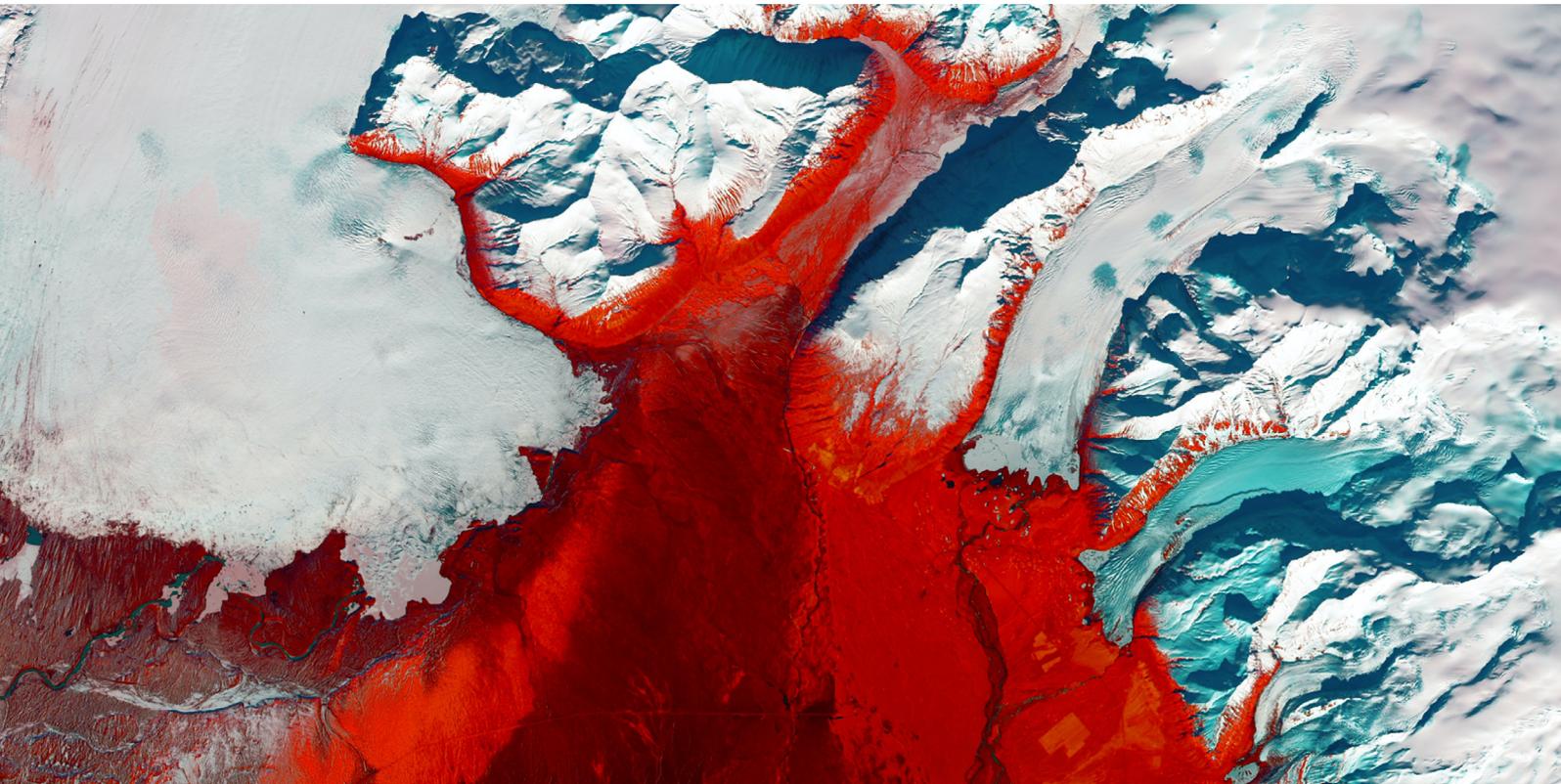


# Introducing performance distributions to visualise collective progress towards mitigation goals of the Paris Agreement

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The first Global Stocktake (GST), taking place in 2021-2023, must provide clear and actionable information to support Parties to the Paris Agreement in planning and implementing more ambitious actions within this decade. Visualising country progress as performance distributions (Figure 1) fulfils the GST's criteria of evaluating collective progress while communicating that not all countries are the same. In the context of the GST, performance distribution analyses could enable peer pressure among Parties and public scrutiny at the national level, which contribute to the enhancing ambition function of the GST process.

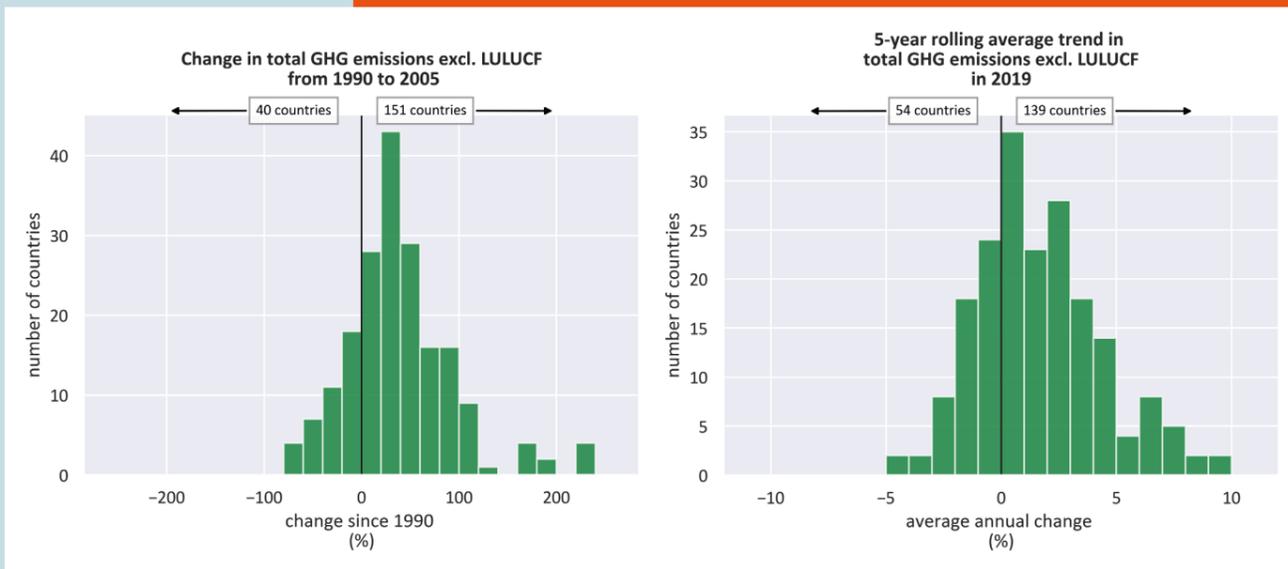


Figure 1: Change in greenhouse gas (GHG) emissions compared to 2005 (left) and average annual change in GHG emissions in the past five years (right). Own figure based on total GHG emissions from the PRIMAP-hist dataset (Gütschow et al., 2016; Gütschow, Günther and Pflüger, 2021).

## The Paris Agreement and Global Stocktake

The Paris Agreement includes an ambition cycle to bridge the gap between current actions and its long-term mitigation goals. Every five years, the GST analyses the global progress regarding the implementation of the Paris Agreement and informs 'Parties in updating and enhancing, in a nationally determined manner, their actions' (UNFCCC, 2018). The Paris Agreement notes that the GST should assess the collective progress towards achieving its long-term goals (UNFCCC, 2015). The GST has a mandate to provide information that can be translated into enhanced targets and actions at the national level.

The GST's mandate to assess collective progress is interpreted such that it must not assess the ambition and implementation performance of individual countries. Still, the GST process should recognise that substantial differences between countries exist, both in terms of where they are now and where they may be heading. Making Parties aware of these differences can act as an enabler for increased ambition, by showing what is already possible, identifying trends and the existence of leaders and laggards.

However, there are challenges to match these two conditions – assessing collective progress without singling out individual countries and providing actionable information for developing subsequent NDCs. Analyses that provide global emissions or warming estimates are important but focus on outcomes and lack the nuance necessary to

translate information into action. We propose that actors involved in the GST process also analyse Parties' progress as performance distributions, in addition to aggregated indicators, to evaluate collective progress. This approach fulfils the GST mandate to assess collective progress but clearly demonstrates differences across Parties.

## Performance distribution tools to evaluate collective progress

To meet the combined challenges of assessing collective progress and providing actionable information, we propose that the GST use performance distributions, that visualise anonymised information from individual countries.

Countries' information is displayed in a graphical form where the distribution of the indicator used to evaluate progress is presented. The plots can also contain information about global averages, which enable comparisons with global (or regional) benchmarks. This is best achieved using a histogram (Figure 1), which for a given indicator displays the number of countries within an interval. This allows for a shared understanding of the performance of countries and enables a more differentiated representation of collective performance without singling out individual countries.

In assessing current values, or historic changes, the GST takes stock and highlights progress, or lack thereof. Using the example of GHG emissions above, we can observe that current emissions remain above 2005 levels in 139 countries (Figure 1 - left) with emissions in a few having more than doubled since then (change above 100%). In most countries, emissions continue to rise but in 54 countries emissions have declined over the past five years. Frontrunners have a maximum rate of emissions decline of 5% per year, while laggards increase emissions at a rate of almost 10% per year (Figure 1 - right). Over time, a shift in the distribution to the left would show that, collectively, countries have improved their mitigation efforts.

## Benefits of visualising information using performance distributions

We argue that performance distributions enable a more effective Global Stocktake because:

- They are aligned with the GST mandate to assess collective progress without singling out individual countries.

- › They mainstream outputs of the GST in national-level discussions, as independent actors can locate their countries in the distribution and benchmark their progress against other countries. This facilitates public scrutiny at the national level.
- › They assess whether all countries move together or whether a few countries make substantial progress. This circumnavigates naming-and-shaming while not letting individual countries hide within a global number and provides pride-and-fame illustration of what can be achieved.

The same distributions can be used to assess progress on a broad range of indicators. Assessing progress of sectoral indicators, such as the share of renewable power generation, can be more actionable than emissions data alone. Subject to available data, the figures could be applied beyond the mitigation theme, for instance to visualize progress on international climate finance. Presenting a consistent style of figure should make the information more accessible - once one figure is explained and understood, the principles can be translated to other indicators and figures.

## About

NewClimate Institute works with Öko Institute and Wuppertal Institute to support the GST as part of the German Environment Agency (Umweltbundesamt, UBA) supervised research project "Support for the first Global Stocktake of the Paris Agreement". As part of this project, we prepare visualisation tools and a series of analyses of historical progress to support the GST process. We argue that inclusion of performance distributions in the synthesis reports would enhance the depth of the information provided to Parties and support the ambition raising needed to keep the goals of the Paris Agreement within reach.

We invite actors to develop their own tools and make our code openly available to facilitate implementation and foster collaborative development (see below).

## Further reading and other resources

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Code repository for tools to visualise collective progress as distributions: <https://github.com/https-githubcom-NewClimateInstitute/performance-distribution-tools>.

## Other references

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### Project Website

<https://www.umweltbundesamt.de/globalstocktake>

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