Implications on sustainable development, poverty reduction and inequality reduction

FAQ5.1: **The United Nations Sustainable Development Goals (SDGs)**

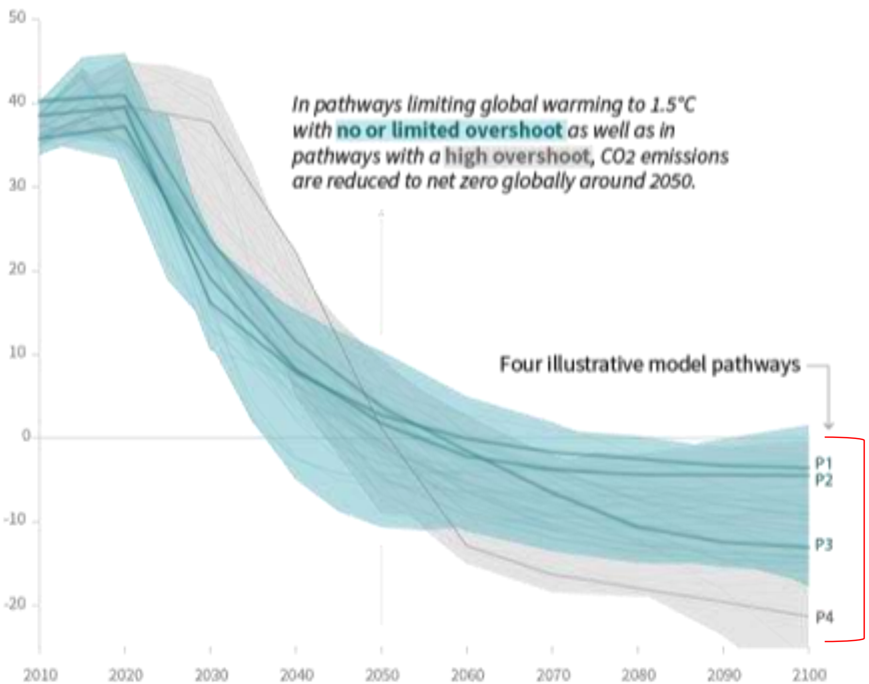
The link between sustainable development and limiting global warming to 1.5°C is recognised by the Sustainable Development Goal for climate action (SDG 13)

Caption: Climate change action is one of the United Nations Sustainable Development Goals (SDGs) and is connected to sustainable development more broadly. Actions to reduce climate risk can interact with other sustainable development objectives in positive ways (synergies) and negative ways (trade-offs).

SPM3a | Global emissions pathway characteristics

Global total net CO_2 emissions

Billion tonnes of CO_2/yr

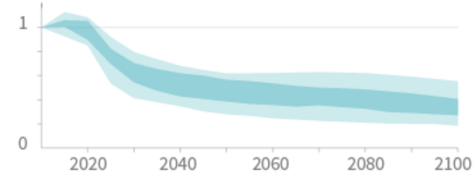


Timing of net zero CO_2
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios

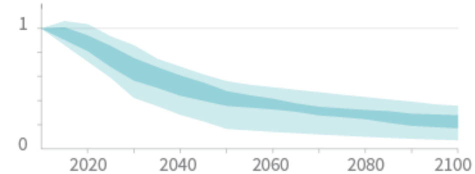
Non-CO_2 emissions relative to 2010

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.

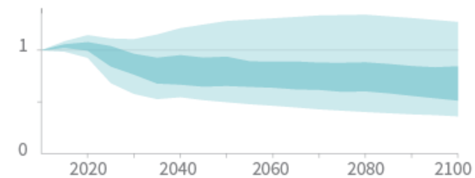
Methane emissions



Black carbon emissions



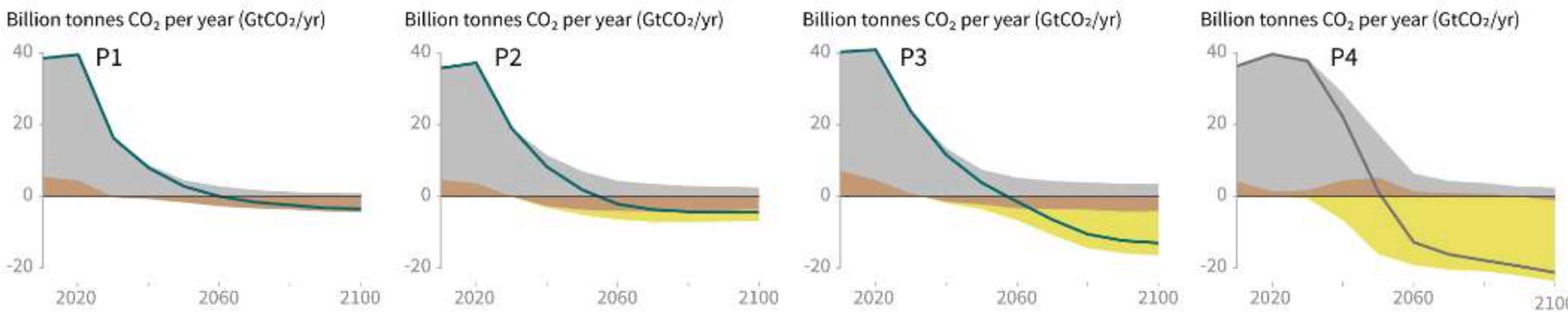
Nitrous oxide emissions



INTERGOVERNMENTAL PANEL ON climate change

SPM3b | Characteristics of four illustrative model pathways

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 down-sized energy system enables rapid decarbonisation 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.

SPM3b | Characteristics of four illustrative model pathways

Global indicators	P1	P2	P3	P4	**Interquartile range**
Pathway classification	No or low overshoot	No or low overshoot	No or low overshoot	High overshoot	No or low overshoot
CO_2 emission change in 2030 (% rel to 2010)	-58	-47	-41	4	(-59,-40)
└ in 2050 (% rel to 2010)	-93	-95	-91	-97	(-104,-91)
Kyoto-GHG emissions in 2030 (% rel to 2010)*	-50	-49	-35	-2	(-55,-38)
└ 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, 87)
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	(243,438)
└ in 2050 (% rel to 2010)	832	1327	878	1137	(575,1300)
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 hectare)	22	93	283	724	(151, 320)
Agricultural CH_4 emissions in 2030 (% rel to 2010)	-24	-48	1	14	(-30,-11)
in 2050 (% rel to 2010)	-33	-69	-23	2	(-46,-23)
Agricultural N_2O emissions in 2030 (% rel to 2010)	5	-26	15	3	(-21,4)
in 2050 (% rel to 2010)	6	-26	0	39	(-26,1)

NOTE: Indicators have been selected to show global trends identified by the Chapter 2 assessment. National and sectoral characteristics can differ substantially from the global trends shown above.

** Kyoto-gas emissions are based on SAR GWP-100*
*** Changes in energy demand are associated with improvements in energy efficiency and behaviour change*

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Temperature and emissions

Energy systems

Carbon dioxide removal

Agriculture

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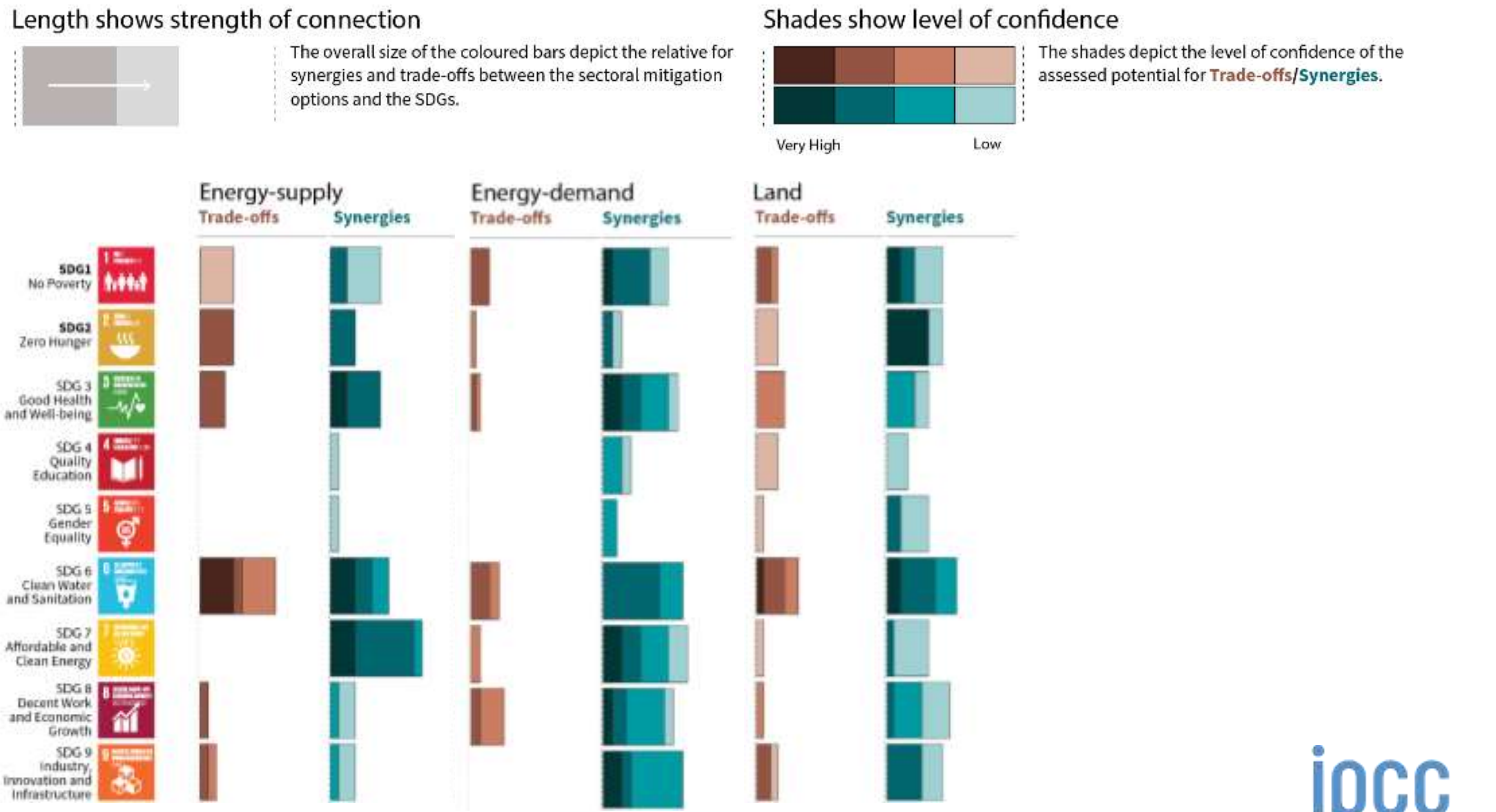
SPM4 | Indicative linkages between mitigation and sustainable development using SDGs (the linkages do not show costs and benefit)



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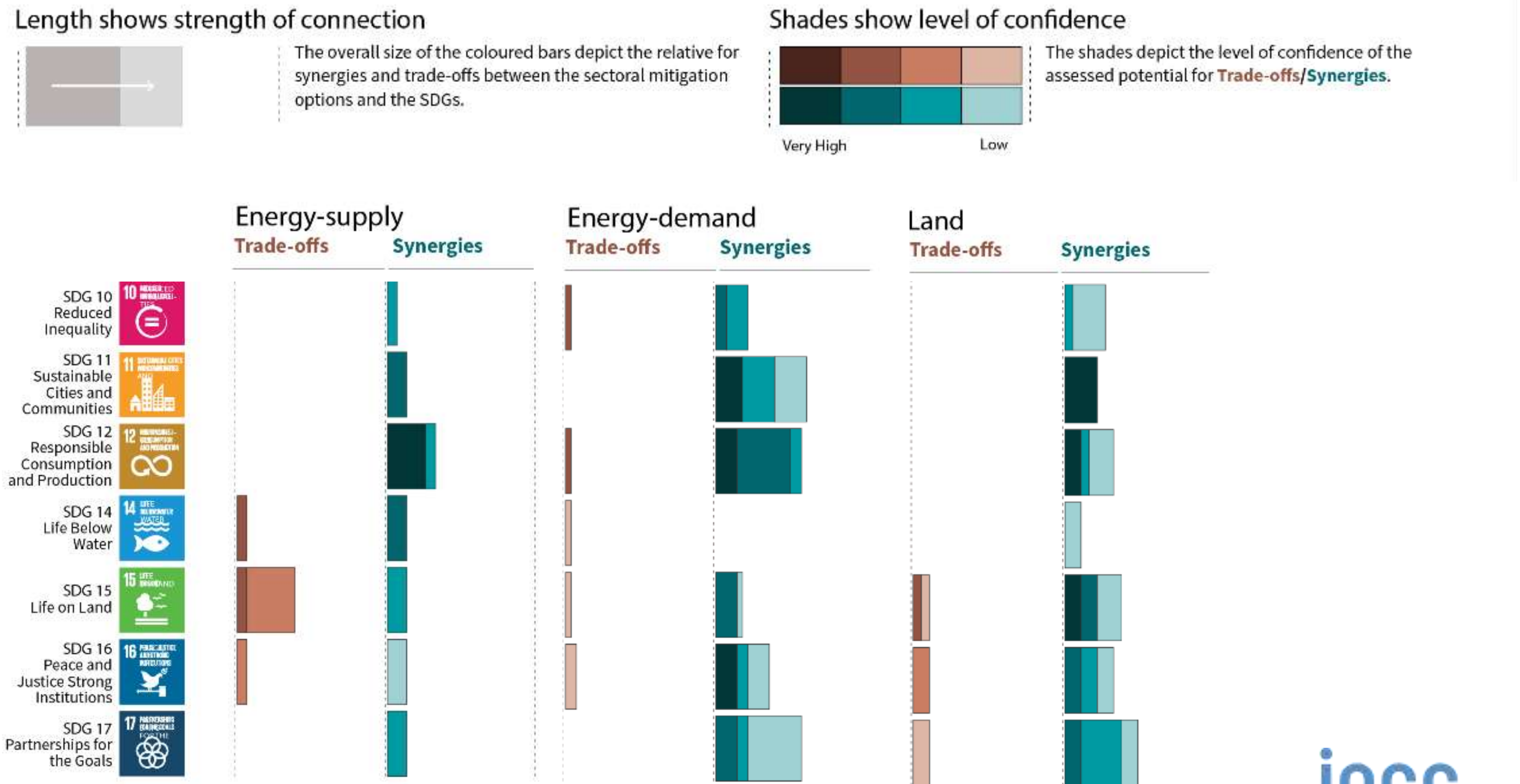

Deploying mitigation options consistent with 1.5° C pathways has multiple synergies across a range of SDGs. The rapid pace and magnitude of change if not carefully managed, would lead to trade-offs with some SDGs

- The number of synergies between mitigation response options and SDGs **exceeds** the number of trade-offs in energy demand and supply sectors, Agriculture, Forestry and Other Land Use (AFOLU) and for oceans
- Robust synergies： particularly for the SDGs 3 (health), 7 (clean energy), 12 (responsible consumption and production), and 14 (oceans)
- Risk of trade-offs or negative side-effects from stringent mitigation actions： SDGs 1 (poverty), 2 (hunger), 6 (water), and 7 (energy access),

Pathways compatible with 1.5°C that feature low-energy demand show the most pronounced synergies and the lowest number of trade-offs with respect to sustainable development and the SDGs

- Low-demand pathways, which would reduce or completely avoid the reliance on Bioenergy with CCS in 1.5°C pathways, would result in significantly reduced pressure on food security, lower food prices, and fewer people at risk of hunger

The impacts of Carbon Dioxide Removal (CDR) options on SDGs depend on the type of options and the scale of deployment

- If poorly implemented, CDR options (e.g. bioenergy, BECCS and AFOLU) would lead to negative consequences.
- Appropriate design and implementation requires considering local people´s needs, biodiversity, and other sustainable development dimensions

A portfolio of mitigation actions and policy instruments is necessary to limit warming to 1.5°C. Redistributive policies that shield the poor and vulnerable can resolve trade-offs for a range of SDGs

- Appropriate choices across the mitigation portfolio can help to maximize positive side-effects while minimizing negative side-effects
- Integration of mitigation with adaptation and sustainable development compatible with 1.5°C requires a systems perspective

Mitigation measures consistent with 1.5C create high risks for sustainable development in countries with high dependency on fossil fuels for revenue and employment generation

- These risks are caused by the reduction of global demand affecting mining activity and export revenues and challenges to rapidly decrease high carbon intensity of the domestic economy

- Targeted policies that promote diversification of the economy and the energy sector could ease this transition

Many Thanks!