



Climate Change

Synthesis report of the 6th IPCC assessment

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Secretariat

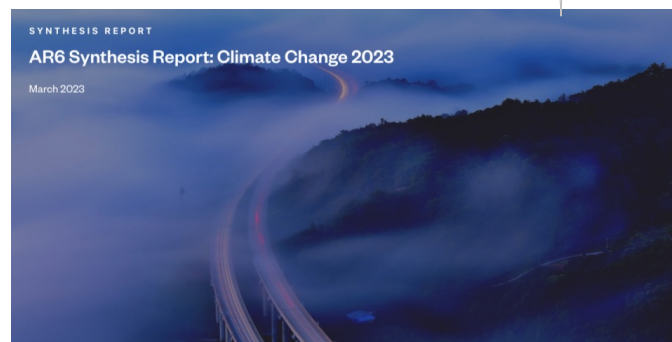
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Coordinating Lead Author in the AR6 WGI report
Contributing Author of the AR6 Synthesis WGI-WGII-WGIII

Lead Author of the AR7 MR on SLCF inventories
Coordinating Lead Author in the AR7 SR on Climate Change and Cities



1000 lead authors, thousands contributors and reviewers
 85 000 scientific publications
 300 000 review comments



www.ipcc.ch/report/ar6/syr/

Climate change is already affecting every inhabited region across the globe, with human influence contributing to many observed changes in weather and climate extremes

Increase in frequency and intensity of extreme events



Heatwaves



Heavy precipitation



Droughts



High intensity Tropical storms

+1.2°C for the 2014-2023 period

Physical changes that compound such as



Droughts + Heatwave

Fires



Acidification + marine heatwaves + desoxygenation

Mortality of marine ecosystems



Sea level rise + Heavy precipitation / High intensity tropical storms

Floods

Widespread and rapid physical changes in the atmosphere, ocean, cryosphere and biosphere



Some are already irreversible

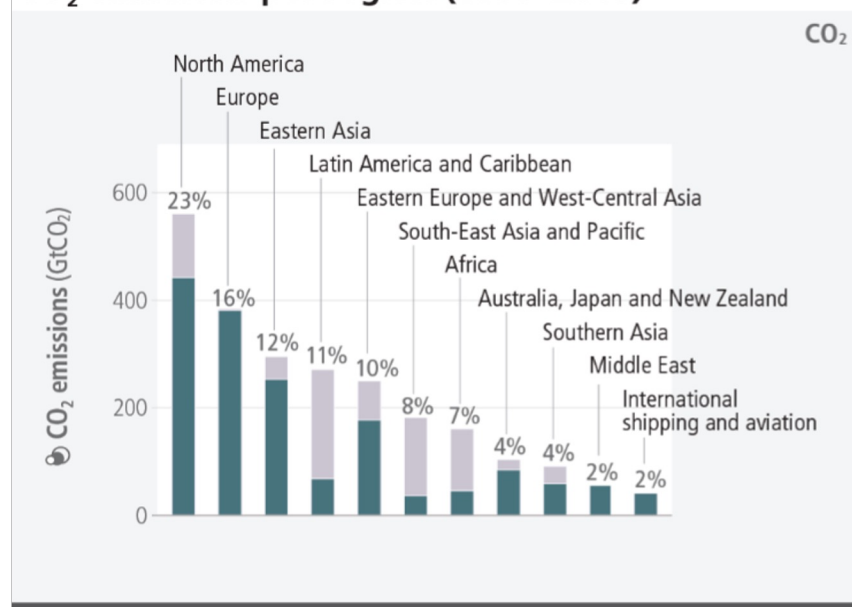
Widespread and substantial impacts and related losses and damages attributed to climate change are observed on human and natural systems across the world



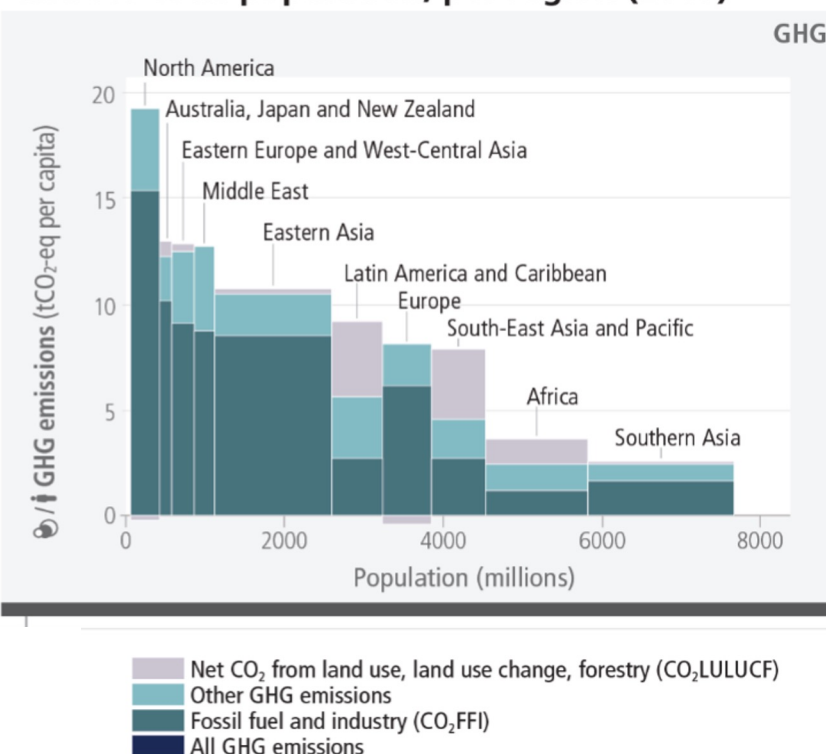
Risks are more and more complex to cope with due to compounding or cascading effects

Emissions have grown in most regions but are distributed unevenly, both in the present day and cumulatively since 1850

a) Historical cumulative net anthropogenic CO₂ emissions per region (1850–2019)



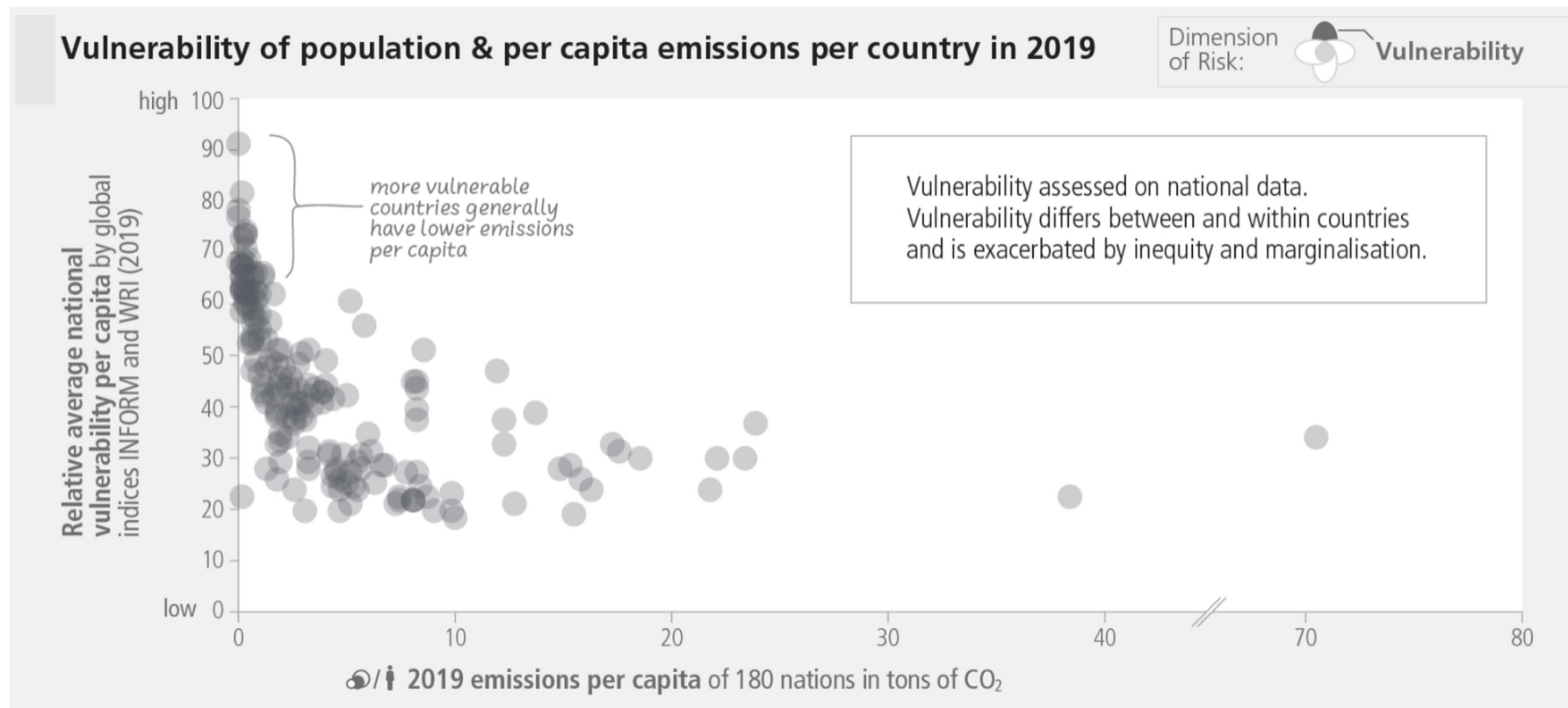
b) Net anthropogenic GHG emissions per capita and for total population, per region (2019)



10% of households with the highest per capita emissions
~40% of global consumption-based household GHG emissions

the bottom 50% contribute ~14%

Those who have generally least contributed to climate change are the most vulnerable



3.3-3.6 billions of persons live in contexts of high vulnerability to climate change
Half of the world's population experiences severe water shortages at least once a year

Some progress in climate actions is underway



Steady decline in greenhouse gas emissions in more than 18 countries

More than half of greenhouse gas emissions in the world are within the scope of public policies

Public policies have made it possible to avoid several billion tonnes of CO₂-equivalent emissions



Renewable energies, batteries: reduction in costs and increase in installed capacities

Energy efficiency, demand management, electrification, reducing food waste are feasible, low-cost and highly acceptable techniques



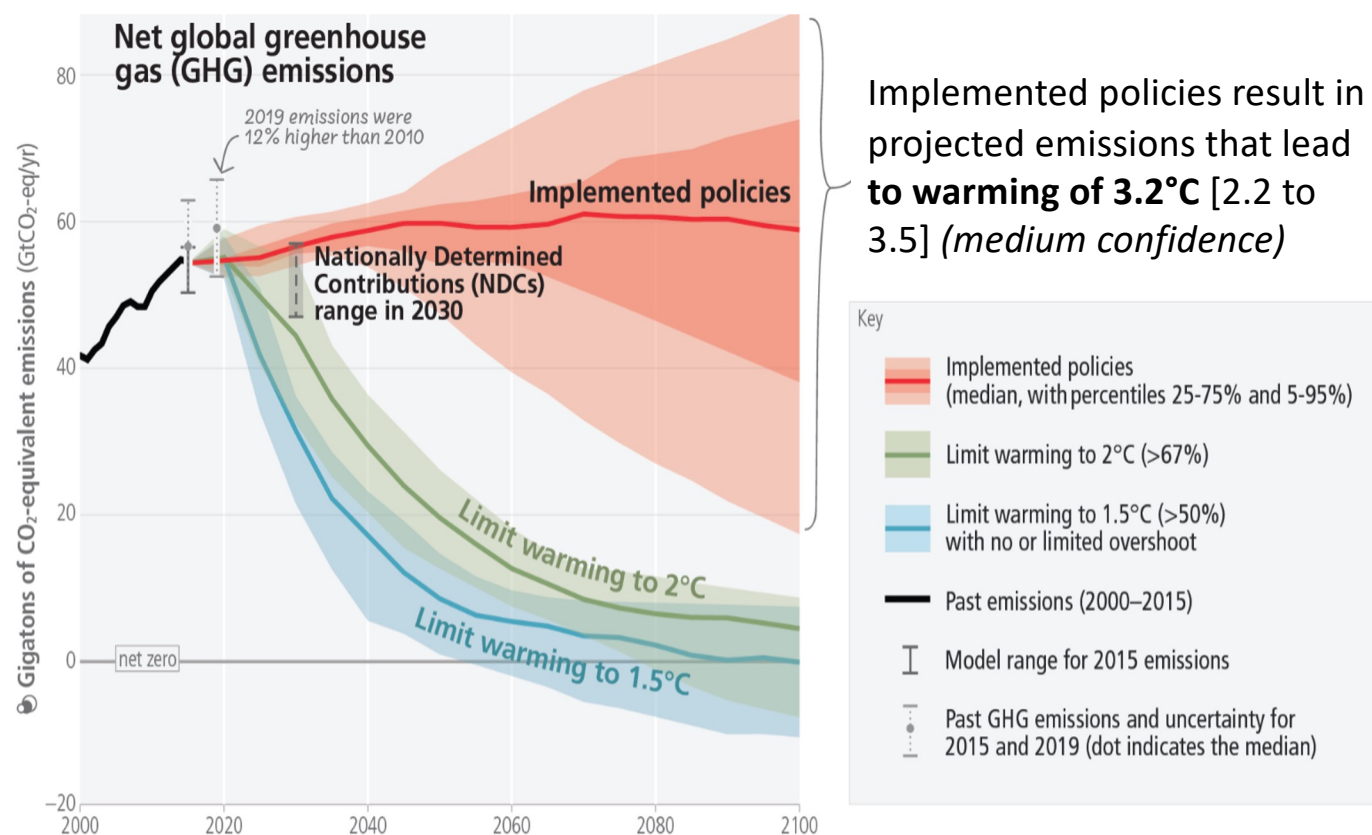
Progress in **adaptation planning** and implementation,

but fragmented responses, limits reached in certain regions/ecosystems, and a growing gap in relation to needs, and **maladaptations**

Insufficient financial flows

The increase of cumulative CO₂ emissions in the next years will result in global warming exceeding 1.5°C in the 2030s

Emissions implied by current policies will cause global warming to exceed 2°C by ~2050



IPCC AR6 SYR Figure SPM.5a

Limiting warming to 1.5°C and 2°C require rapid, deep GHG emission reductions

GHG emissions in 2030 (relative to 2010)

+5%

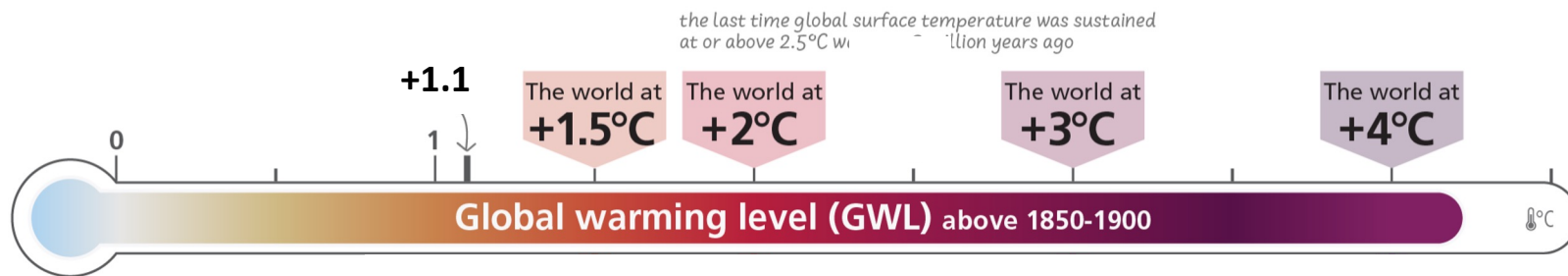
-26%

-43%

Net Zero CO₂ requires negative CO₂ emissions to match regions/sectors that cannot reach zero.

Negative emissions are based on the deployment of elimination methods which raise questions of feasibility, sustainability and risks.

With every increment of global warming, regional changes in mean climate and extremes become more widespread and pronounced

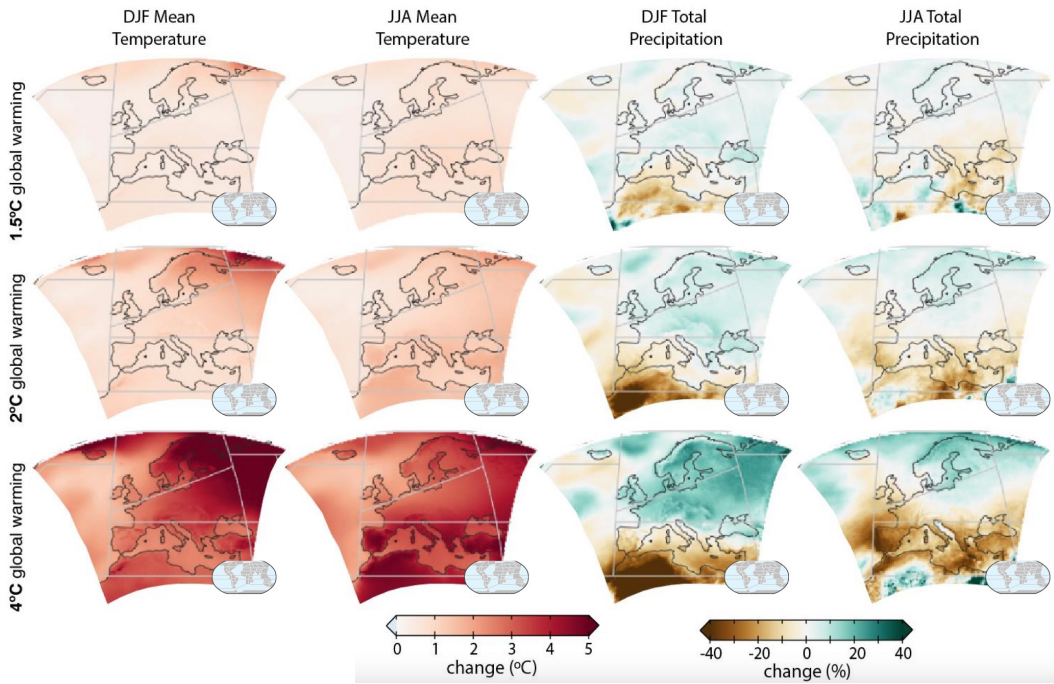


But also:

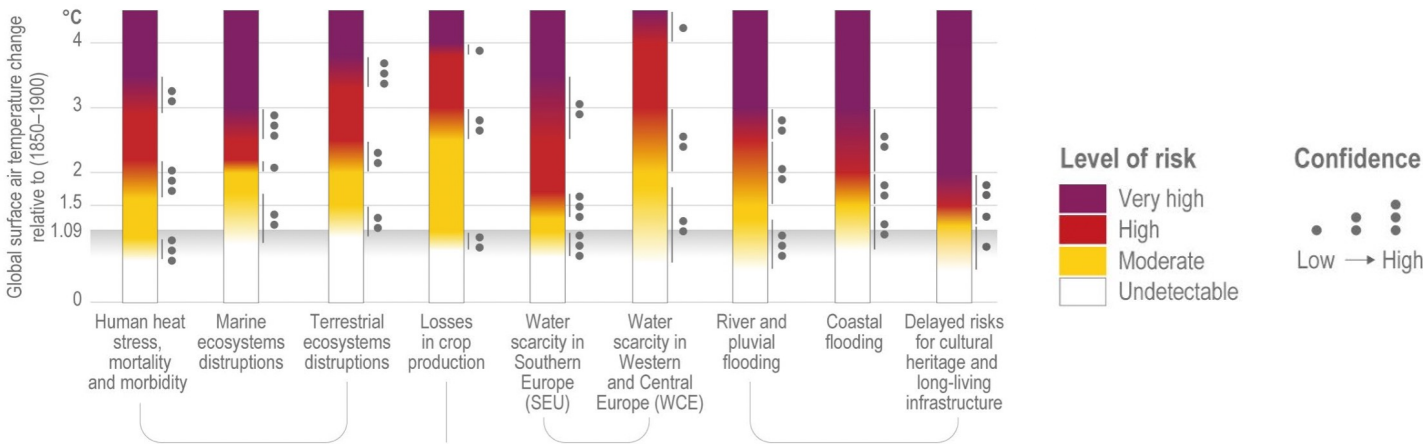
- health risks increase
- impacts on ecosystems will worsen
- risks to food production will worsen
- increasingly complex risks and difficulties to manage

Future risks for Europe

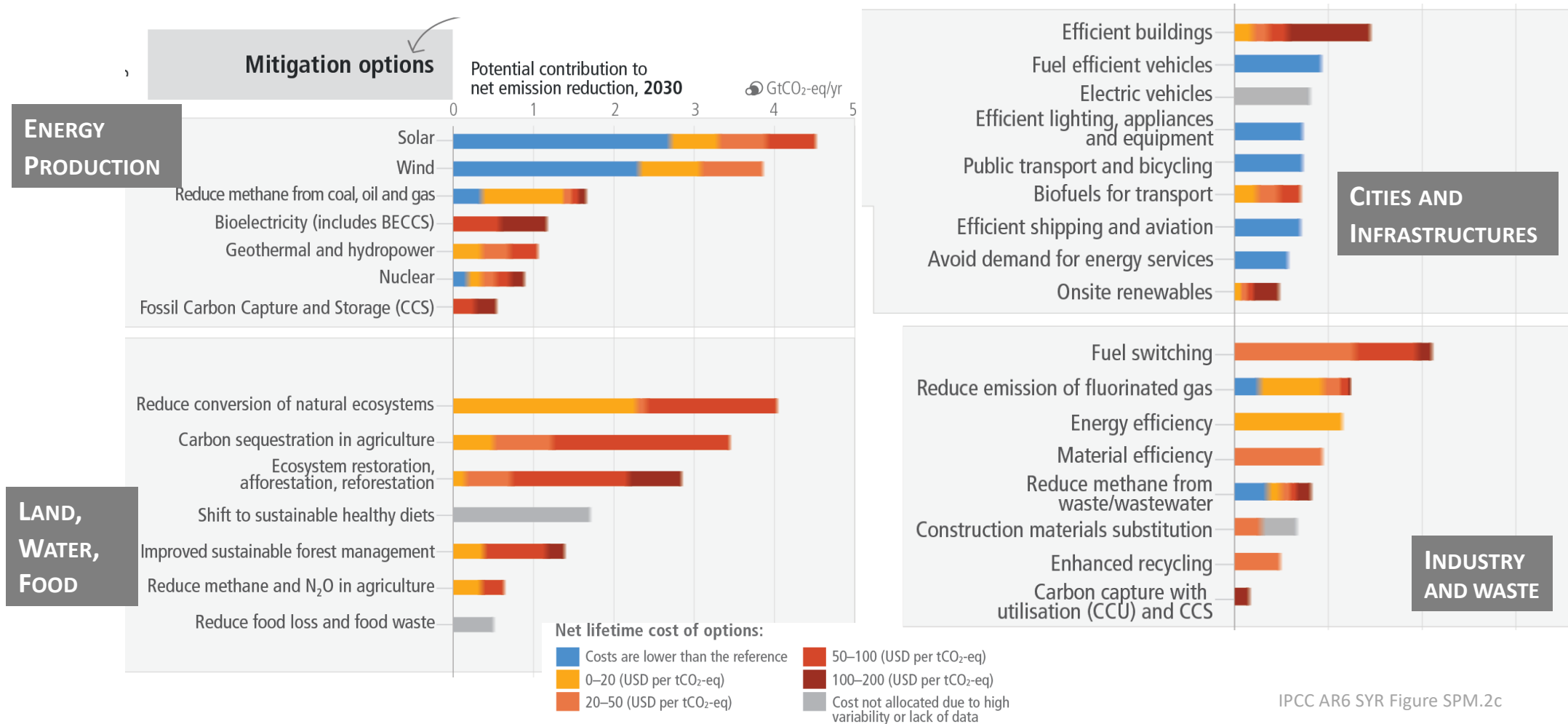
Projected changes relative to 2000
in seasonal mean temperature and
precipitation



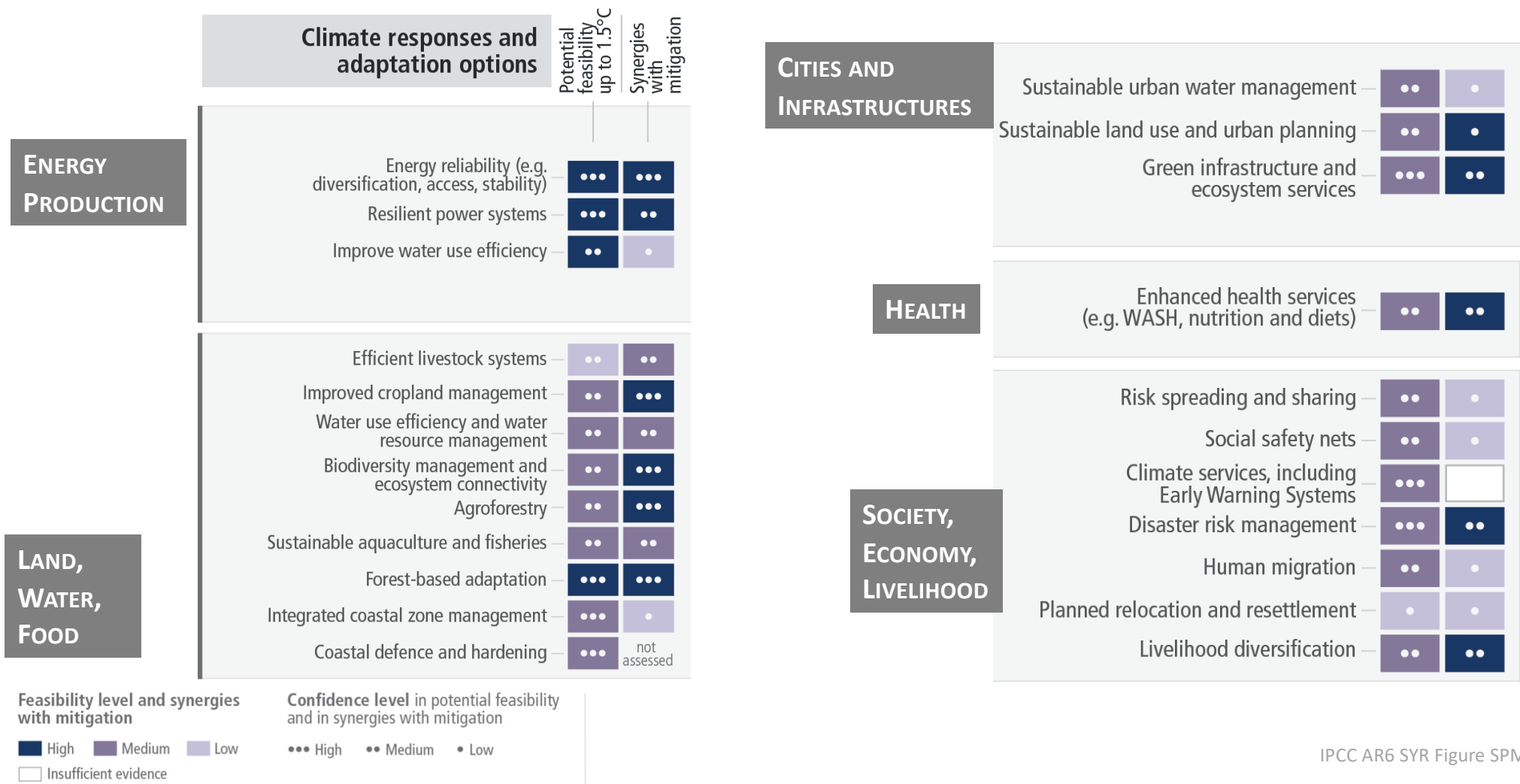
Key risks for Europe under low to medium adaptation



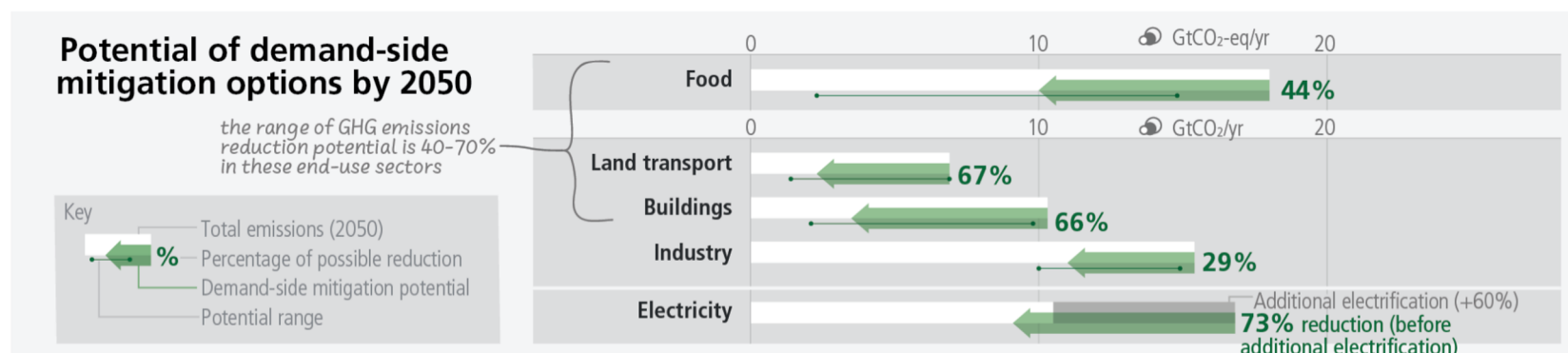
There are multiple feasible, efficient and affordable opportunities to reduce emissions in the near term



There are multiple opportunities for near-term adaptation in a changing climate (also requires long-term planification)



Public policies and infrastructure play a key role in making low-carbon lifestyles accessible

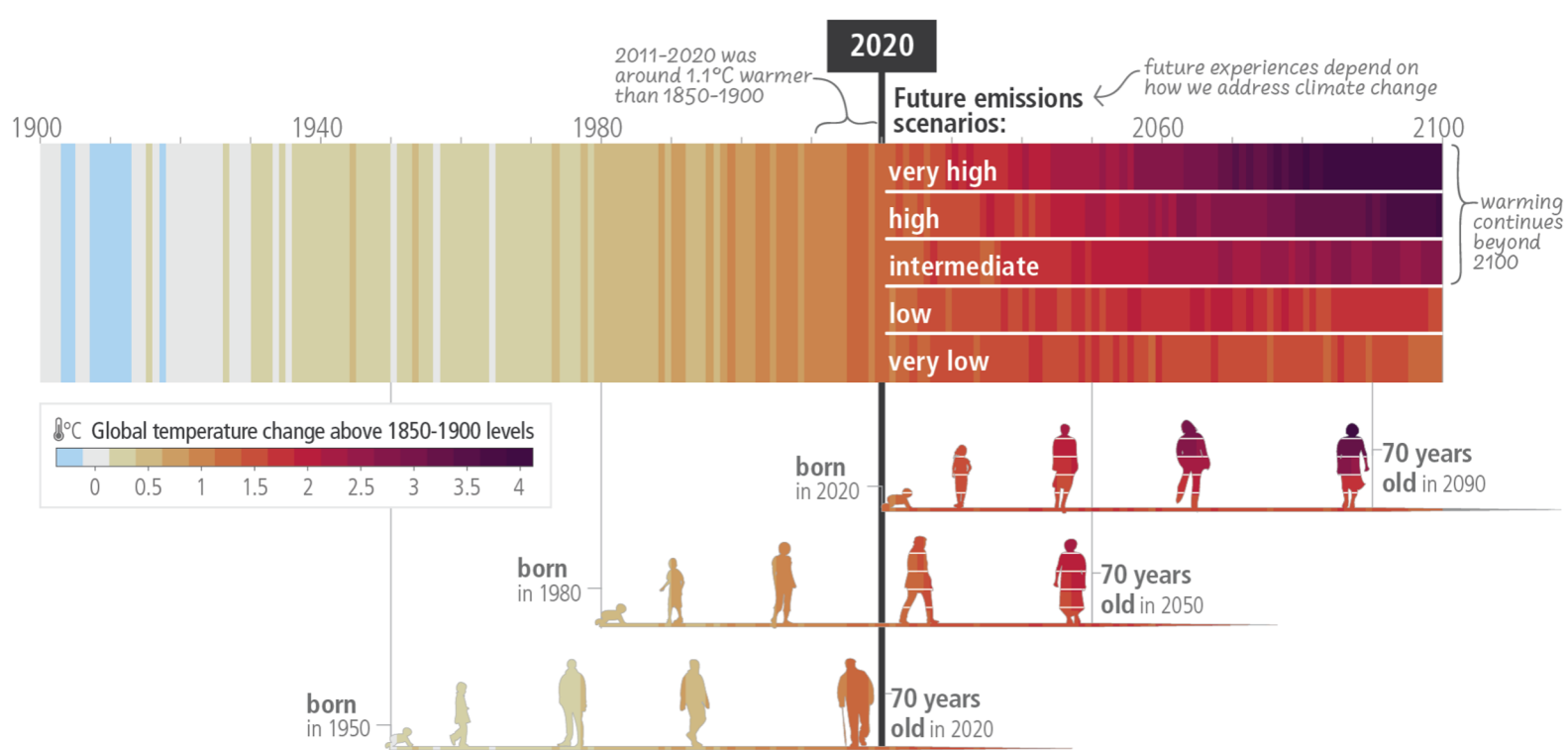


Many mitigation actions have co-benefits for health:

Air quality, active mobility, healthy diets

Adverse impacts from human-caused climate change will continue to intensify

The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



Half of the world population lives in **cities** where the effects of global warming are exacerbated (urban heat island, flooding...) The concentration and interconnection of people, infrastructures drives the creation of risks

Cities also play a pivotal to implement the paris agreement, advance the sustainable development goals, and foster climate resilient development



Urban adaptation is happening, but significant gaps remain. Over 100 cities of varying sizes and locations have climate adaptation plans

Even if all planned adaptation was implemented, it would be insufficient to address all risks faced by urban areas.

2/3 of global emissions can be attributed to urban areas

Cities of all types can accelerate systemic climate responses through five interconnected Systems Transitions: energy, urban and infrastructure, land and ecosystems; industry; and societal.

Urban mitigation actions linked to these Systems Transitions can reach across multiple sectors, urban boundaries and regions.

Cities in the Global South, at an early stage of urban development, need new infrastructure and buildings, leading to potentially high material demand and embodied emissions.

Established cities across the world, often in the global North, need to replace or rebuild ageing infrastructure and retrofit buildings.

If unaddressed, these challenges could drive unsustainable emission growth from urban consumption and production through the 21st century.

AR7: Special Report on Climate Change and Cities



- Challenges**
- having an **actionable** report: Reasons to act. Instruments to act. Directions to act. Conditions to act.
 - based on a large corpus of knowledge: academic, indigenous knowledge, case studies, development policies, city networks
- Should**
- help to facilitate choices that have to be made now and that require balancing multiple interests/necessity
 - cover the diversity of cities and risks they face and specificity of the various city/context

