

Mitigation – State of GHG emissions and removals and mitigation efforts undertaken by Parties

Performance distributions to assess collective progress in reducing greenhouse gas emissions

1. Introduction

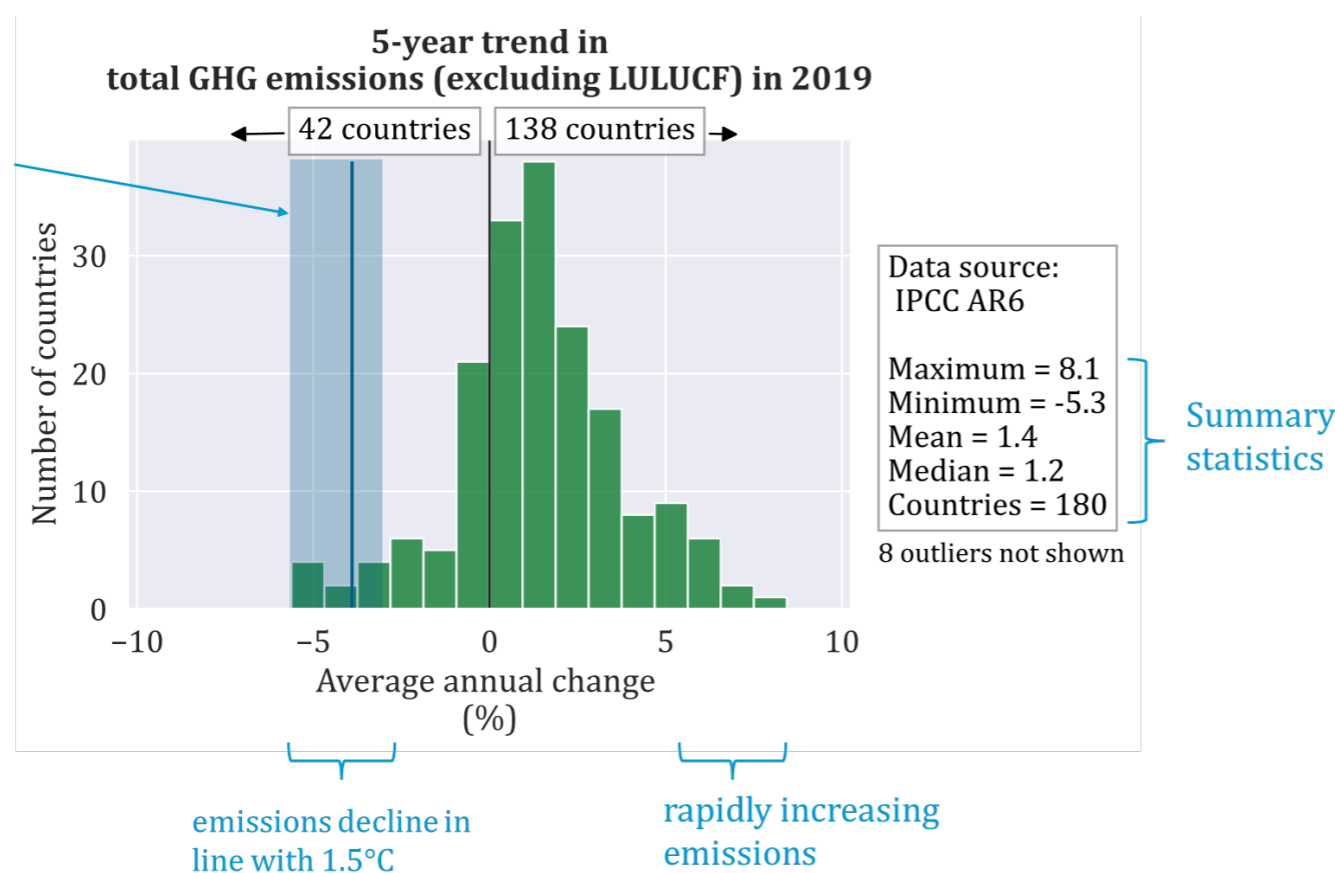
A performance distribution is a histogram that groups countries based on how they fare on a specific indicator, such as greenhouse gas emissions per capita.

Performance distributions support national-level discussions, since interested actors can locate their country and **benchmark progress** against others.

Performance distributions are aligned with the Global Stocktake's mandate to assess **collective progress without singling out** individual countries.

2. A change in direction is urgently needed

Approximate global annual reduction needed to limit warming to 1.5°C with limited overshoot



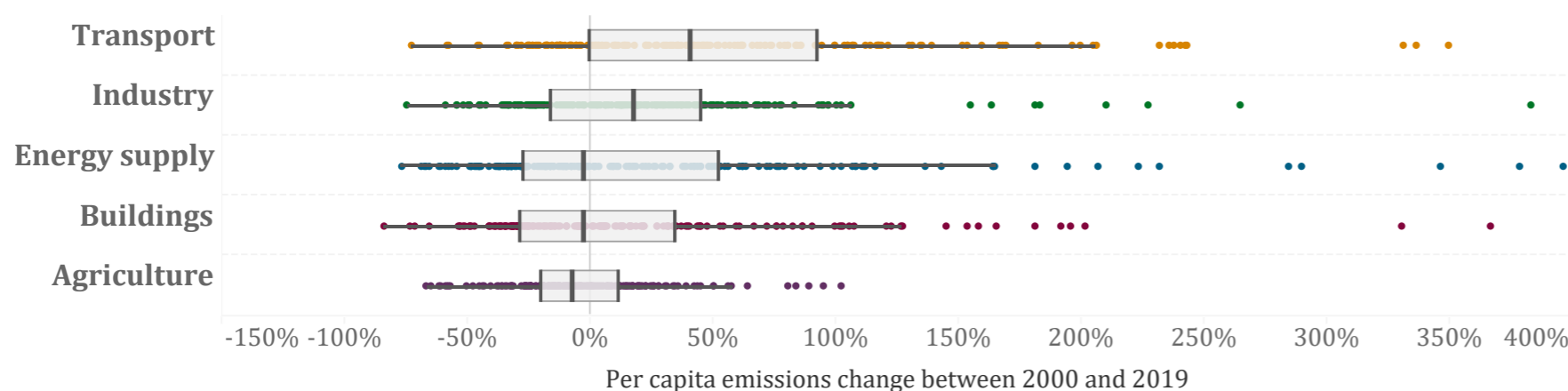
Over a five-year period, greenhouse gas emissions continued to increase in most countries.

In almost all countries, annual change rates of emissions are outside the range which is needed to keep the temperature goal of the Paris Agreement within reach (range depicted in blue in the figure).

Figure 1: Performance distribution showing average five-year annual change rate of total emissions across 180 countries between 2015 and 2019 (excluding land use, land-use change and forestry). Annual reduction median and range (5-95th percentile) needed between 2019 and 2030 calculated based on mitigation scenarios compatible with 1.5°C warming with no or limited overshoot (IPCC, 2022, *Mitigation of Climate Change – Summary for Policymakers (SPM)*, *Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, <https://www.ipcc.ch/report/ar6/wg3/>).

3. Across countries, some sectors perform better than others

Distribution of change in emissions per capita between 2000 and 2019



In the transport and industry sectors, per-capita greenhouse gas emissions showed strong increases in most countries between 2000 and 2019.

However, in other sectors, emissions per capita decreased in most countries.

Findings from countries that achieved sustainable emission reductions can provide lessons for others.

Figure 2: Distribution of per capita emissions per sector. Each dot represents one country, and the boxes cover the interquartile range (25th to 75th percentiles). The line in the centre of the box indicates the median, or central, country in the distribution. Whiskers cover 1.5 times the interquartile range. Some outliers are excluded from the plot for visualisation purposes but here this exclusion does not affect interquartile or median calculations. Source: Own calculations based on: Minx et al. (2021) 'A comprehensive and synthetic dataset for global, regional and national greenhouse gas emissions by sector 1970-2018 with an extension to 2019'. doi: 10.5281/ZENODO.5566761.

Authors: Leonardo Nascimento, Eduardo Posada, Louise Jeffery and Lorenz Moosmann

Disclaimers: This poster is based on the discussion paper: Nascimento, L. et al. (2023) *Greenhouse gas emission distributions: Informing the Global Stocktake (2021-2023)*. German Environment Agency. Available at: <https://www.umweltbundesamt.de/publikationen/greenhouse-gas-emission-distributions>

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