THE CARBON BUDGET

WHAT IS THE CARBON BUDGET?

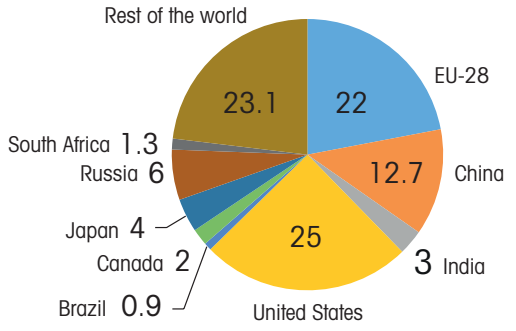
- A 2018 IPCC report titled *Global warming of 1.5°C* has estimated the amount of CO_2 the world can emit to stay **below 1.5°C global warming** over pre-industrial levels.
- The world had already **emitted about 2,200 Gt of CO_2** from the dawn of the industrial revolution till 2017. To remain below 1.5°C rise, only **420–570 Gt more can be emitted** till the end of this century.
- Together, past emissions and tolerable future emissions of CO_2 feed into the **carbon budget** of the world. Past emissions have **consumed over four-fifths** of the 1.5°C budgetary carbon allocations.
- At the current rate of global emissions, these allocations are set to be **exhausted in 12 years**.
- IPCC's *Fifth Assessment Report*, 2014 estimates a **carbon allocation of 2,900 Gt** from pre-industrial times to the end of 21st century to limit warming to 2°C. By 2017, the world had **consumed over three-fourths** of this allocation.
- These are carbon budgets rather than **greenhouse gas (GHG) budgets** and the large range for 1.5°C budgetary allocations partly reflects varying assumptions on how fast non-CO_2 GHG emissions can be mitigated.
- Fossil CO_2 emissions accounted for less than **68 per cent of GHG emissions** in 2018. Thus, while the carbon budget as a concept is useful for policy making in key sectors such as energy, total GHG emissions and the overall **emissions budget** is equally critical.

THE CARBON PIE HISTORICAL DIVISION

The US, constituting 4.3 per cent of the world's population in 2018, has been responsible for over a quarter of the world's total CO_2 emissions between 1751 and 2017. The EU, accounting for 22 per cent of historical emissions with just 6.8 per cent of the population, is not far behind. Other voracious consumers of the historical carbon pie include Russia and Japan, responsible for 6 per cent and 4 per cent of global emissions respectively, with both having less than 2 per cent of the global population. Together, these top four, with less than 15 per cent of the world's population, have devoured 57 per cent of the carbon pie. This is in sharp contrast with countries such as India, which has nibbled a mere 3 per cent of the pie despite having 17.8 per cent of the world's people.

Thus, the historical division of the carbon pie has been extremely iniquitous.

Per cent share of cumulative CO_2 emissions, 1751-2017

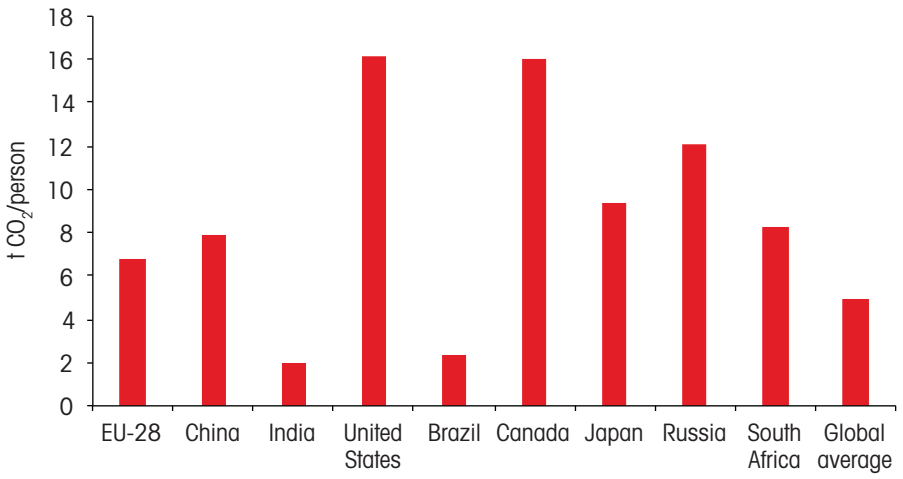


Source: Our World in Data, https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions

THE CARBON PIE
PRESENT SCENARIO

Current annual per capita emissions continue to be deeply inequitable. While an Indian emitted only 1.97 tonnes of CO_2 (tCO_2) annually in 2018, Americans and Canadians both emitted well over 16 tCO_2. India's per capita emissions were a fraction of not just the EU (6.78 tCO_2/person), but also China (7.95 tCO_2/person), making it the lowest per capita emitter amongst the world's large economies.

Per capita CO_2 emissions from fossil fuel combustion in 2018



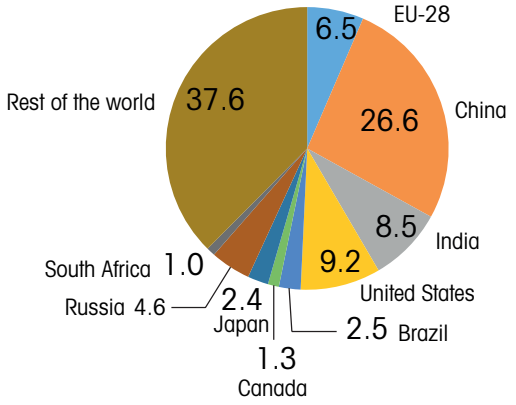
Source: European Commission, Emission Database for Global Atmospheric Research (EDGAR)

THE CARBON PIE
FUTURE PROJECTIONS

A Centre for Science and Environment (CSE) analysis reveals that, even if historical responsibility is overlooked by focusing exclusively on future emissions, the division of the carbon pie will continue to be grossly unfair. Accounting for 9.2 per cent of all GHG emissions between 2019 and 2030—and despite the assumptions of the analysis tilting in its favour—the US will still consume over double the fair share of its population. In contrast, India will consume only 8.2 per cent, less than half the fair share of its population.

Moreover, climate inequity in the present and future needs to confront a new reality—the rise of China. Accounting for over a quarter of emissions, it displaces the US and the EU as the top future polluter. Even more worryingly, the country also crosses the threshold of being a **disproportionate polluter**, accounting for 26.6 per cent of cumulative future emissions with just 18.4 per cent of world's population. **As of now, China sits at the climate table as a developing country. This status needs to be reassessed.**

Per cent share of cumulative GHG emissions, 2019-30



Source: CSE analysis based on data from UNEP, Emissions Gap Report 2019

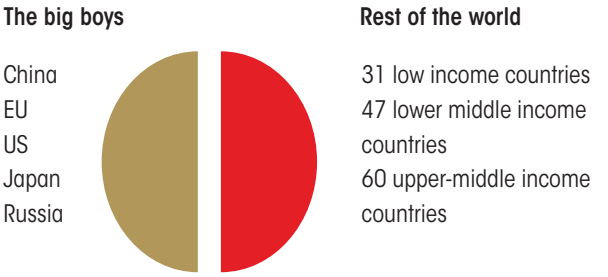
To estimate future emissions, the CSE analysis assumes that all countries will meet their NDC targets. Numbers for present and (projected) 2030 GHG emissions under such a scenario are taken from UNEP's 2019 *Emissions Gap Report*. The analysis also assumes that emissions from all countries will increase or decrease at an annual rate consistent with their NDCs from now to 2030. An exception is the US. Its NDC terminates in 2025 but it is unlikely to meet targets. Nevertheless, our analysis assumes that the US will honour its NDC and its emissions will continue to decline at the same rate after 2025.

WHAT IS LEFT FOR THE
REST OF THE WORLD?

Thus, inequity is likely to persist in the future, albeit with a new big boy (China) joining the high table as its leader. China, the EU and the US, along with Japan and Russia,with 33 per cent of world's population, will consume nearly half of the future emissions pie.

Poor countries will not be able to satisfy the hunger of development needs with a just share as the world's biggest polluters continue to feast on a gluttonous amount of the future carbon pie.

Equality among unequals



Future emissions

Source: CSE analysis based on UNEP, Emissions Gap Report 2019

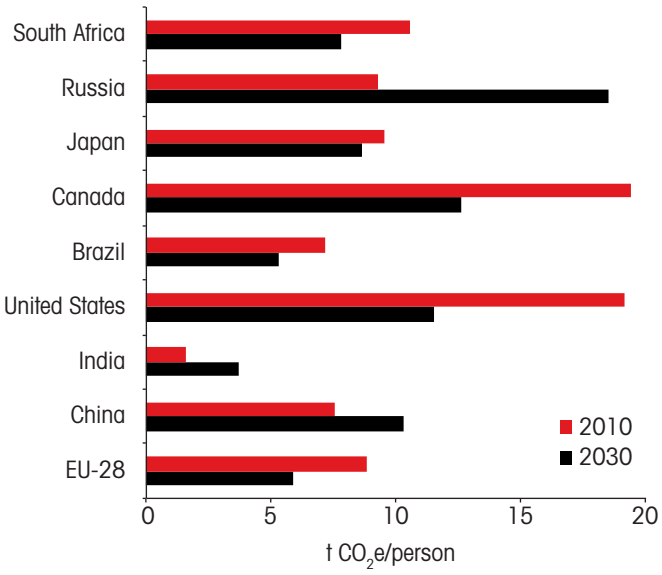
THE SAME OLD WORLD
2030

An examination of the projected GHG emissions in 2030 is sobering. Injustice and imbalance is likely to persist. Russia, whose climate targets have been put in the worst possible 'Critically Insufficient' category by Climate Action Tracker, emerges as the top per capita polluter among large countries, with the figure on track to double between 2010 and 2030 to reach 18.5 tCO_2e, even if it meets its NDC.

The US might be able to reduce its per capita emissions to 11.5 tCO_2e by 2030, but it will depend critically on whether the country meets its commitments under the Paris Agreement, from which it has withdrawn.

China's per capita emissions are slated to rise to 10.3 tCO_2e. India's will only climb to 3.7 tCO_2e, and will remain far lower than other developing economies such as Brazil and South Africa.

Per capita GHG emissions by country, 2010 and 2030



Source: UNEP, Emissions Gap Report 2019