

# 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.**



## Where are we now?

Since pre-industrial times, human activities have caused approximately 1°C of global warming.

- Already seeing consequences for people, nature and livelihoods
- At current rate, would reach 1.5°C between 2030 and 2052
- Past emissions alone do not commit the world to 1.5°C

Ashley Cooper / Aurora Photos

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INTERGOVERNMENTAL PANEL ON climate change

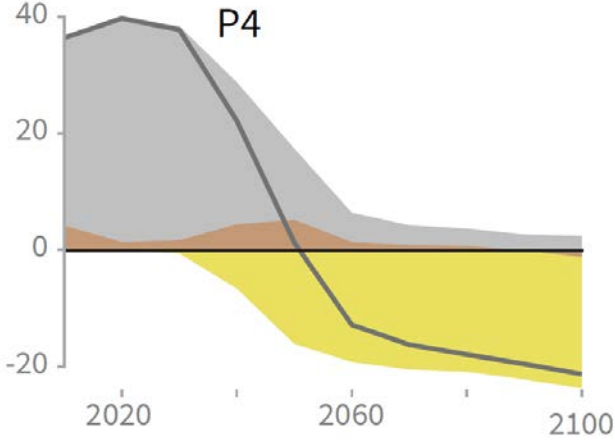
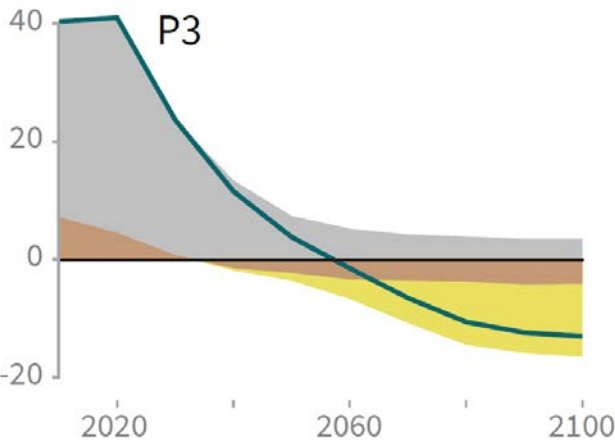
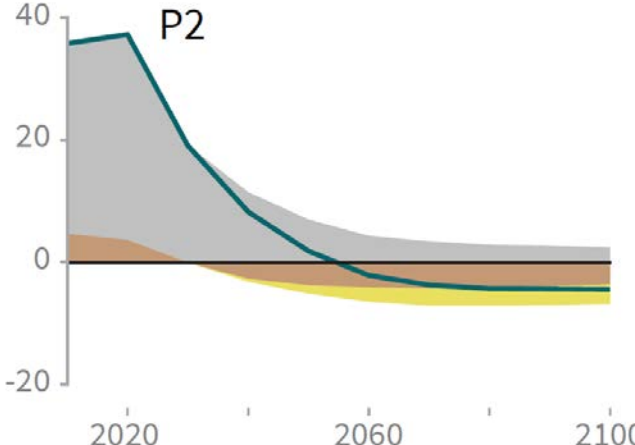
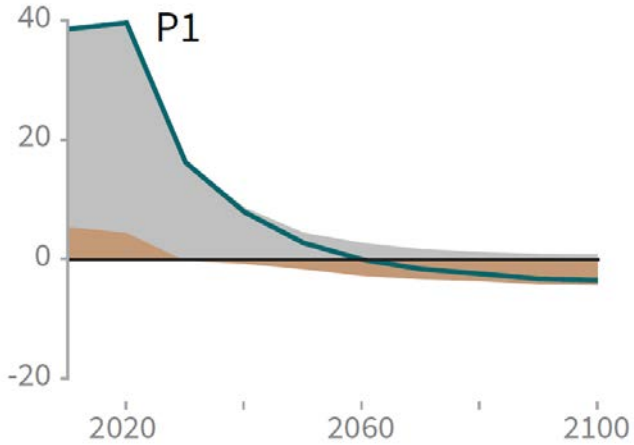




## What are the implications?

- National ambitions expressed in the last three years will not be enough on their own to limit global warming to 1.5°C
- Currently tracking towards 3°C by 2100, with warming continuing afterwards
- In all pathways that limit global warming to 1.5°C with no or limited overshoot, CO<sub>2</sub> emissions fall substantially by 2030

# Different pathways and mitigation strategies could limit global warming to 1.5°C

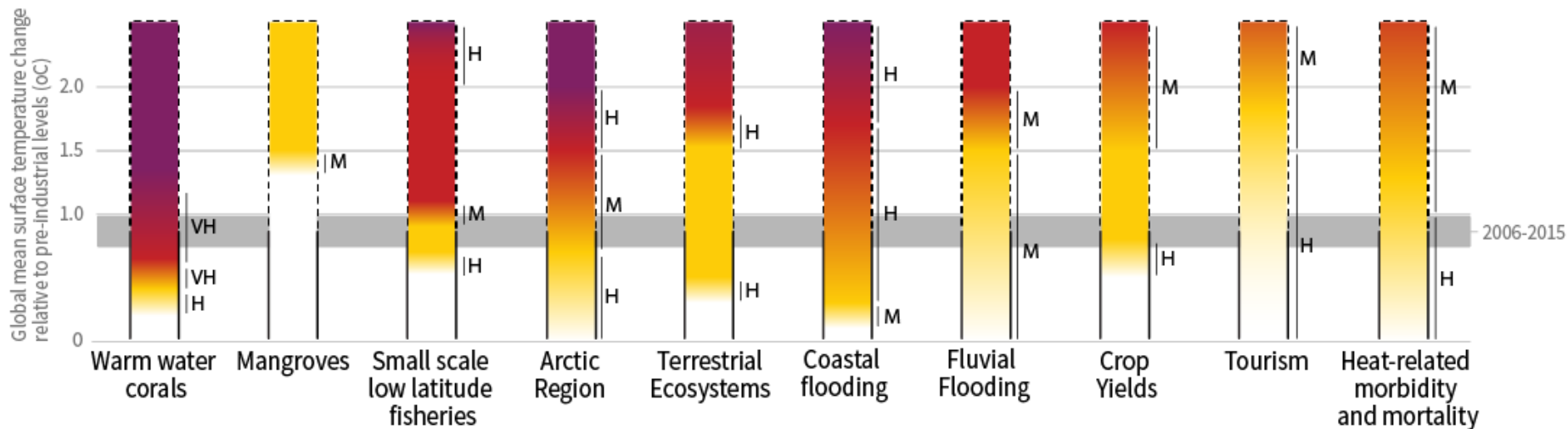


Fossil fuel and industry
  AFOLU
  BECCS

# SPM2

How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

## Impacts and risks for selected natural, managed and human systems



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





## Limiting warming to 1.5°C

Would require rapid, far-reaching and unprecedented changes in all systems

- A range of technologies and behavioural changes
- 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
- Deep emissions cuts in transport and buildings
- Changes in land use and urban planning

# Mind the Enabling Conditions!

**Section D: Strengthening the Global Response  
in the Context of Sustainable Development and  
Efforts to Eradicate Poverty**

## 4.1. Strengthening action in a specific macroeconomic context

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- A menu of climate actions BUT the main lesson of the ‘C’ section is:

C2.7. Modelled pathways limiting global warming to 1.5°C with no or limited overshoot project a wide range of global average discounted marginal abatement costs over the 21st century. They are roughly 3-4 times higher than in pathways limiting global warming to below 2°C (high confidence).

- Necessity of reframing the ‘possibility’ question: no way out without *using climate action as a lever to reducing the ‘fault lines’ of the world economy : in a context of short term world tensions,*
  - gap between propensity to save and propensity to invest
  - fragility of the financial intermediation system
  - Too export dependent development strategy;
  - A large funding gap on infrastructures (IMF)
  - the traps of non targetted ‘quantitative easing’ and of ‘growth austerity’



- **D4. Headline**

- Limiting global warming of 1.5°C is characterised by system transitions that are projected to involve an increase of adaptation and mitigation investments, and ***an overall redirection of world investments***. Challenges include mobilising public finances and private savings, and ***reducing the sectoral and geographic mismatch between capital flows and financial needs***. Addressing these challenges, and designing ***fit-for purpose synergetic policy instruments***, can help strengthen the global response to the threat of climate change, and ***manage the potential adverse effects of these transitions*** (*high confidence*). Adaptation finance continues to be a serious knowledge gap. {2.3, 2.4, 2.5, 3.2, 4.2, 4.4, 4.5}

**D 4.1.** Limiting global warming of 1.5°C in the context of sustainable development and poverty reduction, is projected to involve *additional investments in infrastructure sectors (e.g. energy, transportation, buildings, water and telecommunication) estimated annually (between 2015 and 2035) to about 0.6% of global GDP* (medium confidence). They could also involve *an overall redirection of investments within these sectors*, over the next two decades and reducing the sectoral and geographic mismatch between capital flows and financial needs. In the energy sector, this is characterised by a *15% increase of the investments* assessed for achieving the NDCs and a doubling of investment in low-carbon energy technologies, energy efficiency and energy storage. Over the same period, *investments in conventional fuel supply chains are projected to be 20% lower than current levels* (medium confidence). {2.5.2, 4.4.5, Box 4.8}

**D 4.2.** Mobilising these additional investments implies *redirecting an estimated 2.5% of world savings*, towards low carbon investments. Both public and private investment will be needed. *De-risking these low carbon investments*, is key to increase their volume and facilitate *the greater involvement of financial sector actors*. This would enable mitigation activities to *access to capital markets at low interest rates, and enable the emergence of new low-carbon asset classes*. (high confidence) {2.5.2, 4.4.5}

- **D4.3. *Adaptation finance consistent with global warming of 1.5°C is difficult to quantify and compare with 2°C.*** Knowledge gaps include insufficient data to calculate specific climate resilience-enhancing investments, as in the provision of currently underinvested basic infrastructure. Estimates of the costs of adaptation may be lower at global warming of 1.5°C than for 2°C. But this would be higher than the USD 22.5 billion (2014) estimates of bilateral and multilateral funding for climate change adaptation (*medium confidence*). Currently, 18–25% of climate finance flows to adaptation in developing countries (*high confidence*) {4.4.5, 4.6}

**D4.4.** The overall systems transition could be enabled by *policy packages that mitigate the adverse impacts of higher marginal cost of abated emissions*, in projected 1.5°C pathways, on growth and social welfare (*high confidence*) {1.3.3, 2.3.4, 2.3.5, 2.5.1.}. These policy packages imply an *evolution of the fiscal and financial systems* : explicit or implicit carbon pricing, reforms of the subsidies and other pricing policies (real estates, land, tolls), de-risking devices, new financial products. They should strengthen the efficacy of associated enabling policies that include performance standards, technology policies and transfers, and financial instruments to de-risk investments. They could also include *compensating transfers and facilitating finance to new low-carbon asset classes*. Cross-Chapter Box 8 in Chapter 3 and 11 in Chapter 4, 2.5.1, 2.5.2, 4.4.5, 5.5.2}

# How much mitigation investment in energy and other infrastructure? (Source: Box 4.8)

Estimated annualized mitigation investment (2015-2035 in Trillion US\$ 2010MER)

	Energy investments	Of which demand side	Transport	Other infra-structures	Total	Ratio to MER GDP
IAM Baseline (mean)	1.96	0.24			1.96	1.8%
IAM NDC (mean)	2.04	0.28			2.04	1.9%
IAM 2°C (mean)	2.19	0.38			2.19	2.1%
IAM 1.5°C (mean)	2.32	0.45			2.32	2.2%
IEA NDC	2.40	0.72	0.35		2.40	2.3%
IEA 1.5°C	2.76	1.13	0.55		2.76	2.7%
<b>Mean IAM-IEA, 1.5°C</b>	<b>2.38</b>	<b>0.54</b>			<b>2.38</b>	<b>2.53%</b>
Min IAM-IEA, 1.5°C	1.38	0.38			1.38	1.6%
Max IAM-IEA, 1.5°C	3.25	1.13			3.25	4.0%
<i>OECD Baseline</i>	<i>1.91</i>	<i>0.36</i>	<i>2.46</i>	<i>1.37</i>	<i>5.74</i>	<i>5.4%</i>
<i>OECD 2°C</i>	<i>2.13</i>	<i>0.40</i>	<i>2.73</i>	<i>1.52</i>	<i>6.38</i>	<i>6.0%</i>



# CONCLUSION: une étape vers .....

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- *Un AR6 remettant 'sur les bons rails' les discussions sur l'articulation entre actions de court terme et objectifs de long terme*
- *Un rapport 'd'un nouveau type' sur la finance suite à une demande du 'Green Climate Fund' aux auteurs du Groupe III du rapport du Giec sur 1°5 C ...(livraison à la COP 25 de Madrid)*
- *Une plus grande maîtrise de la 'traduction' des rapports du GIEC dans un contexte ...*