



Detailed system limits and calculation methods for the increase in energy efficiency of the actors of Exemplary Energy and Climate

Fundamental points

System limits

The system limits should, in principle, include the sub-organizations that are consolidated in the enterprise's own environmental reporting system. Rented buildings should, as a rule, be included, because a large proportion of energy consumption can be influenced. Leased-out buildings are, as a rule, not included as it is difficult to exert any influence over them.

Unless otherwise stated, the same system limits were used for the energy consumption data and the calculation of the increase in energy efficiency.

Calculation methodology for increase in energy efficiency

The increase in energy efficiency is calculated according to the formulae below. The increases in efficiency are calculated in final energy; at SBB an additional increase in efficiency 2 is calculated in primary energy.

1. Swiss Post

System limits

The organizational system limit comprises all Group, management and service divisions of Swiss Post and all fully-consolidated subsidiaries with a head office in Switzerland.

The operational system limit comprises all the processes needed to provide Swiss Post's services. Account is also taken in particular of processes that were performed by Swiss Post subcontractors (for example, PostBus contractors and third-party drivers).

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = Gew_{B1,13} * \left(\frac{I_{B1,13}}{EV_{B1,13}} / \frac{I_{B1,06}}{EV_{B1,06}} - 1 \right) + Gew_{B2,13} * \left(\frac{I_{B2,13}}{EV_{B2,13}} / \frac{I_{B2,06}}{EV_{B2,06}} - 1 \right) + etc.$$

where $Gew_{B1,13} = EV_{B1,13} / EV_{Total,13}$, etc.

EV: energy consumption

I: reference variable

Gew: weighting factor

B: corporate divisions

Swiss Post uses the following corporate divisions and reference variables:

- PostMail: number of consignments
- Post Logistics: number of consignments
- Post offices and sales: number of customer transactions
- PostFinance: number of transactions
- PostBus Switzerland: passenger kilometers
- Post Real Estate: energy reference surface areas
- Others (management and service divisions): full-time equivalents

2. ETH Domain

System limits

ETH Zürich: ETH Zürich has 2 main locations: ETH Center and ETH Hönggerberg. There are two other smaller locations in the canton of Zurich: Schwerzenbach and Lindau-Eschikon. The LCA data center is operated in Lugano (formerly in Manno). The ETH runs the Chamau and Frübüel research station in Zug. In Basel, ETH has rented premises for the D-BSSE department (Biosystems Science and Engineering). Small pieces of real estate in Zurich are not included. Leased real estate is not included in the energy assessment (with exceptions). ETH Zurich supplies various private and cantonal buildings in the center with heat. This district heating has been deducted in the ETH energy assessment.

EPFL: All the academic buildings, including the buildings not operated by EPFL, such as, for example, those let to EPFL. The data concerning the institute in Neuchâtel are also included.

PSI: The entire site in Villigen/Würenlingen, not counting rented premises.

WSL: All WSL sites that will receive energy bills, i.e. not counting locations with all-inclusive rents. Specifically, the locations indicated comprise Birmensdorf, Davos, Bellinzona, Alpthal, but not Lausanne (to EPFL).

EMPA: Entire St. Gallen site. Empa Dübendorf site not counting Eawag buildings or the rented guest houses. Not counting rented premises in Thun.

EAWAG: Sites in Kastanienbaum and the buildings on the Empa site in Dübendorf. The Empa/Eawag guest houses are not included.

General: the ETH Domain is characterized by the energy consumption of large-scale research facilities, whose requirements were included everywhere. The buildings not included have only a small energy consumption, which concerns approx. 1-2% of the total consumption of the ETH Domain. Conversely, many facilities are also available to outside researchers, without their energy consumption being “deducted”.

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = Gew_{B1,13} * \left(\frac{I_{B1,13}}{EV_{B1,13}} / \frac{I_{B1,06}}{EV_{B1,06}} - 1 \right) + Gew_{B2,13} * \left(\frac{I_{B2,13}}{EV_{B2,13}} / \frac{I_{B2,06}}{EV_{B2,06}} - 1 \right) + etc.$$

where $Gew_{B1,13} = EV_{B1,13} / EV_{Total,13}$, etc.

EV: energy consumption

I: reference variable

Gew: weighting factor

B: ETH institutions and sectors

The ETH Domain uses the following ETH institutions/sectors and reference variables to calculate the increase in energy efficiency 1:

- ETHZ, EPFL, WSL, EAWAG: full-time equivalents
- PSI: full-time equivalents, energy reference surface areas, instrument days and patient treatments
- EMPA: full-time equivalents and energy reference surface areas

To calculate the increase in energy efficiency 2, the ETH Domain uses in addition the reference variable ‘computing output’ [Tflop] for the CSCS mainframe computer in Lugano.

3. Genève Aéroport

System limits

The data comprise the energy distributed by Genève Aéroport on the airport platform. Kerosene consumption is excluded, as the airlines buy their kerosene direct from the pipeline operator.

Calculation methodology for energy efficiency coefficient Eff_{16}

$$Eff_{06-16} = Gew_{B1,16} * \left(1 - \frac{EV_{B1,16}}{I_{B1,16}} / \frac{EV_{B1,06}}{I_{B1,06}}\right) + Gew_{B2,16} * \left(1 - \frac{EV_{B2,16}}{I_{B2,16}} / \frac{EV_{B2,06}}{I_{B2,06}}\right)$$

EV: energy consumption

Gew: weighting factor

I: reference variable

B: sectors

Genève Aéroport uses the following sectors and reference variables:

- Buildings: energy reference surface areas
- Services: traffic unit TU (1 TU = 1 passenger = 100 kg air cargo)

4. SBB

System limits

System limits for the energy consumption figures

The organizational system limits correspond to the SBB parent company in Switzerland (Group sector, passenger traffic, cargo traffic, infrastructure, real estate), subsidiaries are not included. Special indications:

- energy consumption rail electric power: consumption on SBB grid and third party grid
- stationary energy consumption fuels: incl. tenants in train stations in investment buildings, excl. rented buildings
- energy consumption 50 Hz power; excl. rented buildings.

System limits for increase in energy efficiency

The increase in efficiency relates to the SBB's passenger and cargo traffic in Switzerland and includes the consumptions of rail electric power and diesel for traction.

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = Gew_{B1,13} * \left(\frac{I_{B1,13}}{EV_{B1,13}} / \frac{I_{B1,06}}{EV_{B1,06}} - 1\right) + Gew_{B2,13} * \left(\frac{I_{B2,13}}{EV_{B2,13}} / \frac{I_{B2,06}}{EV_{B2,06}} - 1\right)$$

wobei $Gew_{B1,13} = EV_{B1,13}/EV_{Total,13}$, $Gew_{B2,13} = EV_{B2,13}/EV_{Total,13}$

EV: energy consumption

I: reference variable

Gew: weighting factor

B: corporate divisions

SBB uses the following corporate divisions and reference variables:

- passenger long-distance traffic: passenger kilometers
- passenger regional traffic: passenger kilometers
- cargo traffic: net ton kilometers.

At SBB, the increase in energy efficiency 1 is calculated in final energy, the increase in energy efficiency 2 in primary energy.

5. Services Industriels de Genève SIG

System limits

At SIG, the system limits for final energy consumption and calculating energy efficiency include all energy consumed in its own facilities, such as for example in the office buildings, the waste water treatment plant, for drinking water purification or in the waste incineration plant. The system limits do not include the energy supplied to SIG customers or the losses that occur in the electricity grids and district heating networks operated by SIG.

Calculation methodology for the energy efficiency indicator Ef

$$Eff_{06-17} = Gew_{B1,17} * \left(1 - \frac{EV_{B1,17}}{I_{B1,17}} / \frac{EV_{B1,06}}{I_{B1,06}}\right) + Gew_{B2,17} * \left(1 - \frac{EV_{B2,17}}{I_{B2,17}} / \frac{EV_{B2,06}}{I_{B2,06}}\right) + etc.$$

EV: energy consumption

Gew: weighting factor

I: reference variable

B: sectors

SIG uses the following corporate divisions and reference variables:

- buildings: energy reference surface area
- mobility: full-time equivalents
- drinking water: cu. metres of drinking water supplied to customers
- waste water: cu. metres of waste water treated
- waste: t of waste burnt

6. Skyguide

System limits

Geneva air traffic control center, ANZ Wangen bei Dübendorf air traffic control center (not counting the premises leased to DDPS Armasuisse Real Estate), Geneva and Zurich control towers, Dôle and Lägern radar stations, control tower of the Bern regional airport with the air traffic control building.

The locations in the regional airports, with the exception of Bern airport and the remaining outside duty stations, are not covered; they account for only a small part of Skyguide's total power consumption.

The reduction in kerosene consumption, noise and pollutant emissions that Skyguide attains with punctual flights, more efficient routings and direct approach paths is reflected in airlines' and airport operators' data and is not included in the energy consumption data. It is mentioned in the report under "Specific measures".

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = Gew_{B1,13} * \left(\frac{I_{B1,13}}{EV_{B1,13}} / \frac{I_{B1,06}}{EV_{B1,06}} - 1\right) + Gew_{B2,13} * \left(\frac{I_{B2,13}}{EV_{B2,13}} / \frac{I_{B2,06}}{EV_{B2,06}} - 1\right) + etc.$$

where $Gew_{B1,13} \sim EV_{B1,13} / EV_{Total,13}$

EV: energy consumption

I: reference variable
 Gew: weighting factor
 B: sectors

Skyguide uses the following sectors and reference variables:

- buildings: energy reference surface areas
- IFR air traffic control: number of IFR flights (instrument flight rules)
- mobility: full-time equivalents

7. Suva

System limits

The system limits for calculating energy efficiency include the final energy consumption of the Suva head office and the two Suva rehabilitation clinics. Reported final energy consumption also includes the fuel consumption of Suva's own vehicles and the operating electricity consumption of the 18 Suva agencies (but not the fuel consumption of the 18 agencies). The Suva real estate in the investment portfolio is always outside of the system limits.

Calculation methodology for the energy efficiency indicator Eff

$$Eff_{06-18} = Gew_{B1,18} * (1 - \frac{EV_{B1,18}}{I_{B1,18}} / \frac{EV_{B1,06}}{I_{B1,06}}) + Gew_{B2,13} * (1 - \frac{EV_{B2,18}}{I_{B2,18}} / \frac{EV_{B2,06}}{I_{B2,06}})$$

EV: energy consumption
 Gew: weighting factor
 I: reference variable
 B: sectors
 Suva uses the following sectors and reference variables:

- head office (B1): number of employees
- clinics (B2): number of care days

8. Swisscom

System limits

The system limits correspond to Swisscom AG in Switzerland: The system limits are described in the Swisscom annual report and in the climate report (CO2 report according to ISO 14064).

Electric power: network, data centers and office operations. The networks are the basic network, the access network (mobile and land lines) and the radio and TV network (broadcast). The network operation takes into account the operation up to the house connection.

fuel (heating): operation of buildings

fuel (transport): operation of the automobile and utility-vehicle fleet.

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = \frac{GEV_{13} + \sum \Delta EffM_{06-13}}{GEV_{13}}$$

GEV: weighted total energy consumption
 ΔEffM: efficiency gains of efficiency measures according to the EnaW monitoring system

The definition of the energy efficiency key figure is given in the annex to the directive on obligations and

target agreements of the FOE.

9. DDPS

System limits

System limits for the energy consumption figures

The data comprise the DDPS's administration and troop service, but exclude foreign interventions. The data cover energy consumptions for both real estate and vehicles and aircraft.

System limits for increase in energy efficiency

The energy consumption of aircraft is not included to calculate the increase in energy efficiency; otherwise the system limits correspond to those of the energy consumption figures.

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = 1 - \frac{EV_{13}}{FTE_{13}} / \frac{EV_{06}}{FTE_{06}}$$

EV: energy consumption

FTE: full-time equivalents (jobs at DDPS and militia service days)

10. Federal Administration FBL

System limits

The data for 2013 comprise the 51 RUMBA units and 207 buildings (property and rental buildings). These buildings comprise 865,625 sq. meters of leasable surface areas. This corresponds to 76% of the building stock covered by FBL in ESTAT.

The most important buildings not included are: in the case of the Federal Customs Administration and the Federal Department of Foreign Affairs, only the central offices in Bern are included. The many small facilities of the Swiss Customs are not covered; nor are the foreign locations of the Federal Department of Foreign Affairs. At the DDPS, only the Federal Office of Sport (FOSPO) is included in the scope. Outside of the Federal Administration, the parliamentary services, the Federal Prosecutor's office and the Federal Supreme Court in Lucerne are included.

The FTEs included account for about 66% of the FTEs in the Federal Administration (not counting the remainder of the DDPS and other excluded sectors).

Calculation methodology for increase in energy efficiency Eff

$$Eff_{06-13} = \frac{FTE_{13}}{EV_{13}} / \frac{FTE_{06}}{EV_{06}} - 1$$

EV: energy consumption

FTE: full-time equivalents