Die große Herausforderung einer klimaneutralen Zukunft

Dr. Oliver Geden, Kernautorenteam IPCC AR6 SYR
Wien, 24.03.2023

Klima-, CO_2- und Treibhausgas-Neutralität

Klimaneutralität (SR1.5)
Concept of a state in which human activities result in no net effect on the climate system. Achieving such a state would require balancing of residual emissions with emission (carbon dioxide) removal as well as accounting for regional or local biogeophysical effects of human activities that, for example, affect surface albedo or local climate

CO_2-Neutralität (WG I/II/III)
Condition in which anthropogenic carbon dioxide (CO_2) emissions associated with a subject are balanced by anthropogenic CO_2 removals

THG-Neutralität (WG I/II/III)
Condition in which metric-weighted anthropogenic greenhouse gas (GHG) emissions associated with a subject are balanced by metric-weighted anthropogenic GHG removals

IPCC AR6 Glossaries (SR1.5 & WG I/II/III)

Klima-, CO_2- und Treibhausgas-Neutralität

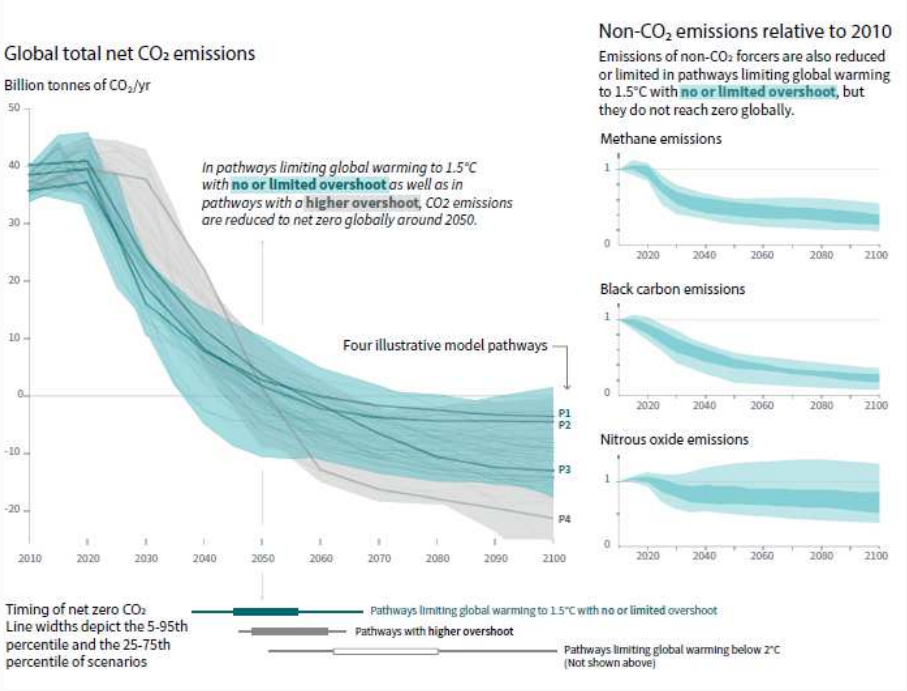
~~**Klimaneutralität (SR1.5)**~~
~~Concept of a state in which human activities result in no net effect on the climate system. Achieving such a state would require balancing of residual emissions with emission (carbon dioxide) removal as well as accounting for regional or local biogeophysical effects of human activities that, for example, affect surface albedo or local climate~~

CO_2-Neutralität (WG I/II/III)
Condition in which anthropogenic carbon dioxide (CO_2) emissions associated with a subject are balanced by anthropogenic CO_2 removals

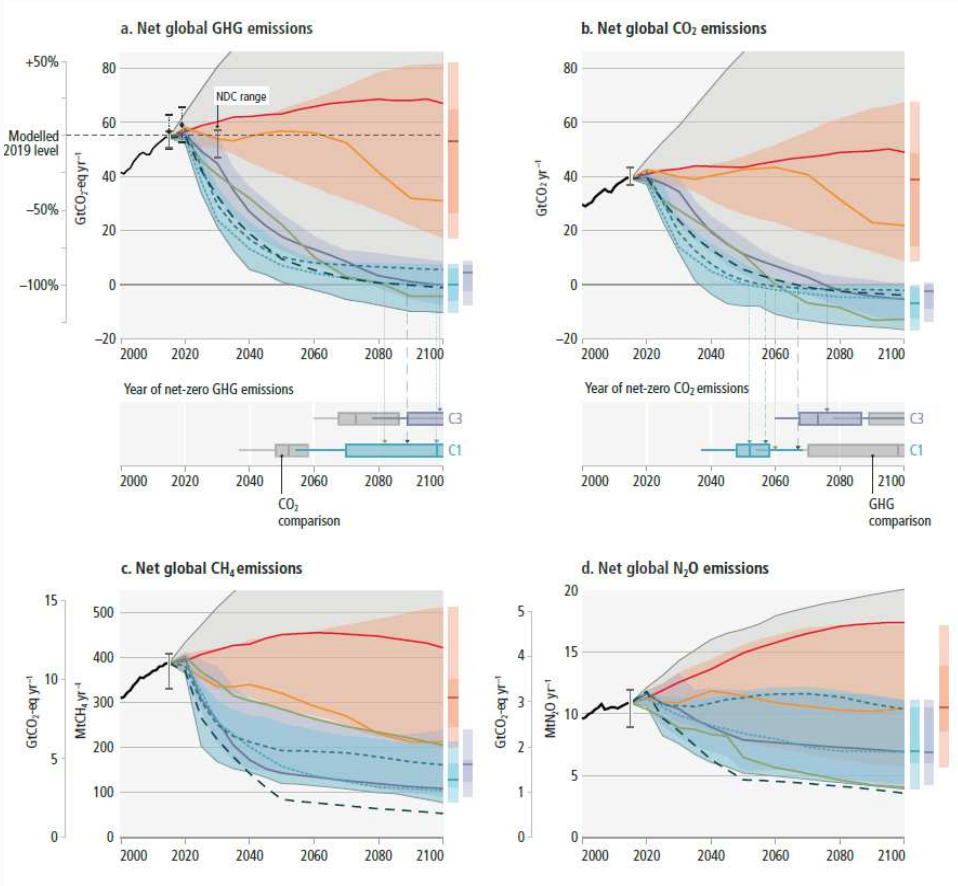
THG-Neutralität (WG I/II/III) (= *Klimaneutralität* in politischer Debatte)
Condition in which metric-weighted anthropogenic greenhouse gas (GHG) emissions associated with a subject are balanced by metric-weighted anthropogenic GHG removals

IPCC AR6 Glossaries (SR1.5 & WG I/II/III)

CO_2- & THG-Neutralität (SR1.5 & WG III)

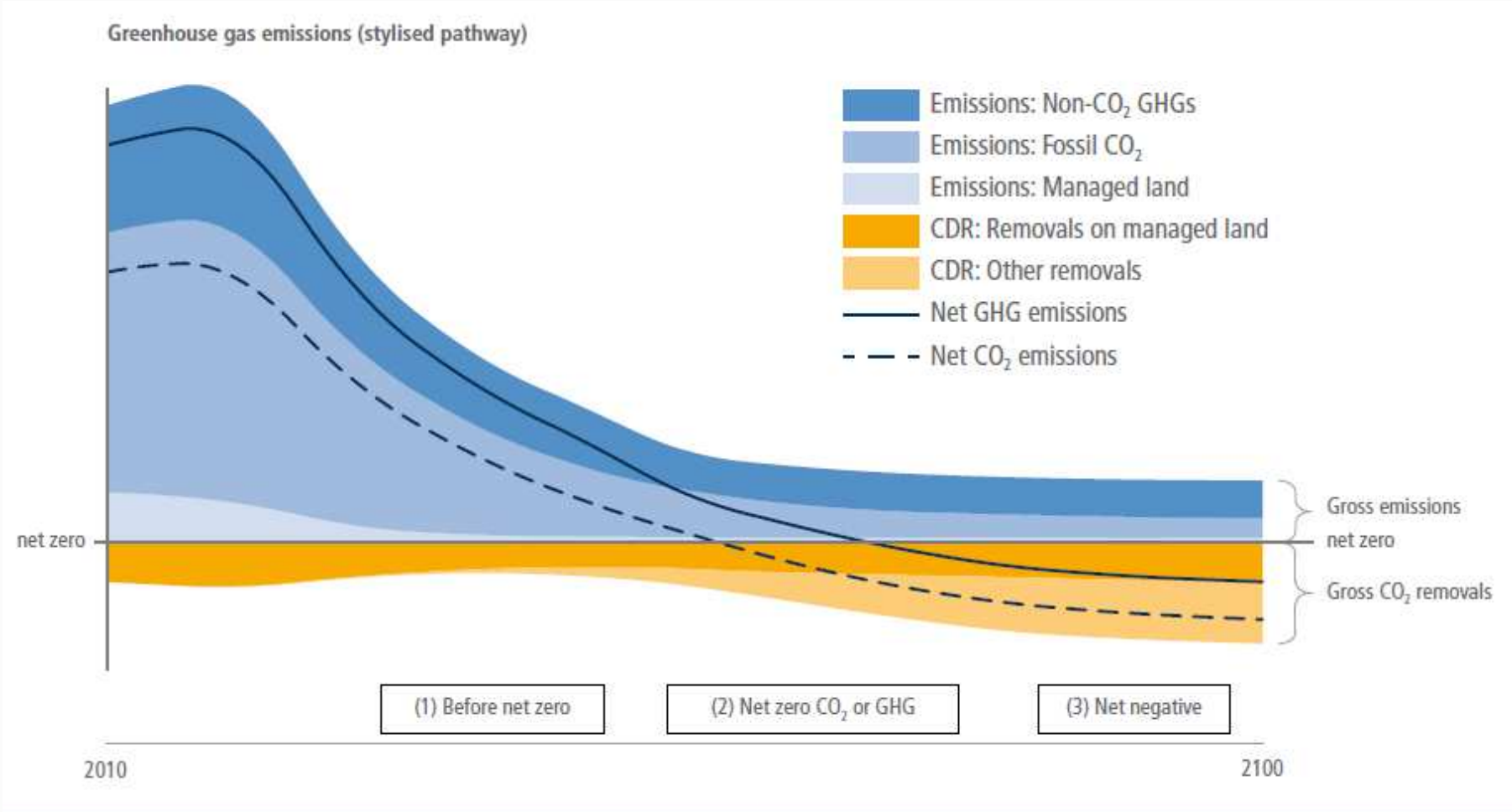


1.5°C: 2050 vs. 2067 (SR1.5)
1.5°C: 2050-55 vs. 2095-2100 (WG III)



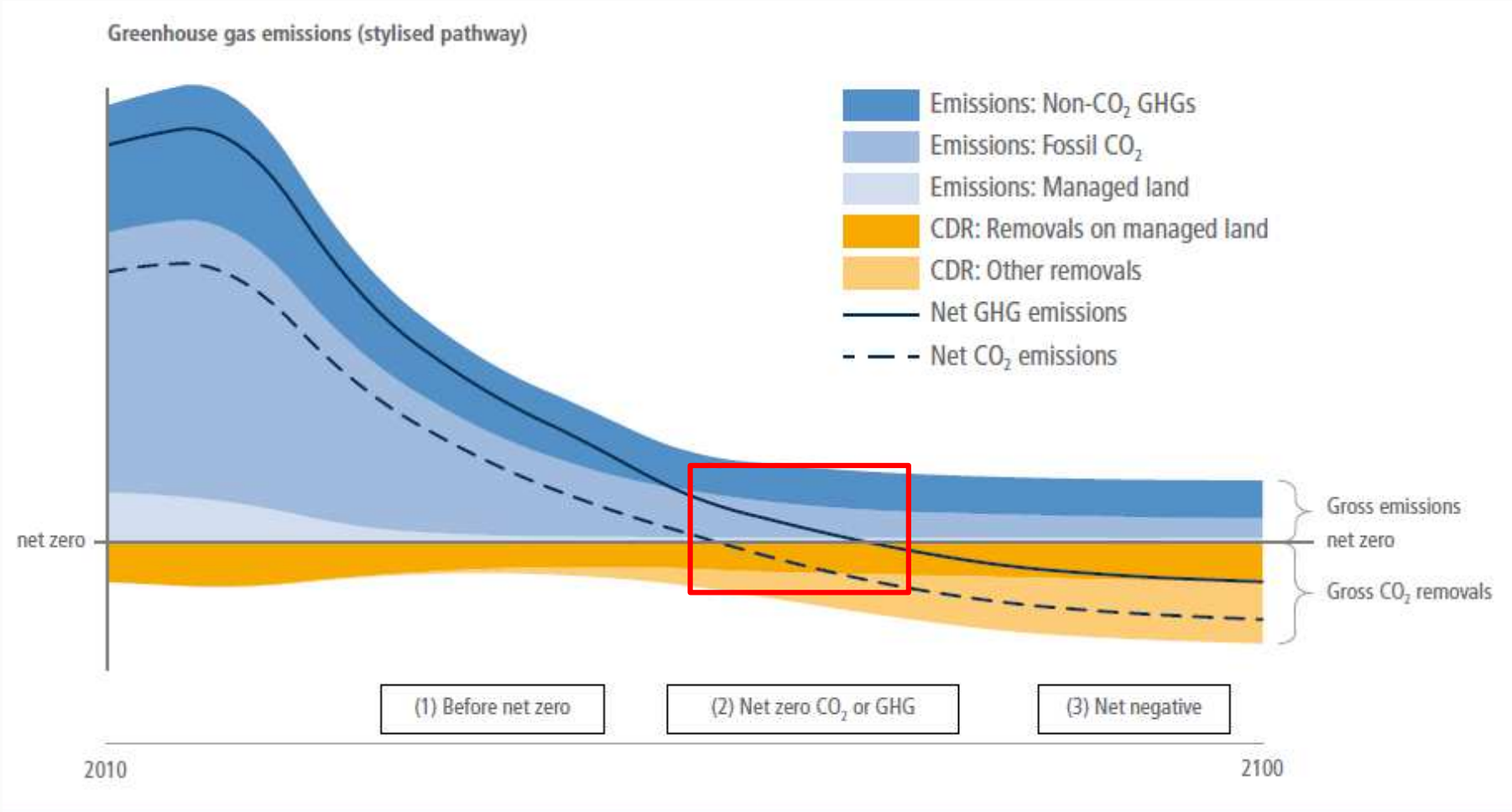
IPCC AR6 SR1.5, Fig SPM.3a & WG III, Fig. SPM.5

Warum wird CO_2- vor THG-Neutralität erreicht?



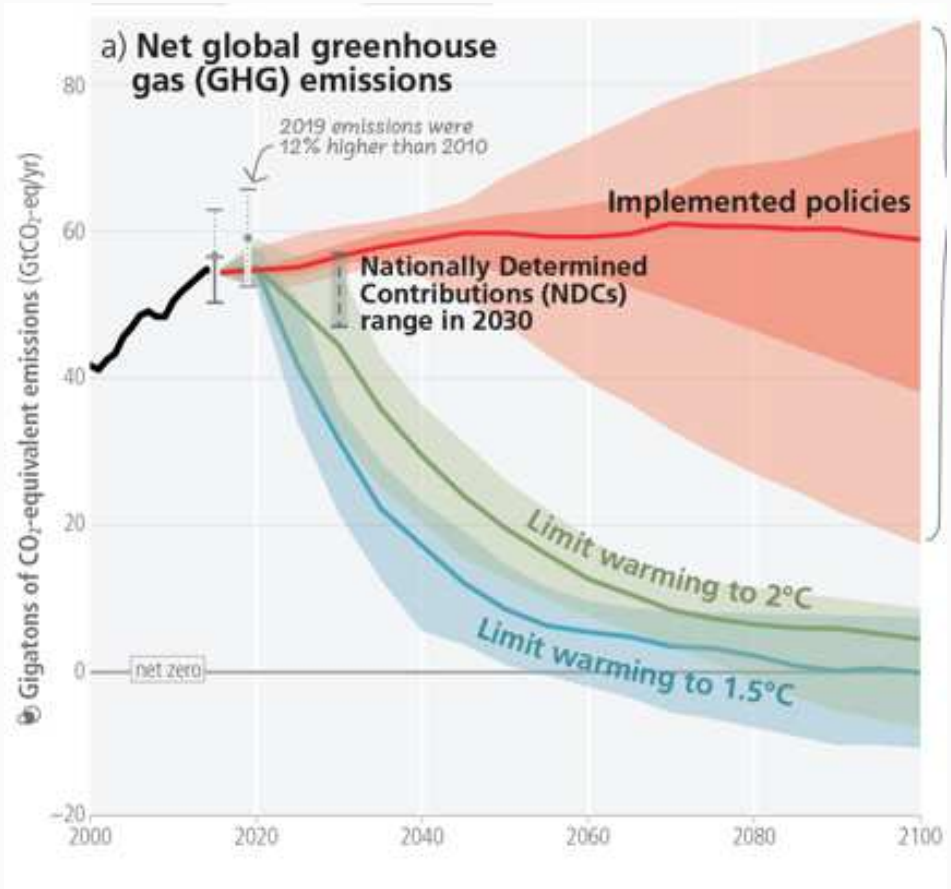
IPCC AR6 WG III, Chapter 12, CCB 8, Fig. 2

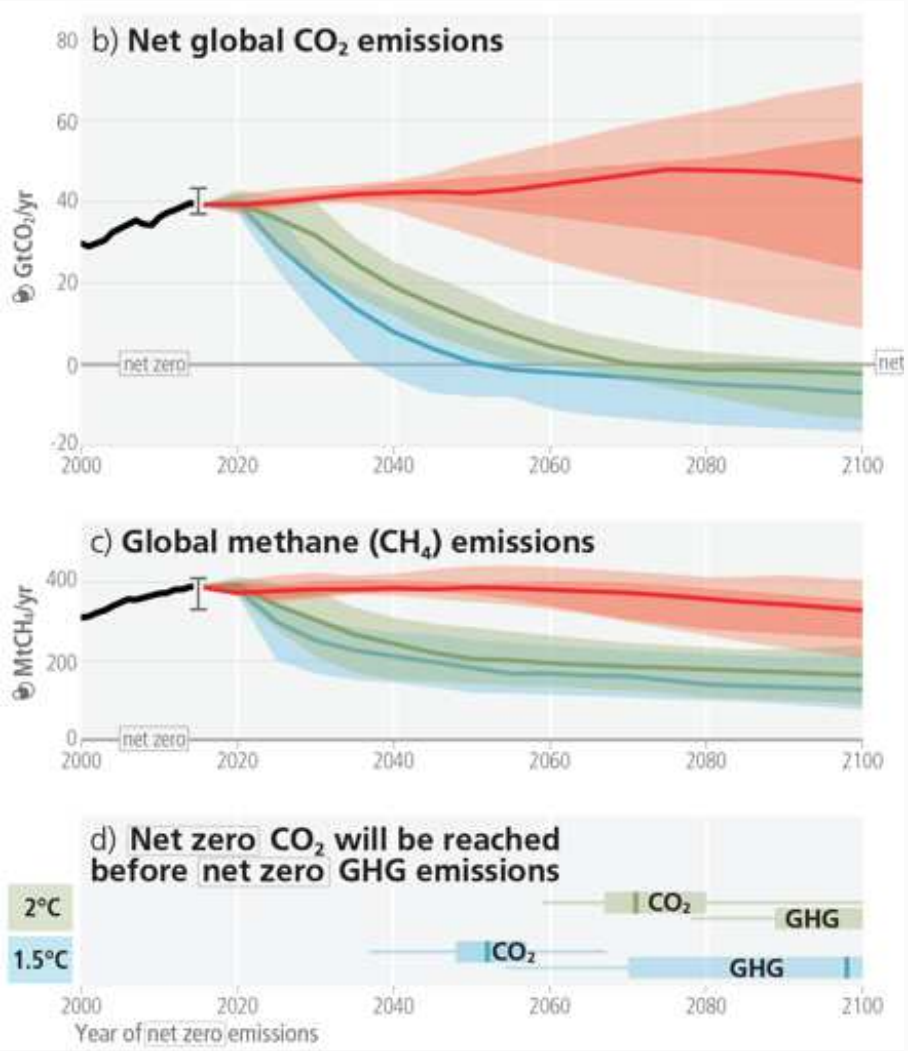
Warum wird CO_2- vor THG-Neutralität erreicht?



IPCC AR6 WG III, Chapter 12, CCB 8, Fig. 2

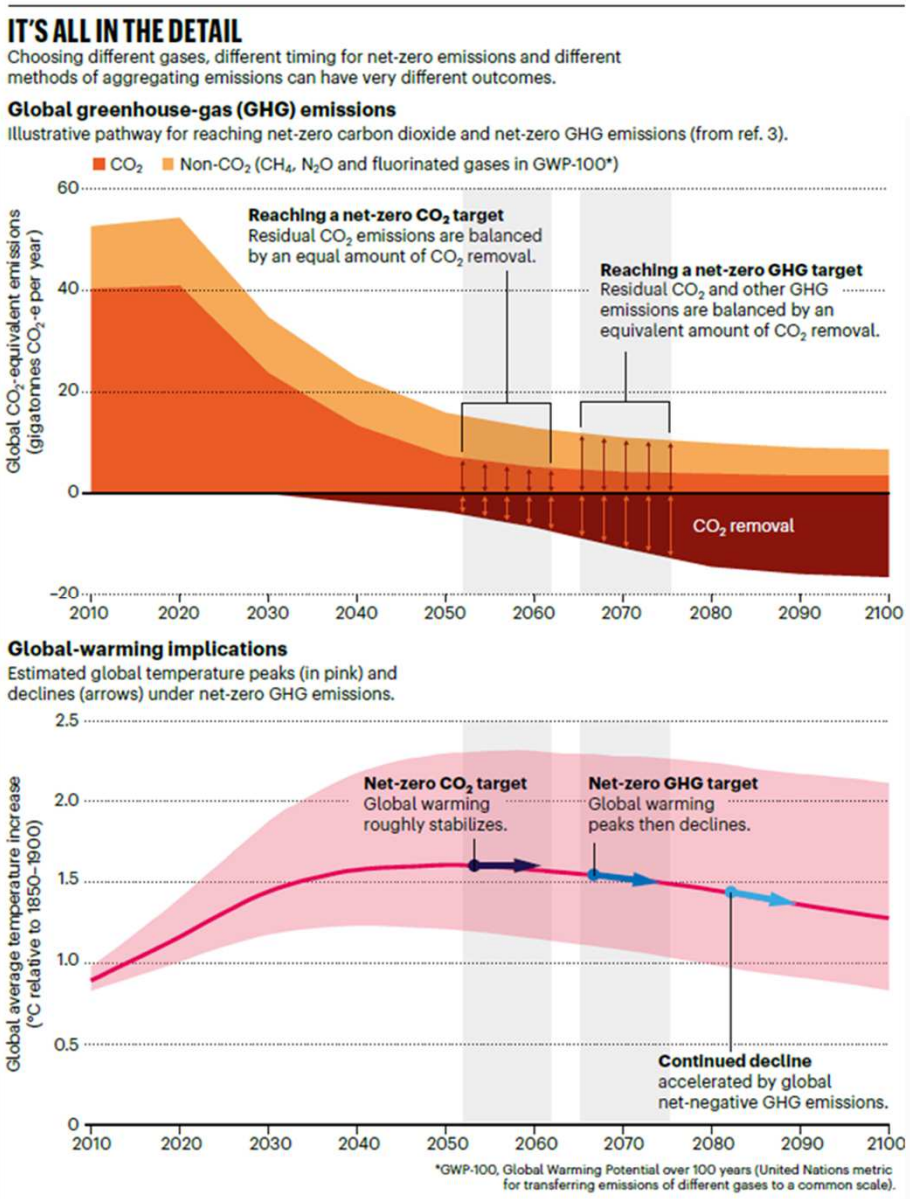
CO_2- & THG-Neutralität im SYR





IPCC AR6 SYR, Fig. SPM.5a-d

CO_2-Neutralität stabilisiert Temperatur, bei THG-Neutralität sinkt sie bereits leicht (GWP100)



Rogelj/Geden/Cowie/Reisinger (2021), Nature 591 (7850)

1.5°C nur noch mit „limited overshoot“ erreichbar

Überschreiten wahrscheinlich schon in frühen 2030er Jahren (SYR SPM B.1.1)

- definiert als “running 20-year average”, einzelne Jahre bereits zuvor
  -> IPCC-Verdikt zum tatsächlichen Überschreiten erst sehr spät

Nach Überschreiten Rückkehr zu 1.5°C bis 2100 möglich (SYR SPM B.7)

- durch netto-negative CO_2-Emissionen (*removals > emissions*)
  -> Plausibilität? problematisches politisches Signal?

1.5°C mit “(no or) limited overshoot” nur bei drastischen Emissionsreduktionen

- Minderungswerte 2030-2050 und Netto-Null-Jahre nicht als Voraussetzung, um *overshoot* zu verhindern, sondern um ihn auf 0.1°C zu begrenzen

Minderungs-Benchmarks bis 2050 (SYR SPM B.6)

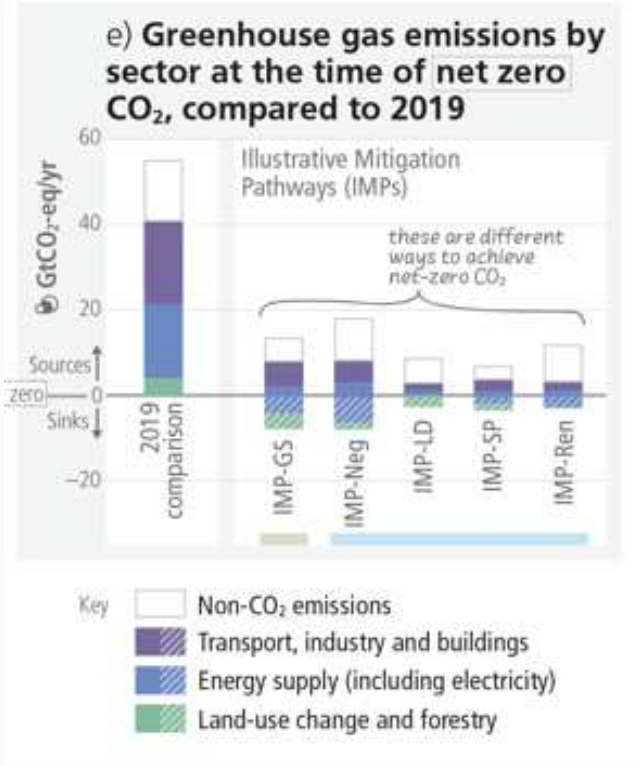
Table XX: Greenhouse gas and CO_2 emission reductions from 2019, median and 5-95 percentiles {3.3.1; 4.1; Table 3.1; Figure 2.5; Box SPM1}

		Reductions from 2019 emission levels (%)			
		2030	2035	2040	2050
Limit warming to1.5°C (>50%) with no or limited overshoot	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
	CO_2	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]
Limit warming to 2°C (>67%)	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]
	CO_2	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]

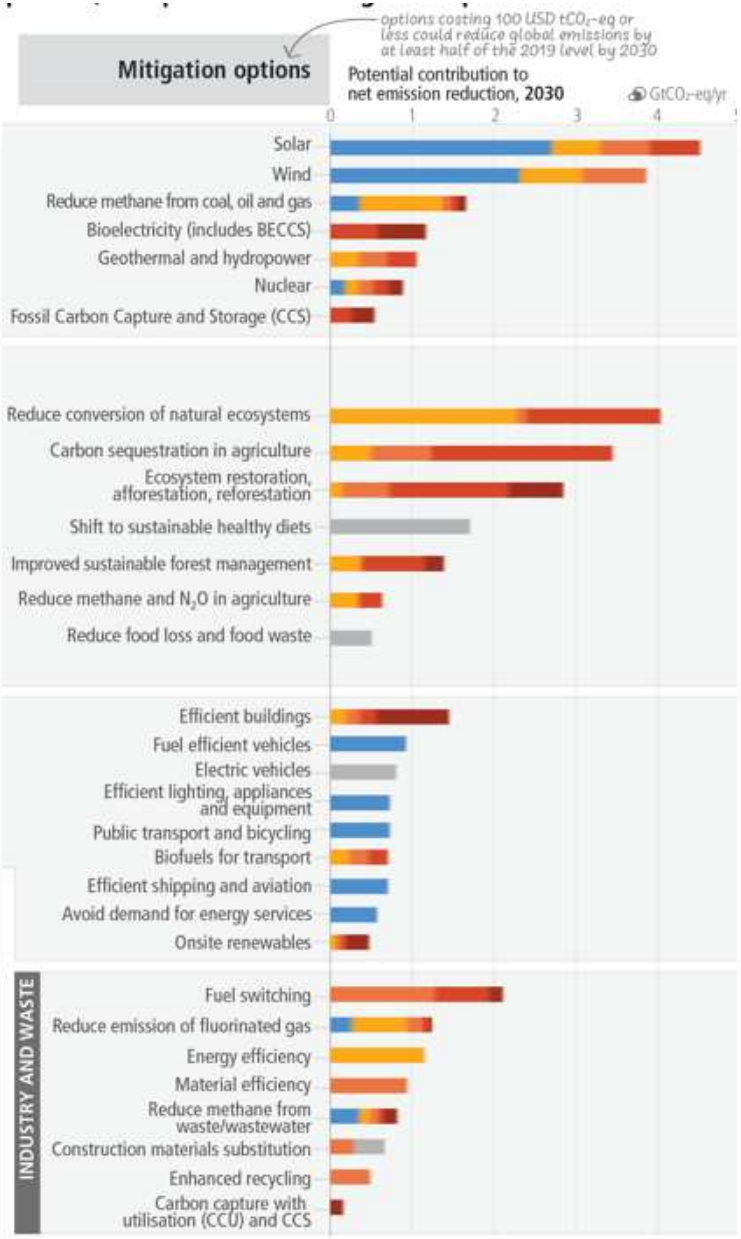
1.5°C (und auch 2°C) nur mit schnellen, tiefgreifenden und (meist) sofortigen Emissionsreduktionen erreichbar

- Erstmals explizite Ausweisung der Werte für 2035, in Bezug auf *Global Stocktake* unter dem Pariser Abkommen (2023) und nächste NDC-Runde (2025)

Minderungsoptionen bis 2030 und Netto-Null-Varianten



IPCC AR6 SYR, Fig. SPM.5e & Fig. 7



Vielen Dank für Ihre Aufmerksamkeit