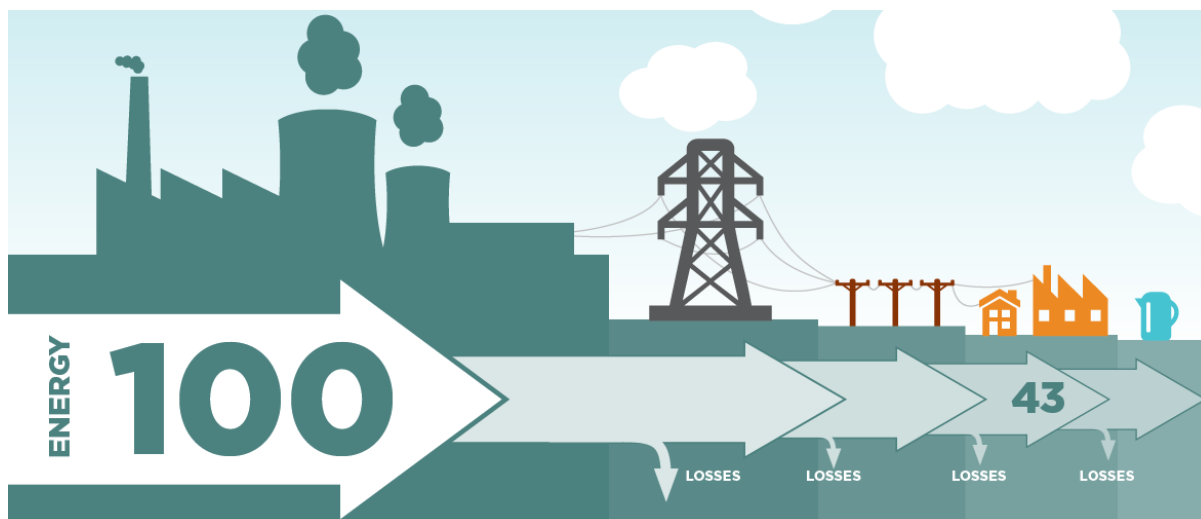


EU Primary Energy Factor for Electricity: key to ensure well-informed choices, achieve real energy savings and reduce consumer energy bills



COGEN EUROPE's key recommendations on EU Primary Energy Factor in the context of the Energy Efficiency Directive Review¹:

- Apply a robust and transparent methodology for the average default EU electricity Primary Energy Factor (PEF) value, reflecting the current efficiency of the electricity mix
- Set an EU-wide average PEF default value of no less than 2.3, based on current data
- Regularly review the PEF value, according to the same methodology
- Provide for a process to further assess and calculate adequate PEF values for more targeted heating and cooling legislation (i.e. EPBD, Energy Labelling and Ecodesign), taking into account seasonal variations in the use of electricity for space heating purposes

Empowering energy consumers and boosting energy efficiency is at the heart of the Clean Energy Package. This can only be achieved if energy consumers and investors can make well-informed choices that bring real energy savings and reduce their energy bills. For this, they need credible information to compare the relative energy efficiency of technologies using different energy sources (e.g. heating with electricity vs. gas vs. solar thermal). This comparison is only possible by using a realistic Primary Energy Factor (PEF) that will provide the right signal to deploy technologies or mix of measures (e.g. insulation plus changing an old boiler) delivering the maximum energy savings at the lowest cost, supporting EU efforts to boost energy efficiency at all levels of the economy, reducing consumer energy bill and bolstering EU competitiveness.

¹ On 30 November 2016 the European Commission published its Clean Energy for all European Package, including a proposal to review the Energy Efficiency Directive (2012/27/EU). The Energy Efficiency Directive review includes a new EU default value for the Primary Energy Factor (PEF) for grid electricity.

What is PEF?

Primary Energy Factors (PEFs) are used for different purposes in energy policy at EU and national levels: as a conversion factor to relate final energy use to primary energy consumption, to define and compare the efficiency of devices using different energy carriers/sources and their potential energy savings, as well as to assess the energy performance of buildings.

The PEF helps compare how much primary energy is needed to produce the energy product (electricity, gas, gasoline or heat) required to satisfy final energy demand. EU legislation currently applies an average electricity PEF of 2.5 when calculating the energy efficiency of nearly all 'electricity using' appliances. This means that for every single unit of electricity used by an appliance, the current PEF value indicates that two and a half times as much primary energy (the fuel used to generate the electricity) has been consumed. In other words, the current PEF assumes that all power generation in the EU is delivered at 40% efficiency (100% divided by 2.5 = 40%). In the context of the Energy Efficiency Directive Member States can use the EU PEF to report achieved primary energy savings.

A low PEF value would undermine the Clean Energy Package objectives

As part of the Energy Efficiency Directive (EED) revision in the Clean Energy Package, the European Commission has proposed to lower the PEF value from 2.5 to 2.0 (EED Annex IV footnote 4), which is equivalent to an increase in the average efficiency of the electricity system from 40% to 50%. This significant change is only partly explained by real improvements in the efficiency of the electricity system. **Re-calculating the PEF using a robust methodology, shows that 2.0 is unreasonably low and does not reflect the current efficiency of the electricity system.**

This is particularly misleading as it makes consumers invest in appliances that appear more efficient (reflected in an improved energy label class) than they are in reality. More concretely, a low PEF value would incentivise the increased use of electric heating, adding more strain on the grids at times of peak demand, while at the same time disincentivising further energy efficiency improvements of the electricity system or the efficient consumption of energy by final users. This **undermines efforts to deliver energy savings, and is against the energy efficiency principle first.** Considering the losses and inefficiencies across the whole electricity system, all energy sources and reflecting when and how heat and electricity is used and produced is therefore key to empower energy consumers. This allows them to make choices that bring real energy savings, boosting energy efficiency and reducing their energy bills, in line with the Clean Energy Package objectives.

A robust and transparent methodology leading to a realistic PEF value

The PEF should be based on a robust and transparent methodology. A detailed analysis by COGEN Europe shows that **a revised PEF of no less than 2.3 should be used to convert final use of electricity into primary energy use as part of EED Annex IV footnote 4.** This figure recognises the improvement of the current, and near future, electricity generation mix, taking into consideration an average efficiency of the energy system at 43%.

A lower PEF value could have negative environmental and economic impacts such as the following:

- **An increasing use of electrical heating appliances** in homes and businesses, leading to an increased (marginal) demand which is nearly always **met by less efficient, more energy intensive and more polluting central electricity generation.**

While an average EU PEF for electricity is appropriate as a conversion factor for energy savings measures deployed across different sectors, when it comes to policy measures addressing buildings, and in particular heating and cooling (covered in the Energy Performance of Buildings Directive, Annex I and in ecodesign/energy labelling), the use of a 'seasonal' PEF must be considered to ensure

a fair comparison between different energy efficiency solutions. This will allow reflecting the seasonal changes in the electricity mix use (e.g. peak electricity demand during particularly cold days, which often coincides with low electricity production from renewables (wind and solar power), where the marginal electricity mix is especially carbon intensive and inefficient).

- **A decrease in demand for cogeneration of heat and electricity**, which can be over 90% efficient and represent an environmentally sensitive and cost effective solution for millions of homes.
- **Greater pressure on the electricity grid infrastructure**, especially in rural areas and in cities which often struggle to have a robust supply of grid based electricity or to increase their supply. Heat demand in homes and businesses is often several times higher than the electricity demand. Meeting the heat demand only with electrical appliances in these locations will put a significant strain on the grids and increase risks of blackouts. The grid reinforcement needed to accommodate for the rapid electrification of heat will be significant and costly. The impact of incentivising electrical heating appliances that increase overall electrical demand should therefore be carefully assessed².
- **Ultimately, all the above-mentioned elements will increase consumers' final energy bill.**

We urge the European Parliament and Council to adopt a robust and transparent methodology for the EU PEF, set the PEF value for the coming period at no less than 2.3, reflecting the real efficiency of the current energy system without understating the environmental impact of electrical heating appliances. This is not an academic exercise, nor is it something that is “too technical”, it is an important aspect of fairly accounting for energy efficiency across the EU economy. A realistic PEF will enable energy consumers to benefit from energy efficiency improvements across all parts of the economy and sectors, from supply to demand.

About COGEN Europe:

COGEN Europe is Europe's umbrella organisation representing the interests of the CHP industry, users of the technology and promoting its benefits in the EU and the wider Europe. The association is backed by the key players in the industry including gas and electricity companies, ESCOs, equipment suppliers, consultancies, national promotion organisations, financial and other service companies. More information on www.cogeneurope.eu

² “Switching 80% of homes [in the UK] to heat pumps would require an additional 105GWs of electricity generation capacity (an increase of 175% above current peak power demand) as well as significant investment to reinforce the power distribution network.” (pp 9) in Howard & Bengherbi, 2016 Too Hot to Handle? How to Decarbonise Domestic Heating?