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COMMUNICATION TO THE COMMISSION

Explanatory Memorandum accompanying

COMMISSION REGULATION (EC) No …/…
implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for small, medium and large power transformers

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1. CONTEXT OF THE PROPOSAL

Grounds for and objectives of the proposal

The Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the Commission to set ecodesign requirements for energy-related products[1] (hereafter referred to as the Ecodesign Directive) is to be implemented by the European Commission through regulations dealing with the product groups identified in the Ecodesign Working Plans. The Ecodesign Working Plan for 2009-2011[2] identified "transformers" as one of the ten priority product groups.

DG Enterprise has explored the possibility of setting Ecodesign requirements for this product group, which includes small, medium (also known as distribution) and large power transformers used in electricity distribution networks operating at a frequency of 50 Hz. Annex II includes the detail of the precise scope of the proposed regulation.

Following the usual practice in Ecodesign regulations, also the possibility of introducing a labelling system under the Energy Labelling Directive (2010/30/EU) of the European Parliament and of the Council has been explored. According to the conclusions of the Impact Assessment Report, in the end it is proposed to launch only Ecodesign requirements for small, medium and large power transformers.

The proposed ecodesign regulation also needs to be put in the context of wider Commission's policies such as the Europe 2020 flagship "A Resource -efficient Europe" and the Internal Energy Market[3] policy, which intends to gradually open up gas and electricity markets for the benefit of consumers.

The main challenge in the transformers' market is that cost-efficient technical solutions to reduce their energy consumption exist, but the market penetration of more efficient transformers is relatively low. One of the reasons for this low market penetration is the emphasis on initial purchase cost, to the detriment of lifecycle costs.

It is estimated that network losses attributable to power and distribution transformers represent 2,6% of total energy consumption in the EU27 in 2005[4]. This is a considerable figure in absolute terms (around 72 TWh/year) and is equivalent to the annual electricity generation of three medium size nuclear power plants.

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1 OJ L 285, 31.10.2009.

2 COM (2008) 660

3 See Commission Communication Making the internal energy market work at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0663:FIN:EN:PDF

4 Ecodesign preparatory study on distribution and power transformers, VITO 2011

Article 16 of the Ecodesign Directive provides the legal basis for the Commission to adopt an implementing measure for this product category. The scrutiny of criteria enshrined in Article 15(2) of the Ecodesign Directive shows that transformers qualify for the adoption of an implementing measure setting new ecodesign requirements.

Furthermore, a number of other jurisdictions around the world have been adopting MEPS (Minimum Energy Performance Standards) for transformers in recent years (US, Japan, Australia, China). Action at EU level is justified to bring the EU's market in line with the most progressive jurisdictions and also to reduce the burden of testing and product development on manufacturers compared with eventual separate measures in different Member States.

The envisaged regulation is fully coherent with other EU policies, and in particular it is to be seen as a contribution to decoupling economic growth from the use of resources, and in particular energy, an objective set out in the Europe 2020 strategy (COM(2010) 2020)[5] under the Resource efficient Europe flagship initiative.

General context

Transformers are procured by professional buyers who follow total cost of ownership (TCO) considerations to inform the required design specifications. This is almost always the case with large power transformers and often the case for distribution transformers. However, there is a large margin for discretion in the valuation of network losses (which are a component of all TCO formulas) done by electricity companies and industrial users, which may result in the calculations not reflecting the true cost of these losses to society.

A number of national regulatory regimes[6] for electricity markets offer incentives to electricity companies for network loss reduction, but the targets are based on average losses calculated over a period of time, not on the real marginal losses which are actually avoided through more efficient equipment. The situation with such incentives is very patchy across the EU, with various types of heterogeneous schemes co-existing. The proposed Ecodesign regulation should reinforce existing incentive schemes in national regulatory regimes, stimulate their introduction in those Member States where they are still not present and foster their overall convergence.

The experience from other countries in regulating transformers shows that establishing minimum performance or efficiency requirements is likely to have a beneficial transformational effect on the market and achieve desirable policy objectives of energy conservation, reduction of greenhouse emissions and stimulation of technological innovation.

Existing provisions in the area of the proposal

No direct regulatory approach to reduce the energy consumption of transformers has been identified in the EU to date.

Consistency with other policies and objectives of the Union

The Ecodesign Framework Directive 2009/125/EC is an important instrument for achieving the objective of 20% energy savings compared with projections for 2020, and its implementation is one of the priorities in the Commission's Communication on Energy 2020

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5 Available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF

6 See for instance the RIIO model in the UK
http://www.ofgem.gov.uk/Media/FactSheets/Documents1/re-wiringbritainfs.pdf

and Energy Efficiency Plan 2011. Furthermore, implementation of Directive 2009/125/EC will contribute to the EU's target of reducing greenhouse gases by at least 20 % by 2020, or by 30 % if there is an international agreement that commits other developed countries to comparable emissions reductions.

Promotion of market take-up of efficient transformers complies with the Europe 2020 agenda and its 20% energy savings target by the year 2020, as it aims to support more efficient and sustainable use of resources, protect the environment, strengthen EU's leadership in developing greener technologies and improve the business environment.

Finally, it will contribute to the objective of decoupling economic growth from the use of resources set out in the Europe 2020 strategy[7] under the 'Resource-efficient Europe' flagship initiative.

2. CONSULTATION OF INTERESTED PARTIES AND IMPACT ASSESSMENT

Consultation of interested parties

Consultation methods, main sectors targeted and general profile of respondents

The opinions of stakeholders were gathered throughout the process through the Consultation Forum created in compliance with Article 18 of the Ecodesign Directive and through numerous bilateral meetings with stakeholders. The preparatory study consulted manufacturers in three stakeholder meetings and registered stakeholders were granted access to the documents publicly available on the project website http://ecotransformers.org.

The Ecodesign Consultation Forum was consulted on 20 April and 9 November 2012 with the participation of Member States, consumer organisations, environmental NGOs and the relevant industry association T&D Europe. The working document presenting the policy options was sent in both cases one month in advance of the meeting. All replies to the working document are available on the CIRCA website. Several other meetings, stakeholders consultations and conference calls occurred, in order to identify the key issues of concern, to discuss the data analysis process, to agree thresholds and finally to review the proposal.

Summary of responses and how they have been taken into account

Member States were largely supportive of the introduction of regulatory measures for storage and blast cabinets, collaborated in the definition of a shared methodology, and some provided useful data from national schemes already in place and explained the relevant national regulations. However, they differed in the suggested level of stringency, reflecting different average efficiency levels in their home markets.

Environmental NGOs were generally in favour of the introduction of an ambitious regulatory measure.

The consultation with the industry (both associations and individual companies) has been an important part of the development of the proposed Regulation. Transformers manufacturers have been in favour of the regulation, as they see it as an element to improve their competitiveness.

Electricity distribution companies (purchasers of transformers) have been, in general, more critical with the proposed Ecodesign regulation. Organized around the European association

[7] COM(2010) 2020

Eurelectric, these stakeholders have challenged the justification for the investment required to put into service more efficient transformers.

Some of the difficulties identified by the electricity distribution companies have to do with the fact that electricity prices and capital discount rates used in their procurement processes are different across Member States. These parameters are critical in the calculation of lifecycle cost and therefore in the justification of investment decisions. The spreads in the values used for these parameters by different companies can be quite considerable[8].

International stakeholders

The proposed measure will be notified to the WTO/TBT at the end of this Interservice Consultation to ensure that no barrier to trade is introduced.

Collection and use of expertise

Scientific/expertise domains concerned

External expertise was mainly gathered through the preparatory study providing a technical, environmental and economic analysis, which was carried out on behalf of the Commission's Directorate-General for Enterprise. Additionally, a scenario analysis of various policy options was developed for the impact assessment by external consultants.

Methodology used

The methodology followed the provisions of the Ecodesign Directive 2009/125/EC, in particular Article 15 and Annexes I and II. The technical, environmental and economic analysis followed the structure of the 'Methodology Study Ecodesign of Energy-using Products' devised for the Commission's Directorate-General for Enterprise and Industry and endorsed by stakeholders.

Main organisations/experts consulted

The preparatory studies were conducted in an open process, taking into account input from stakeholders, including manufacturers, their associations, environmental NGOs, consumer organisations, EU/EEA Member State experts and experts from third countries.

Summary of advice received and used

The technical, market and economic analysis carried out for the preparatory studies resulted in recommendations for ecodesign requirements for small, medium and large power transformers. These recommendations were used, in conjunction with the most recent available data from the industry, to propose ecodesign requirements for small, medium and large power transformers. The comments of members of the Consultation Forum were addressed during the impact assessment, which involved continuous collaboration with various individual stakeholders and experts.

Means used to make the expert advice publicly available

The preparatory study was accompanied by a dedicated website where interim results and further relevant materials were published regularly for timely stakeholder consultation and input. The study websites were publicised on DG ENTR specific ecodesign websites.

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[8] See for instance SEED Selecting Energy Efficient Distribution Transformers

A Guide for Achieving Least-Cost Solutions (page 15) at
http://www.copperinfo.co.uk/transformers/downloads/seedt-guide.pdf

The written input received during the Consultation Forum process and the minutes of the Forum meetings on tranformers are available on the Commission's CIRCABC website.

Impact assessment

An impact assessment of the possible policy measures was carried out in accordance with Article 15(4)(b) of the Ecodesign Directive 2009/125/EC which also examined the option of labelling.

Several policy options for achieving a market transformation fulfilling the appropriate level of ambition were considered in the impact assessments, including the business as usual case, self-regulation, energy labelling and minimum energy performance requirements.

Due to the clear mandate given by the legislator to establish ecodesign requirements for transformers, the depth of analysis for options other than an implementing legal act is proportionate, and the focus is on the assessment of the proposed implementing regulation.

The following policy options have been considered:

- Option A: No new EU action
- Option B: Adoption of existing foreign policy
- Option C: Self-Regulation
- Option D: Energy Labelling only
- Option E1: Strict Minimum Energy Performance Standards (MEPS)
- Option E2: Intermediate Minimum Energy Performance Standards (MEPS)

Options A, C and D have been considered not viable due to their limited transformational impact on the market. Option B was considered too complex technically.

Options E1 and E2 aimed at improving the environmental impact of transformers by defining maximum levels of load and no-load losses or minimum energy efficiency values. The only difference between them is the initial level of stringency in the proposed MEPS (Minimum Energy Performance Standards) requirements.

The proposed MEPS requirements can be achieved by the manufacturers using existing technology (e.g. high grade commercially available silicon electrical steel, larger magnetic cores and increased cross-section of the conductors), with some adaptation of their existing manufacturing equipment.

Energy losses in transformers are tested before delivery to final destination for contractual requirements. The extra costs associated with the declaration of conformity of a transformer are expected to be negligible, as the measurement of energy losses already takes place a standard contractual practice. Furthermore, verification for market surveillance purposes could take place at the same time as losses (or efficiency) are tested for contractual purposes.

An Ecodesign Regulation setting MEPS on transformers would allow the specific mandate of the Legislator to be met.

For the purpose of comparative impact analysis, Options E1 and E2 were characterized as follows with respect to the BAT (Best Available Technology) option:

- Option E1 - Strict MEPS (Minimum Energy Performance Standards) - This option would include the setting of minimum requirements based on strict least lifecycle cost calculations (as indicated in Annex II of the Ecodesign Directive).

- Option E2 - Intermediate MEPS (Minimum Energy Performance Standards) - As the calculation of the least life cycle cost could not take into account certain installation costs associated with putting into service more efficient transformers, which can be quite onerous in specific cases, this option would be setting minimum requirements at a lower level of stringency than those in option E1 - Strict MEPS, so as to compensate for these additional costs.
- Best Available Technology (BAT) - This option would include the setting of minimum requirements based on what is technically possible with transformer models that embody BAT in the market. As some of the required technologies are not cost-effective within a reasonable payback period, this option is included for the purpose of the comparative analysis only.

Both Options E1 and E2 scored well in terms of coherence with other neighbouring policies, such as the Energy Efficiency Directive and climate change policies.

In terms of effectiveness, both Options E1 and E2 scored well, as they are expected to gradually transform the market towards more efficient models and generate substantial energy and C02 savings. In the long term, their effect is nearly indistinguishable, as they are proposing the same MEPS from 2020 onwards.

Option E2 scores slightly higher than Option E1 in terms of efficiency. The reason for this is the smoother introduction of MEPS in Tiers 1 and 2. The stricter Option E1 could have some disruptive effect in the market, as purchasers of transformers are likely to frontload orders ahead of the coming into force of the regulation, thus straining manufacturers' production capacity and their supply chains for input materials.

Option E2 is therefore expected to have a more gradual market transformation effect, but without the risks that could be associated with the more stringent Option E1.

Overall, Option E2 presents the better profile in terms of effectiveness, efficiency and coherence and therefore it is the retained option.

3. LEGAL ELEMENTS OF THE PROPOSAL

Summary of the proposed action

Scope of the proposed Regulation

The Regulation establishes ecodesign requirements for the putting into service of transformers with a minimum power rating of 1 kVA used in 50Hz electricity transmission and distribution networks or for industrial applications.

Information and minimum requirements are set out for three different product categories, as follows:

- Minimum energy performance requirements or minimum energy efficiency requirements (Peak Efficiency Index) for medium power transformers, according to their rated power
- Minimum energy efficiency requirements (Peak Efficiency Index) for large power transformers
- Product information requirements for small, medium and large power transformers

Phased implementation of ecodesign requirements

It is proposed that requirements on minimum energy efficiency and information to be provided by manufacturers will enter into force as follows:

1) Information requirements for small, medium and large power transformers from 1 July 2015

2) Minimum performance or efficiency requirements for medium and large power transformers from 1 July 2015 (Tier 1) and from 1 July 2021 (Tier 2)

Measurements and calculations

Measurements and calculations of the relevant product parameters should be performed taking into account generally recognised state-of-the-art calculation and measurement methods. In this context, manufacturers may apply reliable, accurate and reproducible measurement and calculation methods[9] and harmonised standards established in accordance with Article 10 of Directive 2009/125/EC, as soon as they are made available and published for that purpose in the *Official Journal of the European Union*. Requirements for calculation and measurement methods are specified in Annex II of the proposed Ecodesign Regulation.

Benchmarks

Based on the information made available by stakeholders during the preparatory phase, it was not possible to establish product benchmarks with a sufficient level of confidence.

Date for evaluation and possible revision

Taking into account the time necessary to collect, analyse and complement the data in order to properly assess technological progress, a review can be presented to the Consultation Forum:

- no later than three years after entry into force of the Regulation

Legal basis

The proposed Regulation is an implementing measure pursuant to Directive 2009/125/EC, in particular Article 15(1) thereof. The Directive is based on Article 114 of the Treaty.

Subsidiarity principle

Action at EU level is appropriate to ensure the free circulation of goods, since there is significant EU and international trade in these products. Regulation at national or regional level would lead to a fragmentation of the market in consequence of the imposition of multiple and different requirements, and would also increase the burden of testing and product development on manufacturers.

The proposal therefore complies with the subsidiarity principle.

Proportionality principle

In accordance with the principle of proportionality, this measure does not go beyond what is necessary to achieve the objective. It offers requirements which act as an incentive for technology leaders to invest in high-efficiency technology for transformers. It also leads to higher savings than any other conceivable option with minimum administrative costs.

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[9] The draft transitional methods and the calculation tools, before harmonized standards will be available, can be found at the following internet address: http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/freezing/index_en.htm

Choice of instrument

Proposed instrument: Regulation.

The proposed form of action is a Commission Regulation implementing Directive 2009/125/EC, because the objectives of the action can be achieved most efficiently by fully harmonised requirements throughout the EU (including the date of entry into force), thus ensuring the free movement of complying products. No costs arise for national administrations for transposition into national legislation.

4. BUDGETARY IMPLICATION

The proposal has no implications for the EU budget.

5. ADDITIONAL INFORMATION

Review/revision/sunset clause

The proposal includes a review clause.

European Economic Area

The proposed act concerns an EEA matter and should therefore extend to the European Economic Area.