

A forward looking Primary Energy Factor for a greener European Future

What is the Primary Energy Factor and why does it exist?

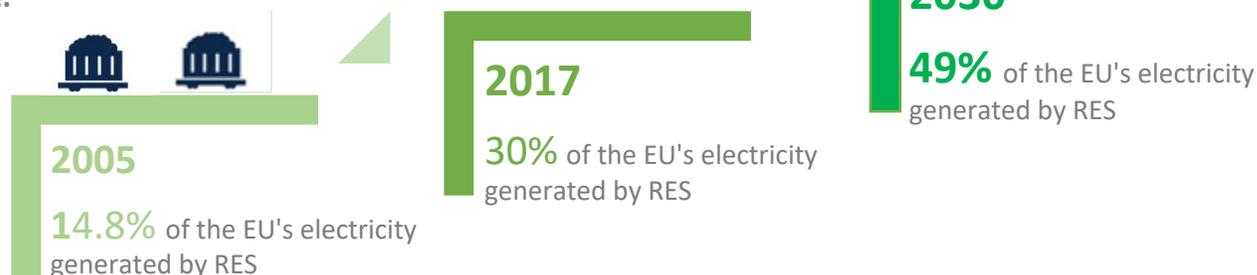
- The Primary Energy Factor (PEF) connects primary and final energy. It indicates how much primary energy is used to generate a unit of electricity or a unit of useable thermal energy.
- It allows for comparison between the primary energy consumption of products with the same functionality (e.g. heating) using different energy carriers (particularly electricity vs. fossil fuels).
- Electricity is a final energy carrier, produced from different primary energy sources like fossil fuels (gas, coal), nuclear and renewables (hydro, wind, solar).
- Currently a PEF of 2.5 is used as a “conversion factor” to express electricity consumption/savings in primary energy consumption/savings, regardless of the type of energy source used to produce it (also when the electricity comes from renewables).



The current conversion factor implies that 1 unit of electricity requires an input of 2.5 units of primary energy. This assumes all power generation in the EU to have a 40% efficiency ($100 / 2.5 = 40$) – even non-dispatchable renewables from which energy is harnessed without the combustion of fuel. A PEF of 2.5 is too high and does not reflect the reality of power generation.

The need to update the PEF to 2.0

- The Commission has decided to review the PEF value and methodology in the Energy Efficiency Directive to better reflect the EU energy mix, in particular today's share of renewable energy in electricity generation and its strong increase in the near future.



The current PEF for electricity is acting as a barrier for the decarbonisation of the heating sector. By 2030 the EU RES share in power generation is projected to be at least 49%. A value of 2.0, to be set for 2020 (when the EED will be implemented) is appropriate and justified by the [Fraunhofer Institute et. al.'s scientific methodology](#), prepared for the European Commission. The accelerated greening of the electricity mix justifies a frequent review of the value based on the aforementioned methodology, in order to reflect changes in reality.

What is the *impact of the Primary Energy Factor?*

EED: How EU Member States calculate the energy they save

The Energy Efficiency target has been expressed in both primary energy and final energy. When Member States choose to express their savings in primary energy, the PEF is applied to convert final energy savings into primary energy. Savings in electricity are multiplied by the current PEF factor of 2.5.



A high PEF incentivises electricity savings over direct fossil savings to meet EU's energy targets, which is counterintuitive for decarbonising heating and gives the impression that savings in electricity are more important than savings in primary energy. It also comes at a time when the electricity system is massively adding renewable generation capacity that poses integration challenges, and where the increased coupling of the electricity and heat sectors could greatly help.

EPBD: How energy efficient the building stock is perceived to be

The EPBD aims at reducing the primary energy demand for buildings. Since technologies applied in the building and improvements in the building envelope lead to savings in final energy, the PEF is applied to convert these savings into primary energy.



*A high PEF value will have an impact on the calculation of the building envelope's energy efficiency. When a PEF of 2.5 is applied to calculate the primary energy demand of a building, it provides a **calculated higher** result, even though the amount of energy the user pays for stays the same. This is less favourable for efficient electric solutions and makes fossil fuels more attractive.*

Ecodesign & Energy Labelling: Impact on the competitiveness of technologies

PEF allows to compare the primary energy consumption of products with the same functionality (e.g. heating) using different energy carriers. The current PEF applied for electricity and the lack of any PEF for fossil energy gives an advantage to fossil technology and thus encourages the use of more fossil fuels, despite the overall intention to incentivise a reduction in fossil fuel use by means of efficient products and systems.



A high PEF puts efficient electric products at a disadvantage when they compete with fossil using products as it impacts the energy label class achieved by those products – the class achieved is expected to directly affect product sales.

In a nutshell, we are calling for:

1

The PEF review should be based on a scientific methodology as proposed by the Fraunhofer Institute study commissioned by the European Commission and should be set at 2.0 in EED recast.

2

To update the PEF wherever it is currently used (EED, EPBD, Ecodesign and Energy Labelling) in order for it to not be a barrier to decarbonisation.

3

In order to reflect the changes in the power mix, the PEF should be reviewed on a regular basis according to the Fraunhofer et.al.'s methodology and flexibility should be granted to Member States.

Who we are

We are a group of companies and associations that are committed to EU's goal of decarbonising the European energy system. We are in this context concerned that the review of the primary energy factor for electricity constitutes a barrier to these objectives. Some of the signatories had also published a **joint statement on PEF** in 2017.

