CONSTRAIN and the first Global Stocktake

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Who are CONSTRAIN?

The **2015 Paris Agreement** aims to help the world avoid the most dangerous climate change by limiting warming to well below 2°C, whilst pursuing efforts to limit warming to 1.5°C.

However, predicting how the climate will change over the next 20-50 years, as well as defining emissions pathways to keep the world on track, depends on how several human and natural factors will affect the climate in coming decades. These include how atmospheric aerosols affect the Earth's radiation budget, and the roles of clouds and oceans in driving climate change.

CONSTRAIN, a consortium of 14 European partners, is investigating these factors, and feeding them into climate models to reduce uncertainties in, and create improved climate projections for, the next 20-50 years, on regional as well as global scales.

How can CONSTRAIN help the GST?

Our **ZERO IN Reports** provide insights into the complex processes represented in climate models and what they mean for temperature change and other climate impacts over the coming decades.

We hope that they will help stakeholders to understand the state of the climate system, and help the GST itself to interpret the huge amounts of information being submitted.

A fourth report focusing on Paris Agreement-compatible emissions pathways will be available by COP27.

· THE REMAINING CARBON BUDGET
· DECADAL WARMING RATES

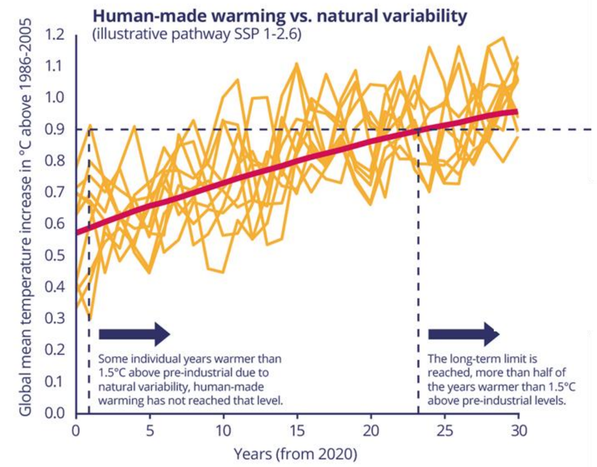
NEAR-TERM WARMING AND OUR CHANCES OF STAYING WITHIN 1.5°C

A NEW GENERATION OF CLIMATE MODELS, COVID-19 AND THE PARIS AGREEMENT

Read CONSTRAIN's initial submission to the GST and find out more at www.constrain-eu.org

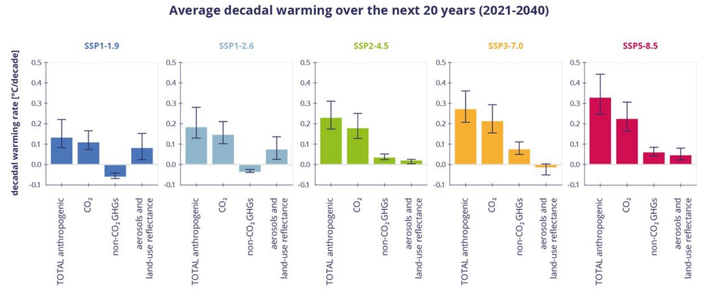
Where are we with the LTTG?

The LTTG aims to hold global average temperature rise to well below 2°C above pre-industrial levels, and pursue efforts to limit this to 1.5°C. It reflects global, human-made long-term (20-30 year) temperature change, excluding short-term natural variability in the climate system. So, reaching or exceeding 1.5°C warming in a single year, month or location, as a result of year-to-year variability, does not mean that the LTTG has been breached, as long as human-made warming still falls below 1.5°C (red = long-term human-made warming; yellow = annual temperatures including year-to-year variability).



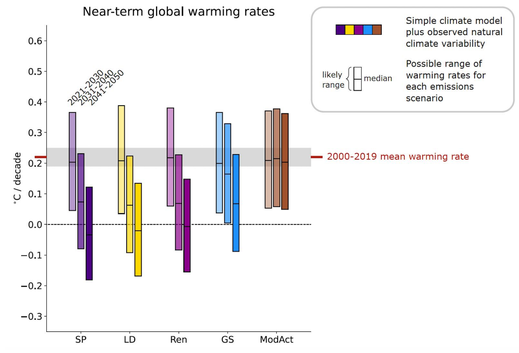
How will temperatures change over the next 20 years?

As well as the total amount of warming we experience, the rate of change over the coming decades is important: higher warming rates would reduce the time available for effective adaptation, particularly for the most climate-vulnerable countries. Strong emissions cuts would slow down warming, highlighting the importance of climate action this decade.



How can strong climate action now stop warming by 2050?

Immediate and rapid energy system transformations and emissions cuts represented by the most ambitious of the IPCC's Illustrative Mitigation Pathways would slow down the rate of global warming between now and 2050. In fact, the current warming rate could well be halved in the next decade (2031-2040), and warming could be halted or even begin to reverse by the middle of the century.



How does the climate system affect our chances of staying within 1.5°C?

If and when we will reach 1.5°C largely depends on which emissions pathway we follow. But exactly how the climate system responds to those emissions will also play a role and there are still uncertainties when it comes to how global temperatures will respond. These include the effects on temperatures of both aerosols and carbon release from thawing permafrost.