



Calculation methods of the organization-specific energy-efficiency key figures

Most of the actors of the initiative already have their own environmental reporting system, which in some cases is also embedded in national or international standards. Therefore the Coordination Group of Exemplary Energy and Climate has decided to let the actors freely choose their calculation methodology for the energy-efficiency key figure, so as to allow them to harmonize it with their own environmental reporting, if they so wish. But in some cases a stronger international orientation is also desired than there may be in an actor's own environmental reporting, and thus a different methodology. The Federal Council's message of September 4, 2013 on the Energy Strategy 2050 specifies only that energy efficiency should be measured in relation to a reference variable such as full-time equivalent FTE, number of passenger kilometers travelled, etc., depending on the sector.

In principle, the actors employ three different calculation methods.

1. **Calculation methodology efficiency = reference variable / energy** **= How much benefit results per unit of energy?**

This definition corresponds to international agreements in the climate and energy sector, such as for example the GHG Protocol (Greenhouse Gas Protocol). It is a definition shaped by the U.S. way of thinking: 'How much benefit do I obtain per unit of input? How can I increase my benefit with an unchanged input?'

Here is a practical example from the mobility sector: the fuel consumption of vehicles is usually indicated in kilometers/liter; according to this definition, a gain in efficiency is obtained if a vehicle travels further on one liter.

The calculation of the increase in energy efficiency between 2006 and 2013 in % is done as follows:

$$\text{Increase in energy efficiency}_{2006-2013} = \left(\frac{\frac{\text{reference variable}_{2013}}{\text{energy consumption}_{2013}}}{\frac{\text{reference variable}_{2006}}{\text{energy consumption}_{2006}}} - 1 \right) \times 100$$

According to this calculation methodology, the increase in energy efficiency can be greater than 100%.

This calculation methodology was adopted by the following actors:

- Swiss Post
- ETH Domain
- Swiss Federal Railways SBB
- Skyguide
- Civil Federal Administration

2. **Calculation methodology Efficiency = Energy / reference variable
= How much energy is required per base unit / benefit?**

This definition derives more from a European way of thinking: 'How much energy is required per base unit? How much energy do I need to attain a defined benefit?' It is also used, for example, to calculate the energy-efficiency classes for appliances.

Here is a practical example from the mobility sector: the fuel consumption of vehicles is usually indicated in liters/100 km; according to this definition, a gain in efficiency is obtained if a vehicle consumes less per 100 km.

$$\text{Increase in energy efficiency}_{2006-2013} = \left(1 - \frac{\frac{\text{energy consumption}_{2013}}{\text{reference variable}_{2013}}}{\frac{\text{energy consumption}_{2006}}{\text{reference variable}_{2006}}} \right) \times 100$$

According to this calculation methodology, the increase in energy efficiency can be up to a maximum of 100%.

This calculation methodology was adopted by the following actors:

- Genève Aéroport
- Services Industriels de Genève
- Suva
- DDPS

3. **Calculation methodology used by the Energieagentur der Wirtschaft (EnAW) = a bottom-up calculation based on efficiency gains from energy-efficiency measures implemented**

Actors which take part in the EnAW and thus have a comprehensive knowledge of the energy savings of individual efficiency measures can also adopt a bottom-up approach to calculate the energy-efficiency key figure. The advantage of a bottom-up calculation is that an attained increase in efficiency can actually be attributed to the efficiency measures taken.

$$\text{EES}_{2013} = \left(\frac{\text{Total energy consumption}_{2013} + \sum \text{efficiency gains from measures}_{2006-2013}}{\text{Total energy consumption}_{2013}} \right) \times 100$$

EES = increase in energy efficiency

According to this method, energy efficiency is the weighted energy saving in relation to the weighted total energy consumption. The definition of total energy consumption is given in the annex to the directive.

According to this calculation methodology, the increase in energy efficiency is greater than 100% (base year = 100%). The difference in the key figure between the base year and the target year corresponds to the increase in energy efficiency.

This calculation methodology was adopted by the following actor:

- Swisscom