

Standing Committee Gas Utilisation **Primary Energy Factor: Positioning Note**

Introduction

The Primary Energy Factor (PEF) gives the ratio between the primary energy used for the production/conversion processes of any type of energy and this energy. Gas, oil or coal are primary energy which means that they do not undergo a conversion process. Therefore, the PEF depends only on losses in production, transport and distribution. On the contrary, electricity is a secondary energy; therefore the PEF depends on the energy mix, the conversion efficiencies and losses in transport and distribution.

For an informed choice to be made between energies, it is necessary to be able to compare them. The concept of PEF enables a comparison between these various types of energy to assess the global energy performance of a system. **The choice of an appropriate calculation method and scope of application are crucial.**

Primary Energy Factor (PEF) and Directives

The PEF is a concept which is used for various objectives and with various methods depending on assumptions.

- For the Energy Performance of Buildings Directive (**EPBD**), it is used for the calculation of the energy performance of buildings so as to take into account the various energy carriers. For this purpose, different climate conditions, buildings, energy mix, **policies can be addressed on a national basis**, leading to different values in different countries. Moreover, misunderstandings are increased since some countries do not use a real global performance, but take only the non-renewable part of energy (assuming that renewables are freely and unlimitedly available).
- For the Eco-design Directive (**ED**), since energy-related products shall be able to be marketed throughout Europe, **only a single common European PEF may be acceptable** for a given product: else it would favor the placing on the market in one country rather than in another one, which cannot be allowed.

Scope of application: a global PEF which takes into account all consumptions

For energy efficiency purposes, all kinds of energy sources are to be taken into account: therefore the primary energy factor shall include the non-renewable and the renewable sources.

With a different objective in mind (development of renewables), some favour a PEF based only on the non-renewable sources used in a system. Such a methodology does not reflect the whole system and therefore does not encourage energy savings. For instance, supposing that all electricity is generated from renewable sources, the PEF for non-renewable energy (PEF_{N-REN}) would be 0. With such a factor, the efficiency and the contribution of renewables will be overestimated and other efficiency measures (e.g. insulation, regulation...) will be hindered and penalized.

Despite the large increases in renewables, we will have to face the gap between the volatile supply and the demand without appropriate storage capacities.

Moreover, not all renewable-energy sources are infinite within a given time frame (e.g. hydraulic electricity, stocks of which need to be managed on an annual basis). The fact that an energy source is renewable does not mean that we can afford to consume it inefficiently. This demonstrates the need to integrate this into the energy balance. This overall energy efficient approach is fully compatible with promoting a more important share of renewables (Figure 1).

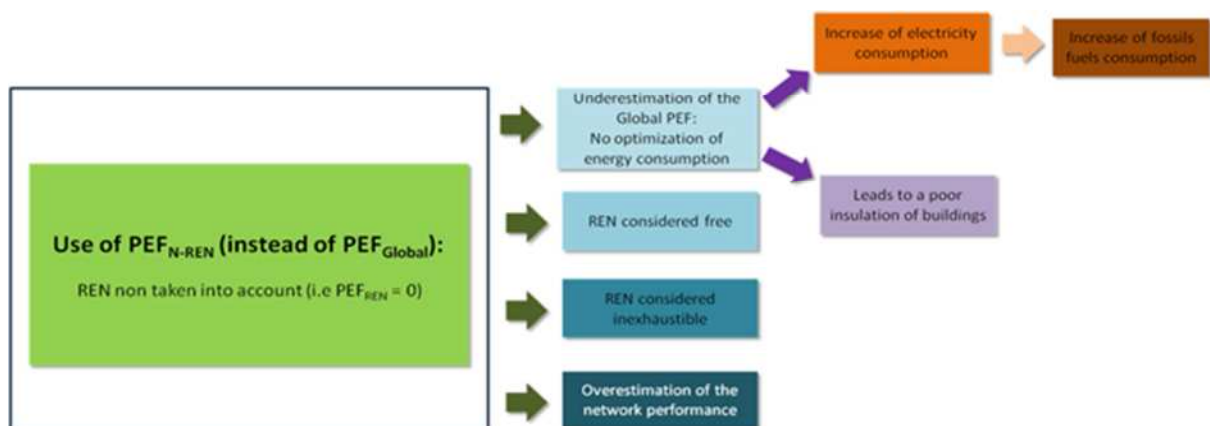


Figure 1. Consequences of not taking into account renewable energy sources in the PEF.

An efficient and environmentally friendly use of energy should be mandatory regardless of renewables and non-renewables.

Calculation method: a PEF calculated with a marginal prospective approach

The future consequences of today's energy-related decisions are best dealt with using marginal prospective methods:

Average methods that enable an energy balance are well suited for current and past electricity consumption. The reduction of environmental impacts cannot be based on a PEF based on average estimates of future generation facilities, for which the underlying message is "no change is needed to meet the objectives, they will be met anyway"! This would yield an artificial impression on the efficiency of energy systems and decrease the pressure on manufacturers to improve their products' efficiency. It would send a wrong signal to stakeholders and give to electricity an artificial increase of efficiency.

Marginal methods reflect the impact of an action (e.g. an increase or decrease in demand on the grid). To ensure a proper assessment of investment decisions, a prospective vision must be added so as to take into account future changes in production facilities and demand for electricity. The Greenhouse Gas Protocol (GHG Protocol)

includes a method that advocates a comparison between two medium- or long-term demand scenarios to determine the impact of a new project. This method ensures that decision makers are given the right signal.

The urgency and importance of initiating an energy transition to reduce the major impact of climate change unequivocally justify the adoption of a global marginal prospective PEF to send clear, mid and long-term signals to energy and construction actors in order to guarantee optimal policy decisions.

In addition: A short-term solution adapted to the European deadline

Given the European schedule, the implementation of a marginal prospective method represents a lot of work that seems to be incompatible with the revision of the ecodesign directive in 2018.

Although the method initially developed by Eurostat for electricity production is not representative of the uphill chain, it could still be used as a short-term solution during a transitional phase. However, it is essential to make some adjustments on this current methodology to ensure a better accuracy. At least, the PEF should be global and take into account all consumptions, renewable or not, and all losses along the process (especially the losses in the transmission and distribution grids). Moreover, self-consumption of power plants should be taken into account and for consistent calculations should be made using Gross Calorific Values (GCV) instead of Net Calorific Values (NCV).