

**ENTSO-E Position Paper on
Draft “EC Regulation implementing Directive 2009/125/EC with regard to small,
medium and large power transformers”**

7 December 2012

Further to the Eco-design Consultation Forum held in Brussels on November 9th, 2012, ENTSO-E would like, through the present document, to underline its concerns on the proposed regulation and its drafting process.

Looking at the scope, the participant’s feedback in the preliminary study and the draft’s further development, ENTSO-E emphasises:

- The changes in the scope of the regulation. Initially this regulation was targeting only the medium voltage transformers and consequently the TSOs - the high voltage transformers’ users - were not involved in the earlier discussions.
- The limited contribution of the large power transformer users in the preliminary study made by VITO and BIO intelligence.

Based on the results of the previous interactions within the Eco-design Consultation forum and the TSOs experience, ENTSO-E highlights the following:

- Important but less active stakeholders such as small utilities (independent power producers) did not contribute to the data collection process. As a result:
 - The survey covers only 10 % of the transformers installed in the last ten years
 - The survey does not cover all categories of users: only the larger users with well-established environmental policies, using transformers with high efficiency criteria.
 - The decisions based only on this limited data inputs could be misleading.
- As indicated in the data collected by the CENELEC WG 29 and presented during the forum meeting, the large transformers are already highly efficient with average energy efficiency greater than 99%.

The results of the survey show discrepancies of as high as 0.3 points of the peak efficiency between large transformers of the same power rate. Because of the limited time available to collect and study the data, it has not yet been possible to find an explanation for such variations, which could be of either economic or technical nature (due to the need to fulfil other functions such as tertiary feeding or short circuit current limitation). If those functions have to be fulfilled, such higher losses cannot be avoided. The change of some characteristics such as impedance to achieve higher efficiency would also have a costly technical impact on the existing network assets such as bus bars and switchgear (increase in short circuit currents for instance).

- Increasing the efficiency of large transformers leads to increase in their size and weight (more material necessary) and changes the existing balance between the usage and the manufacturing, transport and recycling life-cycle phases of units. This may lead to an overall negative impact on energy efficiency, which may diminish the expected benefit stemming from implementing the draft legislation.

A large proportion of the transformers bought by the TSOs are installed in existing substations either as replacement of older units or as a substation extension with limited space availability. An increase of the size and weight of large transformers would also have an impact on substation structures (civil work) and on the feasibility to replace existing transformers in situ (more efficient but more bulky units). Therefore, ENTSO-E recommends that the global life cycle analysis of the high voltage transformers to be reassessed.

- The mass and profile of large power transformers may also make transport non practicable due to the limitation of roads, bridges and tunnels. There could also be potentially public acceptance issues since the transport of large transformers may require the demolition of buildings such as houses etc. Alternatively the impossibility of accessing existing substations with larger transformer can drive to alternative solutions such as the requirement for new substations and the consequent networks links (for security of supply reasons) which will have greater cost and environmental impact. Delivery of alternative solutions will also take considerable additional time with, again consequent security of supply issues.
- An increase of the size and weight will lead to a rise in manufacturing costs, civil work and transport in such a way as to question the affordability and proportionality of the new energy efficiency measures in comparison to the small amount of losses reduction. Higher efficient transformers would not be reached at an affordable cost as specified in article 15.4 of 2009/125/EC.
For large power transformers, there is currently no reliable formula for the relationship between price, volume, weight and energy performance. It is also impossible to give a simple answer on which transformers are less efficient than permitted under the Eco-design principles and which are efficient. As a result, the proper impact of the draft regulation is difficult to anticipate. Should a longer time period be allocated for preliminary studies, a clearer relationship between price, volume, weight and energy performance may be identified, which would facilitate this impact assessment.

In order for EC to take an informed decision and improve the regulation, **ENTSO-E recommends to postpone the approval of the draft regulation until the following concerns are addressed:**

- **The survey is enlarged to include more than 10% of the installed transformers in order to be more representative of the current market.**
- **The correlation between price, weight and performance is better established and the impact of extra costs on the relation with national regulators and electricity markets is considered.**
- **An assessment of the potential energy efficiency improvements due to technological evolutions is considered.**
- **An estimate of the impact on substation structures such as civil work and the feasibility to replace existing transformers in situ by new more efficient but more bulky units is undertaken.**
- **An estimate of the impact of a higher mass and profile of large power transformers on transport is undertaken.**

Additionally, **ENTSO-E recommends excluding all transformers above 100 MVA from the scope of the present draft regulation.** This suggestion is in line with the findings of CENELEC's WG 29 which underlined the state of art of the above mentioned transformers.

Since all large transformers are currently highly efficient, establishing one single set of ambitious values covering all types of units may be too restrictive. Instead **ENTSO-E recommends setting a minimum energy efficiency level ensuring in this way that all the units, independent of their capacity, will least reach the desired efficiency threshold.**

ENTSO-E is convinced that EC, based on the above suggested studies, will establish ambitious but realistic energy efficiency targets for the large power transformers, implementable at an affordable societal cost.

As such studies will also involve clear criteria on the appropriate value of electricity and on discount rate techniques which are also applicable to medium voltage transformers, ENTSO-E suggests Option **B** (as outlined on 9th Nov 2012) as the appropriate next step i.e. the Directive would not precede until both medium voltage and large power transformer issues are resolved.