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The EU needs a primary energy factor that supports the objectives of the Energy Union

We are a group of companies and associations that are committed to EUs goal of decarbonising the European energy system, while increasing energy security; and see increased integration between sectors (heating, cooling, transport and electricity) as a cost-efficient tool to achieve this. We are in this context concerned that the European Commission's (EC) review of the primary energy factor[1] (PEF) for electricity constitutes a barrier to these objectives.

To not be a barrier to decarbonisation, the outdated PEF must be updated wherever it is currently used (for example: Ecodesign and Energy labelling legislation use a PEF of 2.5, which reflects the power system of the nineties). In order to reflect the changes in the power mix, the PEF should therefore be reviewed on a regular basis.

The hired experts working for the EC have shortlisted four options[2] for a methodology and data to determine the PEF for the coming years. The PEF over time for the four shortlisted options are shown in the table below (the current value used is 2.5):

[1] The PEF is a multiplicator used to compare mainly electricity to other energy sources. The logic is to compare the amount of primary energy that was consumed to produce one unit of final electricity.

[2] Calculation method 1 is designed to provide a calculation method that is in line with the Eurostat primary energy calculation. Calculation method 2 is like method 3 but counting primary energy input of non-combustible RES as 0, Calculation method 3 is a variation of calculation method 1 in order to analyse the impact of changing the allocation method for CHP from the "IEA method" to the "Finish method". Calculation method 4 modifies calculation method 3 by adding the life cycle perspective to the conventional fuels.

PEF Method	2010	2015	2020	2025	2030
Method 1	2.25	1.98	1.88	1.79	1.74
Method 2	2.12	1.73	1.54	1.46	1.35
Method 3	2.38	2.09	1.99	1.93	1.87
Method 4	2.48	2.17	2.06	2.00	1.93

From the table one can observe that method 4 gives the highest results for PEF, while option 2 gives the lowest results for PEF. The experts undertaking the in-depth study prefer option 2: *The authors' preference is to include all non-renewable resource consumption [option 2] in the calculation process in a simplified life cycle perspective. This leads to the lowest PEF of electricity and the most appropriate comparison with other fuels delivering services such as heat.*

Despite this clear recommendation to go for the *lowest PEF*, the current proposal recommends the more conservative option (option 3). When assessing the four options, we would like to express our agreement with the experts and raise 3 high-level concerns that arise from choosing method 3 above method 2:

1. Method 3 is a barrier to more flexible electricity markets and thus a barrier to decarbonisation.
2. Method 3 reduces security of supply by ignoring that non-combustible RES are never imported.
3. Method 3 is likely to misguide consumers and disempower them.

On decarbonisation: The Commission's energy and climate roadmap and numerous other studies underline the role of electrification as a pre-requisite for decarbonisation, and the role in providing flexibility. A high PEF (method 3) on the other hand promotes the use of fossil fuels for heating and the EU runs the risk of locking in fossil fuel investments for decades, while being a barrier to more flexible heat demand. Together this makes the long-term objective of decarbonisation more costly and difficult to reach.

In the current impact assessment it is argued that: *"A PEF as 1 for RES recognises that it makes sense to place value on, and save where possible, all types of energy including renewable energy".* The Energy efficiency directive is in place to save energy, while other legislation and markets are in place to ensure balance between supply and demand and efficient use of energy. The PEF, which is in itself a highly hidden and obscure number, cannot successfully find the right balance between all objectives. The fact is that electricity from PV and wind runs on wind and sunshine, hence they do not consume imported or domestic primary energy. The logical conclusion is to apply method 2.

On security of supply: One of the four energy policy criteria in the consultants' report is to maintain and strengthen EU security of supply. To achieve this, EU's energy imports must be reduced. However, there is no shortage of wind or solar in the EU. These are not energy sources that are imported to the EU. This fact is reflected in method 2.

On consumer empowerment and information: In order for consumers to become more active participants in the electricity markets, they must have the ability to reduce or shift electricity loads through smart appliances. Electricity loads that are particularly relevant for demand response purposes are low priority loads such as electrical heaters, heat pumps, boilers, and other household appliances, which are all discouraged with a high PEF – thus reducing consumer empowerment in the electricity market.

With smart meters and dynamic pricing such appliances will use cheap electricity that is mainly renewables (as low prices will correlate with a high infeed of RES), and thus at times of low PEF. This will be highly efficient use of resources, but consumers will be discouraged from buying electrical appliances as the PEF is based on yearly average figures, thus ignoring the market reality. While a time-of-use PEF is challenging (impossible) to implement, method 2 is closer to reality than method 3. Method 2 would therefore provide more correct energy labels.

The current impact assessment argues that "*By using a PEF of 0 for RES, that would mean that 35% of the electricity used would be ignored when comparing the performance of electricity and gas appliances. The choice for PEF of 0 for RES could undermine the credibility of a consumer-serving label;"*

However, with increasing shares of renewable energy in the grid, it is misinformation to portray to consumers that a heater running on electricity consumes 2.0 times more primary energy than a heater running on gas or coal. This approach implies that burning fossil fuels on-site is more efficient than consuming renewables electricity generated off-site.

As stated in the expert study, a lower PEF (method 2) for electricity constitutes the most appropriate comparison between different energy carriers.

The way forward should be to follow the advice of the experts and choose option 2.