Ziel

- -45% CO2 in 2030 bezogen auf das Niveau von 2010
- Kohlenstoffneutralität Mitte des Jahrhunderts

Glasgow Ankündigungen

- >140 verbesserte NDCs
- >70 Net-zero Goals
- Dennoch THG in 2030 >13% über 2010 Niveau

Vorsichtiger Optimismus

- NDCs nach Paris – 3,2°C Erwärmung
- NDCs Stand Juli 2021 – 2,7°C Erwärmung
- Glasgow NDCs und Net-zero – 2-2,4°C Erwärmung