Eurogas Views on Primary Energy Factor

Introduction

The Primary Energy Factor (PEF) is a method of comparing the primary energy consumption of technologies using different energy carriers. Electricity is consumed as final energy and applying a PEF is a means to account for the energy that is consumed and/or lost in energy transformation, transmission and distribution processes.

The concept of a PEF is contained within a host of European energy legislation and this is described in more detail in Annex 1. It is fundamentally used in two areas; firstly under the Energy Efficiency Directive to convert values for final energy savings to primary energy, in order to allow the assessment of whether Member States are meeting their energy efficiency goals for primary energy reduction. Secondly, it plays a crucial role in the energy labelling and eco-design legislation, where it effects the comparison of different heating products.

Under current legislation, the EU use a number of 2.5 to convert final energy values to primary energy. The figure is based on an average European-wide conversion efficiency of 40%. It means that for every unit of electricity used by a consumer, two and a half times as much primary energy (the energy used to generate the electricity) has been consumed.

The principles of a harmonised European PEF

1. The PEF should not be used as a tool to achieve policy objectives, as is sometimes contended, but remain a derived calculation to reflect the conversion of final energy to primary energy.

2. A single value for the PEF must continue to be used on a European basis for application of the Eco-design and Labelling legislation as it facilitates trading products across Member State (MS) borders. For the application of the Energy Performance of Buildings Directive its application need not be harmonised on a European level. As MS choose their own energy mix, the PEF should be calculated for each MS in building and heating evaluation.

    a. For example: a country with a high PEF for electricity should focus more on switching from electric heating to condensing gas boilers in order to increase efficiency. On the other hand, a country with large shares of renewable electricity might choose to push for flexible CHP heating systems in order to stabilise electricity grids.

The derivation of a PEF

3. The PEF should be based on the existing fuel mix and not on potential forward looking scenarios, as the future energy mix of Europe is very uncertain and impacted by many different factors. Given that the fuel mix is continually changing this should be updated every five years, thereby providing stability, while evolving over time.

4. The PEF should be derived on a 'marginal' methodology. For electricity, this means the PEF is based on an assumed marginal unit that is needed to provide an additional kWh to meet the needs of a new consumer, called the marginal generator. The corresponding marginal generator(s) can be determined in a "what if analysis" by creating two calculations of the electricity system, with and without the additional kWh.

5. The PEF used for the labelling and Ecodesign legislation should also be derived individually for different appliances, depending on their specific energy usage. For example, an air conditioning unit would generally be based on the electricity mix in the summer time which would include more solar photovoltaic, whereas a heating appliance would use electricity more often in the winter, when less solar photovoltaic is available.

6. Eurogas favours a transparent approach to include transport for all energy carriers in the PEF. This would mean incorporating the entire delivery chain from production to consumption, e.g. in the gas grid and in the electricity grid.

7. Renewable energy should be given a PEF of 1 rather than 0, as it should be treated as a resource to use scarcely, which has a cost and an impact on environment. The PEF is for use in the Energy Efficiency Directive and should be designed for energy efficiency. Separate legislation is designed to support renewable energy.