

Overview of new knowledge on the LTGG emerging form the IPCC 2018-19 Special Reports Presentation: Piers Forster (UK), Kirsten Zickfeld (Canada) Q&A: Pauline Dube (Botswana), Michael Taylor (Jamaica) (all are authors of the IPCC SR1.5 report)

- 2. Scenarios compatible with the LTGG considered in the IPCC 2018-19 special reports
- 3. Information and knowledge gaps addressed in the IPCC 2018-19 Special Reports with regard to scenarios to achieve the LTGG and the range of associated impacts
- 4. Challenges and opportunities for achieving the LTGG, as identified in the IPCC 2018-19 Special Reports



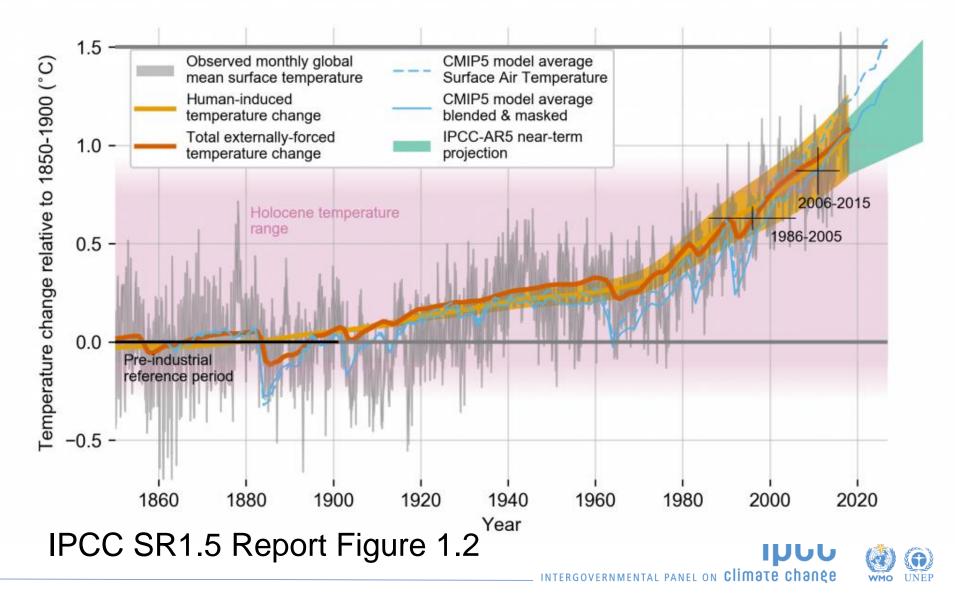


The talk covers:

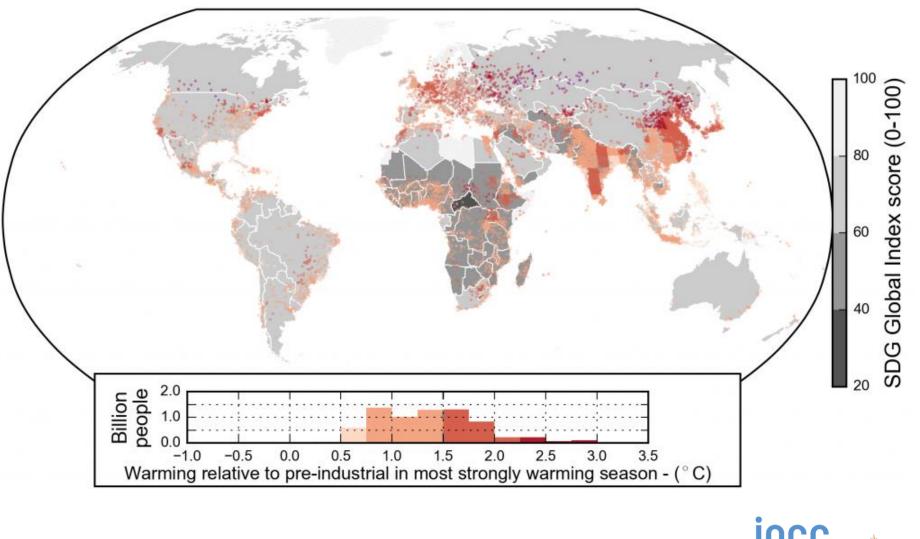
- Global warming to date
- Link between regional and global warming
- CO₂ and non-CO₂ emission requirements for LTGG
- Overshoot and stabilisation
- Remaining carbon budgets



The best estimate of global warming from human-emissions was between 1.1 and 1.2°C above preindustrial levels in 2020 using SR1.5 methods and approximately matched the observed warming



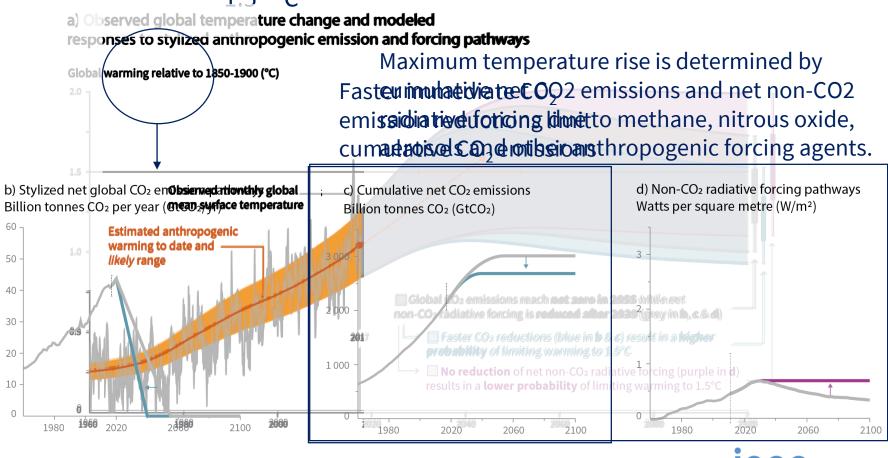
People are already living with climate change. Most impacts are expected to scale with warming level



IPCC SR1.5 Figure 1.2



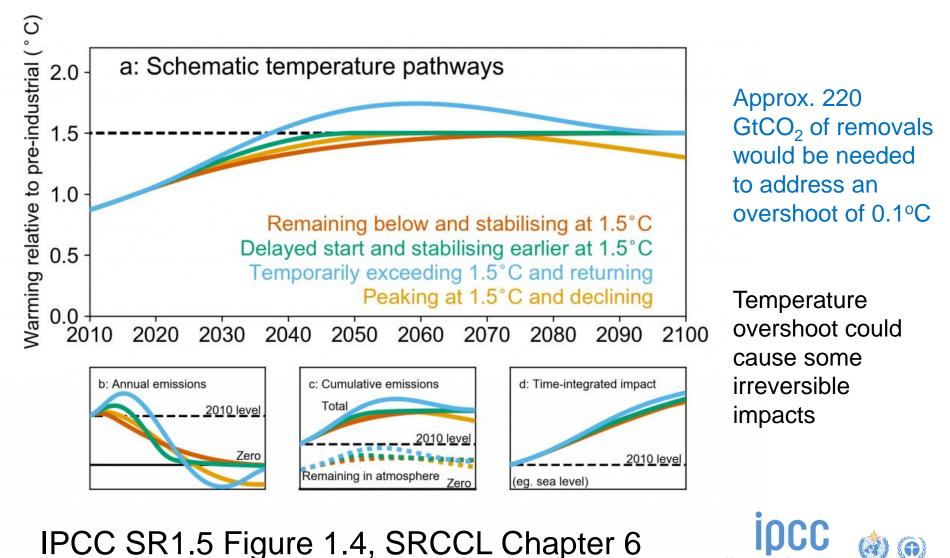
SPN1 Cumulative emissions of CO₂ and future non-CO₂ radiative forcing determine the probability of limiting warming to 1.5° C



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Eventual warming depends on cumulative CO2 emissions. Exceeding temperature limits will have additional impacts and require net CO2 removals to reverse warming



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Emissions need to stay within a remaining carbon budget to keep temperatures below a given warming level but uncertainty in climate response affects the chance

> At the end of 2017: 580 GtCO₂ remained in the budget for 50% probability of staying below 1.5°C

420 GtCO₂ remained in the budget for 67% probability of staying below 1.5°C. Meeting this budget would stay below 1.5°C in all but the highest climate sensitivity worlds

Permafrost and other Earth system feedbacks could add warming equivalent to 100 GtCO_2 over the century

Approx. 42 GtCO₂ currently emitted per year

.5°C Remaining CO₂ warming Global warming level Future non- CO_2 Warming to date 2200 ± 320 GtCO₂ 0°C



IPCC SR1.5 Chapter 2

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Conclusions

- Long-term temperatures depend on cumulative CO₂ emissions and level of non-CO2 emission reductions
- Parts of the world are already experiencing higher temperatures than the LTGG temperature limits
- To meet the LTGG temperature limits **rapid** emission reduction to net-zero CO_2 is needed as well as deep reductions in non- CO_2 GHGs
- Meeting the LTGG temperature limit in an overshoot scenario could cause additional impacts that take decades to many centuries to reverse
- Geophysical factors that make meeting the LTGG more challenging are:
- 1. If we are in a high climate sensitivity world
- 2. Future climate risk to land-based carbon dioxide removals
- 3. Other Earth system feedbacks such as GHG release from land systems

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Conclusions

Reaching the ultimate LTGG may well imply achieving global sustainability, which requires significant transformative change in human systems.

*Global sustainability entails environmental sustainability; Social equity; and Economic prosperity

IPCC SR1.5 SPM (Fig. SPM.3b, Fig. SPM.4, D.6, D.6.3, D.7.4), SROCC SPM (C.4, C.4.7)

