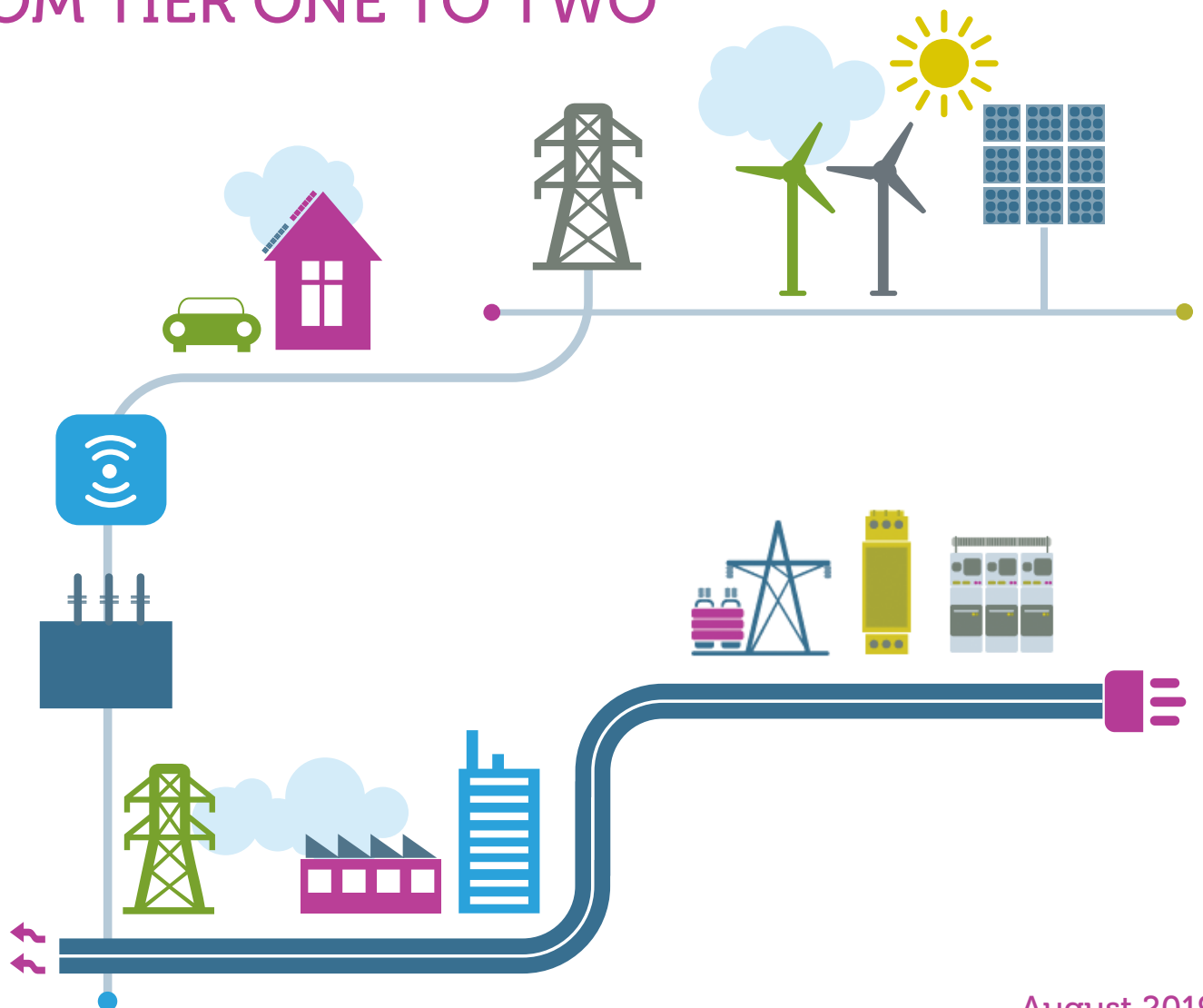


BEAMA NETWORKS ECO DESIGN DIRECTIVE FOR TRANSFORMERS – THE TRANSITION FROM TIER ONE TO TWO



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ABOUT BEAMA

BEAMA represents manufacturers of electrical infrastructure products and systems from transmission through distribution to the environmental systems and services in the built environment, with 200 members ranging from SMEs to large multinationals.

We work with our members to ensure their interests are well represented in the relevant political, regulatory and standardisation issues at UK, EU & international levels.

BEAMA member products provide a sustainable, safe, efficient and secure UK electrical system. We support our members in ensuring that the UK has a strong electrotechnical industry which is recognised as an essential part of modern society and brings invaluable economic, social and environmental benefits.

Our Networks Sector is made up of members with interests in network products, transformers, switchgear, communications, automation, relays, smart grid, and related safety and energy supply and control technology. As part of the networks section of BEAMA, our aim is to explore and develop opportunities, provide technical services and to foster sustainable growth in new markets.

This paper was produced in coordination with the BEAMA Principal Products Section which has membership from the following organisations:



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Introduction

The Eco Design Regulations for new Transformers (No 548/2014)¹ came into force on the 11th June 2014, setting in place mandatory levels of efficiency from 1st July 2015. This directive defined efficiency levels for tier 1 transformers and proposed efficiency levels for tier 2 to be introduced from 1st July 2021. Under Article 7 a review was proposed after 3 years from coming into force and that took place in 2017. This has resulted in a revised regulation.

There was some uncertainty with regard to the use of repaired, refurbished, recommissioned and rented power transformers, manufactured and placed into service prior to the regulation; BEAMA published a paper "BEAMA Networks Technical Report No 2 – Eco Design Directive for Transformers: Refurbished Equipment" to clarify its position in 2018 for the benefit of UK manufacturers, suppliers, purchasers and wider stakeholders. Steps have been taken to clarify the position in the revised regulation, these are detailed in Article 1 Clause (3) which covers replacing of the core and at least one set of windings.

To produce this document reference has been made to document D060353/2² which is the draft of the amending Regulation (EU) No 548/2014 of 21 May 2014 and the Annex². A commission staff working document³ has also been produced with explanatory notes which has been used to pick out a number of key points.

The amended regulations were scheduled for publication in July 2019.

Draft amending regulation – 'Whereas' clauses

The clauses in the 'Whereas' part have been rewritten to reflect the current position, the original clauses recognized some areas of concern that are now considered to have been addressed. The following clauses out of the 14 have been highlighted as being of particular interest. Text in italics is transposed from the draft amending regulation.

Clauses (4) to (6) state:

- (4) *The study confirmed that Regulation (EU) No 548/2014 has had a positive effect on the efficiency of power transformers being placed on the market, and found that available transformer models can fulfil minimum requirements set in Tier 1 (July 2015) without difficulties.*
- (5) *It is generally recognised that the most appropriate method to optimise transformer designs in order to minimise electricity losses continues to be the valuation and capitalisation of future losses using proper capitalisation factors for load and no load losses in the tendering process. However, for the purposes of product regulation only the use of prescribed values for minimum efficiency or maximum losses is feasible.*

- (6) *The study also confirmed that for manufacturers there are no major technical barriers to manufacturing transformers compliant with the minimum requirements set out in Tier 2 for entry into force in July 2021.*

These clauses indicate that the requirements set out in Tier 2 are acceptable and will become the new requirements from July 2021. Clause (7) allows for a concession to Tier 1 transformers where disproportionate costs would be incurred, this is discussed further down.

With regard to repair of transformers clause (10) states:

- (10) *The existence of a market for the repair of transformers makes it necessary to provide guidance on the circumstances under which a transformer that has undergone certain repair operations should be considered equivalent to a new product and therefore it should comply with the requirements set out in Annex I of this Regulation.*

Draft amending regulation – Articles

In Article 1 Subject matter and scope the exclusions in clause 1 have need updated and a new clause 3 has been included covering changes to transformers regardless of the date when they were taken into use.

- ((3) *Medium and large power transformers, regardless of when they were first placed on the market or put into service, shall be reassessed for conformity and comply with this Regulation, if they are subject to all of the following operations:*
- a) *replacement of the core or part thereof;*
 - b) *replacement of one or more of the complete windings.*

Other articles -

- **Article 2** has amended the definitions for medium and high power transformer.
- **Article 3** now allows deviations in the threshold voltages, but only if the Commission is notified.
- **Article 4** Conformity assessment has been substantially extended.
- **Article 7** Review has been rewritten to include a further review to conclude by July 2023 to identify if further improvements are possible in a number of areas detailed in the Article.
- **A new Article has been added**, Article 8 Circumvention, to stop product from altering their performance when being tested.
- **Articles 5 and 6** are unchanged.

¹ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.152.01.0001.01.ENG

² http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&Dos_ID=17174&DS_ID=60353&Version=2

³ http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&Dos_ID=17174&DS_ID=61311&Version=1

Draft amending annex

There are a number of changes in the amended annex that due to their technical nature require careful analysis to fully understand their implications for transformers. They appear to affect both Tier 1 and Tier 2.

Background from Explanatory notes

The following points are a short summary of what was discussed in the explanatory notes.

It is considered that Regulation (EU) No 548/2014 will have resulted in an energy saving of 16.2TWh by 2020 compared with the position had the regulation not been introduced. It is recognised that the regulation will have increased industrial costs, but that it has also brought about extra revenue. The regulations are seen to have introduced innovation as well as other benefits.

The circular economy initiative stresses the need to include reparability, recyclability and durability in ecodesign.

The review held in 2017 was unable to assess the impact of Tier 1 as insufficient time was available since Tier 1 transformers were introduced, as such the review was guided by stakeholder feedback with an emphasis on the technological feasibility and cost effectiveness of the Tier 2 requirements.



The study undertaken as part of the review identified that to meet the Tier 2 requirements transformers would require more magnetic steel and copper/aluminium which would make them larger and heavier. Where required for replacement this increase could result in them being unable to be accommodated within some existing sites. It was estimated that this could affect 15% of sites. The result was to not alter the Tier 2 requirements in relation to stringency or timing but to introduce a number of regulatory concessions. The intention of these concessions is to avoid situations where the installation of new replacement transformers would entail unintended disproportionate costs. This requirement inevitably relies on the determination that costs are disproportionate, and this is recognised as a shortfall. There is further clarification in the Annex, details are required of exactly where the replacement transformer has been installed. It is expected that guidance will be produced to define what constitutes disproportionate costs.

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