IPCC Fifth Assessment Report Synthesis Report

16th Annual Symposium of the French Renewable Energy Association

12th February

UNESCO House, Paris

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The IPCC Fifth Assessment Report

A clear and up to date view of the current state of scientific knowledge relevant to climate change.

Working group I

The Physical Science Basis

- ✓ 259 authors
- ✓ 39 countries
- ✓ 54,677 comments
- ✓ 2 million gigabytes of numerical data from climate model simulations
- ✓ Over 9200 scientific publications cited

Working Group II

Impacts, Adaptation and Vulnerability

- ✓ 309 authors
- ✓ 70 countries
- ✓ 50,444 comments
- ✓ Over 12,000 scientific references cited

Working Group III

Mitigation of Climate Change

- ✓ 235 authors
- ✓ 57 countries
- ✓ 38,315 comments
- ✓ Close to 1200 scenarios of socioeconomic development analyzed
- ✓ Close to 10,000 references to literature

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The IPCC Synthesis Report

Member governments approved the SPM on 1st November 2014 (total membership of IPCC is 195 governments)

Integration of three Working Group Reports of the 5th Assessment, 2013-2014

- ✓ WGI: The Physical Science Basis
- ✓ WGII: Impacts, Adaptation and Vulnerability
- ✓ WGIII: Climate Change Mitigation

- ✓ 51 members of the Core Writing Team
- ✓ 18 members of the Extended Writing Team
- ✓ 18 countries
- ✓ 5944 comments

Key Messages

→ Human influence on the climate system is clear

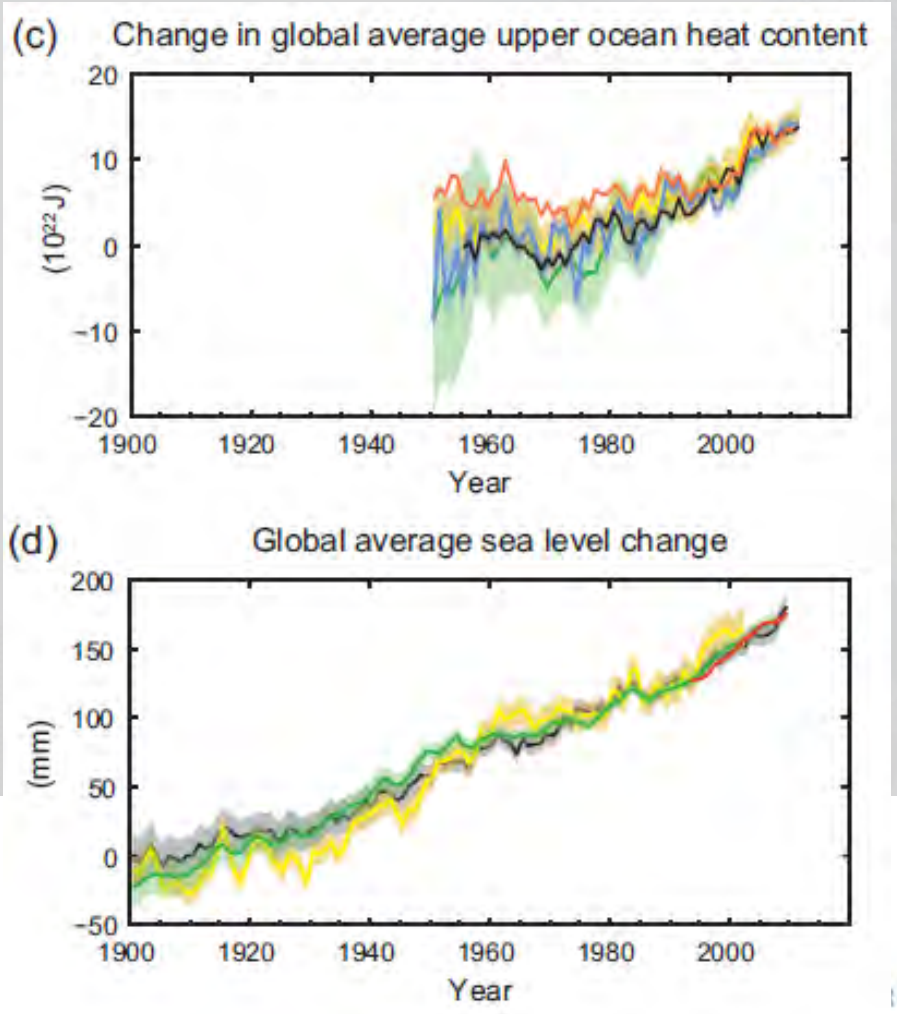
→ The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts

→ We have the means to limit climate change and build a more prosperous, sustainable future

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

Observed changes in the climate system

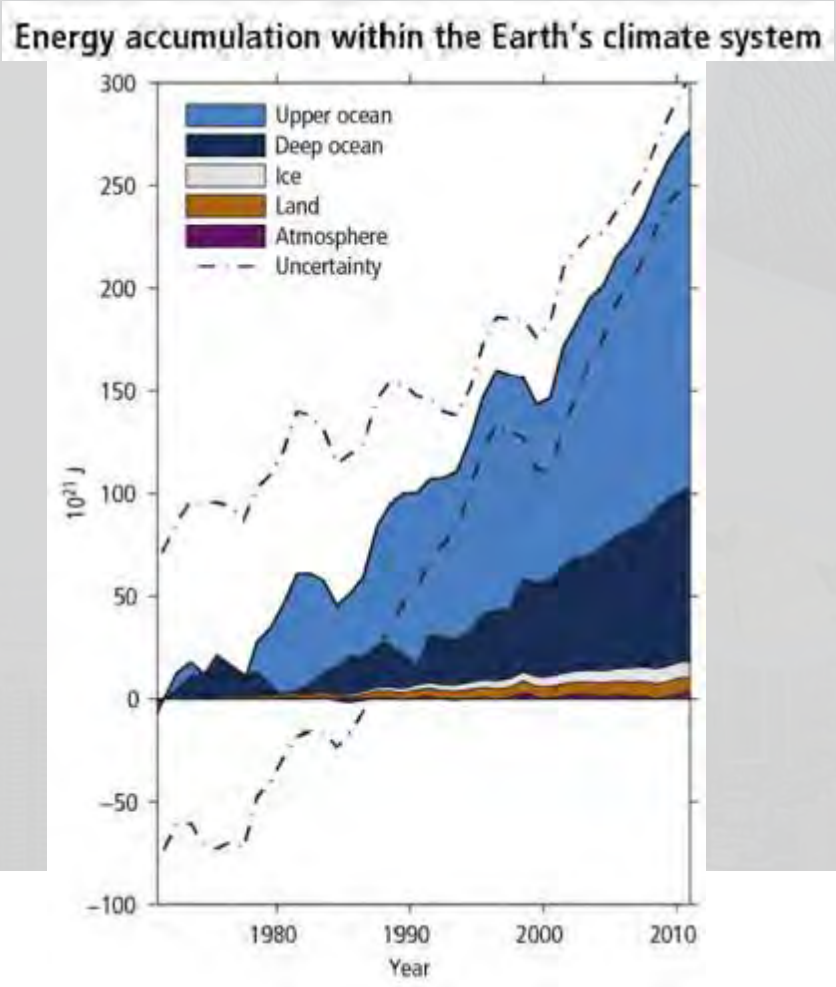
Climate change is unequivocal



- The oceans have warmed and risen
- The amounts of snow and ice have diminished
- Sea level has risen
- The concentrations of greenhouse gases have increased

IPCC AR5 WGI

Oceans absorb most of the heat

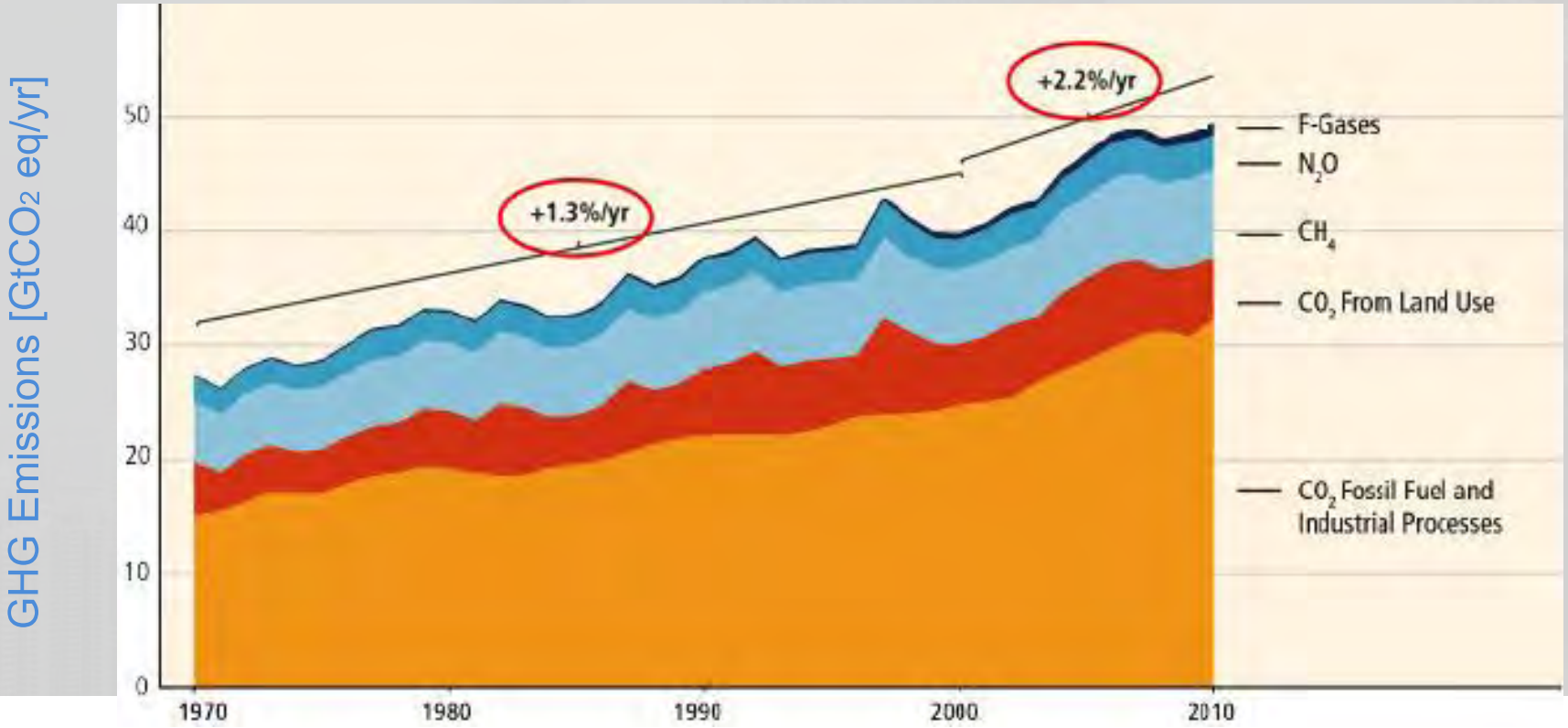


- More than 90% of the energy accumulating in the climate system between 1971 and 2010 has accumulated in the ocean
- Land temperatures remain at historic highs while ocean temperatures continue to climb

AR5 SYR

Anthropogenic GHG emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever.

The atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years.



EXTREME EVENTS DURING AND BY THE END OF THE 21ST CENTURY

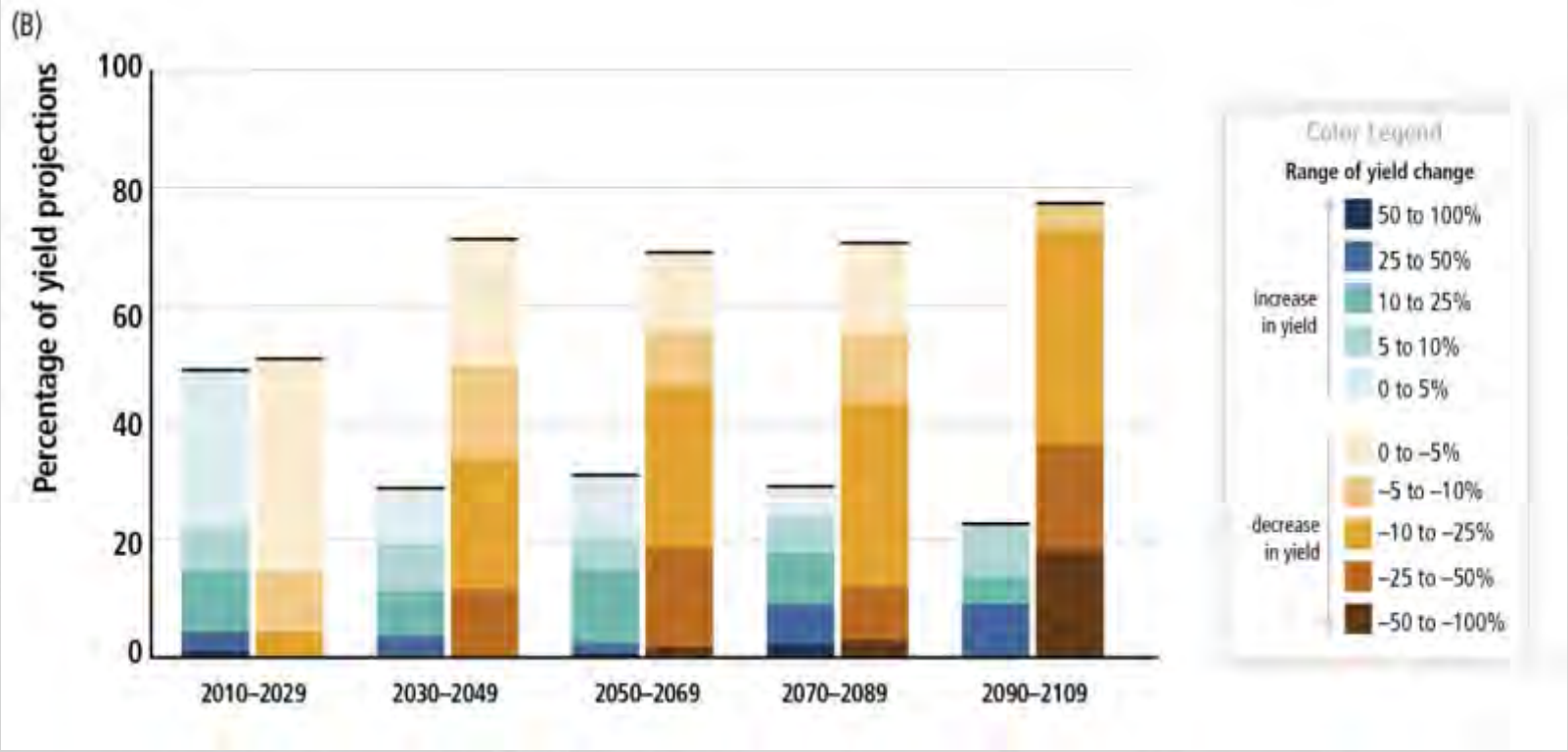
It is very likely that the length, frequency, and/or intensity of warm spells or heat waves will increase over most land areas.

Under some scenarios, a 1-in-20 year hottest day is *likely* to become a 1-in-2 year event in most regions.

It is likely that the frequency of heavy precipitation or the proportion of total rainfall from heavy falls will increase over many areas of the globe.

Climate Change Poses Risk for Food Production

Percentage of yield projections



AR5 SYR SPM

Impacts on human health

Throughout the 21st century, climate change is expected to lead to increases in ill-health in many regions and especially in developing countries with low income.

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Increased likelihood of:

- Injury, disease, and death due to more intense heat waves and fires.
- Under-nutrition from diminished food production in poor regions.
- Risks from food- and water- and vector-borne diseases.

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Impacts on Human Security

Climate change over the 21st century can increase:

- Displacement of people, particularly in developing countries with low income.
- Risks of violent conflicts by amplifying poverty and economic shocks.
- Rivalry among states due to potential transboundary impacts of climate change, such as changes in sea ice, shared water resources, and pelagic fish stocks.

Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty.

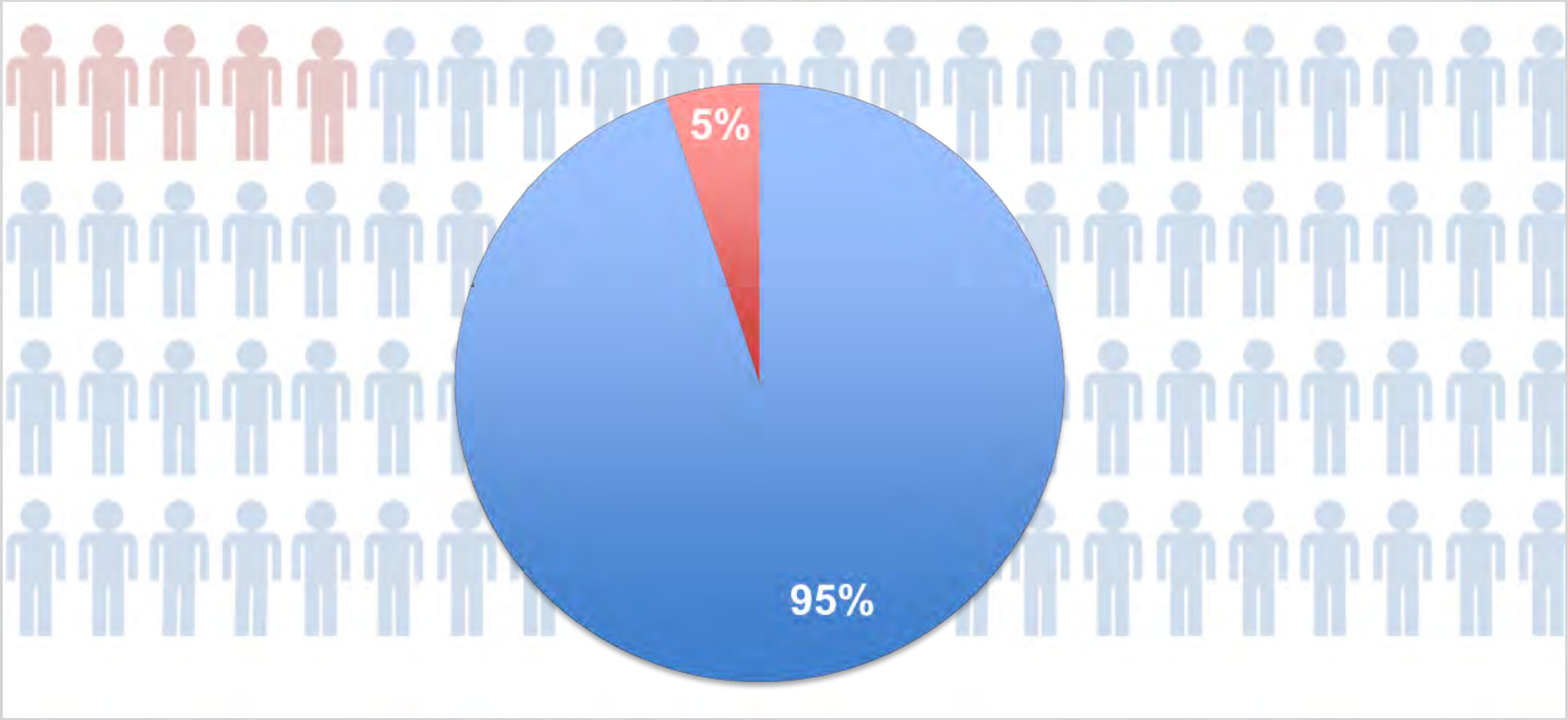
Implications for development:

Throughout the 21st century, climate-change impacts are projected to:

- Slow down economic growth
- Make poverty reduction more difficult
- Further erode food security
- Prolong existing and create new poverty traps, particularly in urban areas and emerging hotspots of hunger

Fatalities are higher in developing countries

From 1970-2008, over 95% of natural-disaster-related deaths occurred in developing countries



Adaptation and Mitigation

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"Climate-resilient pathways combine adaptation and mitigation to reduce climate change and its impacts. Since mitigation reduces the rate and magnitude of warming, it also increases the time available for adaptation to a particular level of climate change, potentially by several decades."

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Limiting Temperature Increase to 2˚C

Measures exist to achieve the substantial emission reductions required to limit likely warming to 2˚ C (40-70% reduction in GHGs globally by 2050 and near zero or below emissions levels in 2100)

A combination of adaptation and substantial, sustained reductions in greenhouse gas emissions can limit climate change risks

Implementing reductions in greenhouse gas emissions poses substantial technological, economic, social, and institutional challenges

Ambitious mitigation is affordable and translates into delayed but not foregone growth (economic growth reduced by ~ 0.06% / BAU growth 1.6-3%). Estimated costs do not account for the benefits of reduced climate change

But delaying mitigation will substantially increase the challenges associated with limiting warming to 2˚ C

Mitigation Measures

More efficient use of energy

Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today
- Nearly a quadrupling of zero- and low-carbon energy supply from renewable energy by 2050

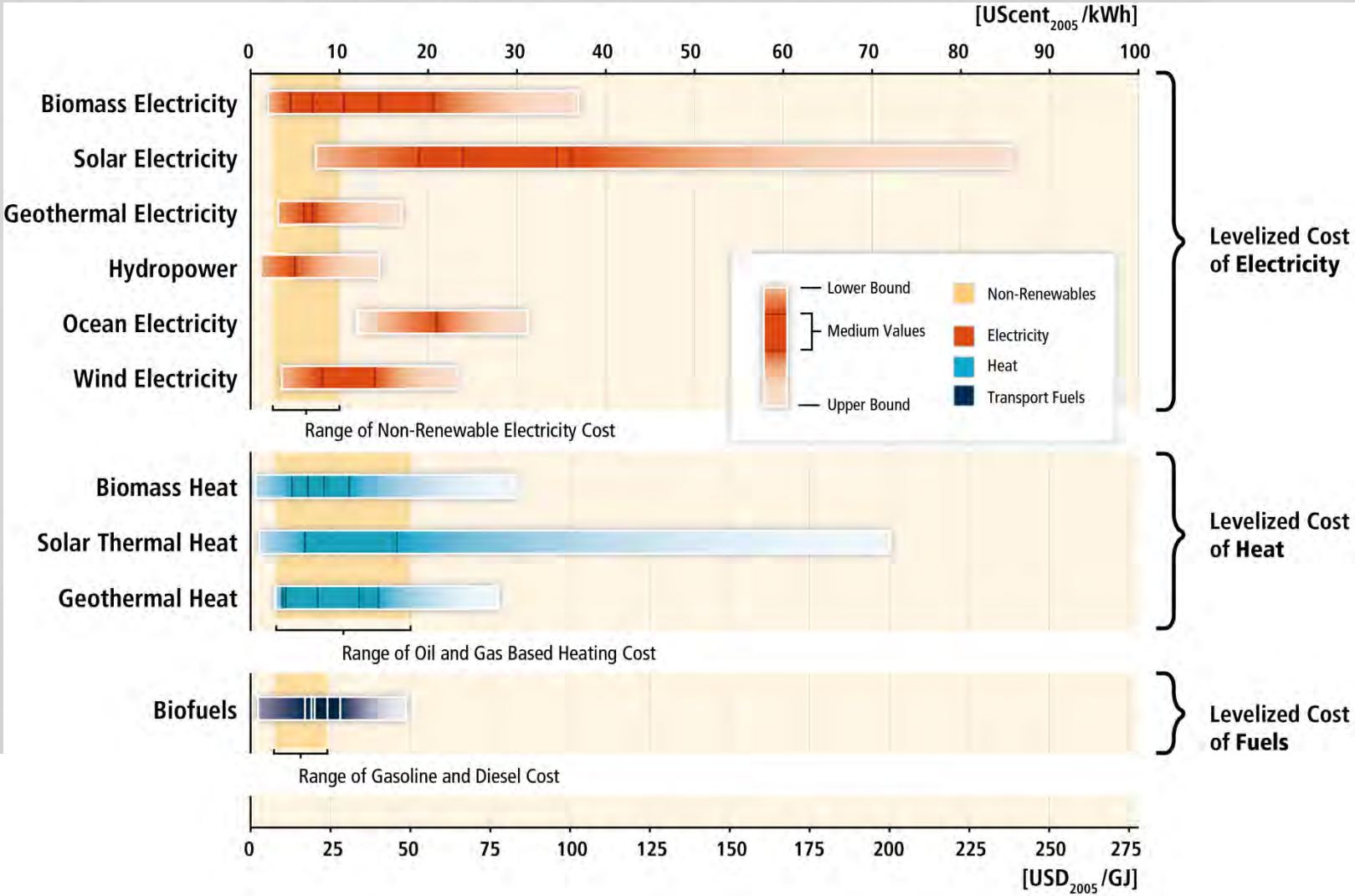
Improved carbon sinks

- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage

Lifestyle and behavioural changes

AR5 WGIII SPM

RE costs are still higher than existing energy prices but in various settings RE is already competitive.



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Source : IPCC SRREN

Co-benefits

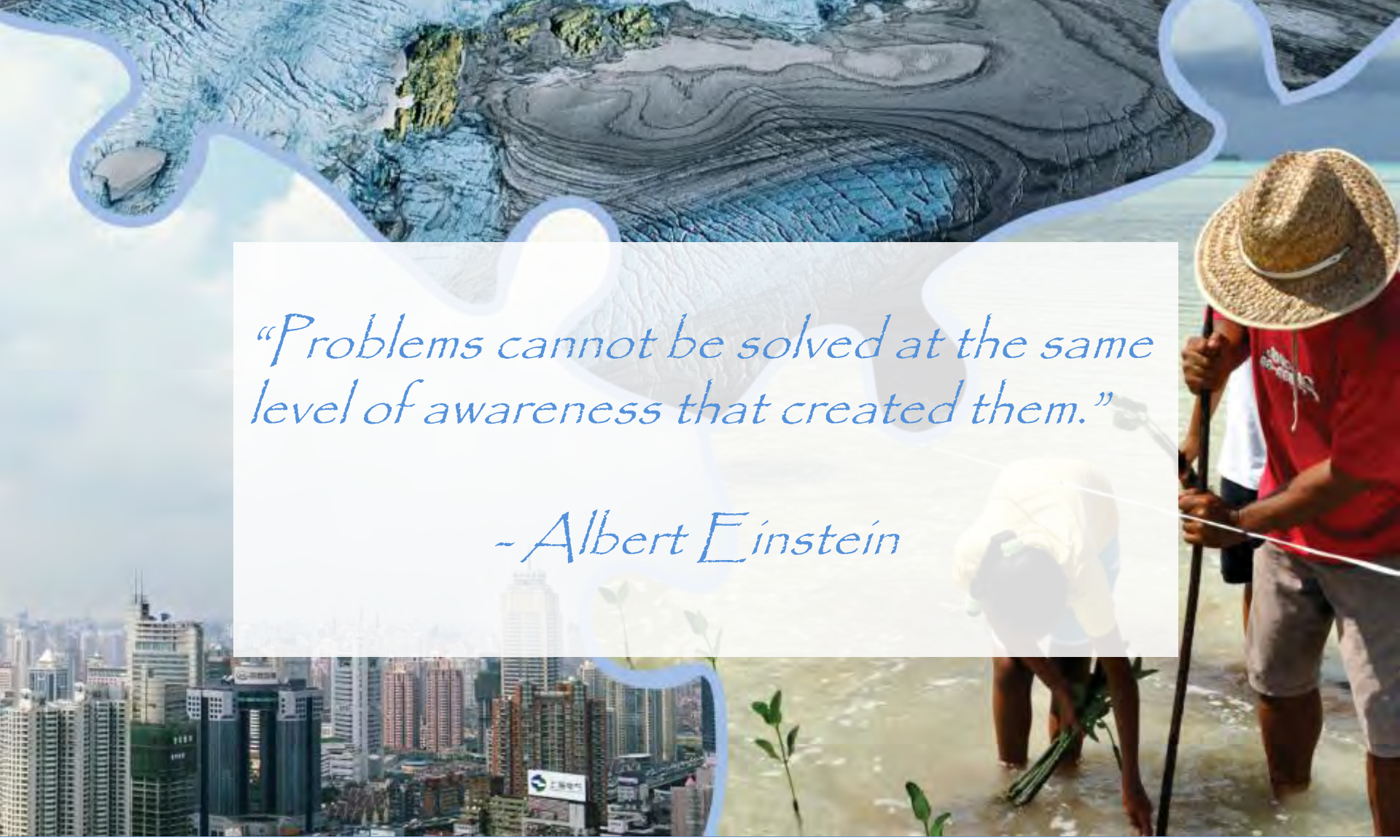
The intersections of mitigation and adaptation with other societal goals, if well managed, can strengthen the basis for undertaking climate action:

- Improved energy efficiency and security
- Cleaner energy sources
- Air quality and human health
- Reduced energy and water consumption in urban areas
- Sustainable agriculture and forestry
- Protection of ecosystems for carbon storage

Climate change and sustainable development

Governing a transition toward an effective climate response and SD pathway is a challenge involving rethinking our relation to nature.

- A stable climate is one component of SD.
- Limiting the effects of climate change is necessary to achieve SD and equity, including poverty eradication.
- Designing an effective climate policy involves “mainstreaming” climate in the design of SD strategies.
- Options for equitable burden-sharing can reduce the potential for the costs of climate action to constrain development.



"Problems cannot be solved at the same level of awareness that created them."

- Albert Einstein

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