

Calculation of Paris Compatible Emission Paths with the ESPM

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Important framework data for deriving Paris compatible NDCs must ultimately be decided politically.

The following agenda is therefore proposed:

- ▶ Concretization of framework data such as the **global CO₂ budget** up to 2100 and the role of net negative emissions based on current scientific knowledge.
- ▶ Establishment of a **national CO₂ budget** that does justice to a fair and economically sensible distribution of a global CO₂ budget.
- ▶ Regarding reduction targets: orientation on compliance with the national CO₂ budget and a **meaningful course** of the **annual reduction rates**.
- ▶ **Regular adjustment** of framework data and reduction targets based on scientific knowledge and new developments.

The **Extended Smooth Pathway Model (ESPM)** (cf. Wiegand, Sargl, Doerenbruch, Wittmann, & Wolfsteiner, 2021) provides a framework for operationalizing this political agenda. The ESPM consists of two steps:

- (1) Determination of a national budget
- (2) Deriving national emission paths that comply with the national budget

The ESPM [web application](#) for the EU offers a weighting model for setting a national CO₂ budget. In the [Excel tools](#), with which Paris compatible emission paths can be calculated for all countries in the world, a budget determined in another way can also be used. See also our [universal web app](#).

The Regensburg Model Scenario Types RM 1 - 6 (cf. Wolfsteiner & Wittmann, 2021) for deriving emission paths cover the range of plausible possibilities well. These scenario types are plausible in the sense that the courses of the annual reduction rates do not show any arbitrary changes in direction.¹

Which type of scenario makes sense must be judged from an overall climate policy perspective. The following questions can play a role:

- (1) Do initially low reduction rates imply an unacceptable burden for the future, since these later require extremely high reduction rates?
- (2) Or do high later reduction rates even make sense because they give you a longer lead time for the necessary investments? However, this requires a very credible climate policy.
- (3) Do rapidly increasing reduction rates lead to a more credible climate policy right from the start, which creates planning security for public and private investments in a fossil-free future?

References

- Wiegand, D., Sargl, M., Doerenbruch, K., Wittmann, G., & Wolfsteiner, A. (2021, 2). Berechnung Paris-kompatibler Emissionspfade mit dem ESP-Modell am Beispiel der EU. *Wirtschaftsdienst*, pp. 127 - 133. Retrieved from <https://zenodo.org/record/4541613>
- Wolfsteiner, A., & Wittmann, G. (2021). Mathematical Description of the Regensburg Model Scenario Types RM 1 – 6. *Zenodo*. Retrieved from <https://doi.org/10.5281/zenodo.4540475>

¹ Mathematically speaking: they have a monotonous trajectory.