

IPCC CO2 emission budget to limit global warming to 2°C and 1.5°C (since 1850-1900) ¹

Carbon Budget	~2°C limit	~1.5°C limit
GtCO ₂ on 1.1.2018 ¹	1,070	320
GtCO ₂ on 1.1.2019 ²	1,028	278
GtCO ₂ fossil fuels & industry on 1.1.2019 ³	905	245
Tonnes CO ₂ per capita 1.1.2019 ⁴	117	32

National Emissions	Sweden	Tanzania
Tonnes CO ₂ per capita per year consumption emissions ⁵	7.4	0.4
2°C: CO ₂ reduction in % per year now (1.7.2020)	-6%	+2%
1.5°C: CO ₂ reduction in % per year now (1.7.2020)	-25%	-1%

¹ Intergovernmental Panel on Climate Change 2018, Special Report Global Warming 1.5°C, table 2.2. The assessed remaining carbon budget, accounting for “Earth system feedbacks”- permafrost thawing or methane released by wetlands -, percentiles of TCRE: 67th;

² Deduct 2018 CO₂ emissions: 42.1 GtCO₂ (Friedlingstein P. et al, Global Carbon Project (GCP), Global carbon budget 2019 (version 1.0));

³ Allocate 88 % of the budget to fossil fuels & industry emission (landuse change emissions are about 12 %) (Friedlingstein P. et al, GCP, Global carbon budget 2019 (version 1.0));

⁴ 2019 human population of 7.7 billion, Sweden: 10.0 million, Tanzania 58.0 million (United Nations World Population Prospects 2019 revision);

⁵ Consumption emissions per capita (Updated from Peters et al, GCP National Carbon Emissions Global 2019 (version 1.0)).

The Intergovernmental Panel on Climate Change concluded that to limit global warming to the internationally agreed objective of 2°C or 1.5°C, CO₂ emissions must be limited to 1,070 or 320 GtCO₂ from 1 January 2018 onwards; this is the carbon budget for a 66% chance, accounting for “earth feedback systems” (100 GtCO₂ until 2100), assuming rapid reduction of other greenhouse gases and with no “negative emissions” and no “overshoot”. ¹

42 GtCO₂ were emitted in 2018 ², thus 1,028 or 278 GtCO₂ remained by 1 Jan 2019. Land-use emissions are about 12% of total CO₂ emissions and therefore 88% of the budget is allocated to fossil fuels and industry, 905 or 245 GtCO₂. Equally divided among humanity (international equity), the per capita limit is 117 tonnes CO₂ for 2°C, 32 tonnes CO₂ for 1.5°C.

With no global government, emissions are allocated to nations, the law-making units. To take a national example, the current per capita consumption emissions of Sweden - an Ultra High Developed nation - are 7.4 tonnes CO₂ per year (decreasing 0.4% per year on a 25 year trend, last year increasing 1.1%). With 10 million people ⁴ Sweden’s “national budget” on 1.1.2019 was 1.2 or 0.3 GtCO₂; not exceeding it as of 1.7.2020 requires reducing emissions 6% or 25% per year starting now (intergenerational equity) increasing with inaction.

In comparison, Low Developed Tanzania, with very low per capita emissions of 0.4 tonnes CO₂ must reduce emissions 1% for 1.5°C but can increase emissions 2% for 2°C and not exceed its limit.

If countries have not yet reached zero emissions by 2100, their remaining limit (budget) is at least 20 years of 2100 emissions.