

more different framework data and corresponding results at: <http://results-esp.msave-the-climate.info>

| framework data (input values here: yellow fields) | | | determination |
|--|-----------------|-----|------------------|
| | Gt | | |
| global CO2 budget 2018 - 2100 | 680 | | global budget |
| land-use change (LUC) emissions 2018 - 2100 | 0 | | |
| international shipping and aviation (ISA) emissions 2018 - 2100 | 3% | -20 | |
| global CO2 emissions 2018 - 2019 without LUC and ISA | | -73 | |
| global CO2 budget 2020 - 2100 to distribute here | | 587 | |
| weighting population key in the weighted key | 0% | | national budget |
| scenario type used for the reference values | RM-3-lin | | reference values |
| minimum annual emissions as a percentage of the country's current emissions | 0% | | |

Calculation **global budget** to distribute here:
 LUC and ISA emissions are not considered here. LUC and ISA budgets are therefore offset against the global budget. The emissions for countries used and the country budgets determined here also do not include LUC and ISA emissions.
 A value of **zero** for LUC means that by 2100, in total, net positive LUC emissions are offset by net negative LUC emissions.

| reference values for the countries with the highest emissions | | | | | emissions 2019 in Gt | per capita 2019 in t | share in global emissions 2019 | accu- mulated share | temporary overshoot in Gt | reduction rate used 2020 |
|---|------|------|------|------|----------------------|----------------------|--------------------------------|---------------------|---------------------------|--------------------------|
| target year: | 2030 | | 2050 | | | | | | | |
| reference year: | 1990 | 2010 | 1990 | 2010 | | | | | | |
| China | 223% | -15% | -58% | -89% | 11.5 | 8 | 31% | 31% | 0 | -1.5% |
| United States | -32% | -38% | -91% | -92% | 5.1 | 16 | 14% | 45% | 0 | -1.5% |
| EU27 | -48% | -42% | -93% | -93% | 2.9 | 7 | 8% | 53% | 0 | -1.5% |
| India | 192% | -1% | -62% | -87% | 2.6 | 2 | 7% | 61% | 0 | -1.5% |
| Russia | -50% | -30% | -93% | -91% | 1.8 | 12 | 5% | 65% | 0 | -1.5% |
| Japan | -32% | -35% | -91% | -92% | 1.2 | 9 | 3% | 69% | 0 | -1.5% |

| largest national budgets 2020 - 2100 | national budget | weighted key | emissions 2019 | scope years |
|--------------------------------------|-----------------|--------------|----------------|-------------|
| | Gt | | Gt | |
| China | 184.6 | 31.5% | 11.5 | 16.0 |
| United States | 81.7 | 13.9% | 5.1 | 16.0 |
| EU28 | 52.9 | 9.0% | 3.3 | 16.0 |
| EU27 | 47.0 | 8.0% | 2.9 | 16.0 |
| India | 41.6 | 7.1% | 2.6 | 16.0 |
| Russia | 28.7 | 4.9% | 1.8 | 16.0 |
| Japan | 18.5 | 3.1% | 1.2 | 16.0 |
| Germany | 11.2 | 1.9% | 0.7 | 16.0 |
| Iran | 11.2 | 1.9% | 0.7 | 16.0 |
| South Korea | 10.4 | 1.8% | 0.7 | 16.0 |
| Indonesia | 10.0 | 1.7% | 0.6 | 16.0 |
| Saudi Arabia | 9.8 | 1.7% | 0.6 | 16.0 |
| Canada | 9.4 | 1.6% | 0.6 | 16.0 |
| South Africa | 7.9 | 1.3% | 0.5 | 16.0 |
| Mexico | 7.8 | 1.3% | 0.5 | 16.0 |
| Brazil | 7.7 | 1.3% | 0.5 | 16.0 |
| Australia | 6.9 | 1.2% | 0.4 | 16.0 |
| Turkey | 6.7 | 1.1% | 0.4 | 16.0 |
| United Kingdom | 5.8 | 1.0% | 0.4 | 16.0 |
| Italy, San Marino and the Holy See | 5.3 | 0.9% | 0.3 | 16.0 |
| Poland | 5.1 | 0.9% | 0.3 | 16.0 |
| France and Monaco | 5.0 | 0.9% | 0.3 | 16.0 |
| Vietnam | 4.9 | 0.8% | 0.3 | 16.0 |
| Kazakhstan | 4.4 | 0.8% | 0.3 | 16.0 |
| Taiwan | 4.4 | 0.8% | 0.3 | 16.0 |
| Thailand | 4.4 | 0.8% | 0.3 | 16.0 |
| Spain and Andorra | 4.1 | 0.7% | 0.3 | 16.0 |
| Egypt | 4.1 | 0.7% | 0.3 | 16.0 |
| Malaysia | 4.0 | 0.7% | 0.2 | 16.0 |
| Pakistan | 3.6 | 0.6% | 0.2 | 16.0 |
| United Arab Emirates | 3.6 | 0.6% | 0.2 | 16.0 |
| Argentina | 3.2 | 0.5% | 0.2 | 16.0 |
| Iraq | 3.2 | 0.5% | 0.2 | 16.0 |
| Ukraine | 3.1 | 0.5% | 0.2 | 16.0 |
| Algeria | 2.9 | 0.5% | 0.2 | 16.0 |
| Netherlands | 2.5 | 0.4% | 0.2 | 16.0 |
| Philippines | 2.4 | 0.4% | 0.2 | 16.0 |
| Bangladesh | 1.8 | 0.3% | 0.1 | 16.0 |
| Venezuela | 1.8 | 0.3% | 0.1 | 16.0 |
| Qatar | 1.7 | 0.3% | 0.1 | 16.0 |
| Czechia | 1.7 | 0.3% | 0.1 | 16.0 |
| Belgium | 1.7 | 0.3% | 0.1 | 16.0 |
| Nigeria | 1.6 | 0.3% | 0.1 | 16.0 |
| Kuwait | 1.6 | 0.3% | 0.1 | 16.0 |
| sum without EU | 542 | | 34 | |
| sum across all countries | 587 | | 37 | 16.0 |

Basic idea behind the ESPM

The ESPM consists of two steps:

- (1) **National budgets:** A predefined global CO2 budget is distributed to countries. The ESPM tool offers the use of a **weighted distribution key** that includes the 'population' and the 'emissions' in a base year (here: 2019).
- (2) **National paths:** The ESPM tool offers the Regensburg Model Scenario Types to derive plausible national paths that adhere to a national budget.

Important parameters

The **weighting of the population distribution key** is an important parameter when determining **national budgets**.

An important parameter for determining the **national paths** is the potential for **net negative emissions** that is assumed. If net negative emissions are taken into account (percentage for the minimum value of emissions is negative), the budget is temporarily exceeded (overshoot). Please note: The actual potential of negative emissions is very uncertain. In addition, a resulting **overshoot** can be problematic with regard to the **tipping points** in the climate system. Negative emissions are only taken into account in this tool from the non-LUC sector, as a separate budget is set for LUC emissions (see above).

Basic idea behind the Regensburg Model Scenario Types RM 1 - 6

With the help of the RM Scenario Types, emission paths can be determined that meet a given budget. The scenario types differ in the **assumption** about the **property of the annual reductions**.

Brief description of the RM Scenario Types:

https://www.klima-rettet.info/Downloads/RM-Scenario-Types_short.pdf