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Just and Sustainable Transitions

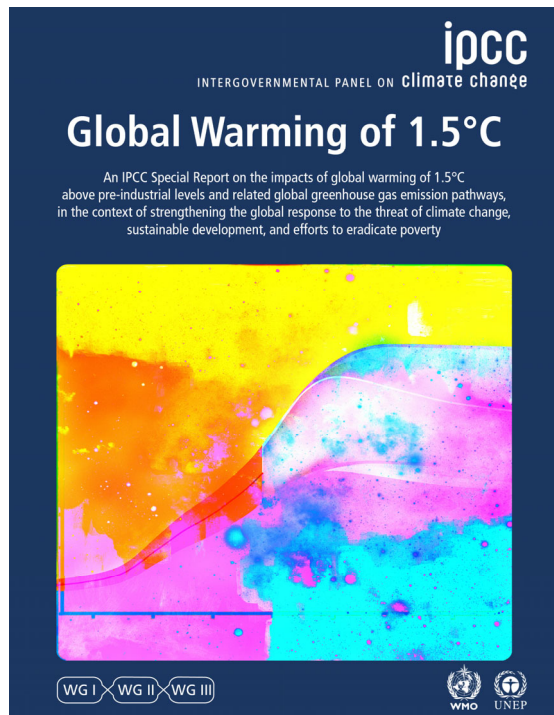
**Accelerating Actions for Leveraging a
Climate-Neutral, Sustainable Society**

**LCS-RNet 12th Annual Meeting
8 December 2021**

**Jim Skea
Professor of Sustainable Energy**



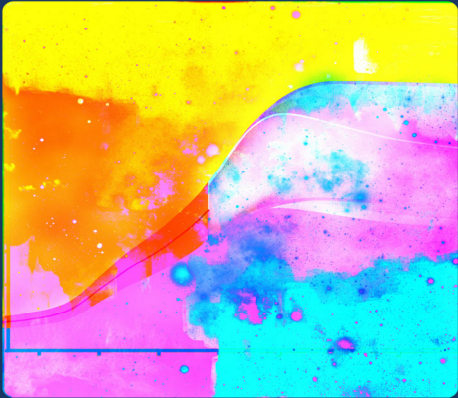
Coming at it from different angles



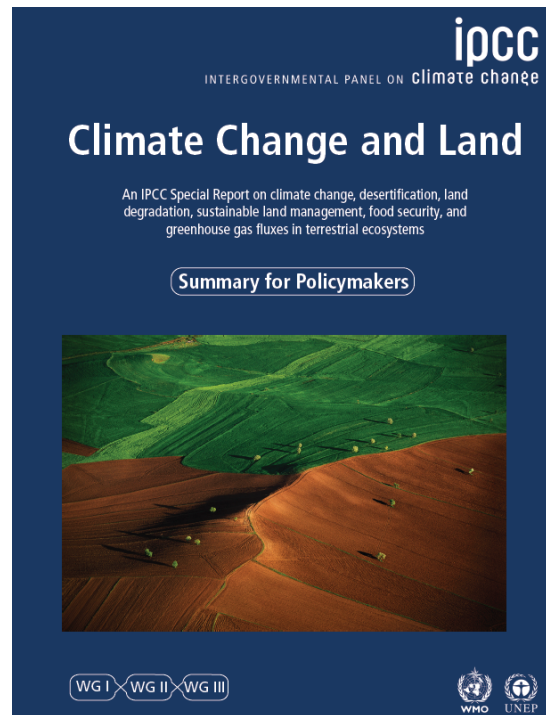

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Global Warming of 1.5°C

An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty



WG I | WG II | WG III




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INTERGOVERNMENTAL PANEL ON climate change

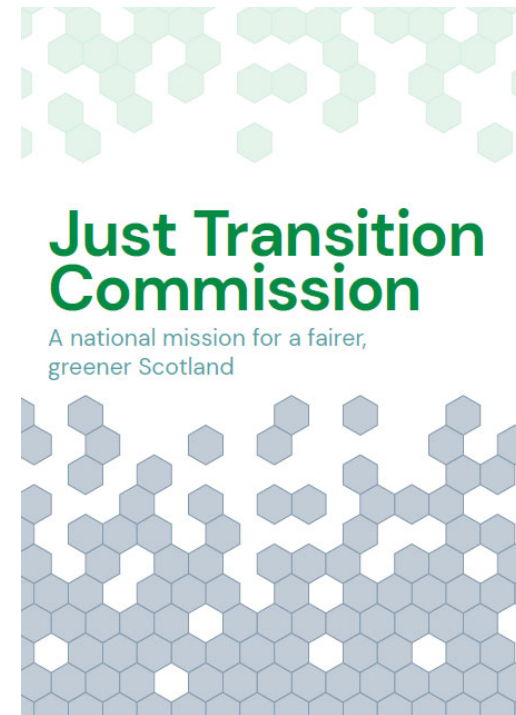

Climate Change and Land

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems

Summary for Policymakers

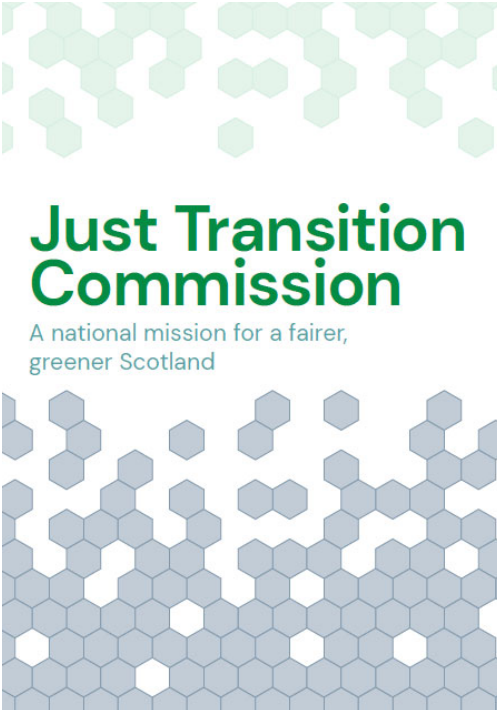


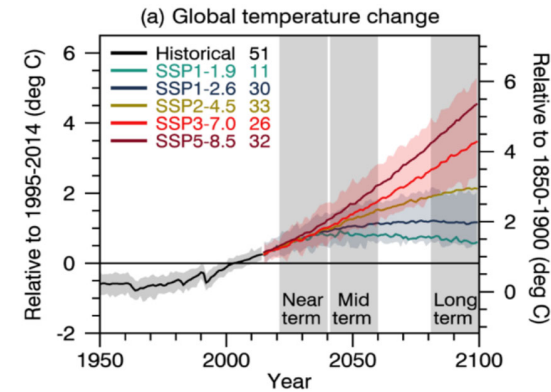
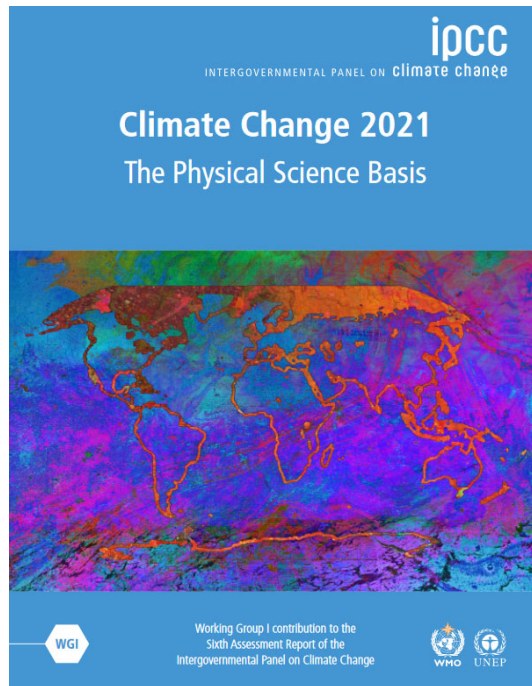
WG I | WG II | WG III



**Just Transition
Commission**

A national mission for a fairer,
greener Scotland





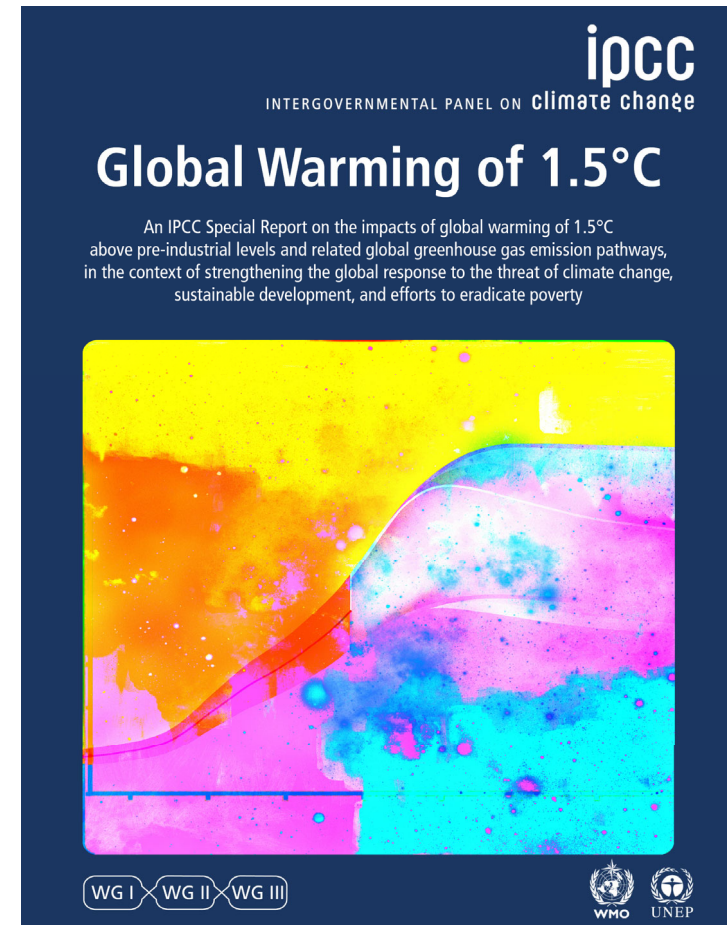
- It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.
- Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in carbon dioxide (CO₂) and other greenhouse gas emissions occur in the coming decades

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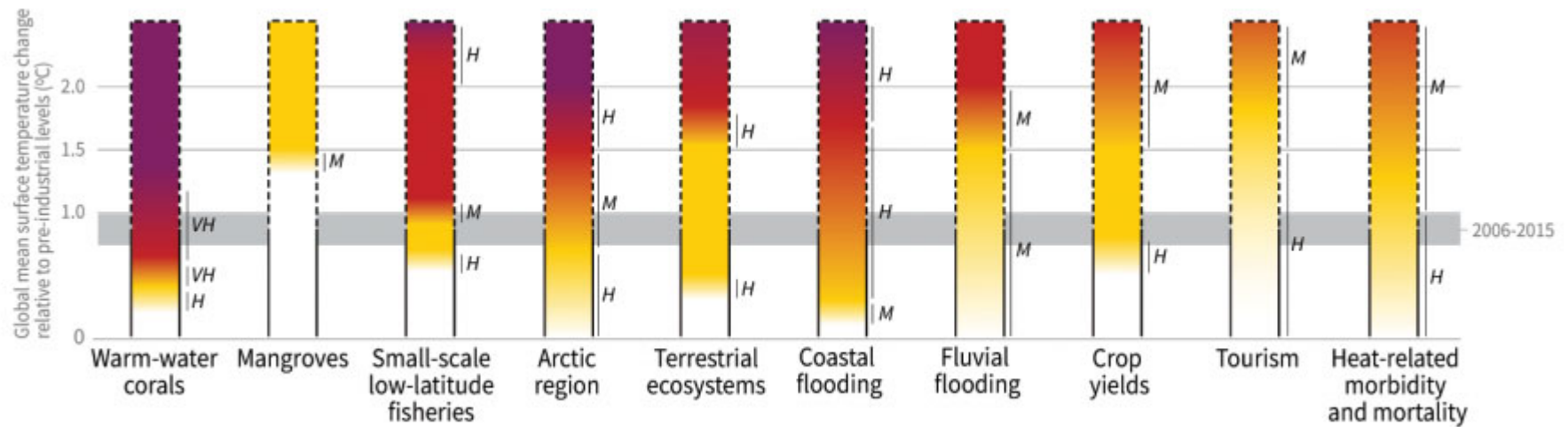
Article 2: “Holding the increase in the global average temperature to well below 2 °C ... and to pursue efforts to limit the temperature increase to 1.5 °C”

The Conference of the Parties invites the Intergovernmental Panel on Climate Change to provide a special report in 2018 on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways

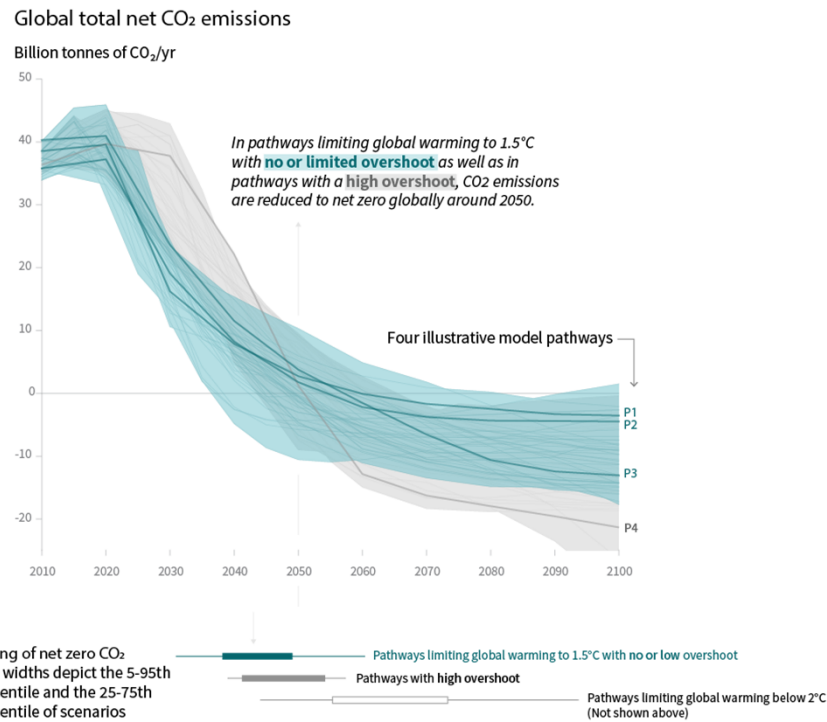
Paris Agreement



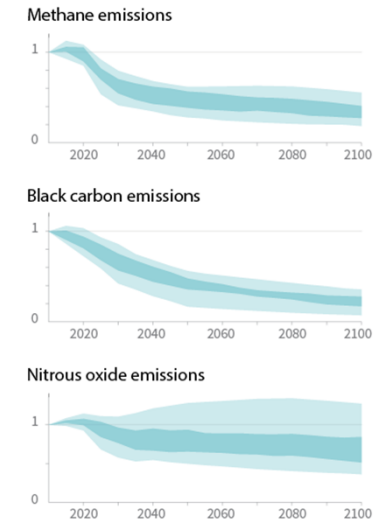
Climate risks increase between 1.5 and 2°C warming



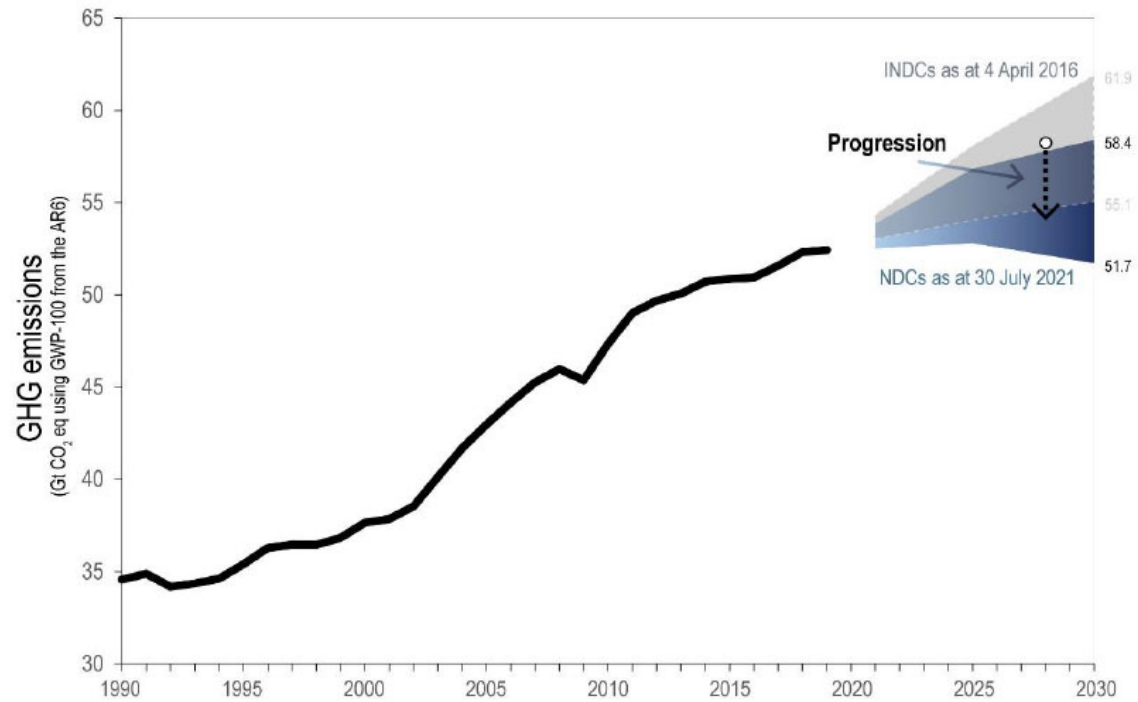
The IPCC 1.5°C report: Emissions of all greenhouse gases need to fall, CO₂ to or below net zero, to limit warming to 1.5°C



Non-CO₂ emissions relative to 2010
Emissions of non-CO₂ 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.



There is progress
with NDCs¹, but not
enough to meet the
Paris long-term
temperature goal

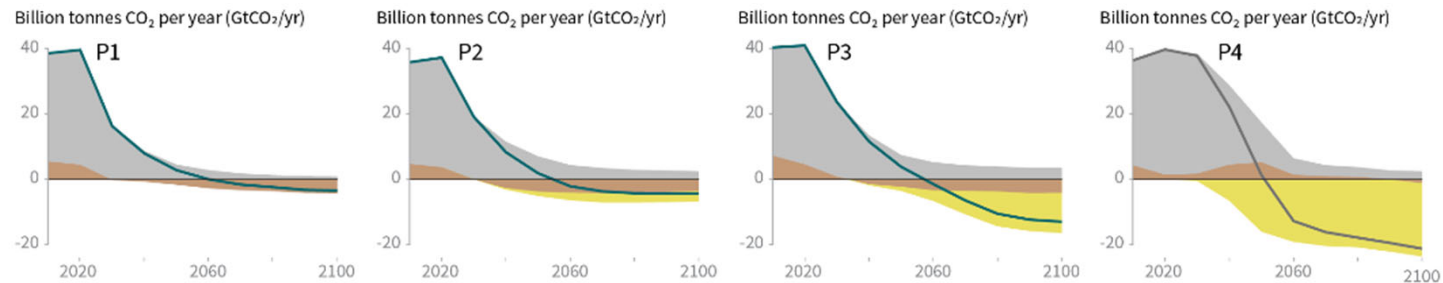


¹ NDCs - nationally determined contributions

There is more than one way of limiting warming to 1.5 °C or well below 2°C

Breakdown of contributions to global net CO₂ emissions in four illustrative model pathways

● Fossil fuel and industry ● AFOLU ● BECCS



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.

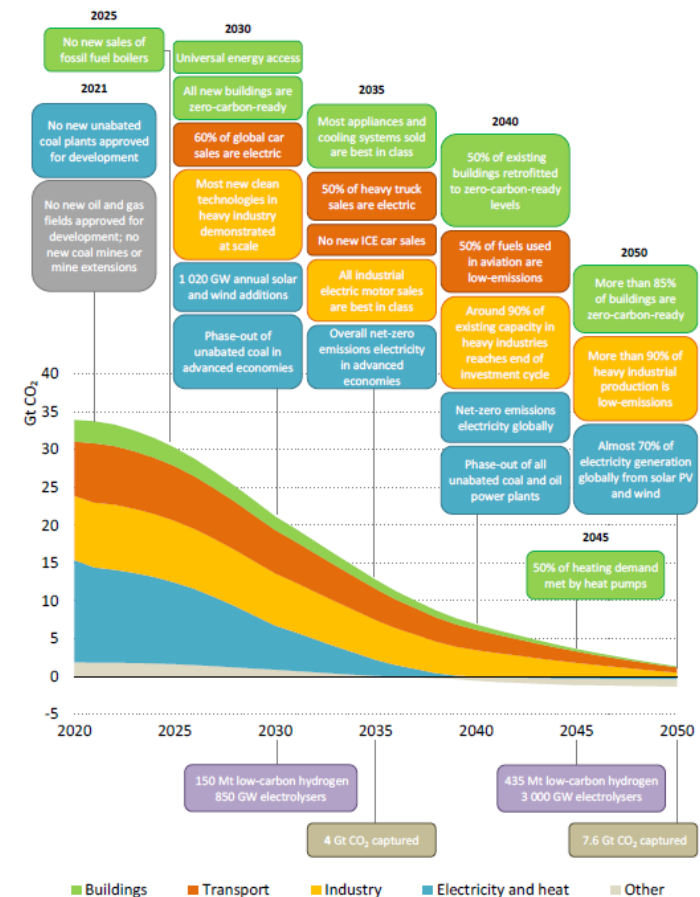
P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making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

Limiting warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all systems

- Scale up in annual investment in low carbon energy and energy efficiency by factor of five by 2050
- Renewables supply 70-85% of electricity in 2050
- Coal declines steeply, ~zero in electricity by 2050
- Oil and especially gas persist longer – gas use rises by 2050 in some pathways
- Electrification of demand and energy efficiency
- Deep emissions cuts in transport and buildings

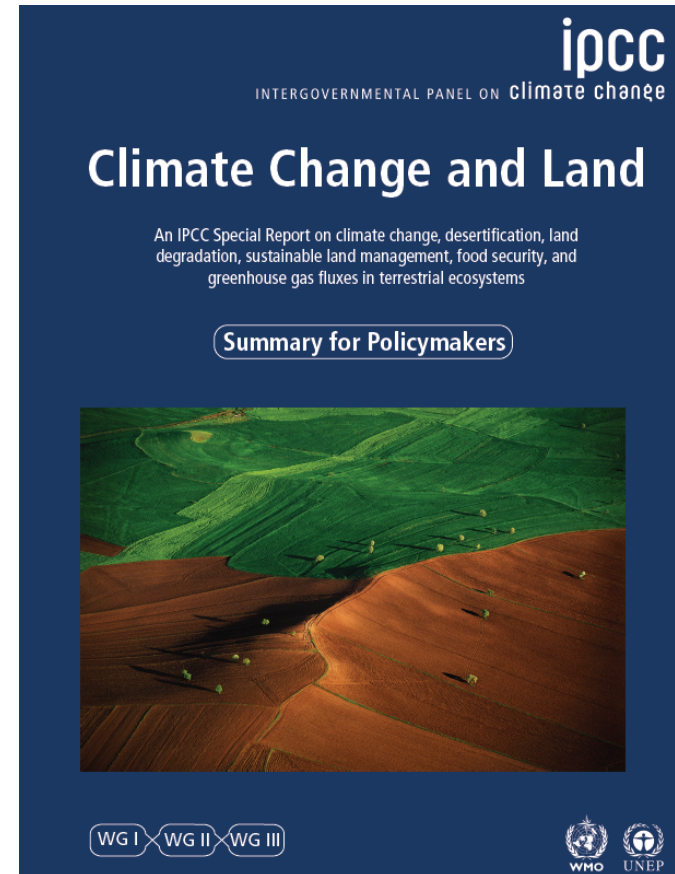
Source: IPCC

Key milestones in the pathway to net zero



Source: IEA

Not just about energy

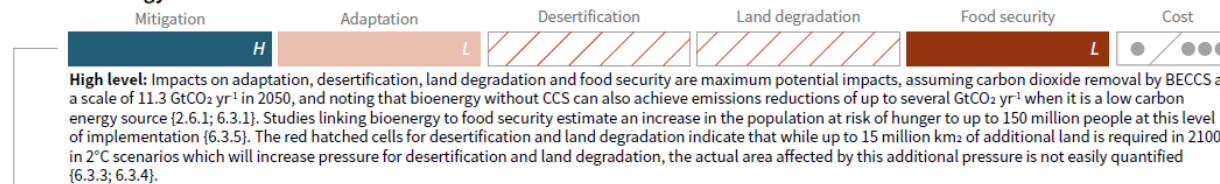


Many land-based
responses advance
mitigation, adaptation
and sustainable
development goals

Response options based on land management		Mitigation	Adaptation	Desertification	Land Degradation	Food Security	Cost
Agriculture	Increased food productivity	L	M	L	M	H	---
	Agro-forestry	M	M	M	M	L	●
	Improved cropland management	M	L	L	L	L	●●
	Improved livestock management	M	L	L	L	L	●●●
	Agricultural diversification	L	L	L	M	L	●
	Improved grazing land management	M	L	L	L	L	---
	Integrated water management	L	L	L	L	L	●●
	Reduced grassland conversion to cropland	L	---	L	L	L	●
Forests	Forest management	M	L	L	L	L	●●
	Reduced deforestation and forest degradation	H	L	L	L	L	●●
Soils	Increased soil organic carbon content	H	L	M	M	L	●●
	Reduced soil erosion	↔ L	L	M	M	L	●●
	Reduced soil salinization	---	L	L	L	L	●●
	Reduced soil compaction	---	L	---	L	L	●
Other ecosystems	Fire management	M	M	M	M	L	●
	Reduced landslides and natural hazards	L	L	L	L	L	---
	Reduced pollution including acidification	↔ M	M	L	L	L	---
	Restoration & reduced conversion of coastal wetlands	M	L	M	M	↔ L	---
	Restoration & reduced conversion of peatlands	M	---	na	M	L	●
Response options based on value chain management							
Demand	Reduced post-harvest losses	H	M	L	L	H	---
	Dietary change	H	---	L	H	H	---
	Reduced food waste (consumer or retailer)	H	---	L	M	M	---
Supply	Sustainable sourcing	---	L	---	L	L	---
	Improved food processing and retailing	L	L	---	---	L	---
	Improved energy use in food systems	L	L	---	---	L	---
Response options based on risk management							
Risk	Livelihood diversification	---	L	---	L	L	---
	Management of urban sprawl	---	L	L	M	L	---
	Risk sharing instruments	↔ L	L	---	↔ L	L	●●

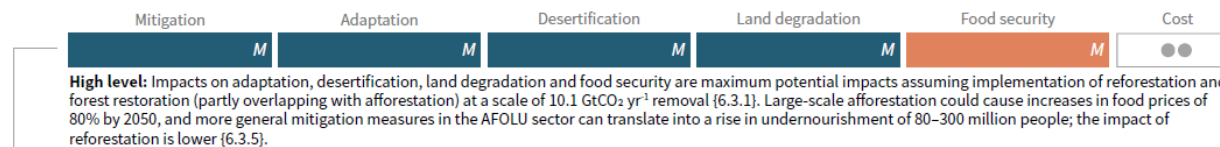
But scale, location and management practices are critical for other land-based responses

Bioenergy and BECCS



Best practice: The sign and magnitude of the effects of bioenergy and BECCS depends on the scale of deployment, the type of bioenergy feedstock, which other response options are included, and where bioenergy is grown (including prior land use and indirect land use change emissions). For example, limiting bioenergy production to marginal lands or abandoned cropland would have negligible effects on biodiversity, food security, and potentially co-benefits for land degradation; however, the benefits for mitigation could also be smaller. {Table 6.58}

Reforestation and forest restoration



Best practice: There are co-benefits of reforestation and forest restoration in previously forested areas, assuming small scale deployment using native species and involving local stakeholders to provide a safety net for food security. Examples of sustainable implementation include, but are not limited to, reducing illegal logging and halting illegal forest loss in protected areas, reforesting and restoring forests in degraded and desertified lands {Box6.1C; Table 6.6}.

Supporting the conditions for a just transition internationally

- Support for workers in the transition to new jobs
 - Support and promote social dialogue and stakeholder engagement
 - Economic Strategies
 - Local, inclusive, and decent work
 - Supply chains
 - Paris Agreement reporting and Just Transition
-

The imperative of a just transition is that Governments design policies in a way that ensures the benefits of climate change action are shared widely, while the costs do not unfairly burden those least able to pay, or whose livelihoods are directly or indirectly at risk as the economy shifts and changes.

The growing scope of just transition

- Not just about coal
- Not just about fossil fuels
- Not just about the supply side
- People as consumers and citizens
- The importance of “place”, communities and local action

- Land tenure
- Fair work
- Energy poverty
- Just transition globally

Four sets of actions for just transition

- Pursue an orderly, managed transition to net zero that creates benefits and opportunities for people. Delivery of this requires national-level missions
- Equip people with the skills and education they need to benefit from the transition
- Empower and invigorate communities and strengthen local economies
- Share benefits widely and ensure burdens are distributed on the basis of ability to pay.

What to expect from the WG III AR6 Report

1. Introduction and framing

2. Emissions trends and drivers

3. Mitigation pathways compatible with long-term goals

4. Mitigation and development pathways in the near- to mid-term

SECTORS AND SYSTEMS →

13. National and sub-national policies and institutions

14. International cooperation

15. Investment and finance

16. Innovation, technology development and transfer

17. Accelerating the transition in the context of sustainable development

5. Demand, services and social aspects of mitigation

6. Energy systems

7. Agriculture, Forestry, and Other Land Uses

8. Urban systems and other settlements

9. Buildings

10. Transport

11. Industry

12: Cross sectoral perspectives

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Thank you!

<https://www.ipcc.ch/sr15/>

<https://www.gov.scot/groups/just-transition-commission/>
