

Reducing ETH Zurich’s flight emissions: Definitions

- **Unit:**

- ETH Zurich emissions are measured in tons of CO₂ equivalents (t CO₂ eq).
- Reason:
 - CO₂ eq gives a more complete picture of emissions than just CO₂.
 - The ETH Zurich Business Travel Report has measured greenhouse gas emissions from business trips in CO₂ eq for the last 11 years.
 - The survey of student flights for 2006 and 2015 as part of the pilot project also measured emissions in CO₂ eq.

- **Reference:**

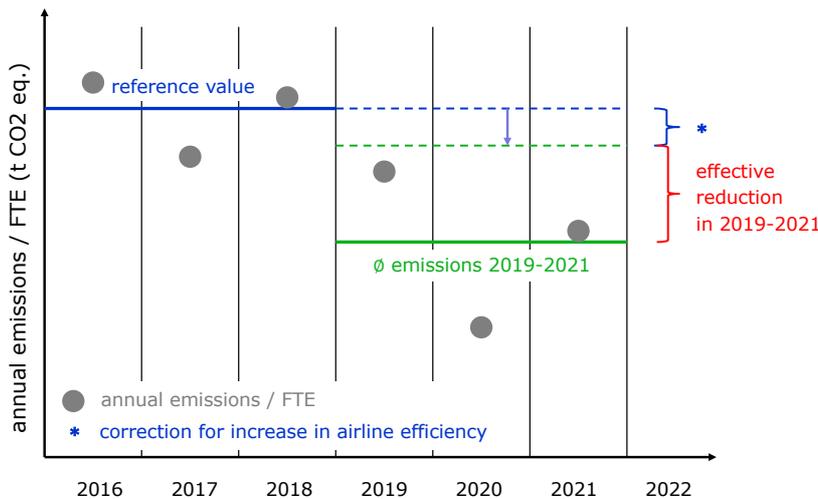
- For ETH staff, guests and students: Average CO₂ eq from 2016-2018 per FTE (CO₂ eq/FTE).
- The reduction targets for ETH should be seen as additional to the reductions made by the aviation industry. Accordingly, the annual efficiency increase of airlines used by ETH members in the reference period is determined, and the individual reductions are expressed in relation to the increase in efficiency that would have occurred without a change in behaviour.
- Reason:
 - Although ultimately the total of greenhouse gas emissions is climate-relevant, the reference value is per FTE. The target value thus reflects the individual’s personal decision to fly.
 - Increase in airline efficiency: In the last 15 years, 1-2% fuel per passenger kilometre has been saved per year through efficiency measures (IATA/ICCT 2018¹). It is assumed that this trend will continue over the next few years, which will result in a reduction of around 10% between 2018 and 2025. If this increase in airline efficiency were not taken into account in the monitoring, departments with relatively low reduction targets could fly more than during the reference period 2016-2018 and still achieve their reduction target.

- **Reduction target**

- Reduction (by X%) of emissions, averaged over the years 2022-2024, compared to the reference period 2016-2018, corrected by the increase in the efficiency of airlines used for ETH flights in the reference period.
- Mid-term evaluation after 3 years (beginning 2022): at least 1/3 of the reduction target of X% is to be achieved, averaged over the years 2019-2021.
- In addition to reduction (e.g. through fewer flights, choice of more efficient airlines, fewer stopovers), flight emissions can be compensated; however, compensation does not count as reduction.
- Calculation: For the period 2022-2024, for example, the reduction corrected with the airlines’ efficiency increase is calculated as

$$X_{2022-2024} = 1 - [(E_{2022} + E_{2023} + E_{2024}) / (3 * E_{ref}) * (1 + R_{airlines})]$$
 where E_N are the emissions of a unit in year N, E_{ref} is the reference value of the emissions of the same unit, and R_{airlines} is the average increase in airline efficiency in the three years compared to the reference period (in %). This formula can be used in the same way to calculate the reduction for 2019-2021.

¹ <https://www.theicct.org/publications/transatlantic-airline-fuel-efficiency-ranking-2017>



The figure illustrates the calculation of the reference value of the departments for the years 2016-2018, as well as the calculation of the effective reduction (taking into account the increase in airline efficiency) for 2019-2022. The effective reduction is shown in t CO₂ eq.; the effective reduction in % can be calculated by dividing it by the reference value.

- **Time frame:**
 - Development of targets, measures and monitoring system 2017-2018
 - Implementation and monitoring 2019-2024
 - Evaluation after 3 and 6 years
- **System boundary: air travel by**
 - ETH Zurich staff
 - Guests
 - Students as part of their curriculum (ECTS points)
 - Later, the CO₂ eq of ETH Zurich events (conferences, summer schools etc.) may also be recorded.
- **Monitoring:**
 - The required flight information is recorded in the ETH finance system.
 - Once a month, the current level of emissions is calculated for each unit on the basis of the consolidated data in the finance system.
- **Reporting:**
 - Each unit receives a monthly report on the current level of emissions compared to the total emissions of the department.
 - Once a year, a report will be issued on ETH Zurich's flight emissions, including flight distance (passenger kilometres) and emissions (in t CO₂ eq), total and per FTE, with and without increased airline efficiency. The report will cover all flights in the previous calendar year, corresponding to the system boundary.