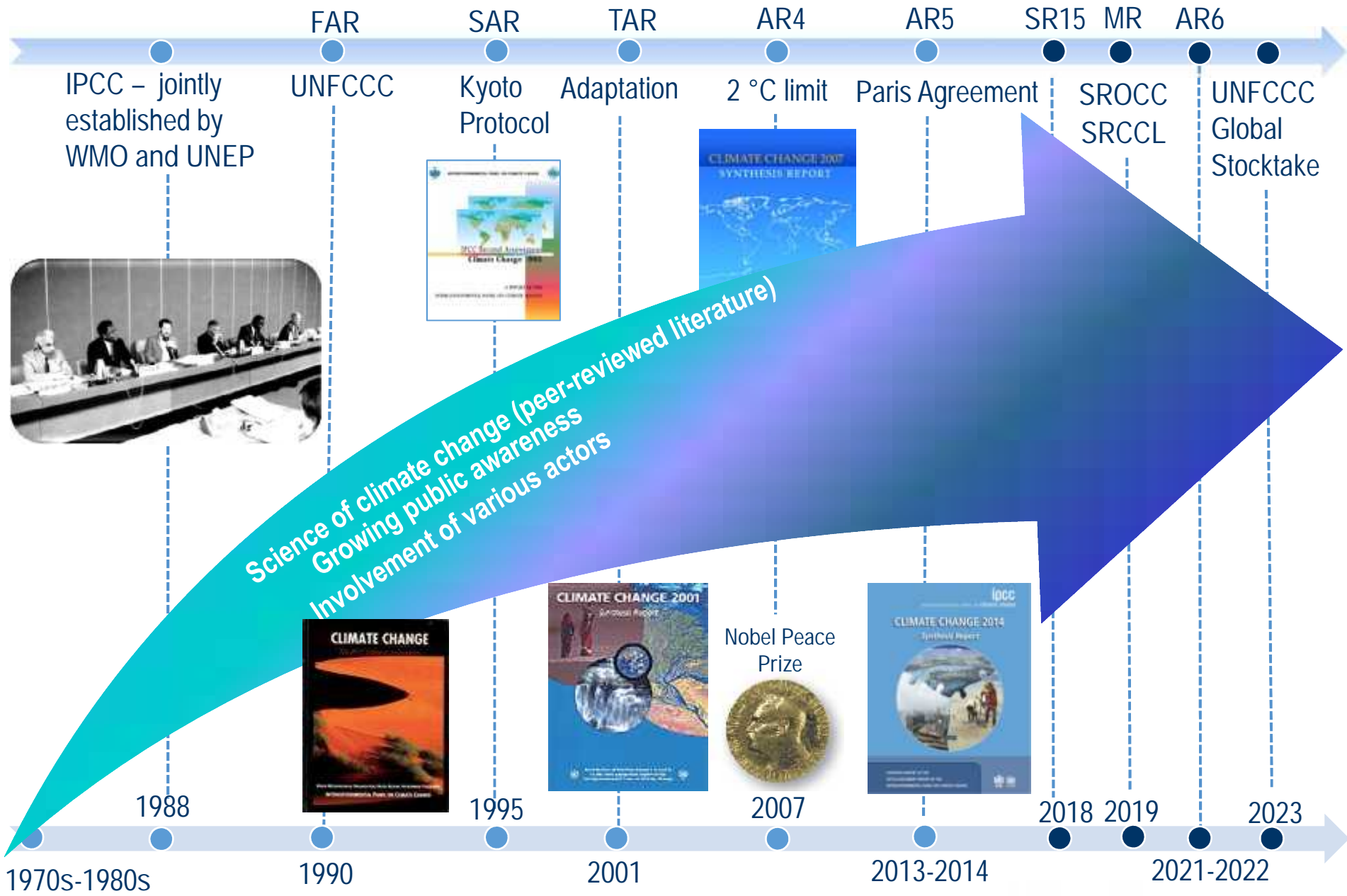


Joy Jacqueline Pereira

IPCC WG II Vice Chair
&

Universiti Kebangsaan Malaysia
(SEADPRI – UKM)



IPCC – jointly established by WMO and UNEP

UNFCCC

Kyoto Protocol

Adaptation

2 °C limit

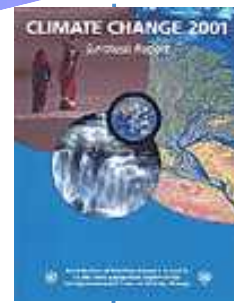
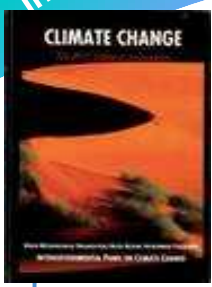
Paris Agreement

SROCC
SRCCCL

UNFCCC
Global Stocktake



Science of climate change (peer-reviewed literature)
Growing public awareness
Involvement of various actors



1988

1990

1995

2001

2007

2013-2014

2018

2019

2021-2022

2023

1970s-1980s

The role of the IPCC is ...

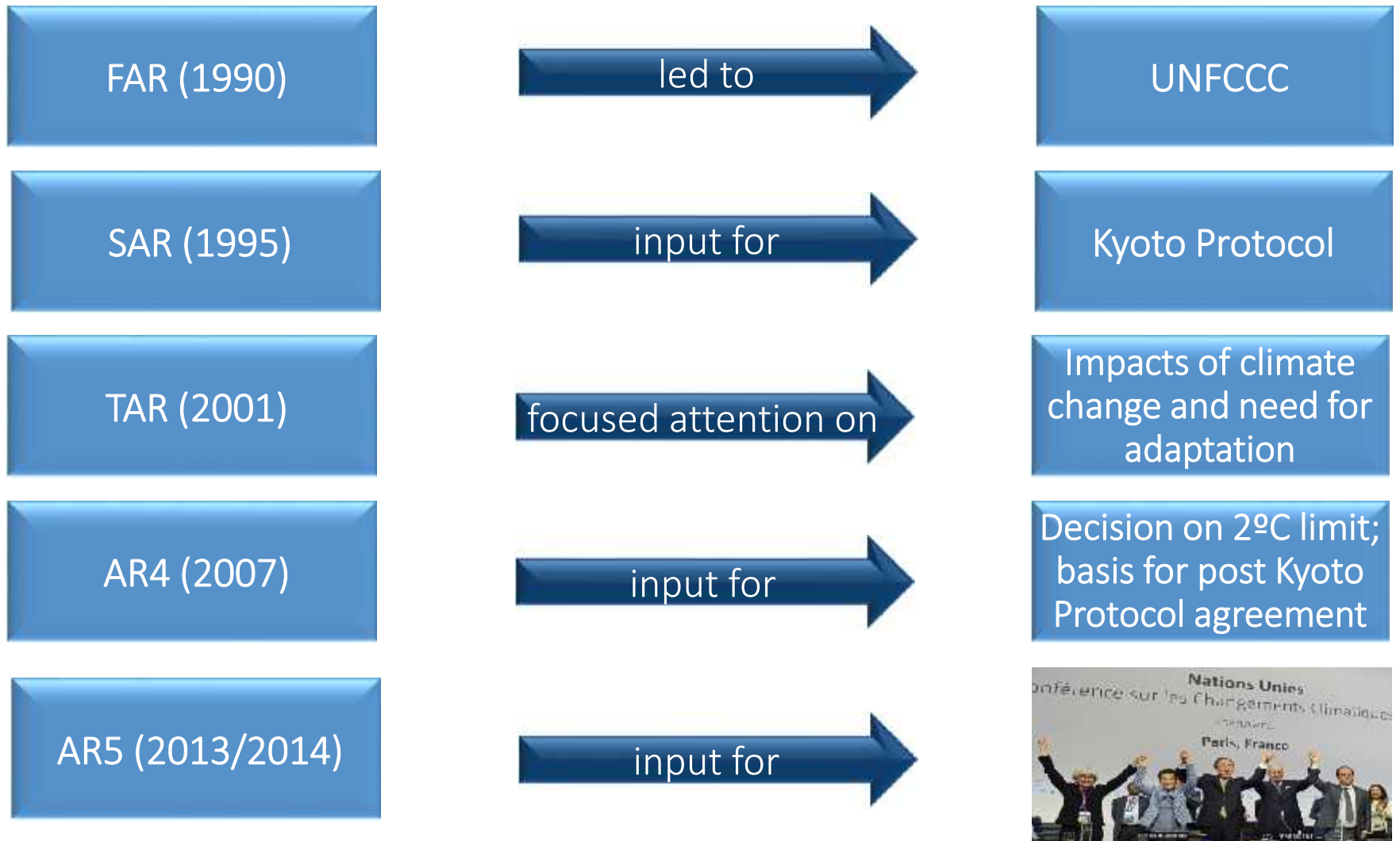
“... to **assess** on a comprehensive, objective, open and transparent basis the **scientific, technical and socio-economic information** relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.”

“IPCC reports should be **neutral with respect to policy**, although they may need to **deal objectively with scientific, technical and socio-economic factors** relevant to the application of particular policies.”

Principles Governing IPCC Work, paragraph 2

Source: <http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf>

...that has made an impact



Sixth Assessment Cycle of the IPCC (AR6)

| Special Reports | |
|--|--|
|  | 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 September 2018 |
| UNFCCC Cop 23 | Facilitative dialogue |
|  | Special Report on the Ocean and Cryosphere in a Changing Climate September 2019 |
|  | Special Report on 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. September 2019 |
| Methodology Report update | |
|  | 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories May 2019 |
| AR6 Main Report | |
|  | Working Group I, II, and III contribution to the Sixth Assessment Report in 2021 Synthesis Report to the Sixth Assessment Report April 2022 |
| UNFCCC global stocktake 2023 | |
| Cities | |
|  | Attention on cities in AR6 including a conference and special report on cities in AR7 |

The report in numbers

91 Authors from **40** Countries

133 Contributing authors

6000 Studies

1 113 Reviewers

42 001 Comments



Ashley Cooper / Aurora Photos

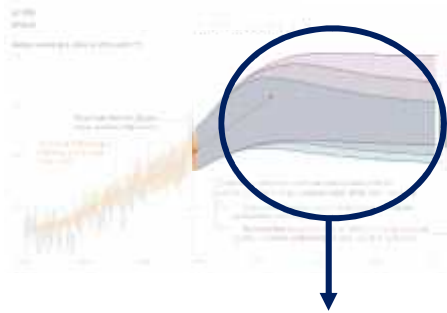
Where are we now?

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

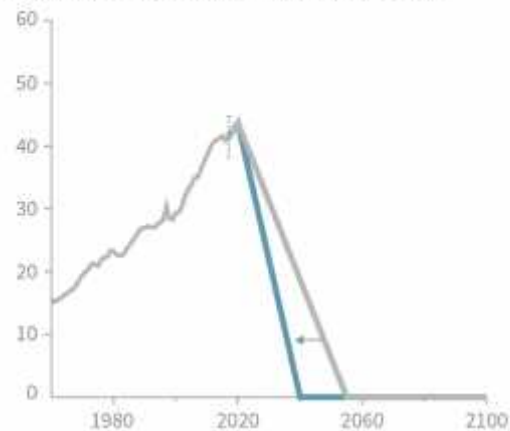
SPM1

Cumulative emissions of CO₂ and future non-CO₂ radiative forcing determine the probability of limiting warming to 1.5°C

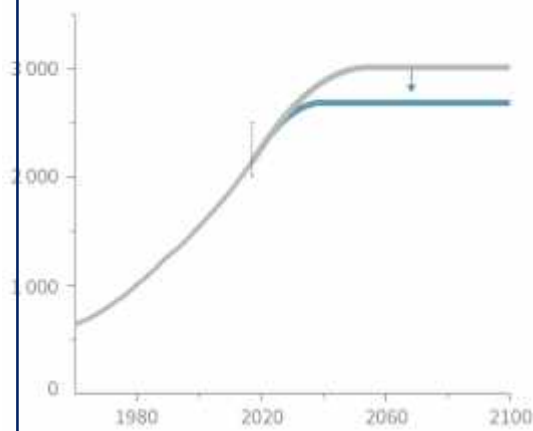


Maximum temperature rise is determined by cumulative net CO₂ emissions and net non-CO₂ radiative forcing due to methane, nitrous oxide, aerosols and other anthropogenic forcing agents.

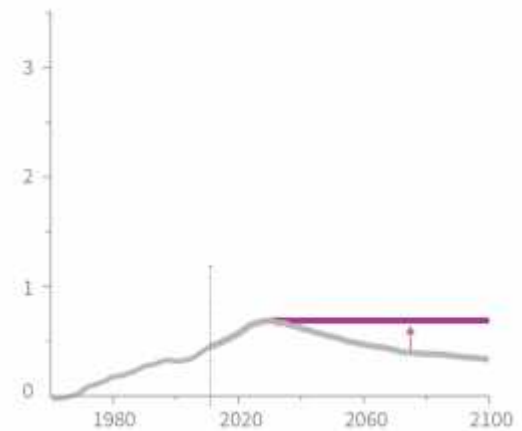
b) Stylized net global CO₂ emission pathways
Billion tonnes CO₂ per year (GtCO₂/yr)



c) Cumulative net CO₂ emissions
Billion tonnes CO₂ (GtCO₂)



d) Non-CO₂ radiative forcing pathways
Watts per square metre (W/m²)





Impacts of global warming 1.5°C

At 1.5°C compared to 2°C:

- Less extreme weather where people live, including extreme heat and rainfall
- By 2100, global mean sea level rise will be around 10 cm lower but may continue to rise for centuries
- 10 million fewer people exposed to risk of rising seas

Jason Florio / Aurora Photos



Andre Seale / Aurora Photos

Impacts of global warming 1.5°C

At 1.5°C compared to 2°C:

- Lower impact on biodiversity and species
- Smaller reductions in yields of maize, rice, wheat
- Global population exposed to increased water shortages is up to 50% less



Natalie Behring / Aurora Photos

Impacts of global warming 1.5°C

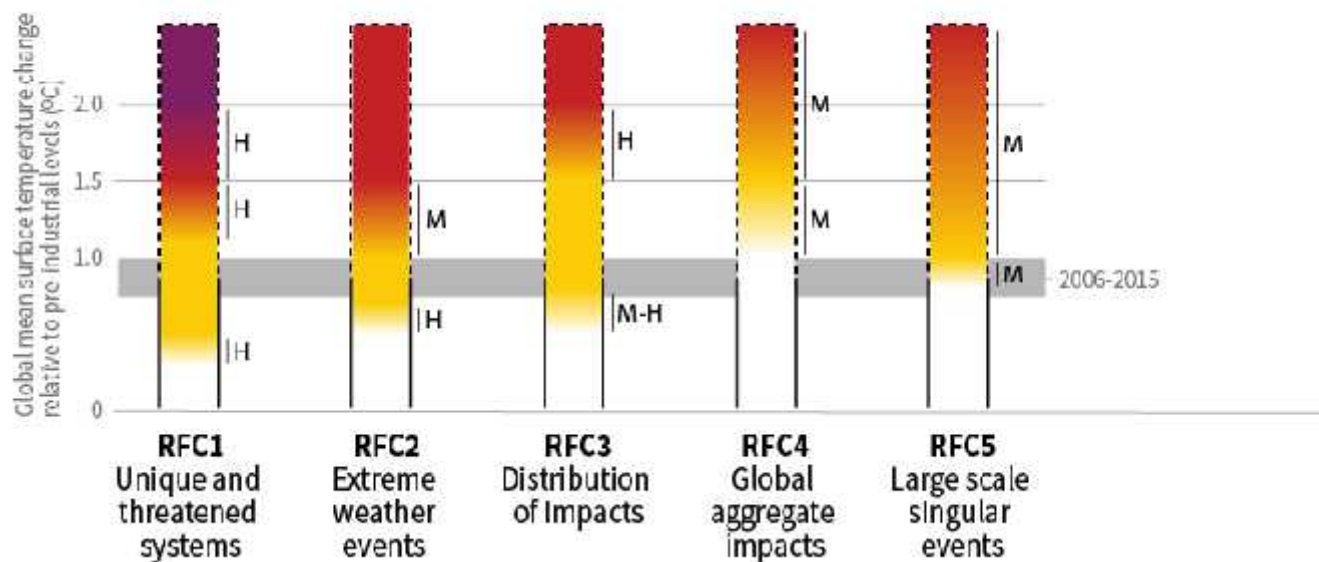
At 1.5°C compared to 2°C:

- Lower risk to fisheries and the livelihoods that depend on them
- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050

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 associated with the Reasons for Concern (RFCs)

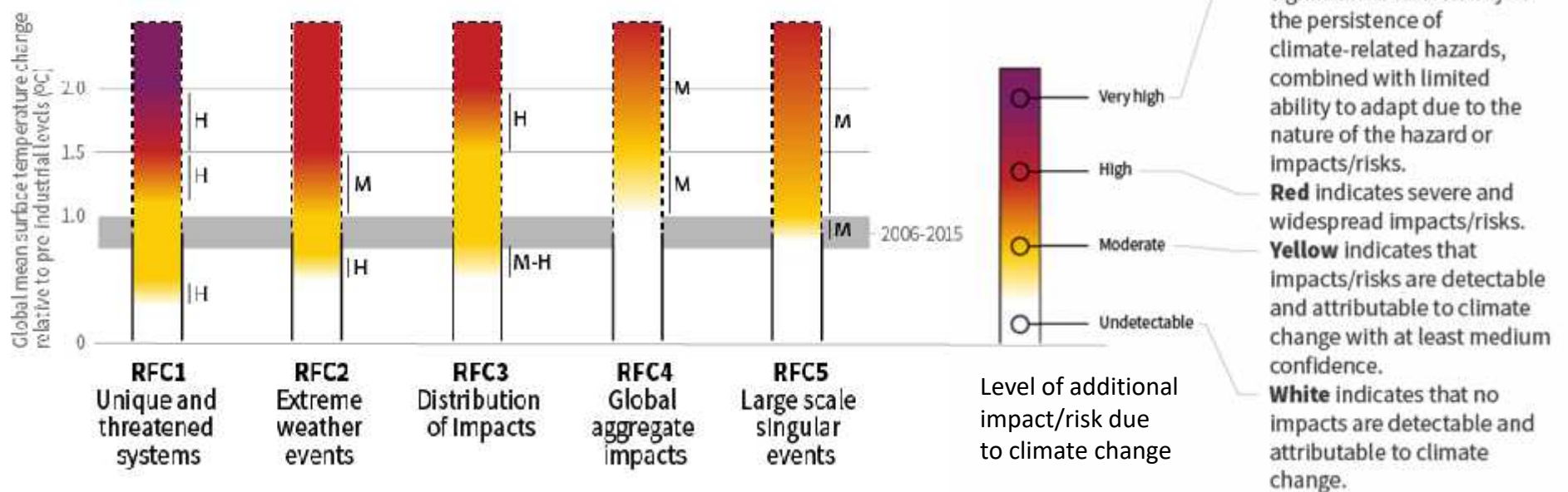


Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high

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 associated with the Reasons for Concern (RFCs)

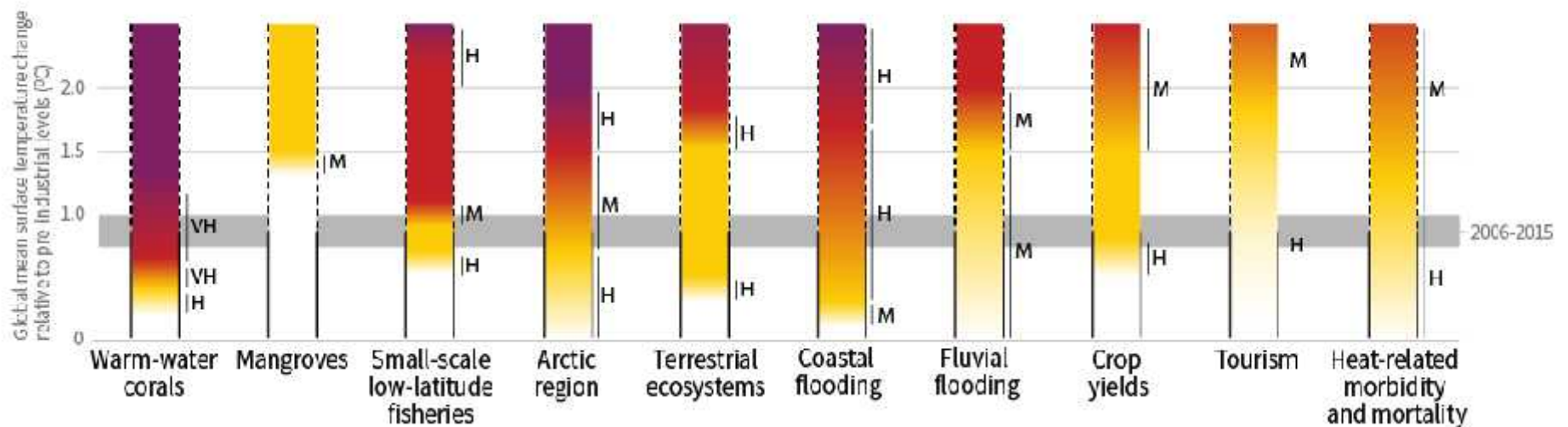


Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high

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

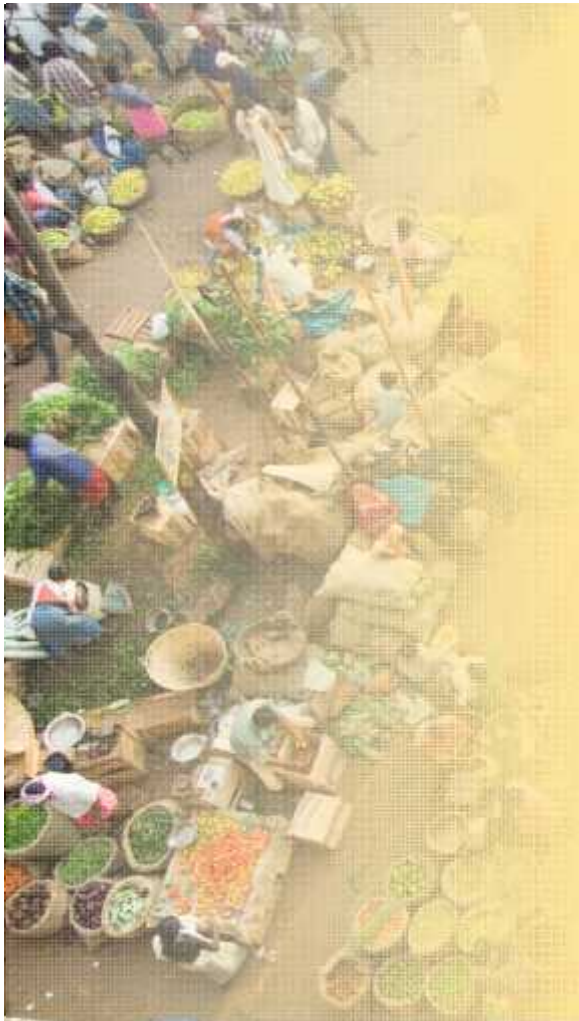
Impacts and risks for selected natural, managed and human systems



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



Emission Pathways and System Transitions Consistent with 1.5°C Global Warming



Greenhouse gas emissions pathways

- Limiting warming to 1.5°C would require changes on an unprecedented scale
 - Deep emissions cuts in all sectors
 - A range of technologies
 - Behavioural changes
 - Increased investment in low carbon options

Neil Emmerson / Aurora Photos



Greenhouse gas emissions pathways

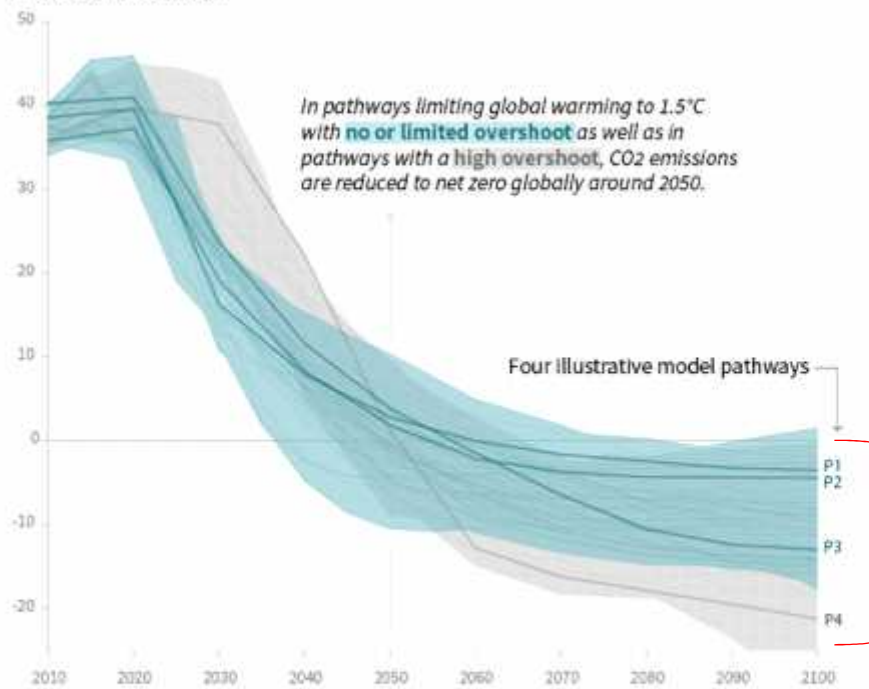
- Progress in renewables would need to be mirrored in other sectors
- We would need to start taking carbon dioxide out of the atmosphere
- Implications for food security, ecosystems and biodiversity

Peter Essick / Aurora Photos

SPM3a | Global emissions pathway characteristics

Global total net CO₂ emissions

Billion tonnes of CO₂/yr



In pathways limiting global warming to 1.5°C with no or limited overshoot as well as in pathways with a high overshoot, CO₂ emissions are reduced to net zero globally around 2050.

Four illustrative model pathways

P1
P2
P3
P4

Timing of net zero CO₂

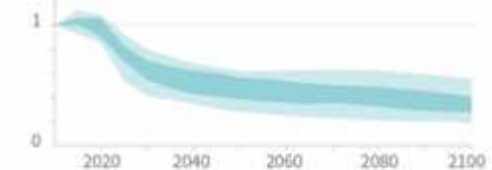
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios



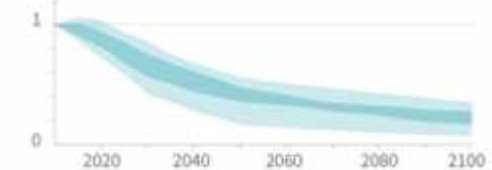
Non-CO₂ emissions relative to 2010

Emissions of non-CO₂ forcings 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.

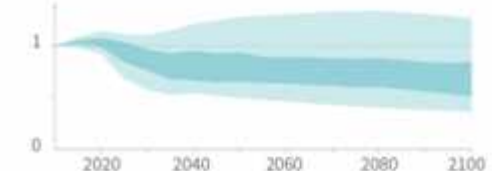
Methane emissions



Black carbon emissions



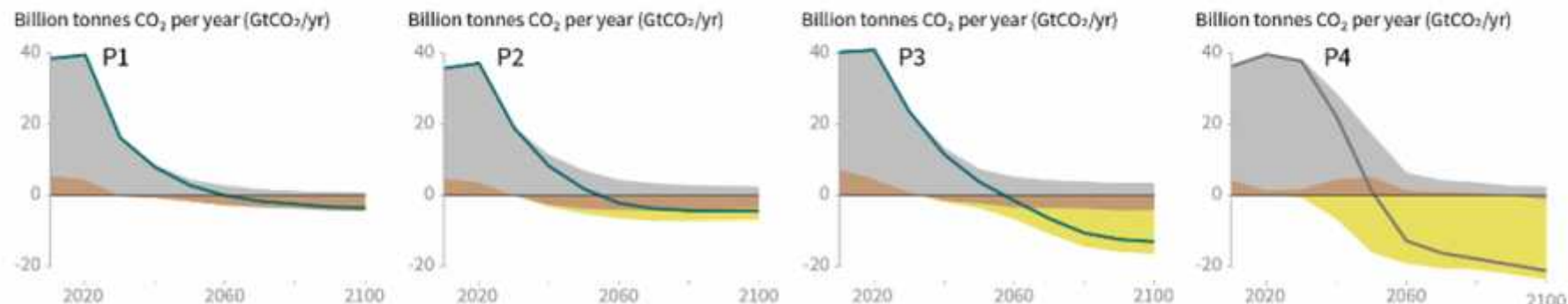
Nitrous oxide emissions



SPM3b | Characteristics of four illustrative model pathways

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.

SPM4

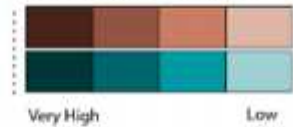
Indicative linkages between mitigation and sustainable development using SDGs (the linkages do not show costs and benefit)

Length shows strength of connection

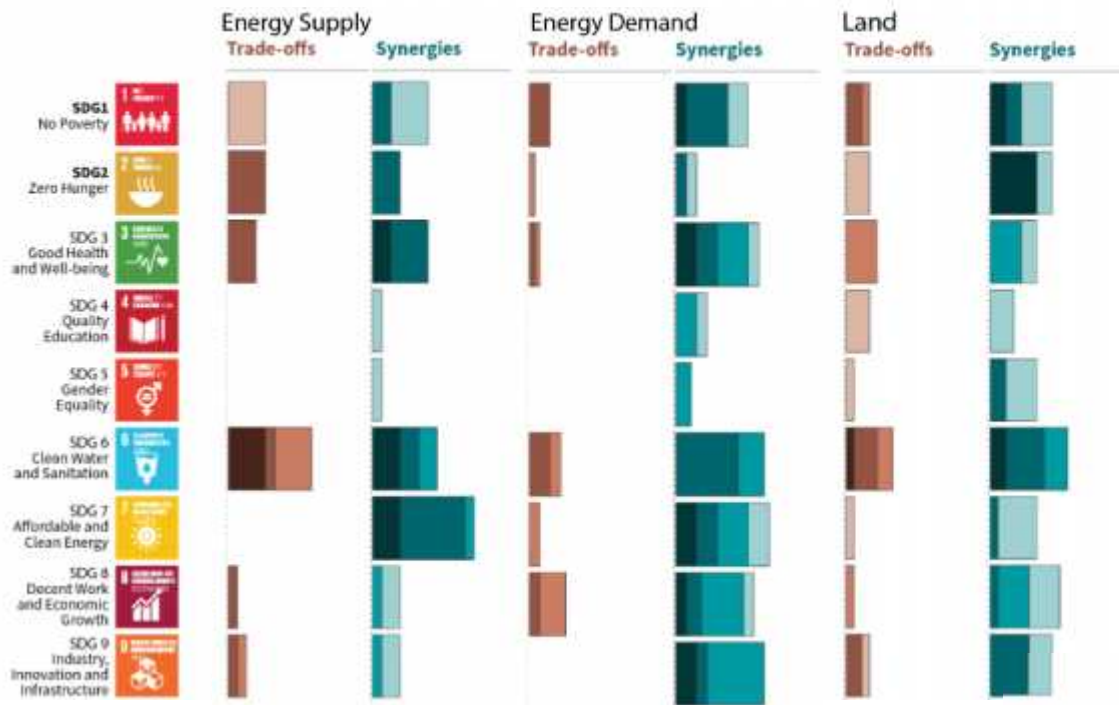


The overall size of the coloured bars depict the relative for synergies and trade-offs between the sectoral mitigation options and the SDGs.

Shades show level of confidence



The shades depict the level of confidence of the assessed potential for Trade-offs/Synergies.



SPM4

Indicative linkages between mitigation and sustainable development using SDGs (the linkages do not show costs and benefit)

Length shows strength of connection

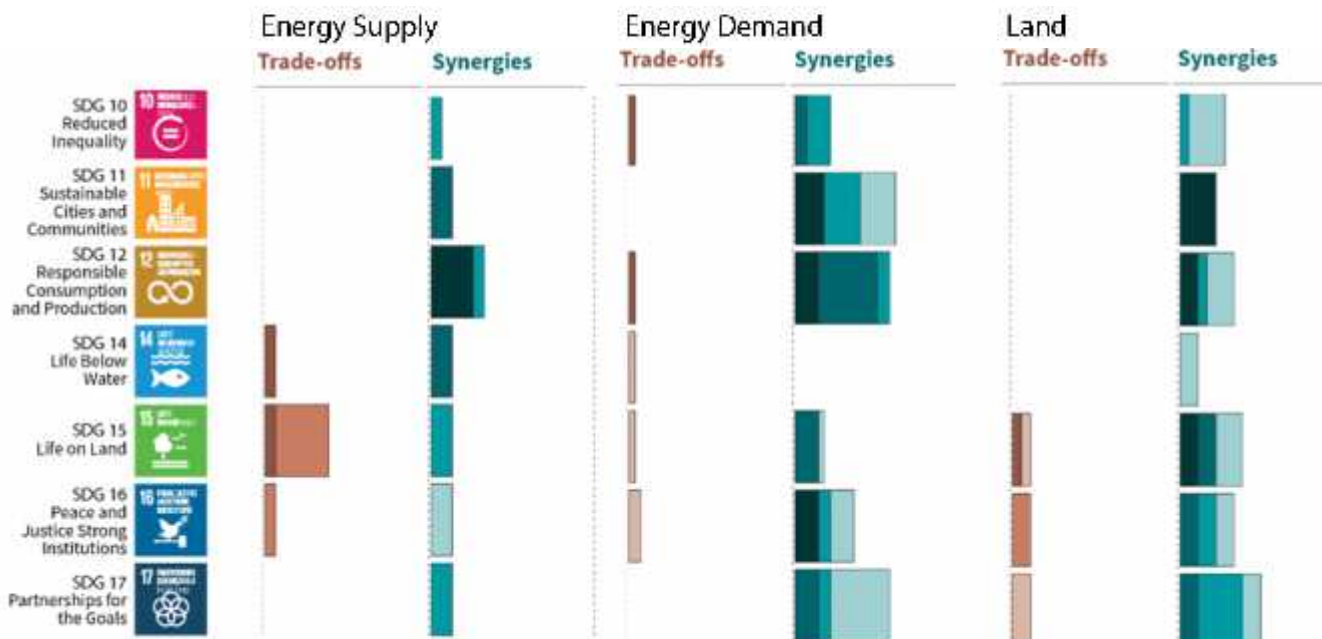


The overall size of the coloured bars depict the relative for synergies and trade-offs between the sectoral mitigation options and the SDGs.

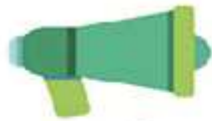
Shades show level of confidence



The shades depict the level of confidence of the assessed potential for Trade-offs/Synergies.



How the IPCC prepares its reports?



Scoping

The outline is drafted and developed by experts nominated by governments and observer organizations



Approval of Outline

The Panel then approves the outline



Nomination of authors

Governments and observer organizations nominate experts as authors



Government and Expert Review - 2nd Order Draft

The 2nd draft of the report and 1st draft of the Summary for Policymakers (SPM) is reviewed by governments and experts



Expert Review - 1st Order Draft

Authors prepare a 1st draft which is reviewed by experts



Selection of authors

Bureaux select authors



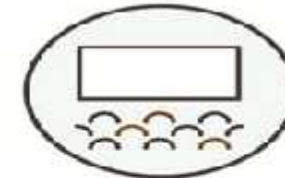
Final draft report and SPM

Authors prepare final drafts of the report and SPM which are sent to governments



Government review of final draft SPM

Governments review the final draft SPM in preparation for its approval



Approval & acceptance of report

Working Group/Panel approves SPMs and accepts reports



Publication of report

Getting involved

1



Contribute to existing literature

IPCC assessments are as good as the literature available. Look out for the various cut off dates for literature for the different reports.

2

As Authors or Review Editors

Bureaux selects Authors and Review Editors from lists of nominations provided by governments and observer organizations. Look out for the calls for nomination of authors and contact your IPCC Focal Point if you are interested in being nominated.



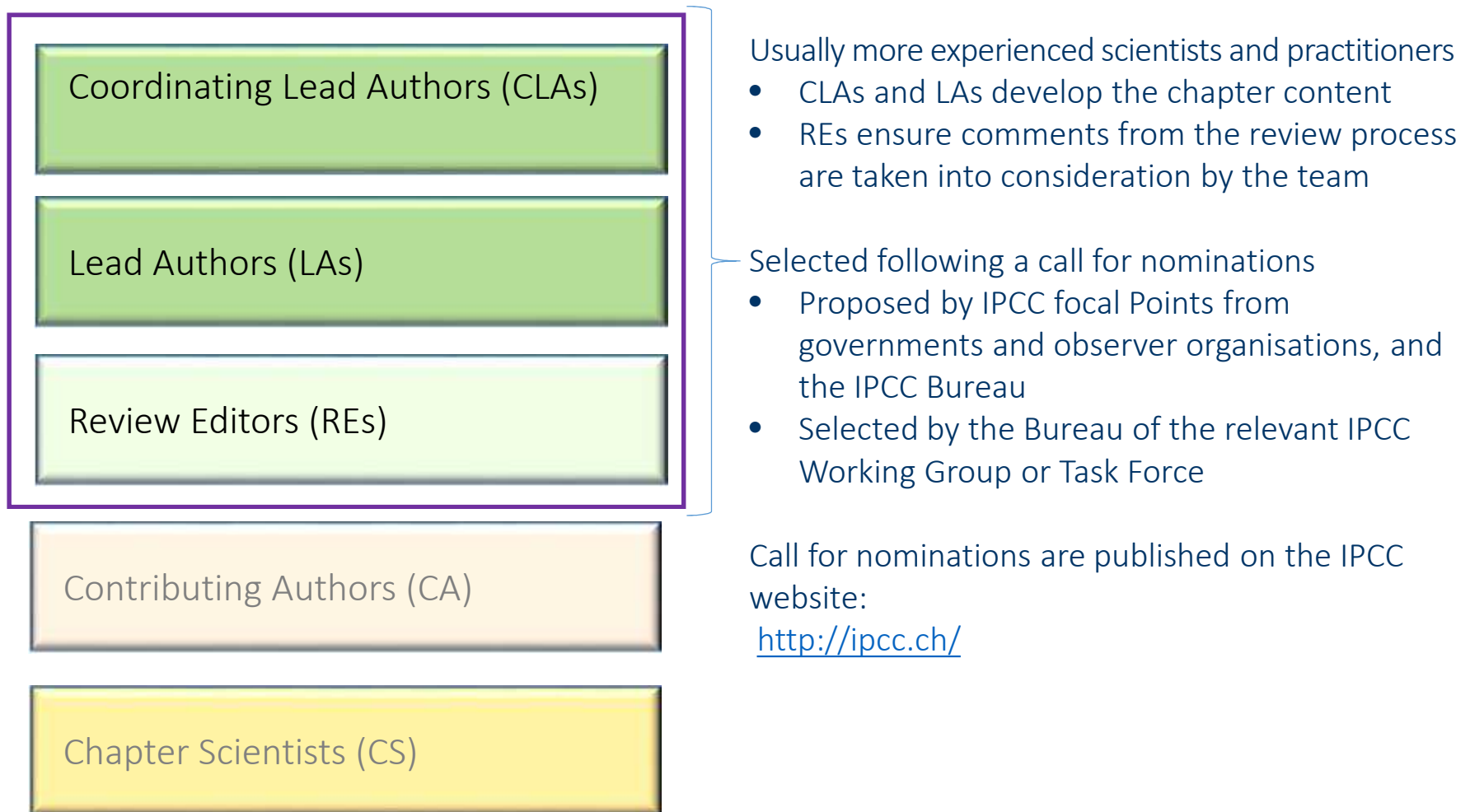
3



As Expert Reviewers

To be involved at the the two review stages, Expert Review of the First Order Draft and Government and Expert Review of the Second Order Draft.

Author teams – CLAs, LAs, REs



Author teams – CAs

Coordinating Lead Authors (CLAs)

Lead Authors (LAs)

Review Editors (REs)

Contributing Authors (CA)

Chapter Scientists (CS)

Prepare technical information in the form of text, graphs or data

Contributions

- Solicited by LAs
- Unsolicited contributions also encouraged

Author teams – CS

Coordinating Lead Authors (CLAs)

Lead Authors (LAs)

Review Editors (REs)

Contributing Authors (CA)

Chapter Scientists (CS)

Scientific assistants who provide support to the author teams

- Technical aspects including cross-checking between findings in different parts of the report
- Additional fact-checking
- Reference management

Recruited

- Directly by CLAs
- Through a call issued by the TSUs

<http://wg1.ipcc.ch/>

<http://www.ipcc-wg2.awi.de/>

<http://www.ipcc-wg3.ac.uk/>

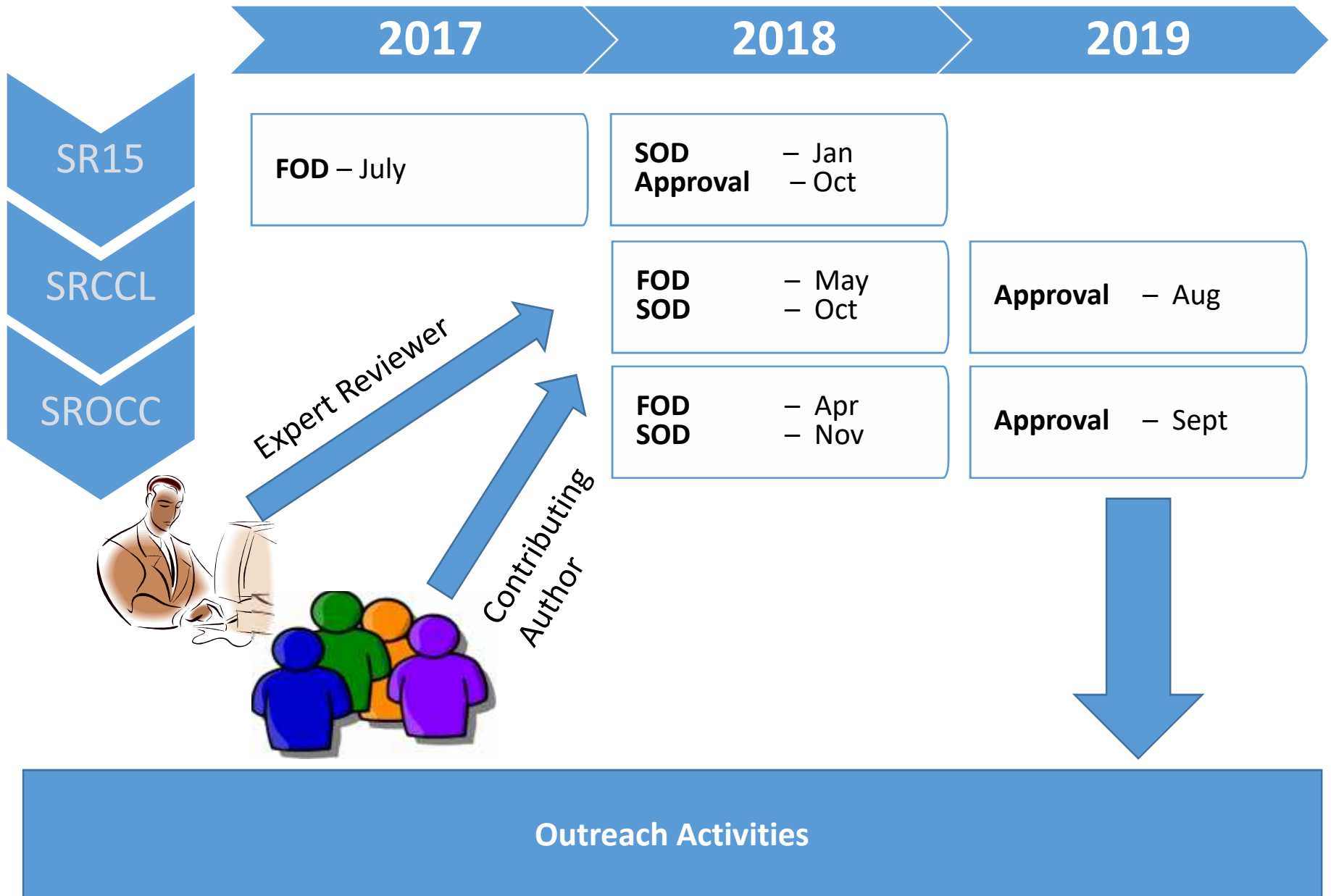
<http://www.ipcc-nggip.iges.or.jp/>

Products and Important Milestones

| | SR15 | SRCCL | SROCC | TFI MR | AR6 |
|-------------------------|--------|--------|---------|--------|--------|
| Call for nominations | | | | | Oct 17 |
| First Order Draft | Jul 17 | May 18 | Apr 18 | Dec 17 | |
| Second Order Draft | Jan 18 | Oct 18 | Nov 18 | Jul 18 | |
| Final Government Review | May 18 | Apr 19 | Jun 19 | Jan 19 | |
| Approval Plenary | Oct 18 | Aug 19 | Sept 19 | May 19 | |

| Other Activities | |
|--|--------|
| Cities and Climate Change Science Conference | Mar 18 |
| Expert meeting on SLCF | May 18 |
| Expert meeting on Regional Aspects | May 18 |

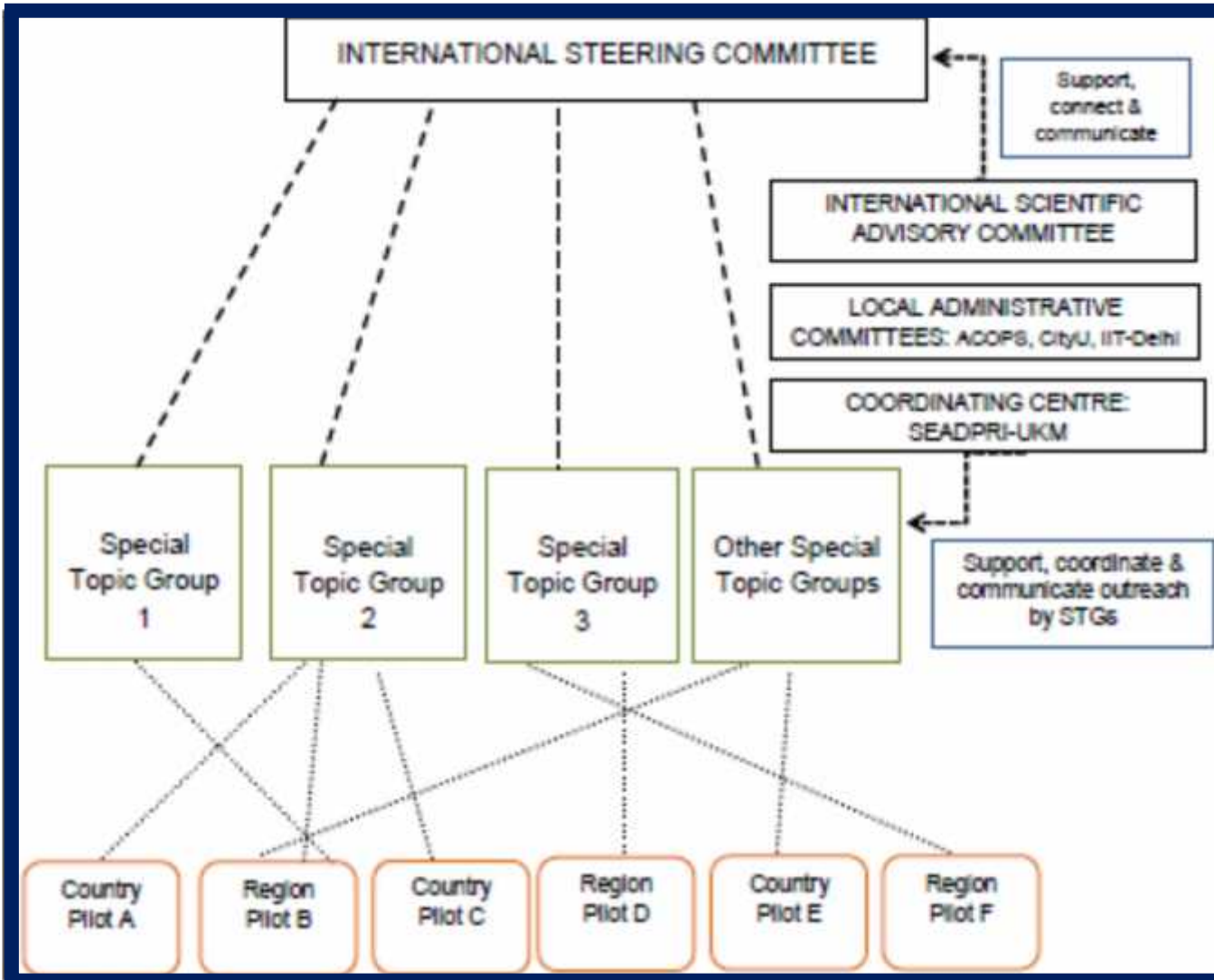
How to Contribute?





Asian Network on
Climate Science and Technology
(ANCST)

<http://www.ancst.org/>



Special Topic Groups

1. Disaster Prevention and Climate Resilience (Prof. Rajib Shaw, Keio University, Japan)
2. Atmospheric Composition and Climate Change (Prof. Mohd. Talib Latif, Univ. Kebangsaan Malaysia)
3. Asian Atmosphere-Ocean Processes (Prof. Manju Mohan, Indian Institute of Technology Delhi)
4. Urban Meteorology and Climate (Prof. Johnny Chan & Prof. Jimmy Fung, Hong Kong)
5. Climate Change, Floods and Anthropogenic Activities (Prof. Zulkifli Yusup, Univ. Teknologi Malaysia)