

Current IPCC Activities and Perspectives in AR6 Products

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IPCC WG III Co-chairs

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IPCC WGIII Co-chairs



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With ad-hoc support kindly provided by Phil O'Brien, Minal Pathak and Renée van Diemen.



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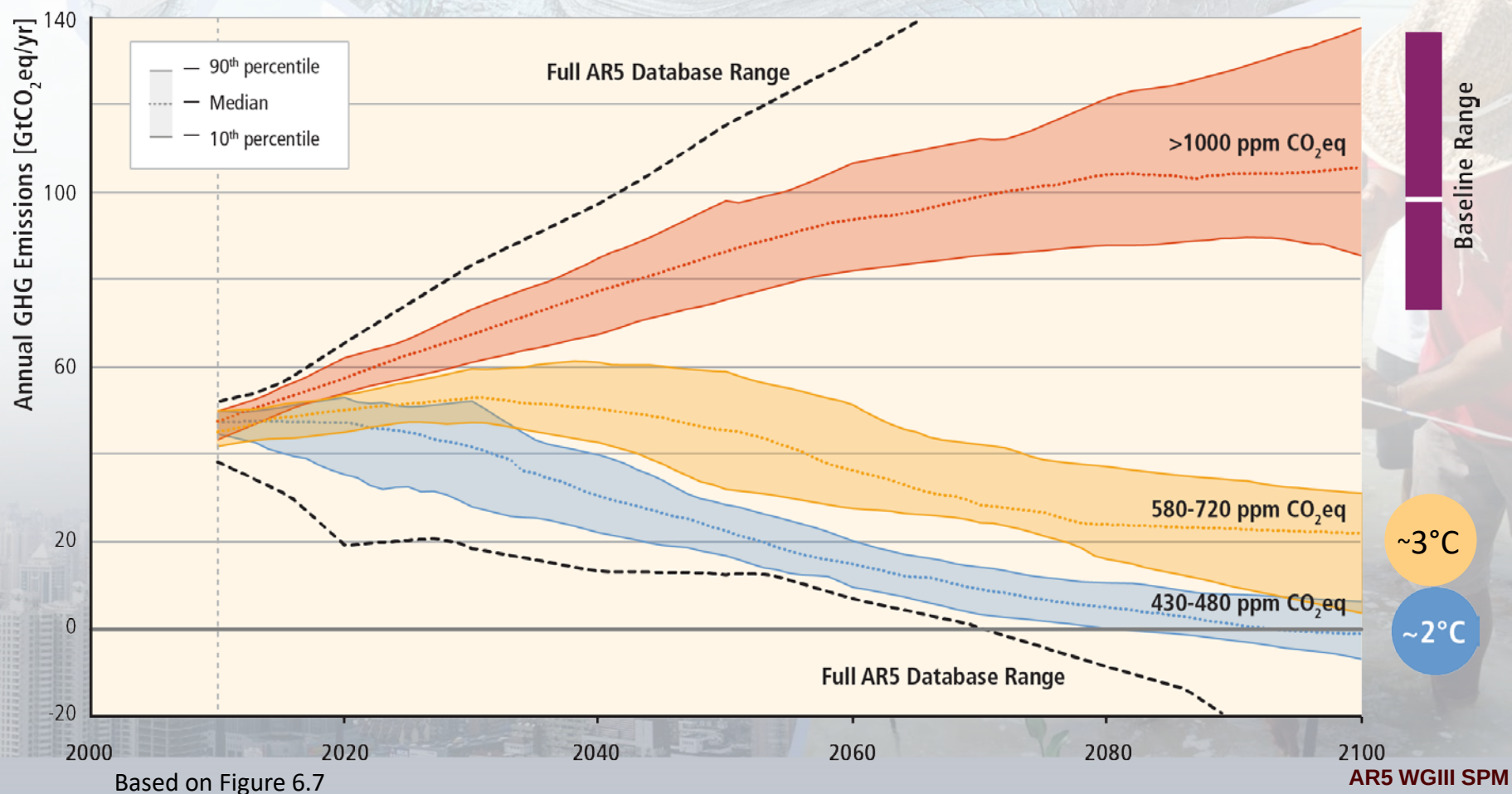
Minal Pathak
Senior Scientist

CLIMATE CHANGE 2014

Mitigation of Climate Change

**Main Findings from AR5:
Brief Summary**

Stabilization of atmospheric concentrations requires moving away from the baseline – regardless of the mitigation goal



Limiting Temperature Increase to 2°C



Measures exist to achieve the substantial emissions reductions required to limit likely warming to 2°C



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



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

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

Mitigation Measures



More efficient use of energy



Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today



Improved carbon sinks

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

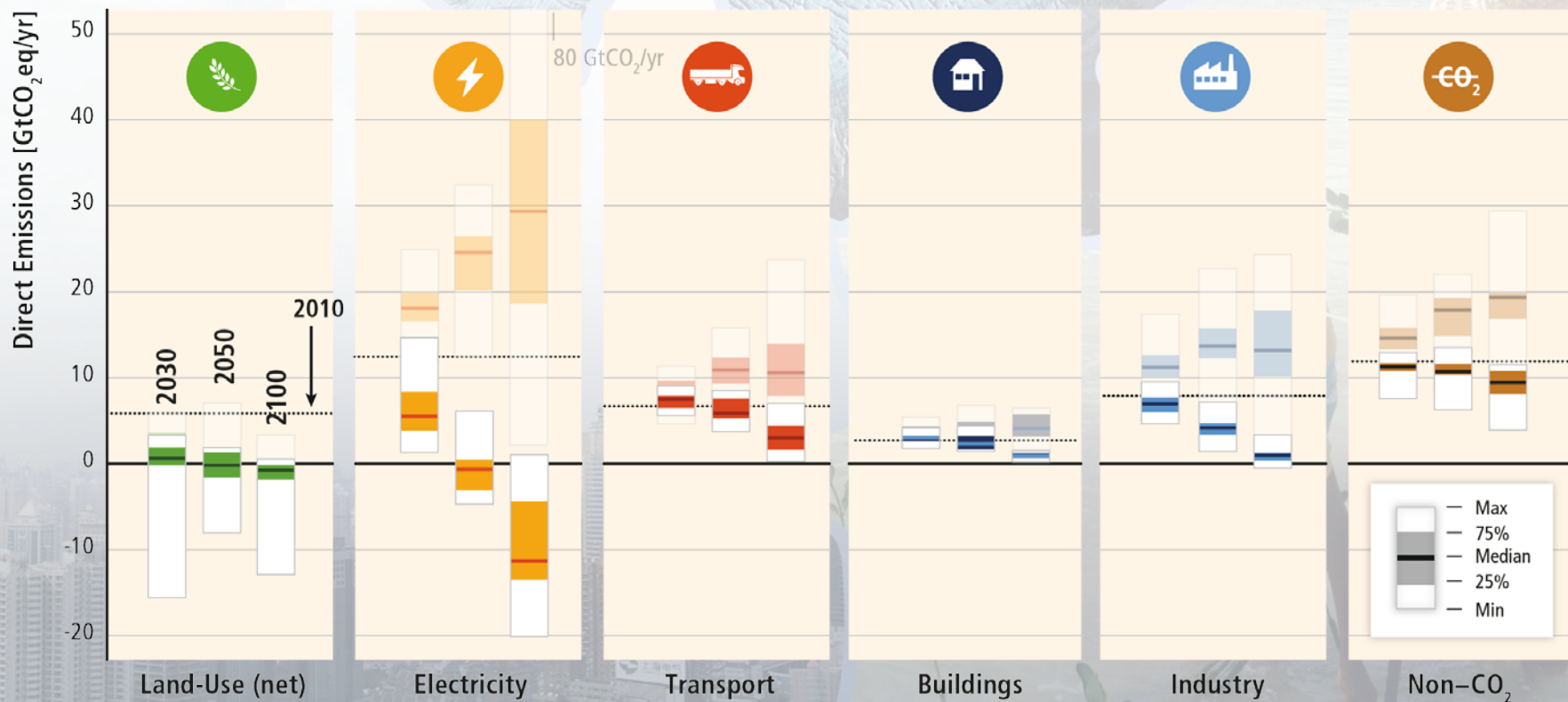


Lifestyle and behavioural changes

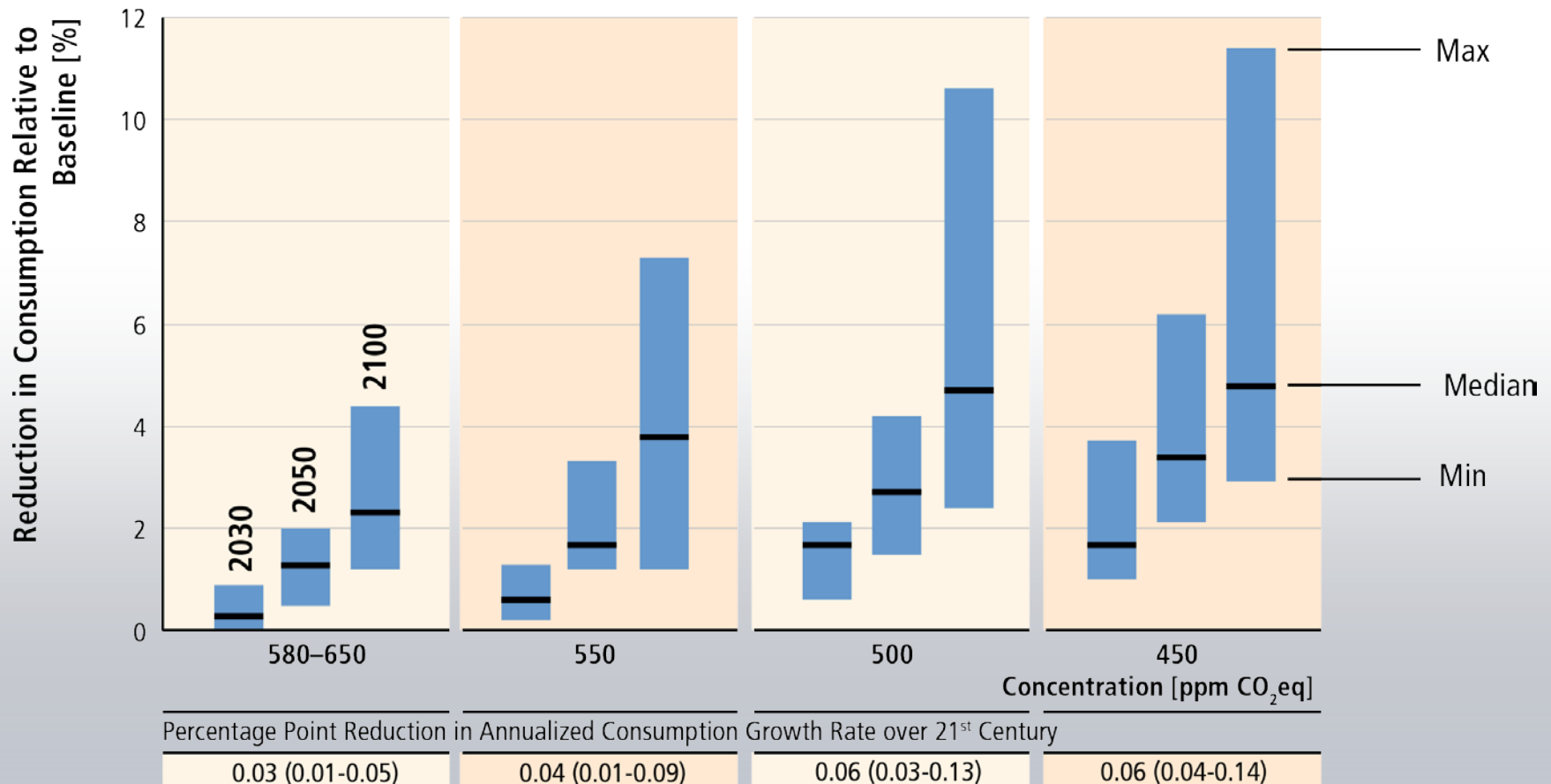
AR5 WGIII SPM

Emission patterns would need to change throughout the economy

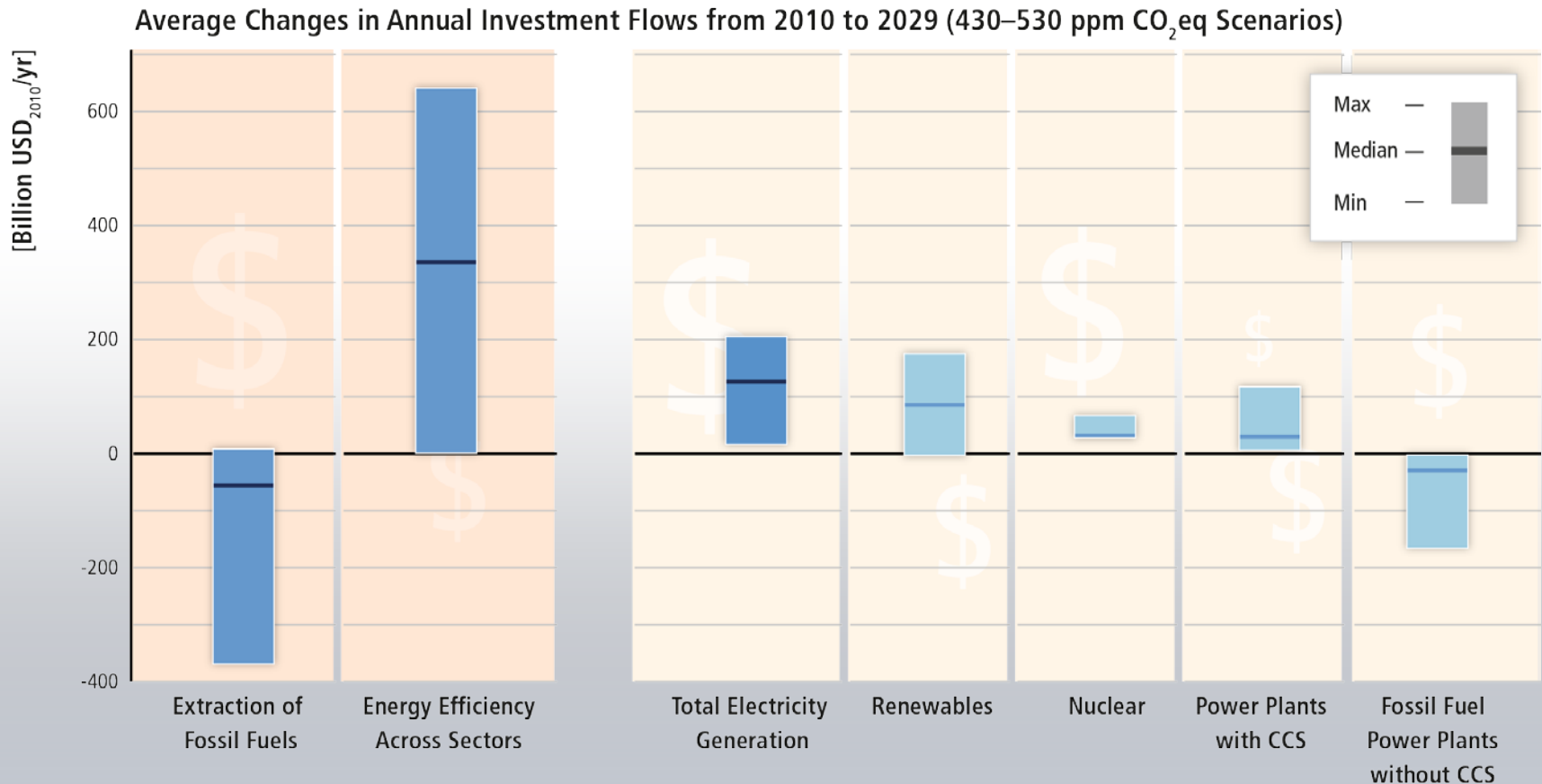
450 ppm CO₂eq with Carbon Dioxide Capture & Storage



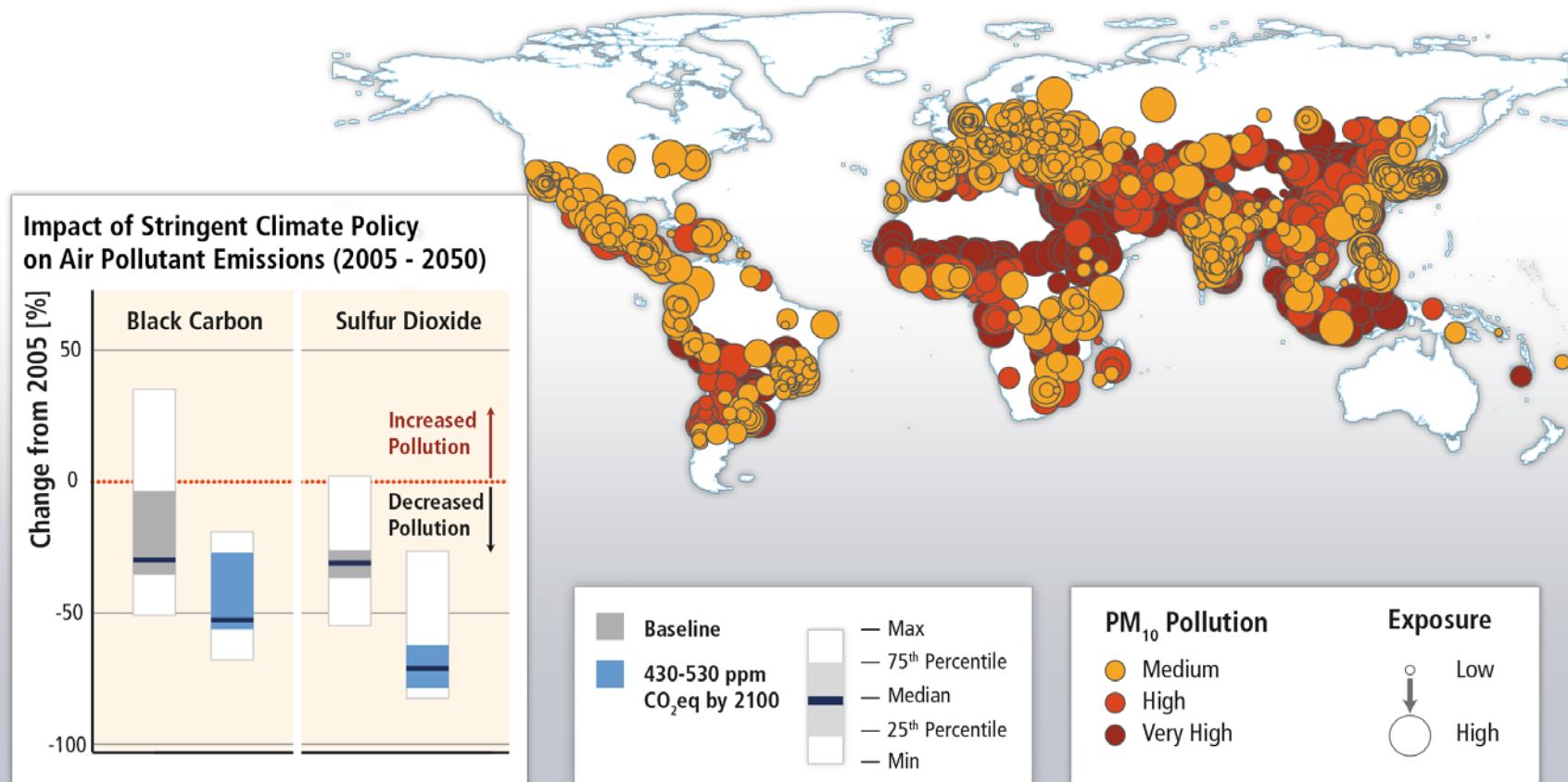
Global costs rise with the ambition of the mitigation goal.



Substantial reductions in emissions would require large changes in investment patterns.



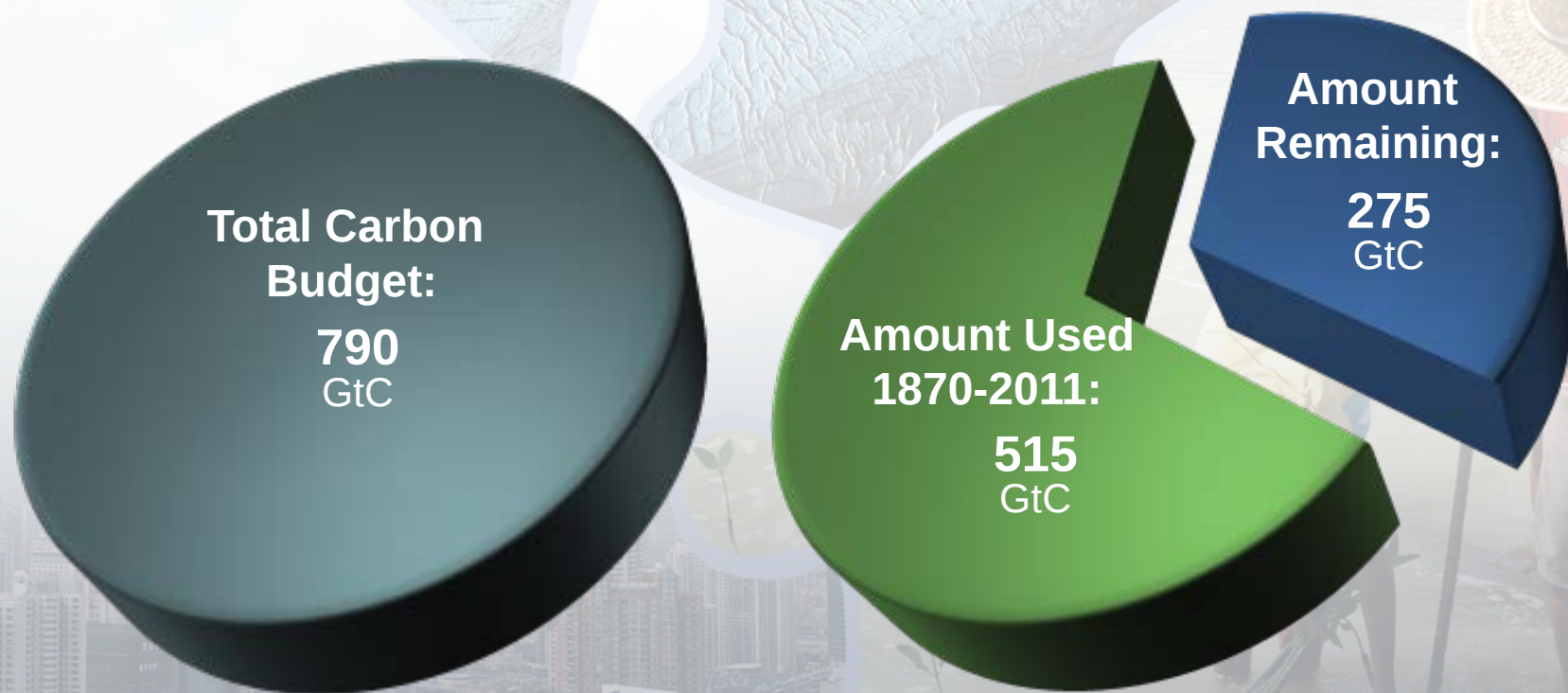
Climate change mitigation can bring co-benefits – health, energy security and other societal goals.



Based on Figures SPM.6 and 12.23

The window for action is rapidly closing

65% of our carbon budget compatible with a 2°C goal already used



AR5 WGI SPM

IPCC WGIII: Mitigation of Climate Change



AR6 Cycle Products and Activities and Planned Schedule

IPCC AR6 cycle: Products and Activities



Special Reports

1. Special Report on global warming of 1.5 °C (SR1.5)
2. SR2
3. SROCC: Special Report on climate change and oceans and the cryosphere (SROCC)

Assessment Reports

1. WGI (The Physical Science Basis)
2. WGII (Impacts, Adaptation, and Vulnerability)
3. WGIII (Mitigation of Climate Change)
4. Synthesis Report

Activities (Expert Meetings/Co-sponsored Conferences)

1. Expert Meeting on Mitigation, Sustainability and Climate Scenarios
2. Expert Meetings (Co-sponsored Conference) on Climate Change and Cities

Links to the Paris Agreement – Article 2

This Agreement.... aims to strengthen the global response to the threat of climate change ...by:

- a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

.....

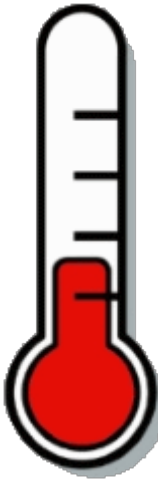
- c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development

Taking stock of the NDCs

- Facilitative dialogue in 2018
- Global stocktake every 5 years from 2023 onwards – are we on track for the long-term aims?
- A role for IPCC - but what that is not yet clear

Title: 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



List of Contents

Front Matter (2 pages)

Summary for Policy Makers (up to 10 pages incl. headline statements, tables, figures)

Chapter 1: Framing and context (15 pages)

Chapter 2: Mitigation pathways compatible with 1.5°C in the context of sustainable development (40 pages)

Chapter 3: Impacts of 1.5 °C global warming on natural and human systems (60 pages)

Chapter 4: Strengthening and implementing the global response to the threat of climate change (50 pages)

Chapter 5: Sustainable development, poverty eradication and reducing inequalities (20 pages)

Boxes - integrated case studies/regional and cross-cutting themes (up to 20 pages)

FAQs (10 pages)

Total: up to 225

Front Matter

- IPCC context
 - Building on AR5
 - Assessing literature since AR5
 - Reports to come in this cycle
- Context of UNFCCC invitation
- Specificity of this report within the cycle (integration, systems- and solutions-based approach, near-term)
- Laying the foundations for the Special Report in the context of strengthening the global response to climate change, sustainable development and poverty eradication

Chapter 1: Framing and Context

- Understanding 1.5°C; reference levels, probability, transience, overshoot, stabilization
- 1.5°C in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, with consideration for ethics and equity
- Key concepts central to understanding the report
- Building on AR5: new information, integrative approaches, response options
- Assessment and methodologies across spatial and time scales
- Treatment of uncertainty
- Storyline of the report

Chapter 2: Mitigation pathways compatible with 1.5°C in the context of sustainable development

- Methods of assessment and assumptions in the literature
- Constraints on, and uncertainties in, global greenhouse gas emissions consistent with warming of 1.5°C compared to 2°C, considering short lived and other climate drivers and taking into account uncertainty in climate sensitivity
- Characteristics of mitigation and development pathways compatible with 1.5°C compared with 2°C and, where warranted by the literature, comparison with higher levels of warming. This may, include short and long term timeframes, sectorial, regional, demand/supply-side, technological and socio-economic implications
- Technological, environmental, institutional and socio-economic opportunities and challenges related to 1.5°C pathways

Chapter 3: Impacts of 1.5°C global warming on natural and human systems

- Methods of assessment
- Observed and attributable global and regional climate changes and impacts and the adaptation experience
- Key global and regional climate changes, vulnerabilities, impacts, and risks at 1.5°C, taking into account adaptation potential and limits to adaptive capacity
- Key sectoral vulnerabilities, impacts, and risks at 1.5°C, taking into account adaptation potential, limits to adaptive capacity and socioeconomic aspects
- Avoided impacts and reduced risks at 1.5°C compared with 2°C and, where warranted by the literature, comparison with higher levels of warming
- Timeframe, slow vs. fast onset, irreversibility and tipping points
- Implications for impacts, adaptation and vulnerability of different mitigation pathways reaching 1.5°C, including potential overshoot

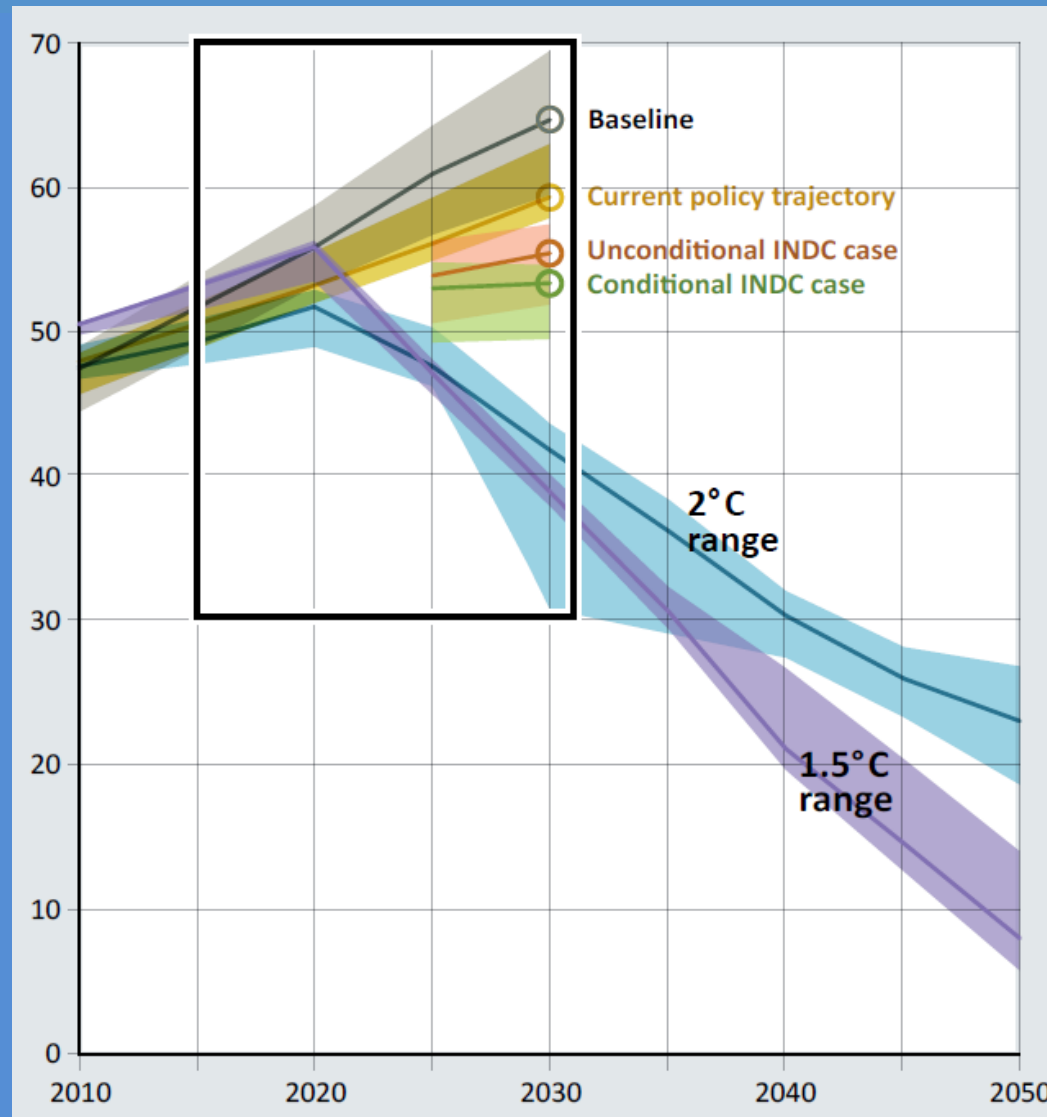
Chapter 4: Strengthening and implementing the global response to the threat of climate change

- Assessing current and emerging adaptation and mitigation options, including negative emission methodologies, and associated opportunities and challenges
- Synergies, trade-offs and integration of adaptation and mitigation options
- The pace of the development and deployment of adaptation and mitigation options compared to pathways consistent with sustainable development and 1.5°C
- The potential and capacity limitations for development and deployment of adaptation and mitigation responses to accelerate transitions within and across scales and systems (e.g. food production, cities)
- Options for implementing far-reaching and rapid change; implications, challenges (e.g. lock in, spillover effects), enabling environments and across scales
- Case studies for implementation of adaptation and mitigation options at different scales and circumstances, and lessons learned

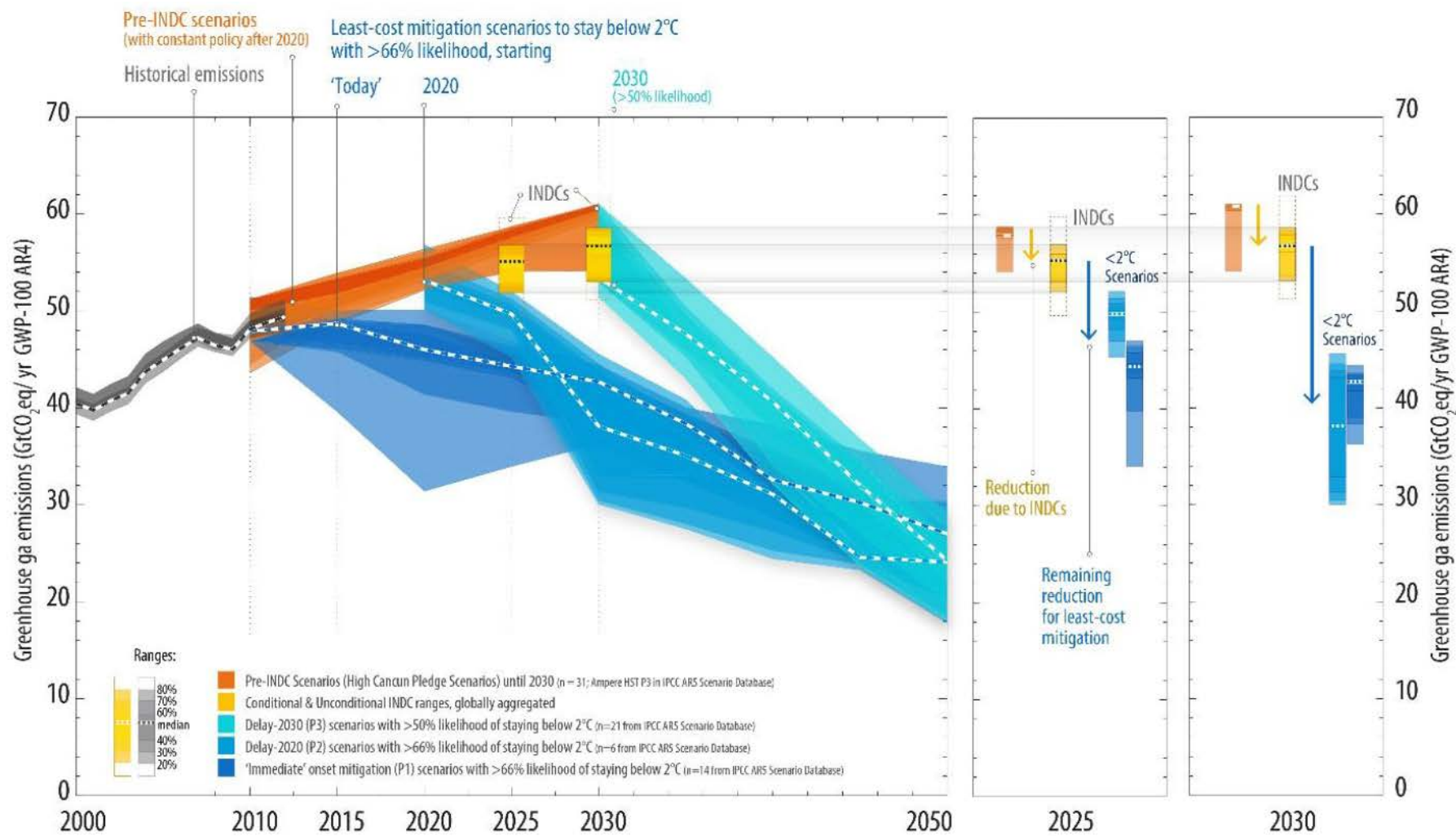
Chapter 5: Sustainable development, poverty eradication, and reducing inequalities

- Linkages between achieving SDGs and 1.5°C
- Distributional impacts arising from response options
- Opportunities, challenges, risks, and trade-offs
- Positive and negative impacts of adaptation and mitigation measures including response measures and strategies, economic diversification, livelihoods, food security, cities, ecosystems, technologies
- Knowledge and experience from local to global, including case studies and integrated planning as relevant to aforementioned bullets
- Climate-resilient development pathways

UNEP Emissions Gap Report: 2°C & 1.5°C Pathways



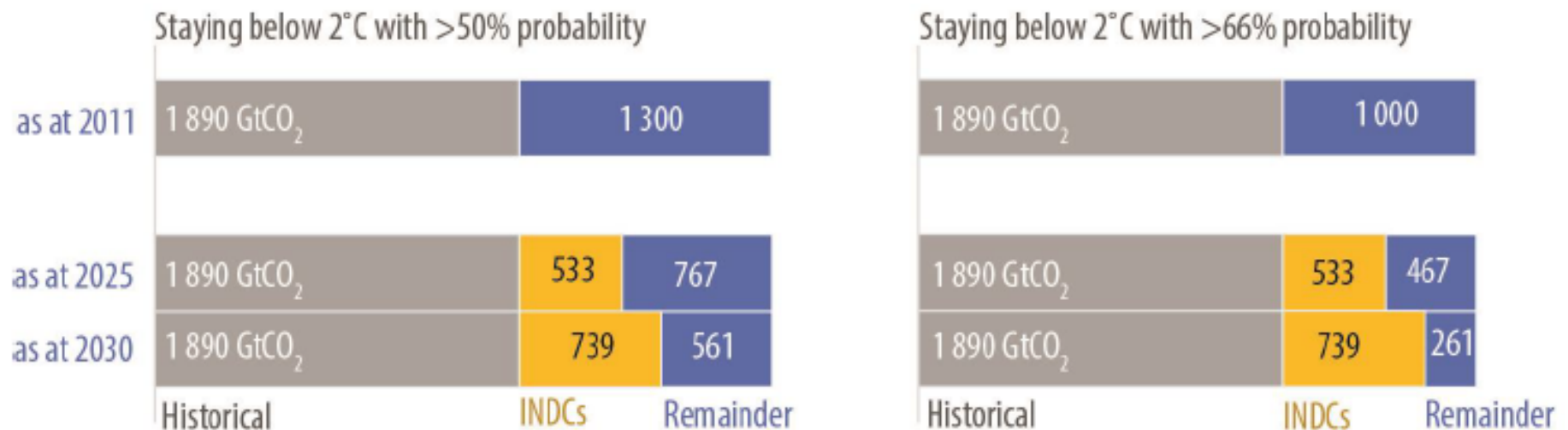
NDCs: Gap between aspirations and offers



CO₂ Emissions Budget for Staying Below 2°C

Figure 11

Comparison of cumulative CO₂ emissions under different scenarios



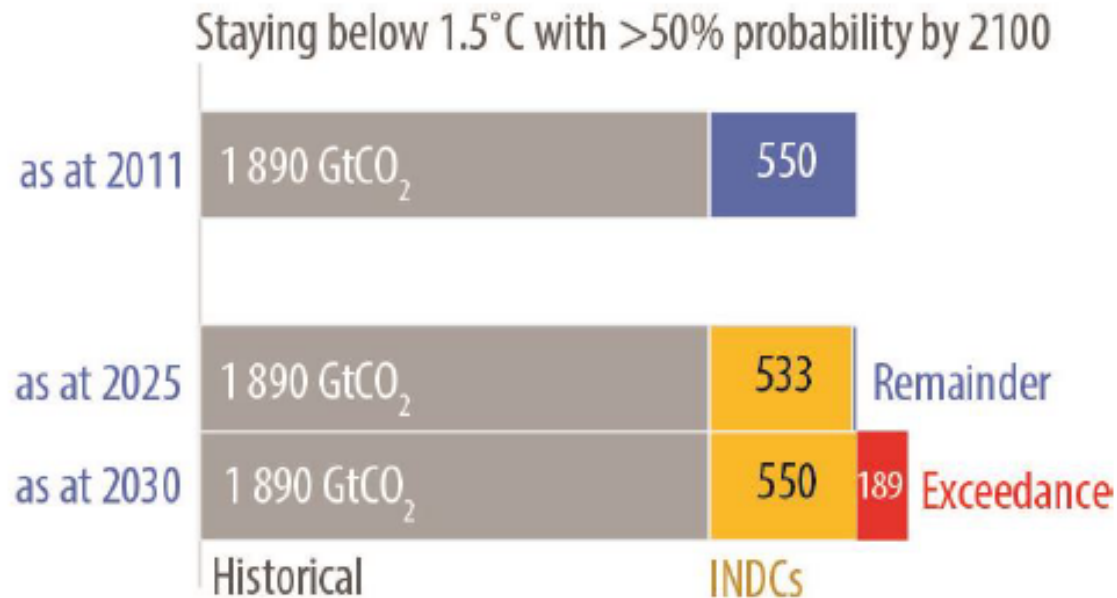
Source: Intergovernmental Panel on Climate Change Fifth Assessment Report scenario database and own aggregation.

Abbreviation: INDCs = intended nationally determined contributions.

CO₂ Emissions Budget for Staying Below 1.5°C

Figure 13

Cumulative CO₂ emissions consistent with the goal of keeping global average temperature rise below 1.5 °C



Source: Intergovernmental Panel on Climate Change Fifth Assessment Report scenario database and own aggregation.

Abbreviation: INDCs = intended nationally determined contributions.

Special Report on climate change,
desertification,
land degradation,
sustainable land management,
food security and
greenhouse gas fluxes in terrestrial ecosystems
(currently “SR2” for short)

Stakeholder consultations for SR2

- Questionnaire to governments and IPCC observer organisations
- In-depth consultation meetings with:
 - UNCCD (UN Convention to Combat Desertification)
 - FAO (Food and Agriculture Organization)
 - IPBES (Intergovernmental Platform on Bio-diversity and Ecosystem Services)

SR2 Timeline

Scoping meeting: Dublin, 13-16 February 2017

Plenary approval of outline: 27-30 March 2017

Call for author nominations: 10 April – 21 May 2017

Selection of authors: 7 July 2017

LAM 1: 9-13 October 2017

LAM 2: 26-30 March 2018

LAM 3: 3-7 July 2018

LAM 4: 11-15 February 2019

Approval session: 2-6 September 2019

Expert meeting on Mitigation, Sustainability and Climate Stabilization Scenarios

The needs:

- **Assessing linkages between high-level climate stabilization goals and scenarios** on the one hand **and the practical steps needed in the short-and medium term** to make the realization of these goals possible
- **anchoring climate responses firmly in the context of development needs.**
- articulating **practical steps** in ways that are **meaningful to stakeholders**, in government, business and civil society, as they formulate their responses to climate change.

For more information on Expert Workshop on Mitigation, Sustainability and Climate Scenarios see link:
http://ipcc.ch/apps/eventmanager/documents/40/200920160712-Doc.7-EM_Mitigation.pdf

Expert meeting on Mitigation, Sustainability and Climate Stabilization Scenarios

The goals:

- To develop **dialogue between different research communities** that can be advanced later through cross-cutting groups linking different chapters of the AR6 reports.
- To identify **Indicators to underpin dialogue between scenario builders and others.**
- To **inform scenarios and models and their input assumptions** through insights derived **from sectoral or regional perspectives.**
- Identify the **implications of top-down stabilization scenarios** for the **pace of change in specific sectors**
- To **stimulate interdisciplinary research activity** that will lead to new literature that can be assessed during the AR6 cycle.

AR6 WGIII Schedule

	SR1.5	SR2	WG-III AR6
Call for scoping nominations	April 2016	September 2016	October 2016
Scoping meeting	August 2016	February 2017	May 2017
Plenary approval of outline	October 2016	April 2017	September 2017
LAM1	March 2017	November 2017	May 2019
LAM4	April 2018	February 2019	October 2020
Plenary Approval	September 2018	September 2019	July 2021

Expert meeting on Mitigation, Sustainability and Climate Stabilization Scenarios scheduled for end of April 2017
Conference on Climate Change and Cities is scheduled for first quarter of 2018

Overall updated IPCC AR6 Cycle Schedule available at link: http://ipcc.ch/activities/pdf/ar6_schedule.pdf

Looking Ahead: AR6 Perspective and Vision

- 1. High-level aims for WG III in AR6**
- 2. WG III challenges identified by the Co-chairs**
- 3. Possible elements of the WGIII AR6**
- 4. Mitigation Risks of 1.5°C versus 2°C? The Pending Agenda of decarbonization**
- 5. Reframing the Assessment**

1. High-level aims for WG III in AR6

- achieving a better synthesis between higher-level **“whole system” perspectives** derived from, for example, global integrated assessment models (IAMs) and **grounded, bottom-up insights** into technologies and other approaches for reducing emissions.
 - making **greater use of social science disciplines**, in addition to economics, especially for gaining insights into issues related to **lifestyle, behaviour and consumption**.
 - **linking climate change mitigation better to other agreed policy goals** nationally and internationally.
- + contributing to the IPCC Chair’s **“solutions focused”** approach

2. WG III challenges identified by the Co-chairs

- Moderating textbook/undergraduate 101 style chapters
- **Adding to** Integrated Assessment Modelling (**IAM**) in developing overall messaging
- Including **regional/national/sectoral modelling** approaches as well as IAM
- **Co-benefits, risks and links** to the Sustainable Development Goals (**SDGs**)
- A place for **consumption/behaviour & governance/institutions** – needs enhanced social science engagement
- **Highlighting literature directly relevant to the Paris Agreement** – technology innovation and transfer; finance
- **Greenhouse gas removal “methodologies” and geo-engineering**
- A better **link between high-level top-down modelling and bottom-up perspectives** on mitigation options

3. Possible elements of the WGIII AR6

- **Context**
 - Sustainable development goals
- **Sectoral chapters** – map on to NDCs and inventory categories - greater attention to land-based solutions?
- **Emerging solutions and innovation**
- **Whole systems approaches**
 - Understanding trends and drivers
 - Looking forwards
 - IAMs globally and cross-sectoral
 - National, sectoral modelling and scenarios
- **Cross-cutting chapters**
 - Behaviour and consumption
 - Policies, institutions and governance
 - What UNFCCC parties do within their own sovereignty
 - What UNFCCC parties do acting jointly
 - Finance and technology

4. Mitigation Risks of 1.5°C versus 2°C: The Pending Agenda of decarbonization

- How much **higher** are mitigation costs?
- **Impacts on sustainable development** including poverty eradication
- **Technology needs**, including negative emissions, and risks not to meet them
- **Impacts on food security and biodiversity**, e.g. by LU change required by BECCS
- **Impacts on carbon cycle** by more ambitious mitigation (e.g. forests)
- **Overshoot risks** (temperature, atmos. GHG conc.), **irreversibility**

5. Reframing the Assessment

- 1) Timing: Closing window of opportunity**
 - Innovation cycle
 - Behavior and institutions
- 2) Cost-benefit Framing: Looking through ethical lens**
 - Irreversibility
 - Uncertainty
 - Equity (Inter and intra generational)
- 3) Reframing?**
 - Bottom-up country driven assessments
 - Prevent creating new lock-ins
 - Prepare for disruptive technological change
 - Implementation Focus (Technology cooperation)

IPCC WGIII: www.mitigation2014.org

WG III links

www.ipcc.ch

www.ipcc-wg3.ac.uk



Thank you