The climate urgency & recent IPCC 1.5°C special report

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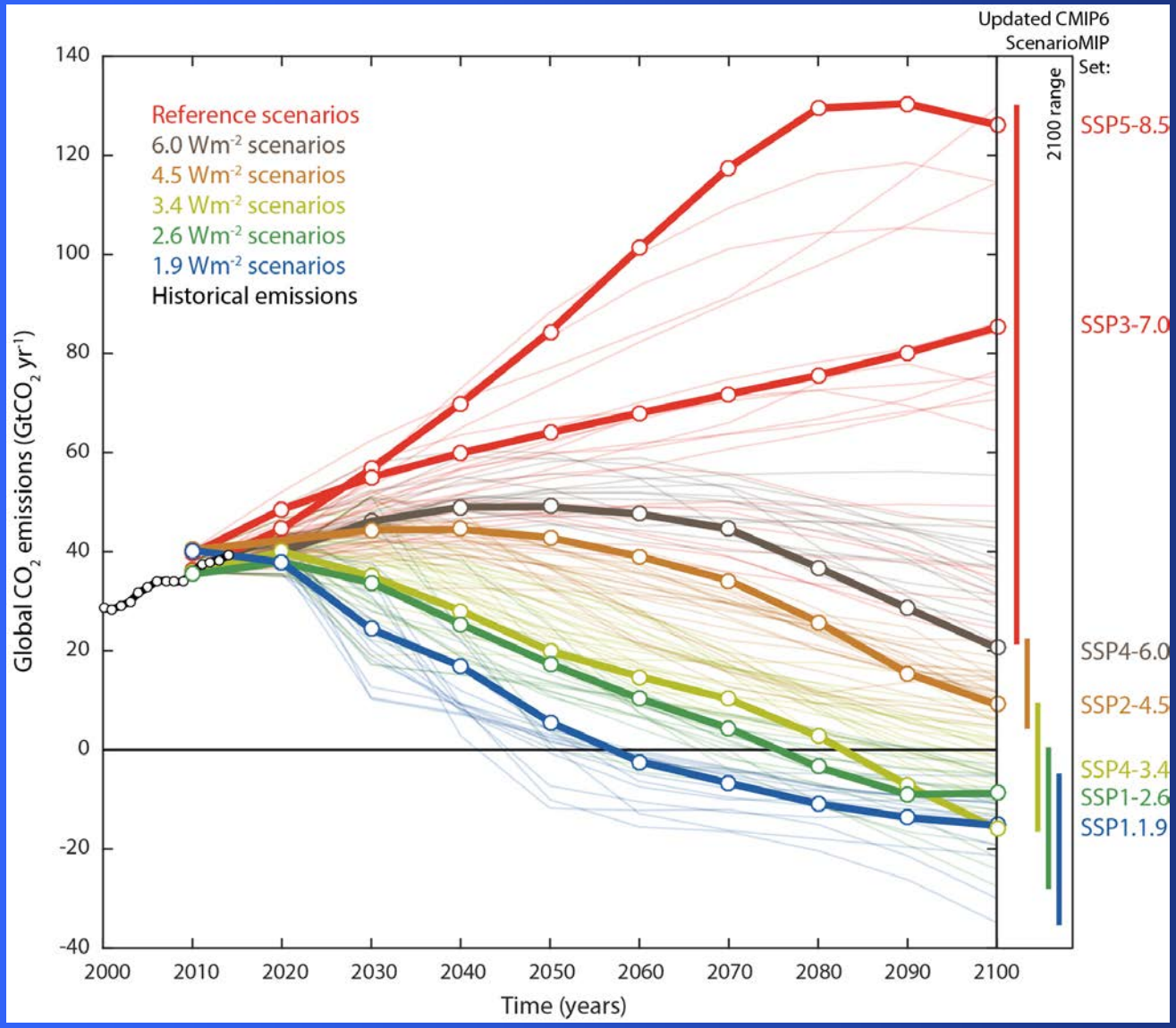
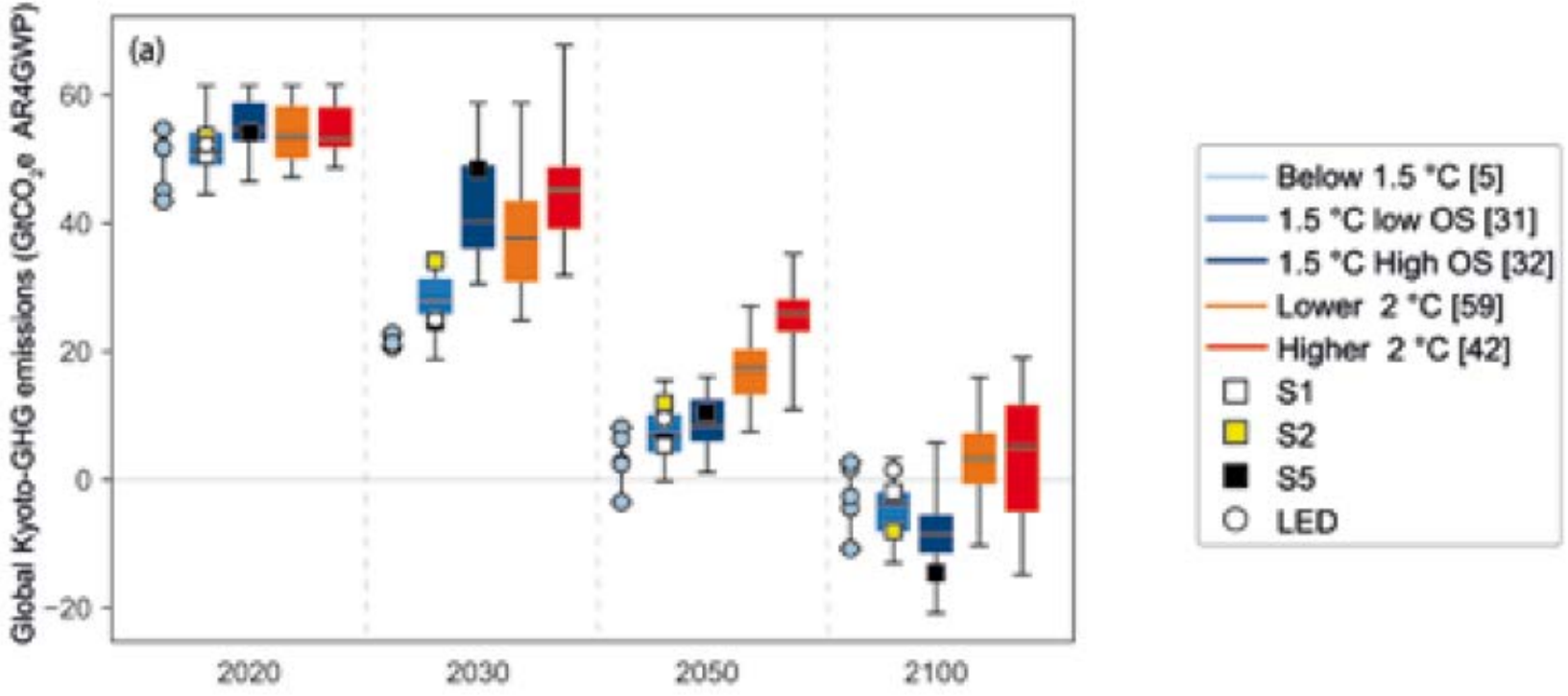
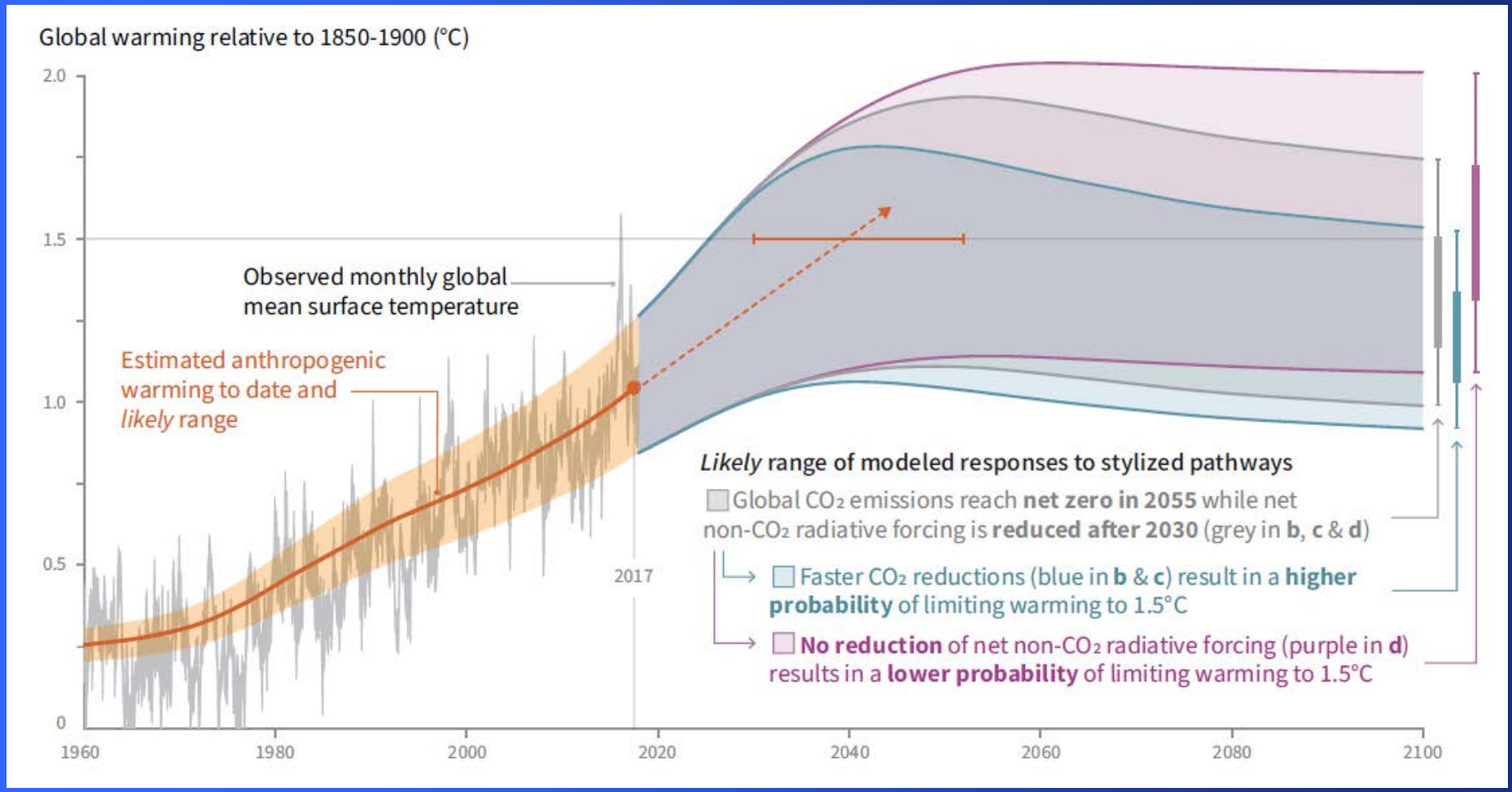
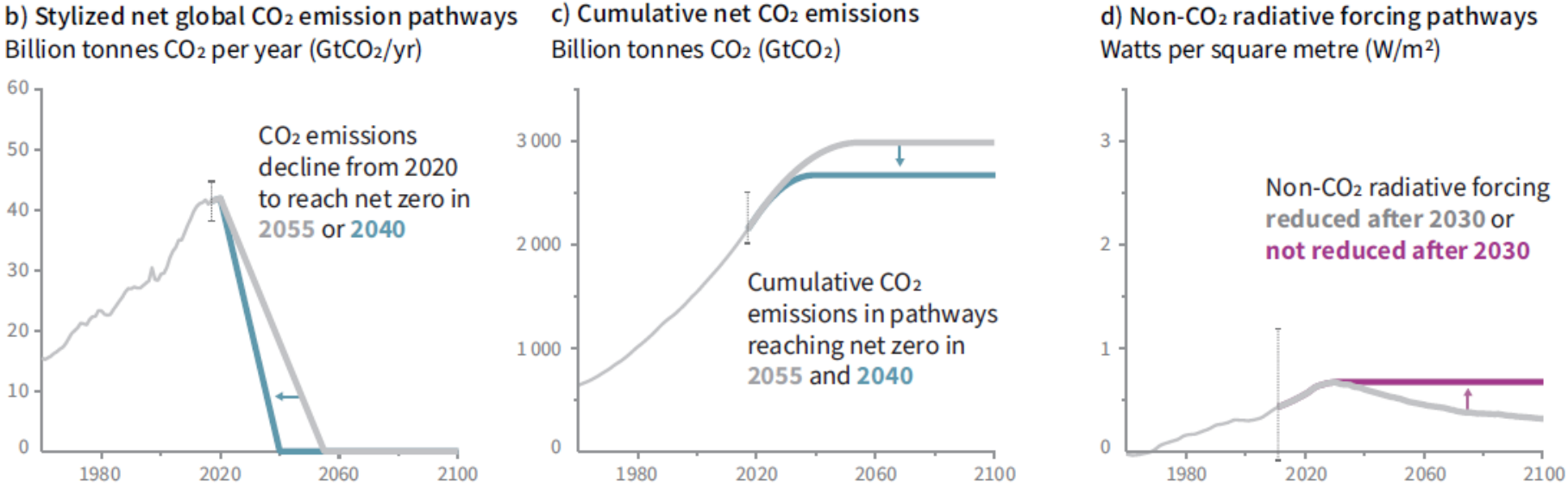

Updated CMIP6
ScenarioMIP
Set:
2100 range
Reference scenarios
6.0 Wm-2 scenarios
4.5 Wm-2 scenarios
3.4 Wm-2 scenarios
2.6 Wm-2 scenarios
1.9 Wm-2 scenarios
Historical emissions
SSP5-8.5
SSP3-7.0
SSP4-6.0
SSP2-4.5
SSP4-3.4
SSP1-2.6
SSP1.1.9
Global CO2 emissions (GtCO2 yr-1)
Time (years)
140
120
100
80
60
40
20
0
-20
-40
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100


(a)
Global Kyoto-GHG emissions (GtCO2e AR4GWP)
60
40
20
0
−20
2020
2030
2050
2100
Below 1.5 °C [5]
1.5 °C low OS [31]
1.5 °C High OS [32]
Lower 2 °C [59]
Higher 2 °C [42]
S1
S2
S5
LED

Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways



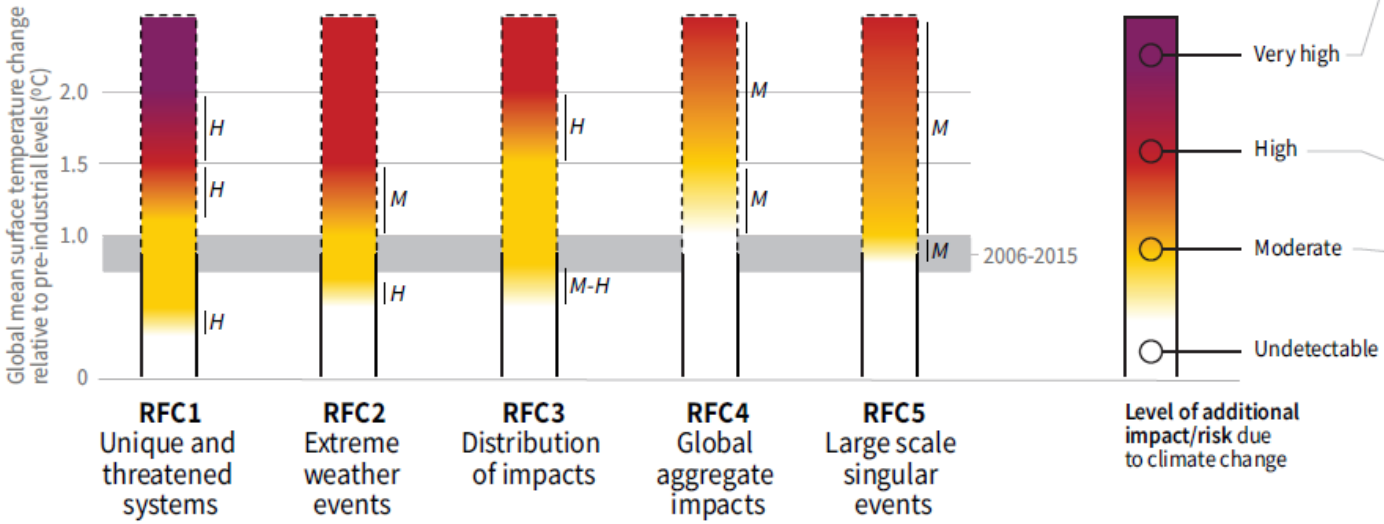


Faster immediate CO_2 emission reductions limit cumulative CO_2 emissions shown in panel **(c)**.

Maximum temperature rise is determined by cumulative net CO_2 emissions and net non-CO_2 radiative forcing due to methane, nitrous oxide, aerosols and other anthropogenic forcing agents.

Five Reasons For Concern (RFCs) illustrate the impacts and risks of different levels of global warming for people, economies and ecosystems across sectors and regions.

Impacts and risks associated with the Reasons for Concern (RFCs)



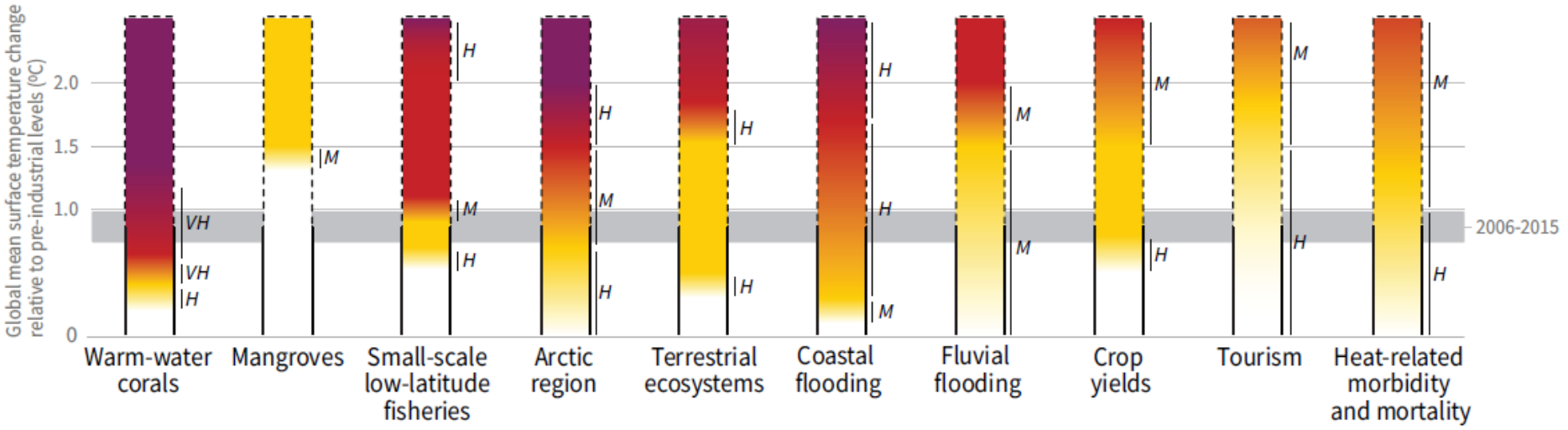
Purple indicates very high risks of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.

Red indicates severe and widespread impacts/risks.

Yellow indicates that impacts/risks are detectable and attributable to climate change with at least medium confidence.

White indicates that no impacts are detectable and attributable to climate change.

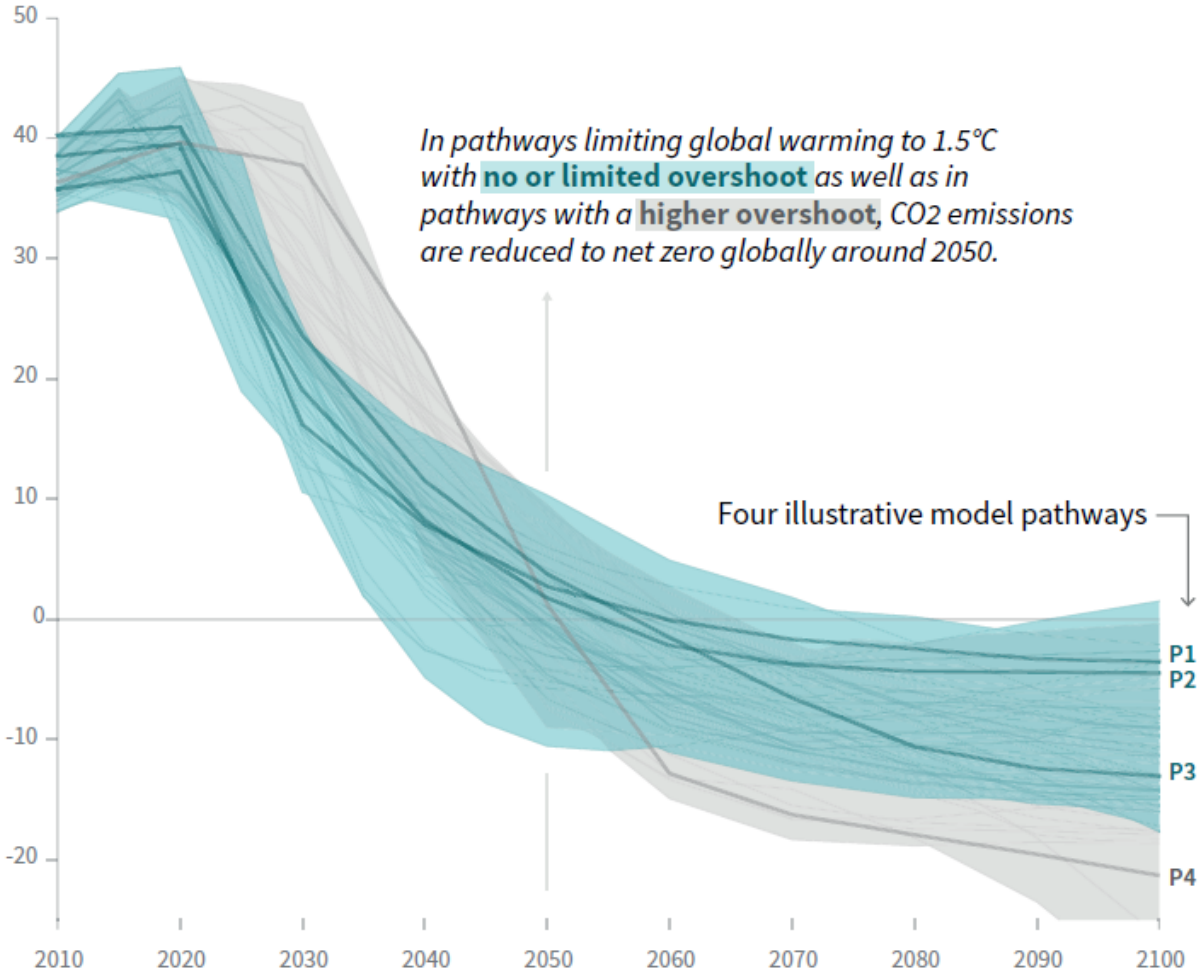
Impacts and risks for selected natural, managed and human systems



Confidence level for transition: *L*=Low, *M*=Medium, *H*=High and *VH*=Very high

Global total net CO_2 emissions

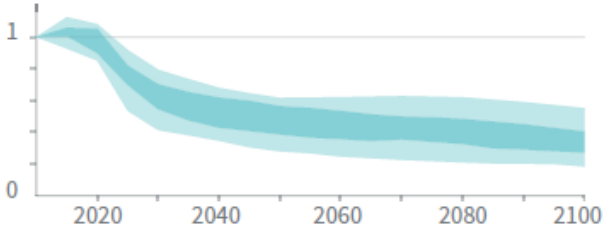
Billion tonnes of CO_2/yr



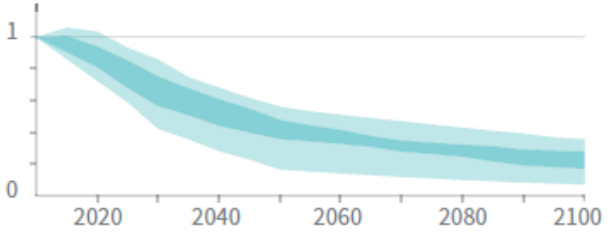
Non-CO_2 emissions relative to 2010

Emissions of non-CO_2 forcers are also reduced or limited in pathways limiting global warming to 1.5°C with **no or limited overshoot**, but they do not reach zero globally.

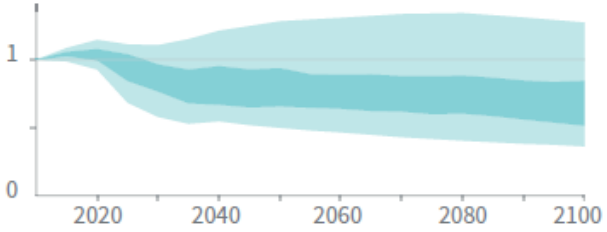
Methane emissions



Black carbon emissions



Nitrous oxide emissions



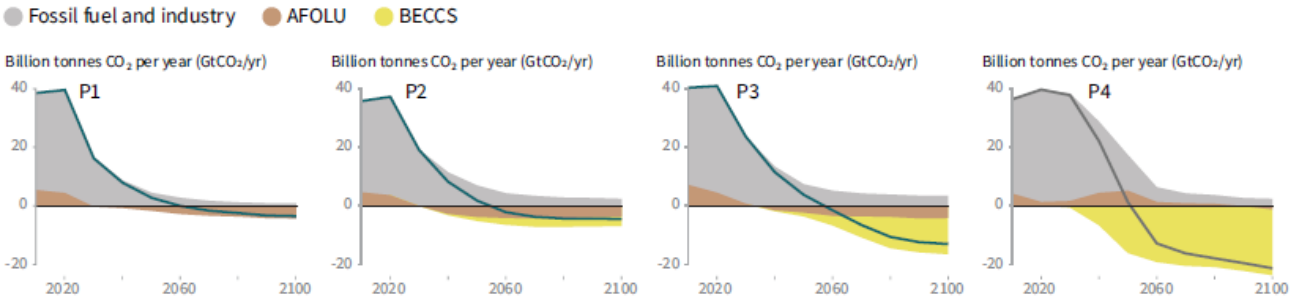
Timing of net zero CO_2
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios

Pathways limiting global warming to 1.5°C with **no or limited** overshoot

Pathways with **higher overshoot**

Pathways limiting global warming below 2°C (Not shown above)

Breakdown of contributions to global net CO_2 emissions in four illustrative model pathways



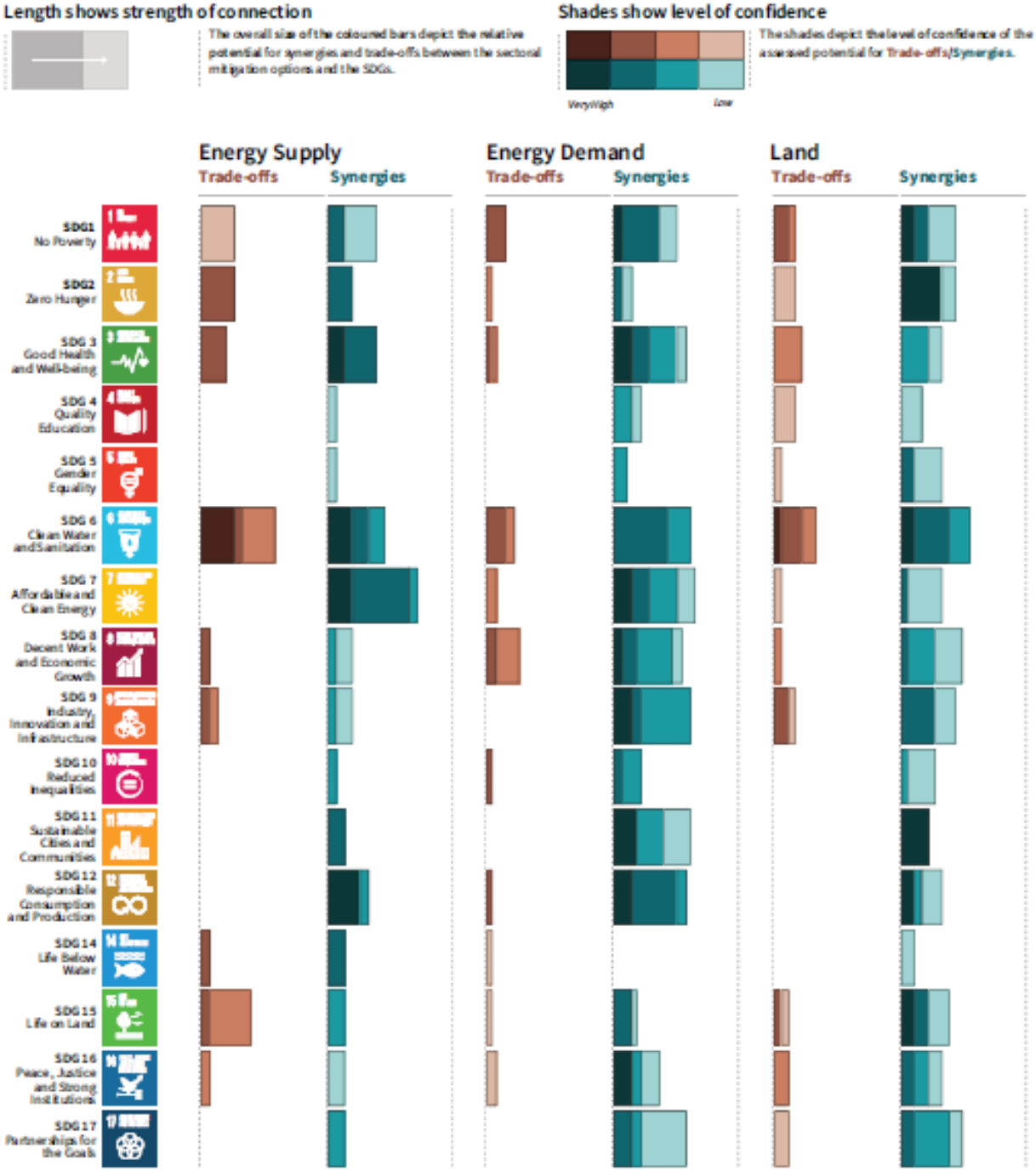
P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

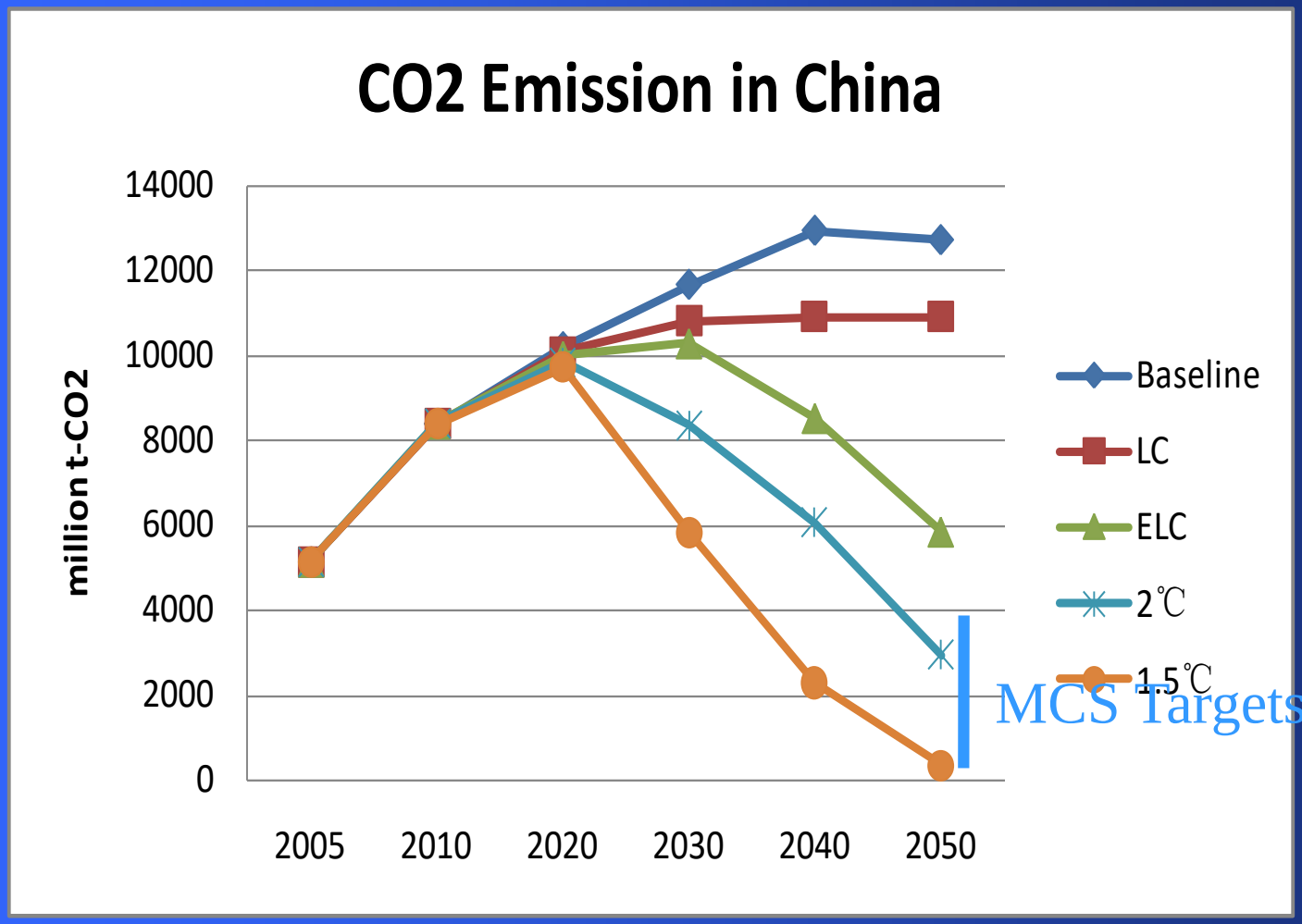
P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

Global indicators	P1	P2	P3	P4	**Interquartile range**
Pathway classification	No or limited overshoot	No or limited overshoot	No or limited overshoot	Higher overshoot	No or limited overshoot
CO_2 emission change in 2030 (% rel to 2010)	-58	-47	-41	4	(-58,-40)
↳in 2050 (% rel to 2010)	-93	-95	-91	-97	(-107,-94)
Kyoto-GHG emissions in 2030 (% rel to 2010)*	-50	-49	-35	-2	(-51,-39)
↳in 2050 (% rel to 2010)	-82	-89	-78	-80	(-93,-81)
*Final energy demand** in 2030 (% rel to 2010)*	-15	-5	17	39	(-12,7)
↳in 2050 (% rel to 2010)	-32	2	21	44	(-11,22)
Renewable share in electricity in 2030 (%)	60	58	48	25	(47,65)
↳in 2050 (%)	77	81	63	70	(69,86)
Primary energy from coal in 2030 (% rel to 2010)	-78	-61	-75	-59	(-78,-59)
↳in 2050 (% rel to 2010)	-97	-77	-73	-97	(-95,-74)
from oil in 2030 (% rel to 2010)	-37	-13	-3	86	(-34,3)
↳ in 2050 (% rel to 2010)	-87	-50	-81	-32	(-78,-31)
from gas in 2030 (% rel to 2010)	-25	-20	33	37	(-26,21)
↳ in 2050 (% rel to 2010)	-74	-53	21	-48	(-56,6)
from nuclear in 2030 (% rel to 2010)	59	83	98	106	(44,102)
↳ in 2050 (% rel to 2010)	150	98	501	468	(91,190)
from biomass in 2030 (% rel to 2010)	-11	0	36	-1	(29,80)
↳ in 2050 (% rel to 2010)	-16	49	121	418	(123,261)
from non-biomass renewables in 2030 (% rel to 2010)	430	470	315	110	(245,436)
↳ in 2050 (% rel to 2010)	833	1327	878	1137	(576,1299)
Cumulative CCS until 2100 ($GtCO_2$)	0	348	687	1218	(550,1017)
↳of which BECCS ($GtCO_2$)	0	151	414	1191	(364,662)
Land area of bioenergy crops in 2050 (million km^2)	0.2	0.9	2.8	7.2	(1.5,3.2)
Agricultural CH_4 emissions in 2030 (% rel to 2010)	-24	-48	1	14	(-30,-11)
in 2050 (% rel to 2010)	-33	-69	-23	2	(-47,-24)
Agricultural N_2O emissions in 2030 (% rel to 2010)	5	-26	15	3	(-21,3)
in 2050 (% rel to 2010)	6	-26	0	39	(-26,1)


Length shows strength of connection
The overall size of the coloured bars depict the relative potential for synergies and trade-offs between the sectoral mitigation options and the SDGs.
Shades show level of confidence
Very High
Low
The shades depict the level of confidence of the assessed potential for Trade-offs/Synergies.
Energy Supply
Trade-offs
Synergies
Energy Demand
Trade-offs
Synergies
Land
Trade-offs
Synergies
SDG1 No Poverty
SDG2 Zero Hunger
SDG 3 Good Health and Well-being
SDG 4 Quality Education
SDG 5 Gender Equality
SDG 6 Clean Water and Sanitation
SDG 7 Affordable and Clean Energy
SDG 8 Decent Work and Economic Growth
SDG 9 Industry, Innovation and Infrastructure
SDG 10 Reduced Inequalities
SDG 11 Sustainable Cities and Communities
SDG 12 Responsible Consumption and Production
SDG 14 Life Below Water
SDG 15 Life on Land
SDG 16 Peace, Justice and Strong Institutions
SDG 17 Partnerships for the Goals


CO2 Emission in China
million t-CO2
14000
12000
10000
8000
6000
4000
2000
0
2005
2010
2020
2030
2040
2050
Baseline
LC
ELC
2℃
1.5℃
MCS Targets

A 2/1.5℃ Asia: A good way to understand the global target

Scenario Analysis:

Japan
Korea
China
India
Thailand
Malaysia
Indonesia
Nepal
Vietnam
Cambodia
Laos
Philippine
Myanmar
Pakistan

IPCC AR6 WGIII
Call for national scenarios

For Chp 3(long-term), Chp4(2030)
Sector chapters

Schedule:
Nov.15, 2019, for FOD
June 15, 2020, for SOD, based on submitted paper
Oct.31, 2020, closing for scenario submission, paper accepted.
Jan.19, 2021, final data

Let’s Work Together, to have

Better Economy, Better Life, Better Environment!

Thanks You!