



INTAS

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Analysis and report on other applicable regulations on transformers

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About the INTAS project

The aim of the INTAS project is to provide technical and cooperative support, as well as capacity building activities, to Market Surveillance Authorities (MSAs). The need for the INTAS project arises from the difficulty that MSAs and market actors face in establishing and verifying compliance with energy performance requirements for large industrial products subject to requirements of the Ecodesign Directive, specifically transformers and industrial fans. Therefore, the project aims to:

- Support European Member State MSAs deliver compliance for large products (specifically for transformers and large fans);
- Support industry to be sure of what their obligations are under the Ecodesign Directive and to deliver compliance in a manner that will be broadly accepted by MSAs;
- Foster a common European approach to the delivery and verification of compliance for these products.

List of project partners:

WIP Renewable Energies	Europe
European Environmental Citizens' Organisation for Standardisation	Europe
European Copper Institute	Europe
Engineering Consulting and Design	Europe
Waide Strategic Efficiency	Europe
Austrian Energy Agency	Austria
Federal Public Service Health, Foodchain, Safety and Environment	Belgium
SEVEN Energy Efficiency Center	Czech Republic
Danish Technological Institute	Denmark
Finnish Safety and Chemicals Agency	Finland
The Polish Foundation for Energy	Poland
Directorate General of Energy and Geology	Portugal
Romanian Regulatory Authority for Energy	Romania
Foundation for the Promotion of Industrial Innovation	Spain
Italian National Agency for New Technologies, Energy and Sustainable Economic Development	Italy
Food and Economic Safety Authority	Portugal

Executive summary

This report summarises the outcomes of Task 3.3 “Multiple regulation testing” in WP3 “Defining an effective compliance framework for MSAs and manufacturers” of the INTAS project, with focus on the power transformer product group. Its goal was to assess which other regulations are likely to be able to be tested alongside Ecodesign testing for power transformers.

The methodology used can be summarised as follows:

- Phase 1: Potentially synergic Other Regulation collection (paragraph 3.2.1)
- Phase 2: Synergy analysis of each potentially synergic other regulation as collected in Phase 1 (paragraph 3.2.2)
- Phase 3: Synergy assessment of each potentially synergic other regulation as analysed in Phase 2 (paragraph 3.2.3)

The main conclusion of this study is that there are no real options to conduct combined multiple testing for Ecodesign market surveillance and other relevant regulations. However, two promising synergic effects among different regulations have been identified:

- the leverage resulting from carrying out surveillance of two regulations together. This leverage is mainly due to the enlargement of the basis of the surveyed perimeter. The synergy is realistically limited to the possibility to collect data and carry out document inspections. A side effect may also be the dissemination of the two regulations together;
- the possibility to delegate document inspections to other official bodies in charge of controls in contexts typically having the large INTAS product installed (even if the subject under surveillance is different).

These suggested approaches should be implemented in conjunction with classical traditional testing activities by MSA as foreseen by each separated regulation.

Among all the options, voluntary certification schemes (not necessarily related to the subject in the scope of Regulation 1) seem to be the most promising.

It is to be pointed out that no differences in the conclusions have been identified for power transformers in comparison to large fans (D3.4). A reason for this is related to the fact that the only promising synergies are just conceptual considering the lack of real options to test together or all at once the product under examination.

1. Introduction

This document reports the results of the research carried out by Task 3.3 „Multiple regulation testing in WP3 - Defining an effective compliance framework for MSAs and manufacturers“ of the INTAS project, for power transformers.

The aim of this Task is to assess which other regulations are likely to be able to be tested alongside Ecodesign testing for either fans or transformers.

The methodology used can be summarised as follows:

- Phase 1: Potentially synergic Other Regulation collection (paragraph 3.2.1)
- Phase 2: Synergy analysis of each potentially synergic other regulation as collected in Phase 1 (paragraph 3.2.2)
- Phase 3: Synergy assessment of each potentially synergic other regulation as analysed in Phase 2 (paragraph 3.2.3)

To increase the chance of success, a creative approach was used when looking for potentially synergic regulations to be assessed. This approach required not just looking at legislation directly or indirectly applicable on transformers or their parts but also at legislation addressing activities or products using or involving or linked to power transformers.

An introductory briefing and analysis on relevant terminology useful to fully understand the technical content of the report is included.

2. Scope

2.1. Technical boundaries

This study considers three-phase and single-phase power transformers (including auto-transformers) with a minimum power rating of 1 kVA used in electricity transmission and distribution networks or for industrial applications with the exception of small and special transformers such as:

- instrument transformers, specifically designed to supply measuring instruments, meters, relays and other similar apparatus
- transformers with low-voltage windings specifically designed for use with rectifiers to provide a DC supply
- transformers specifically designed to be directly connected to a furnace
- transformers specifically designed for offshore applications and floating offshore applications
- single-phase transformers with rated power less than 1 kVA and three-phase transformers less than 5 kVA
- transformers, which have no windings with rated voltage higher than 1 000 V
- traction transformers mounted on rolling stock
- starting transformers
- testing transformers
- welding transformers
- explosion-proof and mining transformers
- transformers for deep water (submerged) applications.

It is to be pointed out that for the INTAS scope and consequently for this report all the transformers above have been considered large products even if the current EN definition (EN 50675) of large power transformers is more stringent.

2.2. Geographical coverage

Through the analysis of EU Regulations, EU Directives and EN standards the results of this study cover the whole EU.

A specific analysis of national legislation not related to EU Directives has been carried out in the EU countries listed in the following table.

Table 1 – EU countries surveyed in terms of national legislation other than the one related to EU Directives.

EU country	INTAS partner
Austria	AEA
Spain	FFII
UK	ECOS
Italy	ECD
France	WSE

3. Background

This section provides some background knowledge and terminology to describe the approach used to carry out this study.

3.1. Terminology

The meaning of the keywords used in this study are shortly discussed hereunder.

3.1.1. Regulation

The term “Regulation” used in this document is defined as in the EU Directive 98/34EC art. 1.

Technical regulations are technical specifications and other requirements, including the relevant administrative provisions, the observance of which is compulsory, de jure or de facto, in the case of marketing or use in a Member State or a major part thereof, as well as laws, regulations or administrative provisions of Member States.

De facto technical regulations include laws, regulations or administrative provisions of a Member State which refer either to technical specifications or other requirements or to professional codes or codes of practice which in turn refer to technical specifications or other requirements and compliance with which confers a presumption of conformity with the obligations imposed by the aforementioned laws, regulations or administrative provisions.

Voluntary agreements to which a public authority is a contracting party and which provide, in the public interest, for compliance with technical specifications or other requirements, excluding public procurement tender specifications have not been considered in the scope of this task.

3.1.2. Test

The term “Test” used in this document includes:

- Information collection
- Document assessment
- Measurement

3.1.3. Alongside

For the aim of this study the term “Alongside” describes the potential synergy with EU Regulation 548/14 in terms of:

- Classification and

- Assessment.

3.1.4. Regulation 1 and Regulation 2

With the scope to shorten the text and reduce the possibility of misunderstanding, in this document the following additional definitions have been used:

- Regulation 1 = Ecodesign Regulation 548/14
- Regulation 2 = any other regulation

3.2. Methodology

The methodology used to approach this study can be described as follow:

- Phase 1: Potentially synergic Other Regulation collection (paragraph 3.2.1)
- Phase 2: Synergy analysis of each potentially synergic other regulation as collected in Phase 1 (paragraph 3.2.23.2.3)
- Phase 3: Synergy assessment of each potentially synergic other regulation as analysed in Phase 2 (paragraph 3.2.3)

3.2.1. Phase 1 - Other Regulation collection

The collection of other potentially synergic regulations (Regulation 2) has been carried out:

- on the basis of discussion with key experts among INTAS partners participating to this work package about EU countries as listed at paragraph 2.2
- on the basis of the experience and the desk research carried out by the partner responsible.

The adopted methodology has not been applied targeting comprehensiveness but with the target of bringing up ideas and possible resource optimization in market surveillance activities.

Key experts were requested

- to provide preliminary list of other potentially synergic regulations on the basis of their experience, skills and knowledge of actual practices
- to populate a form considering in the research both:
 - European legislation (Directives and Regulations) and
 - National legislation

applicable to INTAS group of products primarily focusing on large than very very large product.

To increase the chance of success, a creative approach was used when looking for potentially synergic regulations to be assessed. This approach required not just looking at legislation directly or indirectly applicable on transformers or their parts (see Product in product Type A and B at paragraph 3.2.2.3) but also

at legislation addressing activities or products using or involving or linked to transformers (see Type C at paragraph 3.2.2.3.).

The main subjects considered potentially synergic have been:

- Energy
 - Ecodesign
 - EPBD
- Safety
 - Electrical
 - Fire
- Workplaces
- Environment
 - Noise
 - ROHS
 - PCB

3.2.2. Phase 2 - Synergy analysis

The synergy of each other regulation to be able to be tested alongside Ecodesign testing transformers has been analysed according with the method described in Figure 1.

Primarily for each Regulation 2 judged potentially useful for the scope, the following information has been collected:

- Subject addressed by the regulation
- Reference to the regulation
- Scope of the regulation
- Content of the regulation

Subsequently for each Regulation 2 the following aspects have been analysed:

- Direct or indirect applicability to the large product under investigation (see paragraph 3.2.2.1)
- Foreseen surveillance activities (see paragraph 3.2.2.2)

Finally, for each Regulation 2 the following classification has been adopted:

- Product in product scenario (see paragraph 3.2.2.3)
- Type of synergy (see paragraph 3.2.2.4)

The following paragraphs describe the adopted criteria.

3.2.2.1. Applicability

Direct or indirect applicability to the large product under investigation is evaluated with reference to the scope and the explicit exclusions:

- Is it explicitly mentioned in the scope?
- Is it explicitly mentioned among the exclusions?
- Does the scope include product in product of interest for this analysis (see paragraph 3.2.2.3)?

3.2.2.2. Surveillance activities

The surveillance activities foreseen in each Regulation 2 can be classified in the following terms:

- Does the Regulation 2 foresee mandatory controls and tests?
- Who are the primary and the secondary target of Regulation 2?
 - Manufacturers
 - Distributors
 - Importers
 - Users
 - Installers
 - Designers
- Who is the surveyed subject?
- Who is the surveillance body?

3.2.2.3. Product in product

Product in product situation can be classified in the following scenarios:

- Type A: INTAS product is part of another product that falls under the scope of Regulation 2
- Type B: a product that falls under the scope of Regulation 2 is part of one of INTAS products

A third different scenario has been also considered of interest:

- Type C: INTAS product is frequently found in a given context/application/boundary that falls under the scope of Regulation 2

3.2.2.4. Types of synergies

In the perspective of classification two possible types of synergies have been primarily considered:

- Type 1: the same test once carried out as per Regulation 1, is automatically valid for Regulation 2, i.e. ensure that two identical tests or two identical properties (required by different pieces of regulation) are not tested twice.

- Type 2: two different tests (as per Regulation 1 and Regulation 2) could be carried out in “one single shot”, i.e. to take the opportunity to carry out together the two different tests once the product is under investigation.

However, in a context of resources optimisation and surveillance coverage increase a third option has been considered:

- Type 3: the opportunity to easily add to surveillance activities foreseen in the context of Regulation 2 surveillance activities of interest for Regulation 1 (for power transformers installed in a given context) like:
 - Basic checks (for example document inspection or collection)
 - Data collection.

3.2.3. Phase 3 - Synergy assessment

On the base of the classification and the analysis described at paragraph 3.2.2, the potential synergy assessment has been carried out through a subjective judgement conventionally adopting the following 4 levels:

- H - High level: surveillance per Regulation 2 is mandatory AND
 - INTAS product is directly in the scope of Regulation 2 AND/OR the same test once carried out as per Regulation 1, is automatically valid for Regulation 2 (Type 1) AND/OR two different tests (as per Regulation 1 and Regulation 2) could be carried out in “one single shot” (Type 2).

OR

- INTAS product is frequently found in a given context that falls under the scope of Regulation 2 (Type C) AND there is the opportunity to easily add basic checks and data collection of interest for Regulation 1 (Type 3).
- M - Medium level: surveillance per Regulation 2 is mandatory AND INTAS product is not directly in the scope of Regulation 2 but
 - two different tests (as per Regulation 1 and Regulation 2) could be carried out in “one single shot” (Type 2)

AND

- there is PinP situation (Type A or B) qualitatively and quantitatively meaningful.

- L - Low level: surveillance per Regulation 2 is mandatory AND INTAS product is not directly in the scope of Regulation 2 but
 - two different tests (as per Regulation 1 and Regulation 2) could be carried out in “one single shot” (Type 2)

AND

- there is PinP situation (Type A or B) with a very limited qualitative and/or quantitative meaningful.
- N - no synergies: Surveillance per Regulation 2 is not mandatory OR no PinP situation applies OR no real interest for carrying out Regulation 1 and Regulation 2 together.

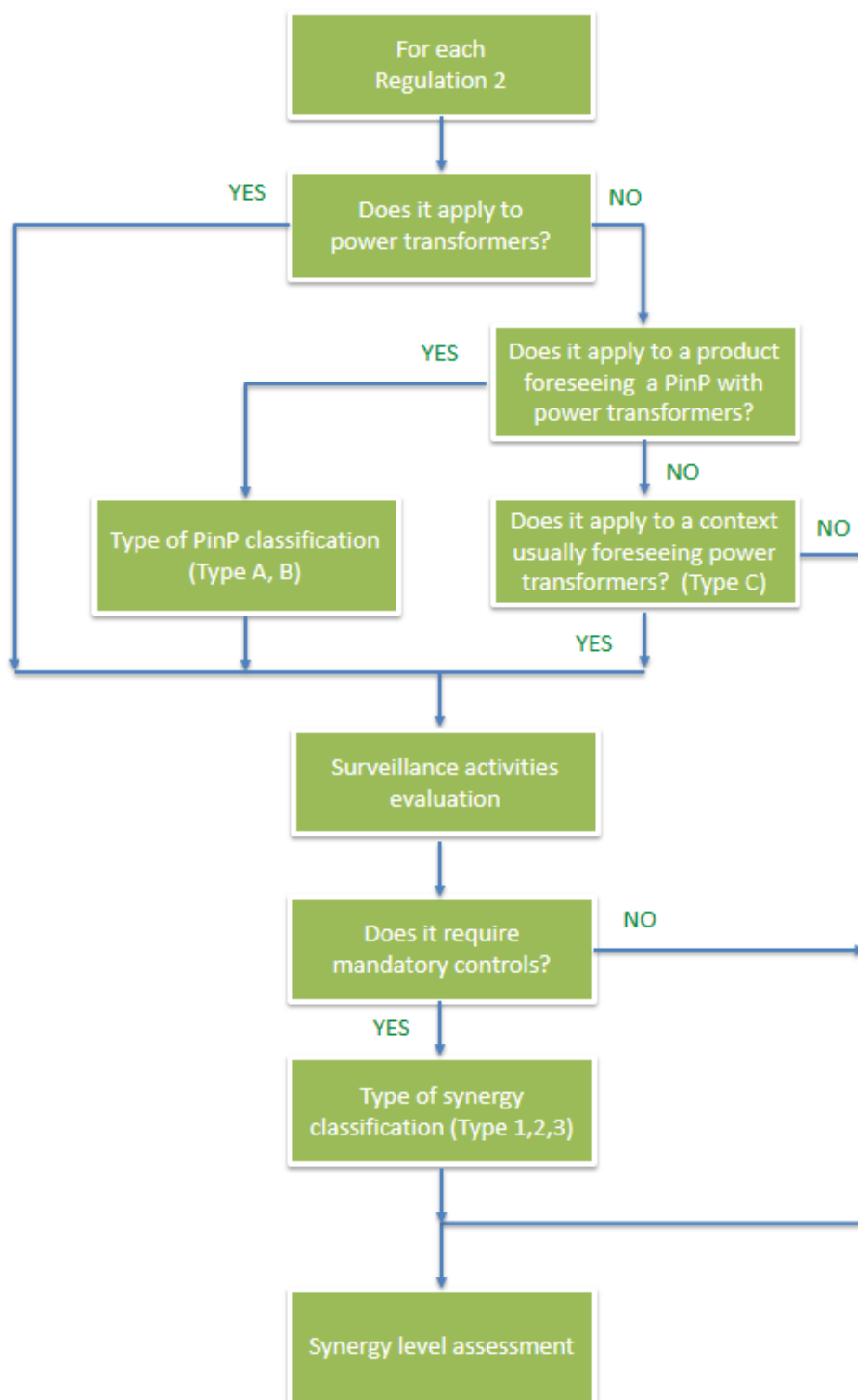


Figure 1 – Flow chart of the method adopted to analyse the collected data.

4. EU Regulations

This section contains the analysis of the EU regulations potentially of interest to be tested alongside Ecodesign testing foreseen for the large product in the scope of this document.

There are some EU Regulations dealing with topics directly or indirectly of interest for large power transformers considered in this document and their subassemblies like cooling and control systems.

The considered regulations are listed in Table 2. The TAG shown in the first column is the unique ID to the document used in this report.

The analysis of each document in the perspective of assessing their potential to be tested alongside Ecodesign testing for the product under investigation is resumed in paragraph 4.1.

The findings in terms of potential interest to consider to test them alongside Ecodesign testing foreseen for the large product in the scope of this document are presented in paragraph 4.2.

Table 2 – List of EU Regulations considered in this study.

TAG	Ref.	Short Title	Original title	Link
#7	548/14	Power transformer regulation	COMMISSION REGULATION (EU) No 548/2014 of 21 May 2014 on implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to small, medium and large power transformers	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32014R0548
#14	305/2011/EU	CPR	REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex:32011R0305
#17	640/2009	Electrical motor Regulation	Commission Regulation (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to Ecodesign requirements for electric motors	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009R0640
#18	327/2011	Fan Regulation	Commission Regulation (EU) No 327/2011 of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW Text with EEA relevance	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011R0327
#21	348/2013	REACH	COMMISSION REGULATION (EU) No 348/2013 of 17 April 2013 amending Annex XIV to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013R0348
#23	1253/2014/EU	Ventilation unit	COMMISSION REGULATION (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for ventilation units	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32014R1253

#28	2017/1369	energy labelling	Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU	http://eur-lex.europa.eu/eli/reg/2017/1369/oj
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4.1. Analysis

The content of each analysed EU Regulation is summarised in Annex A, while their characteristics of interest are analysed in the following tables:

- Table 3 – Analysis of the scope and the exclusions of EU Regulations considered in this study.
- Table 4 – Analysis of targets and main characteristics of surveillance foreseen by EU Regulations considered in this study.
- Table 5 – Analysis of PinP categories and type of synergy classification of EU Regulations considered in this study.

Table 3 – Analysis of the scope and the exclusions of EU Regulations considered in this study.

TAG	Ref.	Short Title	Included
#7	548/14	Power transformer regulation	YES
#14	305/2011/EU	CPR	NO
#17	640/2009	Electrical motor Regulation	NO
#18	327/2011	Fan Regulation	NO
#21	348/2013	REACH	NO
#23	1253/2014/EU	Ventilation unit	NO
#28	2017/1369	Energy labelling	NO

Table 4 – Analysis of targets and main characteristics of surveillance foreseen by EU Regulations considered in this study.

TAG	Ref.	Short Title	1 target	2 target	Surveyed subject	Surveillance body	Mandatory control/test
#7	548/14	Power transformer regulation	Manufacturers, importers	--	Manufacturers, importers	MSA	mandatory
#14	305/2011/EU	CPR	Manufacturers, distributors and importers	Users Installers, Designers	Manufacturers, distributors and importers	Depending on national implementing legislation	mandatory
#17	640/2009	Electrical motor Regulation	Manufacturer, importer	--	Manufacturer, importer	MSA	mandatory
#18	327/2011	Fan Regulation	Manufacturer, importer	--	Manufacturer, importer	MSA	mandatory
#21	348/2013	REACH	Manufacturer, importer	--	Manufacturer, importer	Member States shall maintain a system of official controls and other activities as appropriate to the circumstances	--
#23	1253/2014/EU	Ventilation unit	Manufacturer	--	Manufacturer	MSA	mandatory
#28	2017/1369	Ecodesign and energy labelling	Suppliers, dealers	--	Suppliers, dealers	MSA	mandatory

Table 5 – Analysis of PinP categories and type of synergy classification of EU Regulations considered in this study.

TAG	Ref.	Short Title	PinP Category	Synergy type
#7	548/14	Power transformer regulation	Type A	Type 2
#14	305/2011/EU	CPR	Type C	--
#17	640/2009	Electrical motor Regulation	Type A	Type 2
#18	327/2011	Fan Regulation	Type A, Type B	--
#21	348/2013	REACH	Type A	--
#23	1253/2014/EU	Ventilation unit	Type B	--
#28	2017/1369	Ecodesign and energy labelling	Type A	--

4.2. Findings

The assessment of the potential synergy between each document listed in Table 2 in the perspective to be tested alongside Ecodesign testing for the product under investigation is resumed Table 6.

Table 6 – Assessment of the potential synergy of other EU Regulations.

TAG	Ref.	Short Title	Synergy level	Notes
#14	305/2011/EU	CPR	N	Not applicable
#17	640/2009	Electrical motor Regulation	M	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included in a product already covered by this directive is null (Type B).
#18	327/2011	Fan Regulation	N	Fans used for cooling power transformers are nowadays always outside the scope of the Regulation 327/2011.
#21	348/2013	REACH	N	No mandatory controls by third parties implies NO interest for the scope of this investigation
#23	1253/2014/EU	Ventilation unit	N	The possibility to have Type A as well as Type B PinP is null.
#28	2017/1369	Energy labelling	N	Power transformers and large fans are not covered by a delegated act (https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products)

5. EU directives and related national legislation

This section contains the analysis of the EU directives and national legislation potentially of interest to be tested alongside Ecodesign testing.

There are several EU Directives dealing with topics directly or indirectly of interest for large power transformers considered in this document and their subassemblies like cooling and control systems. EU countries have national legislations implementing these directives.

The considered directives have been listed in Table 7. The TAG shown in the first column is the unique ID to the document used in this report.

The analysis of each document in the perspective of assessing their potential to be tested alongside Ecodesign testing for the product under investigation is resumed in paragraph 5.1.

The findings in terms of potential interest to consider to test them alongside Ecodesign testing foreseen for the large product in the scope of this document are presented in paragraph 5.2.

Table 7 – List of EU Directives and related national legislation considered in this study.

TAG	Ref.	Short Title	Original title	Link
#1	2009/125/EC	Ecodesign	DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for the setting of Ecodesign requirements for energy-related products	http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0125
#2	2014/35/EU	LVD	DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32014L0035
#3	2014/30/EU	EMC	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex:32014L0030
#4	2006/42/EC	Machinery	DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32006L0042
#5	2012/19/EU	RoHS and WEEE	DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012L0019
#6	2014/34/EU	ATEX	DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0034
#8	2014/68/EU	Pressure equipment	DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32014L0068
#9	2014/32/EU	Measuring instruments	DIRECTIVE 2014/32/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments	http://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:32014L0032

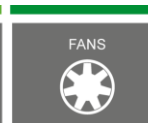
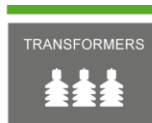
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TAG	Ref.	Short Title	Original title	Link
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	DIRECTIVE 2000/14/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0014
#11	2016 No. 1101 UK	Electrical Equipment (Safety) Regulation	The Electrical Equipment (Safety) Regulations 2016 (implementing the EU LVD)	http://www.legislation.gov.uk/ukxi/2016/1101/contents/made
#12	The Control of Substances Hazardous to Health Regulations 1994 UK	Control of Substances Hazardous	The Control of Substances Hazardous to Health Regulations 1994	http://www.hse.gov.uk/pubns/msa19.htm#a10
#13	The building regulations 2010 UK	Building regulations	Building regulations part J (Fire Safety), VOLUME 2 – BUILDINGS OTHER THAN DWELLINGHOUSES	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441669/BR_PDF_AD_B2_2013.pdf
#19	96/59/EC	PCB disposal directive	Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31996L0059
#20	89/391/EEC	Safety and health of workers at work	Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work	http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31989L0391



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5.1. Analysis

The content of each analysed EU Directive is summarised in Annex B while their characteristics of interest are analysed as follow:

- Table 8 – Analysis of the scope and the exclusions of EU Directives and related national legislation considered in this study.
- Table 9 – Analysis of targets and main characteristics of surveillance foreseen by of EU Directive and related national legislation considered in this study.
- Table 10 – Analysis of PinP categories and type of synergy classification of EU Directive and related national legislation considered in this study.

Table 8 – Analysis of the scope and the exclusions of EU Directives and related national legislation considered in this study.

TAG	Ref.	Short Title	Included
#1	2009/125/EC	Ecodesign	YES
#2	2014/35/EU	LVD	NOT CLEAR*
#3	2014/30/EU	EMC	NOT CLEAR*
#4	2006/42/EC	Machinery	NO
#5	2012/19/EU	RoHS and WEEE	NO
#6	2014/34/EU	ATEX	NO
#8	2014/68/EU	Pressure equipment	NO
#9	2014/32/EU	Measuring instruments	NO
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	NO
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	NOT CLEAR*
#12	The Control of Substances Hazardous to Health Regulations 1994	Control of Substances Hazardous	NO
#13	The building regulations 2010	Building regulations	NO
#19	96/59/EC	PCB disposal directive	NO
#20	89/391/EEC	Safety and health of workers at work	NO

Note: * Power transformers could in principle fall into the scope of the regulation but they are not explicitly mentioned in the scope nor mentioned among the exclusions.

However other documents such as:

- Application Guides issued by EC
- EN technical standards by Cenelec
- Position papers issued by T&D
- Opinions provided by EC official consultant assigned to Cenelec

report conflicting conclusions.

Table 9 – Analysis of targets and main characteristics of surveillance foreseen by of EU Directive and related national legislation considered in this study.

TAG	Ref.	Short Title	1 target	2 target	Surveyed subject	Surveillance body	Mandatory control/test
#1	2009/125/EC	Ecodesign	Manufacturers, importers	--	Manufacturers, importers	MSA	mandatory
#2	2014/35/EU	LVD	Manufacturers, importers, distributors	--	Manufacturers, importers, distributors	MSA	mandatory
#3	2014/30/EU	EMC	Manufacturers, importers, distributors	--	Manufacturers, importers, distributors	MSA	mandatory
#4	2006/42/EC	Machinery	Manufacturers, importers, distributors	--	Manufacturers, importers, distributors	Notified bodies	mandatory
#5	2012/19/EU	RoHS and WEEE	Manufacturers, importers	--	Manufacturers, importers	Depending on national implementing legislation	--
#6	2014/34/EU	ATEX	Manufacturers, importers	--	Manufacturers, importers	Notified bodies	--
#8	2014/68/EU	Pressure equipment	Manufacturer	--	Manufacturer	Notified bodies	mandatory
#9	2014/32/EU	Measuring instruments	Manufacturers, importers, distributors	--	Manufacturers, importers, distributors	MSA	mandatory
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	Manufacturer	--	Manufacturer	MSA	mandatory
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	Manufacturer	--	Authority can intervene if they feel equipment presents a	Health and Safety Executive	mandatory

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TAG	Ref.	Short Title	1 target	2 target	Surveyed subject	Surveillance body	Mandatory control/test
					risk; hinges on CE marking and conformity assessment.		
#12	The Control of Substances Hazardous to Health Regulations 1994	Control of Substances Hazardous	Manufacturer	--	PCBs	--	mandatory
#13	The building regulations 2010	Building regulations	User	--	Defines "Places of special fire hazard" of which 'Oil-filled transformer and switch gear rooms' is first example.	--	mandatory
#19	96/59/EC	PCB disposal directive	User	--	User		mandatory
#20	89/391/EEC	Safety and health of workers at work	Employers	Manufacturer, Installers, Designers	Employers	Depending on national implementing legislation	mandatory

Table 10 – Analysis of PinP categories and type of synergy classification of EU Directive and related national legislation considered in this study.

TAG	Ref.	Short Title	PinP Category	Synergy Type
#1	2009/125/EC	Ecodesign	Type A	Type 2
#2	2014/35/EU	LVD	Type A	Type 2
#3	2014/30/EU	EMC	Type A	Type 2
#4	2006/42/EC	Machinery	Type A	--
#5	2012/19/EU	RoHS and WEEE	Type A	--
#6	2014/34/EU	ATEX	Type A	--
#8	2014/68/EU	Pressure equipment	Type A	Type 2
#9	2014/32/EU	Measuring instruments	Type A	--
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	Type A	--
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	Type A	Type 2
#12	The Control of Substances Hazardous to Health Regulations 1994	Control of Substances Hazardous	Type A	Type 2
#13	The building regulations 2010	Building regulations	Type C	Type 2
#19	96/59/EC	PCB disposal directive	Type A	--
#20	89/391/EEC	Safety and health of workers at work	Type C	Type 2

5.2. Findings

The assessment of the potential synergy between each document listed in Table 7 in the perspective to be tested alongside Ecodesign testing for the product under investigation is resumed in Table 11.

Table 11 – Assessment of the potential synergy of EU directives and related national legislation.

TAG	Ref.	Short Title	Synergy level	Notes
#1	2009/125/EC	Ecodesign	H	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included in a product already covered by this directive is null (Type B).
#2	2014/35/EU	LVD	M	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included

TAG	Ref.	Short Title	Synergy level	Notes
				in a product already covered by this directive is null (Type B). It is not yet explicitly defined if power transformers are excluded or included in the scope of this Directive.
#3	2014/30/EU	EMC	L	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included in a product already covered by this directive is null (Type B). It is not yet explicitly defined if power transformers are excluded or included in the scope of this Directive.
#4	2006/42/EC	Machinery	N	Power transformers are formally excluded and no practical reason to have synergy for testing in terms of PinP (Type A and Type B)
#5	2012/19/EU	RoHS and WEEE	N	No mandatory controls by third parties implies NO interest for the scope of this investigation
#6	2014/34/EU	ATEX	N	No mandatory controls by third parties implies NO interest for the scope of this investigation
#8	2014/68/EU	Pressure equipment	L	Usually the large product of interest for this document is not included in and does not include any product falling into the scope of this regulation.
#9	2014/32/EU	Measuring instruments	N	The possibility to have Type A as well as Type B PinP is null.
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	N	Power transformers are not listed in the art. 12 and 13.
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	M	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included in a product already covered by this directive is null (Type B). It is not yet explicitly defined if power transformers are excluded or included in the scope of this regulation
#12	The Control of Substances Hazardous to Health Regulations 1994	Control of Substances Hazardous	L	The synergy is due to the possibility to have other products covered by this document included into the transformer (Type A). The possibility to have a power transformer included in a product already covered by this directive is null (Type B).
#13	The building regulations	Building regulations	M	The synergy is due to the possibility to have the large product of interest in this document in a

TAG	Ref.	Short Title	Synergy level	Notes
	2010			context subject to this regulation (Type C).
#19	96/59/EC	PCB disposal directive	N	Oil in transformers is considered 'in use' and not 'in storage' and so transformers are generally exempt, even if the TRF is being stored prior to use. In Scotland: Water Environment (Oil Storage) Regulations 2006
#20	89/391/EEC	Safety and health of workers at work	M	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).

6. Other national legislation

This section reports the analysis of some EU national legislation other than the ones linked to an EU directive potentially of interest to be tested alongside Ecodesign testing.

There are several areas subjected to EU national legislation dealing with topics directly or indirectly linked to contexts or applications typically involving/having power transformers like the ones considered in this document.

The following areas have been considered:

- Fire codes
- Electrical installation safety codes

The other national legislation considered by this study have been listed in Table 12. The TAG shown in the first column is the unique ID to the document used in this report.

The analysis of each document in the perspective of assessing their potential to be tested alongside Ecodesign testing for the product under investigation is resumed in paragraph 6.1.

The findings in terms of potential interest to consider to test them alongside Ecodesign testing foreseen for the large product in the scope of this document are presented in paragraph 6.2.

Table 12 – List of the other national legislation considered in this study.

TAG	Ref.	Short Title	Original title	Link
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	The Control of Pollution (Oil Storage) (England) Regulations 2001	http://www.oilstorageregs.co.uk/
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión y sus Instrucciones Técnicas Complementarias ITC-RAT 01 a 23	https://www.boe.es/boe/dias/2014/06/09/pdfs/BOE-A-2014-6084.pdf
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	Regola tecnica di prevenzione incendi per la progettazione, l'installazione e l'esercizio delle macchine elettriche fisse con presenza di liquidi isolanti combustibili in quantità superiore ad 1 m3	http://www.gazzettaufficiale.it/eli/id/2014/08/05/14A06181/sq

6.1. Analysis

The content of each analysed EU Directive is summarised in Annex C while their characteristics of interest are analysed in the following tables:

- Table 13 – Analysis of the scope and the exclusions of the other national legislation considered in this study.
- Table 14 – Analysis of targets and main characteristics of surveillance foreseen by the other national legislation considered in this study.
- Table 15 – Analysis of PinP categories and type of synergy classification of the other national legislation considered in this study.

Table 13 – Analysis of the scope and the exclusions of the other national legislation considered in this study.

TAG	Ref.	Short Title	Included
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	NO
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	NO
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	NO

Table 14 – Analysis of targets and main characteristics of surveillance foreseen by the other national legislation considered in this study.

TAG	Ref.	Short Title	1 target	2 target	Surveyed subject	Surveillance body	Mandatory control/test
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	User	--	Storage of oil	--	mandatory
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	User	--	Safety of installation and components	National Authority and regional Authority	mandatory
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	User	--	User	Fire brigades	mandatory



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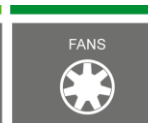
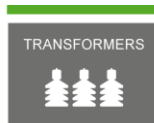


Table 15 – Analysis of PinP categories and type of synergy classification of the other national legislation considered in this study.

TAG	Ref.	Short Title	PinP Category	Synergy Type
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	Type A	--
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	Type C	Type 3
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	Type C	Type 3



6.2. Findings

The assessment of the potential synergy between each document listed in Table 12 in the perspective to be tested alongside Ecodesign testing for the product under investigation is resumed in Table 16.

Table 16 – Assessment of the potential synergy of other national legislation.

TAG	Ref.	Short Title	Synergy level	Notes
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	N	Oil in transformers is considered 'in use' and not 'in storage' and so transformers are generally exempt, even if the TRF is being stored prior to use. In Scotland: Water Environment (Oil Storage) Regulations 2006
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	H	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	H	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).

7. Voluntary certification schemes

This section contains the analysis of voluntary certification schemes potentially of interest to be tested alongside Ecodesign testing.

There are several voluntary certification schemes dealing with areas directly or indirectly linked to contexts or applications typically involving/having power transformers like the ones considered in this document.

The following areas have been considered:

- Quality assurance ISO EN 9000
- Environment 14000
- Energy management systems ISO EN 50001
- Social responsibility ISO 26000

The characteristic of each analysed area is shortly resumed in Annex A4.

The analysis of each area in the perspective of assessing their potential to be tested alongside Ecodesign testing for the product under investigation is resumed at paragraph 7.1.

Table 17 – List of voluntary certification schemes considered in this study.

TAG	Ref.	Short Title	Original title	Link
#24	ISO EN 9001	Quality management	Quality management systems -- Requirements	https://www.iso.org/standard/62085.html
#25	ISO EN 14001	Environmental management	Environmental management systems -- Requirements with guidance for use	https://www.iso.org/standard/60857.html
#26	ISO EN 50001	Energy management systems	Energy management systems -- Requirements with guidance for use	https://www.iso.org/standard/51297.html
#27	ISO EN 26000	Social Responsibility	Guidance on social responsibility	https://www.iso.org/standard/42546.html

7.1. Analysis

The content of each analysed certification scheme is summarised in the following paragraphs while their characteristics of interest are analysed in the following tables:

- Table 18 – Analysis of the scope and the exclusions of voluntary certification schemes considered in this study.
- Table 19 – Analysis of targets and main characteristics of surveillance foreseen by voluntary certification schemes considered in this study.
- Table 20 – Analysis of PinP categories and type of synergy classification of voluntary certification schemes considered in this study.

Table 18 – Analysis of the scope and the exclusions of voluntary certification schemes considered in this study.

TAG	Ref.	Short Title	Included
#24	ISO EN 9001	Quality management	NO
#25	ISO EN 14001	Environmental management	NO
#26	ISO EN 50001	Energy management systems	NO
#27	ISO EN 26000	Social Responsibility	NO

Table 19 – Analysis of targets and main characteristics of surveillance foreseen by voluntary certification schemes considered in this study.

TAG	Ref.	Short Title	1 target	2 target	Surveyed subject	Surveillance body	Mandatory control/test
#24	ISO EN 9001	Quality management	Manufacturers, Users, Organisations	--	Manufacturers, Users, Organisations	Certification bodies	Voluntary
#25	ISO EN 14001	Environmental management	Manufacturers, Users, Organisations	--	Manufacturers, Users, Organisations	Certification bodies	Voluntary
#26	ISO EN 50001	Energy management systems	Manufacturers, Users, Organisations	--	Manufacturers, Users, Organisations	Certification bodies	Voluntary
#27	ISO EN 26000	Social Responsibility	Manufacturers, Users, Organisations	--	--	--	--

Table 20 – Analysis of PinP categories and type of synergy classification of voluntary certification schemes considered in this study.

TAG	Ref.	Short Title	PinP Category	Type
#24	ISO EN 9001	Quality management	Type C	Type 3
#25	ISO EN 14001	Environmental management	Type C	Type 3
#26	ISO EN 50001	Energy management systems	Type C	Type 3
#27	ISO EN 26000	Social Responsibility	Type C	--

7.2. Findings

The assessment of the potential synergy between each document listed in Table 17 in the perspective to be tested alongside Ecodesign testing for the product under investigation is resumed in Table 21.

Table 21 – Assessment of the potential synergy of other voluntary certification schemes.

TAG	Ref.	Short Title	Synergy level	Notes
#24	ISO EN 9001	Quality management	H	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).
#25	ISO EN 14001	Environmental management	H	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).
#26	ISO EN 50001	Energy management systems	H	The synergy is due to the possibility to have the large product of interest in this document in a context subject to this regulation (Type C).
#27	ISO EN 26000	Social Responsibility	N	No mandatory controls by third parties implies NO interest for the scope of this investigation

8. Conclusions

Table 22 lists the most promising regulations to be tested alongside Ecodesign testing for the product under investigation.

As compendium to the content of the table it is useful to mention that:

- a. The large product under investigation does not fall in any other regulation in force except for the general Ecodesign Directive 125/2009;
- b. There is no case of Type 1 synergy where the same test once carried out as per Regulation 1 is automatically valid for Regulation 2 or vice versa (i.e. ensure that two identical tests or two identical properties (required by different pieces of regulation) are not tested twice);
- c. There are two main cases:
 1. a large product in the scope of this document is under surveillance
 2. another product covered by another regulation is under surveillance

In case 1 the synergy is represented by an additional possibility to test the other product found together with the large product in the scope of this document.

In case 2 the synergy is represented only by the possibility to collect data and carry out a document inspection on the power transformer as there is not any (technical or economic) sense to carry out real measurements on the large product simply based on the fact that it was found together with another (small) product under surveillance. In other words, there is no synergy possible when it comes to real measurements as the problem of testing large products is related to their (large) size irrespective of the fact they may be associated with other smaller products under market surveillance

- d. In the case of EU directives and related national legislations (i.e. national regulations covering the same subject in a given country) as well as other national legislations (i.e. regulations covering only a specific country) the findings are to be considered with reference more to the covered area than to the specific document (see Note 1)
- e. A coverage larger than EU would represent the possibility to use the corresponding Regulation 2 as an informal leverage for increasing de facto controls all around the world on manufactures exporting their products to EU (see Note 1)
- f. In some case the surveyed subjects or the surveillance bodies of Regulation 1 and Regulation 2 differ (see Note 2)
- g. All the regulations related to voluntary certification schemes, exactly because they are voluntary and therefore driven by the market (i.e. the customers), could act as a strong and diffused leverage for document inspections in the interest of Regulation 2 (see Note 3);

- h. The following synergies do not show any concrete and real option to test other regulations alongside Ecodesign testing for transformers:
- synergies lying in staff skills, equipment for inspection/testing, physical location and handling of the product under test, commonality or similarity of the parameters being assessed, the point of inspection in the manufacturing/delivery timeline with regards making an Ecodesign assessment;
 - apparent scope for Ecodesign parameters to be assessed alongside the other requirement being inspected anyway, where staff are likely to have highly relevant skills, insight and equipment to make Ecodesign assessments, such that added costs are low and so joint assessment could be attractive.

Additional notes:

1. Because of lack of legal basis to have Regulation 1 controls alongside those foreseen by the Regulation 2, nor at national level nor at EU level nor at worldwide level, these Regulations 2 only represent opportunities to push minimal controls (for example doc collections and examinations) of interested for the large product Ecodesign in the same context in all the EU countries as well as worldwide (for voluntary regulations only).
2. Because of lack of legal basis to delegate controls requested by regulation 1 to the body having in charge the controls required by regulation 2, without any new legal enforcement, these Regulations 2 only represent opportunities to add minimal controls (for example doc collections and examinations) of interested for the large product Ecodesign.
3. Experiences mentioned by experts shown positive effects of controls not related to the scope of the voluntary regulation but included de facto into the check list of certification bodies (for example, in Italy the inclusion of the work safety issues related to DLgs 81/08 - former DLgs 626/94 - into the check list of certification bodies for ISO 9001)

The main conclusion of this study is that there are no real options to conduct combined multiple testing for Ecodesign market surveillance and other relevant regulations.

However, two promising synergic effects among different regulations have been identified:

- the leverage resulting from carrying out surveillance of two regulations together. This leverage is mainly due to the enlargement of the basis of the surveyed perimeter. The synergy is realistically limited to the possibility to collect data and carry out document inspections. A side effect may also be the dissemination of the two regulations together;
- the possibility to delegate document inspections to other official bodies in charge of controls in contexts typically having the large INTAS product installed (even if the subject under surveillance is different).

These suggested approaches should be implemented in conjunction with classical traditional testing activities by MSA as foreseen by each separated regulation.

Among all the options, voluntary certification schemes (not necessarily related to the subject in the scope of Regulation 1) seem to be the most promising.

It is to be pointed out that no differences in the conclusions have been identified for power transformers in comparison to large fans (D3.4). A reason for this is related to the fact that the only promising synergies are just conceptual considering the lack of real options to test together or all at once the product under examination.

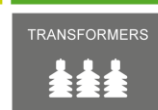


Table 22 – Most promising Regulations 2 to be tested alongside Ecodesign testing for the product under investigation.

TAG	Ref.	Short Title	Coverage	Surveyed subject	Surveill. body	Mandatory control/test	PT into the scope	PinP Category	Synergy class	Synergy level
#1	2009/125/EC	Ecodesign	EU	Manufacturers, importers	MSA	mandatory	yes	Type A	Type 2	H
#2	2014/35/EU	LVD	EU	Manufacturers, importers, distributors	MSA	mandatory	not clear*	Type A	Type 2	M
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	UK	Manufacturers, importers, distributors	Health and Safety Executive	Authority can intervene if they feel equipment presents a risk; hinges on CE marking and conformity assessment	not clear*	Type A	Type 2	M
#13	The building regulations 2010	Building regulations	UK	"Places of special fire hazard" of which 'Oil-filled transformer and switch gear rooms' is first example.	Legal Authority	mandatory	no	Type C	Type 3	H
#16	R.D.337/2014 ES	Regulation on technical conditions and safety	M	The synergy is due to the possibility to have the large	Organismos de Control Habilitados Real Decreto	mandatory	no	Type C	Type 3	H

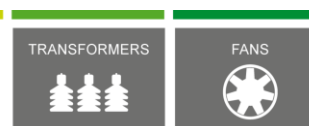


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		warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23		product of interest in this document in a context subject to this regulation (Type C).	2200/1995					
#17	640/2009	Electrical motor Regulation	EU	Manufacturer, importer	MSA	mandatory	no	Type A	Type 2	M
#20	89/391/EEC	Safety and health of workers at work	EU	Employers	Depending on countries	Depending on countries	no	Type C	Type 2	M
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	IT	User	Fire brigades	mandatory	no	Type C	Type 3	H
#24	ISO EN 9001	Quality management	World	Manufacturers, Users, Organisations	Certification bodies	Voluntary	no	Type C	Type 3	H
#25	ISO EN 14001	Environmental management	World	Manufacturers, Users, Organisations	Certification bodies	Voluntary	no	Type C	Type 3	H
#26	ISO EN 50001	Energy management systems	World	Manufacturers, Users, Organisations	Certification bodies	Voluntary	no	Type C	Type 3	H



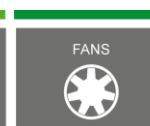
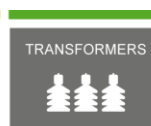
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Note: * see Table 8 – Analysis of the scope and the exclusions of EU Directives and related national legislation considered in this study.



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Annex A:

Regulation 2 main content of interest

This annex contains:

- the summaries
- the scopes
- the explicit exclusion

of the Regulations 2 considered in this study.



A1. EU Regulations summaries

A1.1 Regulation (EU) 2017/1369 for energy labelling

This Regulation lays down a framework that applies to energy-related products ('products') placed on the market or put into service. It provides for the labelling of those products and the provision of standard product information regarding energy efficiency, the consumption of energy and of other resources by products during use and supplementary information concerning products, thereby enabling customers to choose more efficient products in order to reduce their energy consumption.

This Regulation does not apply to:

- second-hand products, unless they are imported from a third country;
- means of transport for persons or goods.

A1.2 Regulation (EC) 640/2009 for electric motors Ecodesign

This Regulation establishes Ecodesign requirements for the placing on the market and for the putting into service of motors, including where integrated in other products.

A1.3 Regulation (EU) 548/2014 for power transformers Ecodesign

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

A1.4 Regulation (EU) 327/2011 for fans Ecodesign

This Regulation establishes Ecodesign requirements for the placing on the market or putting into service of fans, including those integrated in other energy-related products as covered by Directive 2009/125/EC.

A1.5 Regulation (EU) 348/2013 - REACH

The REACH (registration, evaluation, authorisation and restriction of chemicals) regulation provides a comprehensive legislative framework for chemicals manufacture and use in Europe. It shifts from public authorities to the industry the responsibility for ensuring that chemicals produced, imported, sold and used in the EU are safe.

A1.6 Regulation (EU) 1253/2014 – Ventilation units Ecodesign

This Regulation applies to ventilation units and establishes Ecodesign requirements for their placing on the market or putting into service.

A1.7 Regulation (EU) 305/2011 – CPR

This Regulation sets out the conditions for the marketing of construction products. It also defines criteria for assessing the performance of such products, and the conditions of use for CE marking.



Table 23 – Scope and explicit exclusions of EU Regulations considered in this study.

TAG	Ref.	Short Title	Scope	Explicit exclusions
#7	548/14	Power transformer regulation	This Regulation establishes Ecodesign requirements for placing on the market or putting into service power transformers with a minimum power rating of 1 kVA used in 50 Hz electricity transmission and distribution networks or for industrial applications. The Regulation is only applicable to transformers purchased after the entry into force of the Regulation.	This Regulation shall not apply to transformers specifically designed and used for the following applications: — instrument transformers, specifically designed to supply measuring instruments, meters, relays and other similar apparatus, — transformers with low-voltage windings specifically designed for use with rectifiers to provide a DC supply, — transformers specifically designed to be directly connected to a furnace, — transformers specifically designed for offshore applications and floating offshore applications, — transformers specially designed for emergency installations, — transformers and auto-transformers specifically designed for railway feeding systems, — earthing or grounding transformers, this is, three-phase transformers intended to provide a neutral point for system grounding purposes, — traction transformers mounted on rolling stock, this is, transformers connected to an AC or DC contact line, directly or through a converter, used in fixed installations of railway applications, — starting transformers, specifically designed for starting three-phase induction motors so as to eliminate supply voltage dips, — testing transformers, specifically designed to be used in a circuit to produce a specific voltage or current for the purpose of testing electrical equipment, — welding transformers, specifically designed for use in arc



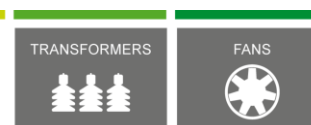
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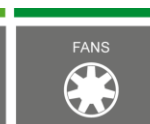
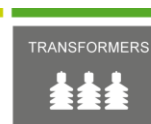
TAG	Ref.	Short Title	Scope	Explicit exclusions
				welding equipment or resistance welding equipment, — transformers specifically designed for explosion-proof and underground mining applications (2), — transformers specifically designed for deep water (submerged) applications, — medium Voltage (MV) to Medium Voltage (MV) interface transformers up to 5 MVA, — large power transformers where it is demonstrated that for a particular application, technically feasible alternatives are not available to meet the minimum efficiency requirements set out by this Regulation, — large power transformers which are like for like replacements in the same physical location/installation for existing large power transformers, where this replacement cannot be achieved without entailing disproportionate costs associated to their transportation and/or installation, except as regards the product information requirements and technical documentation set out in Annex I, points 3 and 4
#14	305/2011/EU	CPR	This Regulation lays down conditions for the placing or making available on the market of construction products by establishing harmonized rules on how to express the performance of construction products in	--



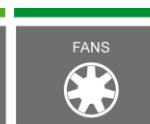
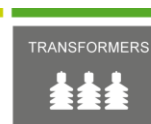
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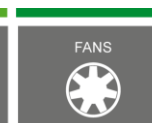
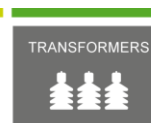
TAG	Ref.	Short Title	Scope	Explicit exclusions
			relation to their essential characteristics and on the use of CE marking on those products.	
#17	640/2009	Electrical motor Regulation	This Regulation establishes Ecodesign requirements for the placing on the market and for the putting into service of motors, including where integrated in other products.	This Regulation shall not apply to: (a) motors designed to operate wholly immersed in a liquid; (b) motors completely integrated into a product (for example gear, pump, fan or compressor) of which the energy performance cannot be tested independently from the product; (c) motors specifically designed to operate: (i) at altitudes exceeding 1 000 meters above sea-level; (ii) where ambient air temperatures exceed 40 °C; (iii) in maximum operating temperature above 400 °C; (iv) where ambient air temperatures are less than – 15 °C for any motor or less than 0 °C for a motor with air cooling; (v) where the water coolant temperature at the inlet to a product is less than 5 °C or exceeding 25 °C; (vi) in potentially explosive atmospheres as defined in Directive 94/9/EC of the European Parliament and of the Council (5); (d) brake motors; except as regards the information requirements of Annex I, points 2(3) to (6) and (12).
#18	327/2011	Fan Regulation	This Regulation establishes Ecodesign requirements for the placing on the market or putting into service of fans, including those	The Regulation shall not apply to fans integrated in: (i) products with a sole electric motor of 3 kW or less where the fan is fixed on the same shaft used for driving the main functionality; (ii) laundry and washer dryers ≤ 3 kW maximum electrical input power;



TAG	Ref.	Short Title	Scope	Explicit exclusions
			integrated in other energy-related products as covered by Directive 2009/125/EC.	<p>(iii) kitchen hoods < 280 W total maximum electrical input power attributable to the fan(s).</p> <p>3. This Regulation shall not apply to fans which are:</p> <p>(a) designed specifically to operate in potentially explosive atmospheres as defined in Directive 94/9/EC of the European Parliament and of the Council (6);</p> <p>(b) designed for emergency use only, at short-time duty, with regard to fire safety requirements set out in Council Directive 89/106/EC (7);</p> <p>(c) designed specifically to operate:</p> <p>(i)</p> <p>(a) where operating temperatures of the gas being moved exceed 100 °C;</p> <p>(b) where operating ambient temperature for the motor, if located outside the gas stream, driving the fan exceeds 65 °C;</p> <p>(ii) where the annual average temperature of the gas being moved and/or the operating ambient temperature for the motor, if located outside the gas stream, are lower than – 40 °C;</p> <p>(iii) with a supply voltage > 1 000 V AC or > 1 500 V DC;</p> <p>(iv) in toxic, highly corrosive or flammable environments or in environments with abrasive substances;</p> <p>(d) placed on the market before 1 January 2015 as replacement for identical fans integrated in products which were placed on the market before 1 January 2013; except that the packaging, the product information and the technical documentation must clearly indicate regarding (a), (b) and (c) that the fan shall only be used for the purpose for which it is designed and regarding (d) the product(s) for which it is intended.</p>

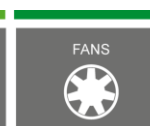
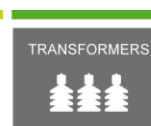


TAG	Ref.	Short Title	Scope	Explicit exclusions
#21	348/2013	REACH	Chemicals	<p>This Regulation shall not apply to:</p> <p>(a) radioactive substances within the scope of Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (26);</p> <p>(b) substances, on their own, in a preparation or in an article, which are subject to customs supervision, provided that they do not undergo any treatment or processing, and which are in temporary storage, or in a free zone or free warehouse with a view to re-exportation, or in transit;</p> <p>(c) non-isolated intermediates;</p> <p>(d) the carriage of dangerous substances and dangerous substances in dangerous preparations by rail, road, inland waterway, sea or air.</p>
#23	1253/2014 /EU	Ventilation unit	This Regulation applies to ventilation units and establishes Ecodesign requirements for their placing on the market or putting into service.	<p>This Regulation shall not apply to ventilation units which:</p> <p>(a) are unidirectional (exhaust or supply) with an electric power input of less than 30 W, except for information requirements;</p> <p>(b) are bidirectional, with a total electric power input for the fans of less than 30 W per air stream, except for information requirements;</p> <p>(c) are axial or centrifugal fans only equipped with a housing in terms of Regulation (EU) No 327/2011;</p> <p>(d) are exclusively specified as operating in a potentially explosive atmosphere as defined in Directive 94/9/EC of the European Parliament and of the Council (5);</p> <p>(e) are exclusively specified as operating for emergency use, for short periods of time, and which comply with the basic</p>



TAG	Ref.	Short Title	Scope	Explicit exclusions
				<p>requirements for construction works with regard to safety in case of fire as set out in Regulation (EU) No 305/2011 of the European Parliament and of the Council (6);</p> <p>(f) are exclusively specified as operating:</p> <p>(i) where operating temperatures of the air being moved exceed 100 °C;</p> <p>(ii) where the operating ambient temperature for the motor, if located outside the air stream, driving the fan exceeds 65 °C;</p> <p>(iii) where the temperature of the air being moved or the operating ambient temperature for the motor, if located outside the air stream, are lower than – 40 °C;</p> <p>(iv) where the supply voltage exceeds 1 000 V AC or 1 500 V DC;</p> <p>(v) in toxic, highly corrosive or flammable environments or in environments with abrasive substances;</p> <p>(g) include a heat exchanger and a heat pump for heat recovery or allowing heat transfer or extraction being additional to that of the heat recovery system, except heat transfer for frost protection or defrosting;</p> <p>(h) are classified as range hoods covered by Commission Regulation (EU) No 66/2014 (7) on kitchen appliances.</p>
#28	2017/1369	energy labelling	This Regulation lays down a framework that applies to energy-related products ('products') placed on the market or put into service. It provides for	<p>This Regulation does not apply to:</p> <p>(a) second-hand products, unless they are imported from a third country;</p> <p>(b) means of transport for persons or goods.</p>

TAG	Ref.	Short Title	Scope	Explicit exclusions
			the labelling of those products and the provision of standard product information regarding energy efficiency, the consumption of energy and of other resources by products during use and supplementary information concerning products, thereby enabling customers to choose more efficient products in order to reduce their energy consumption.	



A2. EU Directives and related national legislation summaries

A2.1 EU Ecodesign Directive 2009/125/EC

The European Union's Ecodesign Directive (Directive 2009/125/EC) establishes a framework to set mandatory requirements for energy-using and energy-related products sold in all 28 Member States. Its scope currently covers more than 40 product groups (such as boilers, lightbulbs, TVs and fridges and also power transformers and fans, which are responsible for around 40% of all EU greenhouse gas emissions).

The 2009 revision of the Directive extended its scope to energy-related products such as windows, insulation materials and certain water-using products.

The ultimate aim of the Ecodesign Directive is that manufacturers of energy-using products will, at the design stage, be obliged to reduce the energy consumption and other negative environmental impacts of products. While the Directive's primary aim is to reduce energy use, it is also aimed at enforcing other environmental considerations including: materials use; water use; polluting emissions; waste issues and recyclability.

The Ecodesign Directive is a framework directive, meaning that it does not directly set minimum requirements. These are adopted through specific implementing measures for each group of products in the scope of the Directive. The implementing measures are adopted through the so-called comitology procedure. Implementing measures are based on EU internal market rules governing which products may be placed on the market. Manufacturers who begin marketing an energy related product covered by an implementing measure in the EU area have to ensure that it conforms to the energy and environmental standards set out by the measure.

In practice, the introduction of a new minimum requirement results in effectively banning all non-compliant products from being sold in the EU, improving product quality and significantly contributing to the EU's energy efficiency objective.

The implementing measures focus on those products which have a high potential for reducing greenhouse gas emissions at low cost, through reduced energy demand.

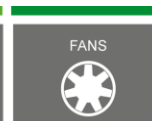
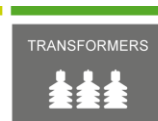
The first Working Plan of the Ecodesign Directive was adopted on 21 October 2008.

Both ventilation systems and power transformers are covered.

A2.2 Low Voltage Directive (LVD) 2014/35/EU

The first Low Voltage Directive (LVD) (Now 2014/35/EU) is one of the oldest Single Market Directives adopted by the European Union before the "New" or "Global" Approach. The Directive provides common broad objectives for safety regulations, so that electrical equipment approved by any EU member country will be acceptable for use in all other EU countries. The Low Voltage Directive does not supply any specific technical standards that must be met, instead relying on IEC technical standards to guide designers to produce safe products. Products that conform to the general principles of the Low Voltage Directive and the relevant particular safety standards are marked with the CE marking to indicate compliance and acceptance throughout the EU. Conformance is asserted by the manufacturer based on its conformity assessment.

The directive covers electrical equipment with a voltage at input or output terminals between 50 and 1000 V for alternating current (AC) or between 75 and 1500 V for direct current (DC). Importantly, it does not cover



voltages within equipment. The directive does not cover components (broadly, this refers to individual electronic components).

Certain classes of equipment, covered by other technical standards, are listed in Annex III of the Directive as excluded from its scope. These items include medical devices, electricity meters, railway or maritime equipment, and electrical plugs and sockets for domestic use.

In May 2016 it has not yet clarified definitively if a power transformer with a LV winding is to be considered or not in the scope of this Directive.

The Directive is implemented in European countries by national laws.

A2.3 EMC directive 2014/30/EU

On 20 April 2016, Directive 2004/108/EC is replaced with 2014/30/EU. The new Directive makes very little practical difference to the requirements or procedures which manufacturers must apply to products and is mainly intended to clarify the obligations of importers and distributors to bring the Directive into line with the other consumer product related directives.

In essence the requirements of the Directive are very simple - it basically states that products must not emit unwanted electromagnetic pollution (interference) and, because there is a certain amount of electromagnetic pollution in the environment, that products must be immune to a reasonable amount of interference. The Directive itself gives no figures or guidelines on what the required level of emissions or immunity are, nor does it state the frequency band limits. This interpretation of the Directive's requirements is left to the standards that are used to demonstrate compliance with the Directive.

In addition to these essential protection requirements, the Directive requires the manufacturer to compile technical documentation which shows that the essential requirements have been met, to put the CE logo on the product and to complete a Declaration of Conformity. Manufacturers must also identify themselves on the equipment and ensure that, where necessary, instructions are supplied to ensure that the use of the equipment meets the essential protection requirements.

The Directive has a very wide application, but it's important to highlight that the scope includes only products "intended for the end user" meaning that products which are intended for incorporation into other products are not within the scope of the Directive, unless that incorporation is done by the end user.

With reference to power transformer subassemblies the application of the directive has never been definitively cleared.

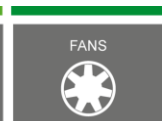
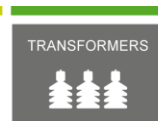
In order to show that a product complies with the essential requirements, its manufacturer is required to complete an 'EMC assessment' which provides a record of a technical analysis justifying a manufacturer's claim of compliance.

Tests are an alternative to an assessment. Tests are not mandatory under the Directive but it can often be difficult to be sure of a product's EMC performance without them. Even where testing is useful, the tests can be performed by a manufacturer in house, they do not have to be performed by a Notified Body.

For the purposes of being able to test whether or not equipment complies with the Directive, tests are divided into five classes:



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- Radiated emissions - Checks to ensure that the product does not emit unwanted radio signals;
- Conducted emissions - Checks to ensure the product does not send out unwanted signals along its supply connections and connections to any other apparatus;
- Radiated susceptibility - Checks that the product can withstand a typical level of radiated electromagnetic pollution;
- Conducted susceptibility - Checks that the product can withstand a typical level of noise on the power and other connections.
- Electrostatic discharge - Checks that the product is immune to a reasonable amount of static electricity.
- Other tests, such as mains harmonics and 'dips and flicker' can be considered as subsets of these five categories.

Definitions of the levels above which emissions are defined as unwanted or below which pollution and noise are accepted as being reasonable are contained in the relevant test standards. The manufacturer (and any test house performing tests on the equipment) must agree on which of the various standards for each category apply to the product in question. Since the different standards have different levels for emissions or immunity, it would theoretically be possible for the same product to be acceptable in one application but not in another - for instance noise emission levels acceptable in an industrial environment may be excessive when created in a domestic setting. In practice the scope of the different standards is fairly clearly defined, but even so it is important for manufacturers or importers of products to have a good idea of where they are intending their product to be used.

While the essence of the Directive is, of course, to ensure that products meet the essential protection requirements for immunity and emissions, the Directive also has certain administrative requirements. These are as follows:

Compile technical documentation - the manufacturer must produce a file of evidence which describes the product and how it is shown to comply with the Directive. This will typically include information on how to identify the equipment, a copy of the instructions, the EMC assessment, and any test data.

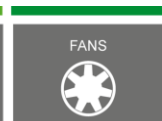
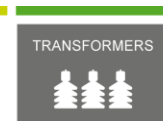
Control of production - although tests may be performed on a sample of the equipment, the Directive requires that all units produced comply with its requirements. The manufacturer will need appropriate quality control procedures accordingly.

Sign a Declaration of Conformity - the manufacturer must sign a document to identify the equipment and confirm the steps they have taken to comply with the Directive. This document is kept on file by the manufacturer - it does not need to be sent to any official body (although sometimes customers may ask to see it).

Put the CE logo on the product - it must be put on the equipment, or on its packaging or instructions.

Power transformer are out of the scope of this Directive but may incorporate devices in the scope of this Directive.

The Directive is implemented in European countries by national laws.



A2.4 Directive 2006/42/EC –Machinery

Directive 2006/42/EC is a revised version of the Machinery Directive, the first version of which was adopted in 1989. The new Machinery Directive has been applicable since 29th December 2009. The Directive has the dual aim of harmonising the health and safety requirements applicable to machinery on the basis of a high level of protection of health and safety, while ensuring the free circulation of machinery on the EU market. The revised Machinery Directive does not introduce radical changes compared with the previous versions. It clarifies and consolidates the provisions of the Directive with the aim of improving its practical application. While the revised Machinery Directive was being discussed by the Council and the European Parliament, the Commission agreed to prepare a new Guide to its application. The purpose of the Guide is to provide explanations of the concepts and requirements of Directive 2006/42/EC in order to ensure uniform interpretation and application throughout the EU. The Guide also provides information about other related EU legislation. It is addressed to all of the parties involved in applying the Machinery Directive, including machinery manufacturers, importers and distributors, Notified Bodies, standardisers, occupational health and safety and consumer protection agencies and officials of the relevant national administrations and market surveillance authorities. It may also be of interest to lawyers and to students of EU law in the fields of the internal market, occupational health and safety and consumer protection. The Guide was endorsed by the Machinery Committee on 2 June 2010. It should be stressed that only the Machinery Directive and the texts implementing its provisions into national law are legally binding.

A2.5 Directive 2012/19/EU - RoHS and WEEE

Directive 2012/19/EU lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment (WEEE) and by reducing overall impacts of resource use and improving the efficiency of such use, thereby contributing to sustainable development.

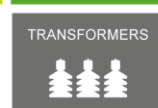
A2.6 Directive 2014/34/EU – ATEX

Directive 2014/34/EU (ATEX Directive) lays down uniform, EU-wide rules on the sale and putting into service of equipment and protective systems intended for use in potentially explosive atmospheres. It seeks to ensure that products fulfil certain requirements to ensure a high level of protection of the health and safety of persons, especially workers, and, where appropriate, the protection of domestic animals and property. It applies to a wide range of products, including equipment used on fixed offshore oil and gas platforms, in petrochemical plants, mines, flour mills (airborne flour particles are highly flammable) and other areas where a potentially explosive atmosphere may be present.

A2.7 Directive 2014/68/EU – Pressure equipment

Directive 2014/68/EU applies to the design, manufacture and conformity of pressure equipment with a maximum allowable pressure greater than 0.5 bar. It covers all pressure equipment and assemblies that are new to the EU market, whether manufactured in the EU or elsewhere. This also includes imported used items.

A2.8 Directive 2014/32/EU – Measuring instruments



Directive 2014/32/EU lays down uniform rules for the sale of measuring instruments. Legally controlled measuring instruments are used for a variety of measurement tasks in the areas of public health and safety and of fair trading.

A2.9 Directive 2000/14/EC – Noise emission

This framework Directive harmonises the 9 existing legal instruments on noise emissions for each type of construction plant and equipment, as well as a directive on lawnmowers. The aim is to improve the control of noise emissions by more than 50 types of equipment used outdoors.

A2.10 Directive 96/59/EC – PCB/PCT

Directive 96/59/EC harmonises law on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs)* and the decontamination or disposal of equipment containing them.

A2.11 Directive 89/391/EEC – Safety and health of workers at work

Directive 89/391/EEC introduces measures to improve the health and safety of people at work. It sets out obligations for both employers* and employees* to reduce accidents and occupational disease in the workplace and it applies to all sectors of public and private activity (industrial, agricultural, commercial, administrative, service, educational, cultural, leisure and others).

Table 24 –Scope and exclusions of EU Directives and related national legislation considered in this study.

TAG	Ref.	Short Title	Scope	Explicit exclusions
#1	2009/125/EC	Ecodesign	<p>1. This Directive establishes a framework for the setting of Community Ecodesign requirements for energy-related products with the aim of ensuring the free movement of such products within the internal market.</p> <p>2. This Directive provides for the setting of requirements which the energy-related products covered by implementing measures must fulfil in order to be placed on the market and/or put into service. It contributes to sustainable development by increasing energy efficiency and the level of protection of the environment, while at the same time increasing the security of the energy supply.</p> <p>3. This Directive shall not apply to means of transport for persons or goods.</p> <p>4. This Directive and the implementing measures adopted pursuant thereto shall be without prejudice to Community waste management legislation and</p>	Means of transport for persons or goods

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			Community chemicals legislation, including Community legislation on fluorinated greenhouse gases.	
#2	2014/35/EU	LVD	The purpose of this Directive is to ensure that electrical equipment on the market fulfils the requirements providing for a high level of protection of health and safety of persons, and of domestic animals and property, while guaranteeing the functioning of the internal market. This Directive shall apply to electrical equipment designed for use with a voltage rating of between 50 and 1 000 V for alternating current and between 75 and 1 500 V for direct current.	<p>Electrical equipment for use in an explosive atmosphere</p> <p>Electrical equipment for radiology and medical purposes</p> <p>Electrical parts for goods and passenger lifts</p> <p>Electricity meters</p> <p>Plugs and socket outlets for domestic use</p> <p>Electric fence controllers</p> <p>Radio-electrical interference</p> <p>Specialised electrical equipment, for use on ships, aircraft or railways, which complies with the safety provisions drawn up by international bodies in which the Member States participate.</p> <p>Custom built evaluation kits destined for professionals to be used solely at research and development facilities for such purposes.</p>
#3	2014/30/EU	EMC	This directive applies to 'equipment' i.e. any apparatus or fixed installation: 'apparatus' means any finished appliance or combination thereof made available on the market as a single functional unit, intended for the end-user and liable to generate electromagnetic disturbance, or the	<p>This Directive shall not apply to:</p> <p>(a) equipment covered by Directive 1999/5/EC;</p> <p>(b) aeronautical products, parts and appliances as referred to in Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (9);</p> <p>(c) radio equipment used by radio amateurs within the meaning of the Radio Regulations adopted in the framework of the Constitution of the International Telecommunication Union and the Convention of the International</p>

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			<p>performance of which is liable to be affected by such disturbance.</p> <p>‘fixed installation’ means a particular combination of several types of apparatus and, where applicable, other devices, which are assembled, installed and intended to be used permanently at a predefined location.</p>	<p>Telecommunication Union (10), unless the equipment is made available on the market;</p> <p>(d) equipment the inherent nature of the physical characteristics of which is such that:</p> <p>(i) it is incapable of generating or contributing to electromagnetic emissions which exceed a level allowing radio and telecommunication equipment and other equipment to operate as intended; and</p> <p>(ii) it operates without unacceptable degradation in the presence of the electromagnetic disturbance normally consequent upon its intended use;</p> <p>(e) custom built evaluation kits destined for professionals to be used solely at research and development facilities for such purposes.</p> <p>For the purposes of point (c) of the first subparagraph, kits of components to be assembled by radio amateurs and equipment made available on the market and modified by and for the use of radio amateurs are not regarded as equipment made available on the market.</p> <p>Where, for the equipment referred to in paragraph 1, the essential requirements set out in Annex I are wholly or partly laid down more specifically by other Union legislation, this Directive shall not apply, or shall cease to apply, to that equipment in respect of such requirements from the date of implementation of that Union legislation.</p> <p>This Directive shall not affect the application of Union or national legislation regulating the safety of equipment.</p>
#4	2006/42/EC	Machinery	<p>This Directive applies to the following products:</p> <p>(a) machinery;</p> <p>(b) interchangeable equipment;</p> <p>(c) safety components;</p> <p>(d) lifting accessories;</p>	<p>The following are excluded from the scope of this Directive:</p> <p>(a) safety components intended to be used as spare parts to replace identical components and supplied by the manufacturer of the original machinery;</p> <p>(b) specific equipment for use in fairgrounds and/or amusement parks;</p> <p>(c) machinery specially designed or put into service for nuclear purposes which, in the event of failure, may result in an emission of radioactivity;</p> <p>(d) weapons, including firearms;</p>

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			<p>(e) chains, ropes and webbing;</p> <p>(f) removable mechanical transmission devices;</p> <p>(g) partly completed machinery.</p>	<p>(e) the following means of transport:</p> <ul style="list-style-type: none"> — agricultural and forestry tractors for the risks covered by Directive 2003/37/EC, with the exclusion of machinery mounted on these vehicles, — motor vehicles and their trailers covered by Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers (13), with the exclusion of machinery mounted on these vehicles, — vehicles covered by Directive 2002/24/EC of the European Parliament and of the Council of 18 March 2002 relating to the type-approval of two or three-wheel motor vehicles (14), with the exclusion of machinery mounted on these vehicles, — motor vehicles exclusively intended for competition, and — means of transport by air, on water and on rail networks with the exclusion of machinery mounted on these means of transport; <p>(f) seagoing vessels and mobile offshore units and machinery installed on board such vessels and/or units;</p> <p>(g) machinery specially designed and constructed for military or police purposes;</p> <p>(h) machinery specially designed and constructed for research purposes for temporary use in laboratories;</p> <p>(i) mine winding gear;</p> <p>(j) machinery intended to move performers during artistic performances;</p> <p>(k) electrical and electronic products falling within the following areas, insofar as they are covered by Council Directive 73/23/EEC of 19 February 1973 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (15):</p> <ul style="list-style-type: none"> — household appliances intended for domestic use, — audio and video equipment, — information technology equipment, — ordinary office machinery, — low-voltage switchgear and control gear,
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				<ul style="list-style-type: none"> — electric motors; (l) the following types of high-voltage electrical equipment: <ul style="list-style-type: none"> — switch gear and control gear, — transformers.
#5	2012/19/EU	RoHS and WEEE	<ol style="list-style-type: none"> 1. Large household appliances 2. Small household appliances 3. IT and telecommunications equipment 4. Consumer equipment and photovoltaic panels 5. Lighting equipment 6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools) 7. Toys, leisure and sports equipment 8. Medical devices (with the exception of all implanted and infected products) 9. Monitoring and control instruments 10. Automatic dispensers 	<p>This Directive shall not apply to any of the following EEE:</p> <p>(a) equipment which is necessary for the protection of the essential interests of the security of Member States, including arms, munitions and war material intended for specifically military purposes;</p> <p>(b) equipment which is specifically designed and installed as part of another type of equipment that is excluded from or does not fall within the scope of this Directive, which can fulfil its function only if it is part of that equipment;</p> <p>(c) filament bulbs.</p> <p>In addition to the equipment specified in paragraph 3, from 15 August 2018, this Directive shall not apply to the following EEE:</p> <p>(a) equipment designed to be sent into space;</p> <p>(b) large-scale stationary industrial tools;</p> <p>(c) large-scale fixed installations, except any equipment which is not specifically designed and installed as part of those installations;</p> <p>(d) means of transport for persons or goods, excluding electric two-wheel vehicles which are not type-approved;</p> <p>(e) non-road mobile machinery made available exclusively for professional use;</p> <p>(f) equipment specifically designed solely for the purposes of research and development that is only made available on a business-to-business basis;</p> <p>(g) medical devices and in vitro diagnostic medical devices, where such devices are expected to be infective prior to end of life, and active implantable medical devices.</p>
#6	2014/34/EU	ATEX	This Directive shall apply to the following, hereinafter referred to as 'products':	<p>This Directive shall not apply to:</p> <p>(a) medical devices intended for use in a medical environment;</p> <p>(b) equipment and protective systems where the explosion hazard results</p>

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			<p>(a) equipment and protective systems intended for use in potentially explosive atmospheres;</p> <p>(b) safety devices, controlling devices and regulating devices intended for use outside potentially explosive atmospheres but required for or contributing to the safe functioning of equipment and protective systems with respect to the risks of explosion;</p> <p>(c) components intended to be incorporated into equipment and protective systems referred to in point (a).</p>	<p>exclusively from the presence of explosive substances or unstable chemical substances;</p> <p>(c) equipment intended for use in domestic and non-commercial environments where potentially explosive atmospheres may only rarely be created, solely as a result of the accidental leakage of fuel gas;</p> <p>(d) personal protective equipment covered by Council Directive 89/686/EEC of 21 December 1989 on the approximation of the laws of the Member States relating to personal protective equipment;</p> <p>(e) seagoing vessels and mobile offshore units together with equipment on board such vessels or units;</p> <p>(f) means of transport, i.e. vehicles and their trailers intended solely for transporting passengers by air or by road, rail or water networks, as well as means of transport in so far as such means are designed for transporting goods by air, by public road or rail networks or by water. Vehicles intended for use in a potentially explosive atmosphere shall not be excluded from the scope of this Directive</p>
#8	2014/68/EU	Pressure equipment	<p>This Directive shall apply to the design, manufacture and conformity assessment of pressure equipment and assemblies with a maximum allowable pressure PS greater than 0,5 bar</p>	<p>This Directive shall not apply to:</p> <p>(a) pipelines comprising piping or a system of piping designed for the conveyance of any fluid or substance to or from an installation (onshore or offshore) starting from and including the last isolation device located within the confines of the installation, including all the annexed equipment designed specifically for pipelines; this exclusion shall not apply to standard pressure equipment such as may be found in pressure reduction stations or compression stations;</p> <p>(b) networks for the supply, distribution and discharge of water and associated equipment and headraces such as penstocks, pressure tunnels, pressure shafts for hydroelectric installations and their related specific accessories;</p>

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				<p>(c) simple pressure vessels covered by Directive 2014/29/EU of the European Parliament and of the Council (13);</p> <p>(d) aerosol dispensers covered by Council Directive 75/324/EEC (14);</p> <p>(e) equipment intended for the functioning of vehicles defined by the following legal acts:</p> <p>(i) Directive 2007/46/EC of the European Parliament and of the Council (15);</p> <p>(ii) Regulation (EU) No 167/2013 of the European Parliament and of the Council (16);</p> <p>(iii) Regulation (EU) No 168/2013 of the European Parliament and of the Council (17);</p> <p>(f) equipment classified as no higher than category I under Article 13 of this Directive and covered by one of the following Directives:</p> <p>(i) Directive 2006/42/EC of the European Parliament and of the Council (18);</p> <p>(ii) Directive 2014/33/EU of the European Parliament and of the Council (19);</p> <p>(iii) Directive 2014/35/EU of the European Parliament and of the Council (20);</p> <p>(iv) Council Directive 93/42/EEC (21);</p> <p>(v) Directive 2009/142/EC of the European Parliament and of the Council (22);</p> <p>(vi) Directive 2014/34/EU of the European Parliament and of the Council (23);</p> <p>(g) equipment covered by point (b) of Article 346(1) TFEU;</p> <p>(h) items specifically designed for nuclear use, failure of which may cause an emission of radioactivity;</p> <p>(i) well-control equipment used in the petroleum, gas or geothermal exploration and extraction industry and in underground storage which is intended to contain and/or control well pressure; this shall comprise the wellhead (Christmas tree), the blow out preventers (BOP), the piping manifolds and all their equipment upstream;</p> <p>(j) equipment comprising casings or machinery where the dimensioning, choice of material and manufacturing rules are based primarily on requirements for sufficient strength, rigidity and stability to meet the static and dynamic</p>
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				<p>operational effects or other operational characteristics and for which pressure is not a significant design factor; such equipment may include:</p> <p>(i) engines including turbines and internal combustion engines;</p> <p>(ii) steam engines, gas/steam turbines, turbo-generators, compressors, pumps and actuating devices;</p> <p>(k) blast furnaces including the furnace cooling system, hot-blast recuperators, dust extractors and blast-furnace exhaust-gas scrubbers and direct reducing cupolas, including the furnace cooling, gas converters and pans for melting, re-melting, de-gassing and casting of steel, iron and non-ferrous metals;</p> <p>(l) enclosures for high-voltage electrical equipment such as switchgear, control gear, transformers, and rotating machines;</p> <p>(m) pressurised pipes for the containment of transmission systems, e.g. for electrical power and telephone cables;</p> <p>(n) ships, rockets, aircraft and mobile off-shore units, as well as equipment specifically intended for installation on board or the propulsion thereof;</p> <p>(o) pressure equipment consisting of a flexible casing, e.g. tyres, air cushions, balls used for play, inflatable craft, and other similar pressure equipment;</p> <p>(p) exhaust and inlet silencers;</p> <p>(q) bottles or cans for carbonated drinks for final consumption;</p> <p>(r) vessels designed for the transport and distribution of drinks having a PS·V of not more than 500 bar and a maximum allowable pressure not exceeding 7 bar;</p> <p>(s) equipment covered by Directive 2008/68/EC and Directive 2010/35/EU and equipment covered by the International Maritime Dangerous Goods Code and the Convention on International Civil Aviation;</p> <p>(t) radiators and pipes in warm water heating systems;</p> <p>(u) vessels designed to contain liquids with a gas pressure above the liquid of not more than 0,5 bar.</p>
#9	2014/32/EU	Measuring instruments	This Directive applies to the measuring instruments	--

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			concerning water meters (MI-001), gas meters and volume conversion devices (MI-002), active electrical energy meters (MI-003), thermal energy meters (MI-004), measuring systems for continuous and dynamic measurement of quantities of liquids other than water (MI-005), automatic weighing instruments (MI-006), taximeters (MI-007), material measures (MI-008), dimensional measuring instruments (MI-009) and exhaust gas analysers (MI-010).	
#10	2000/14/EC	Noise emission in the environment by equipment for use outdoors	This Directive applies to equipment for use outdoors listed in Articles 12 and 13 and defined in Annex I. This Directive only covers equipment that is placed on the market or put into service as an entire unit suitable for the intended use. Non-powered attachments that are separately placed on the market or put into service shall	The following shall be excluded from the scope of this Directive: - all equipment primarily intended for the transport of goods or persons by road or rail or by air or on waterways, - equipment specially designed and constructed for military and police purposes and for emergency services.

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			be excluded, except for hand-held concrete-breakers and picks and for hydraulic hammers.	
#11	2016 No. 1101	Electrical Equipment (Safety) Regulation	Safety of electrical products, including CE marking (Implementing the LVD)	These Regulations do not apply to— (a)electrical equipment for use in an explosive atmosphere; (b)electrical equipment for radiology and medical purposes; (c)electrical parts for goods and passenger lifts; (d)electricity meters; (e)plugs and socket outlets for domestic use; (f)electric fence controllers; (g)specialised electrical equipment for use on ships, aircraft or railways, which complies with the safety provisions drawn up by international bodies in which the member States participate; (h)custom-built evaluation kits destined for professionals to be used at research and development facilities solely for research and development.
#12	The Control of Substances Hazardous to Health Regulations 1994	Control of Substances Hazardous	assess and prevent risks and exposure of employees to PCBs	--
#13	The building regulations 2010	Building regulations	fire safety of buildings	--
#19	96/59/EC	PCB disposal directive	For the purposes of this Directive: (a) 'PCBs' means: — polychlorinated biphenyls, — polychlorinated terphenyls, — Monomethyl-tetrachlorodiphenyl methane, Mono-methyl-dichloro-diphenyl methane, Monomethyl-dibromo-diphenyl methane, — any mixture containing any of the above mentioned substances in a total of more	--

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			<p>than 0,005 % by weight;</p> <p>(b) 'equipment containing PCBs' means any equipment containing PCBs or having contained PCBs (e.g. transformers, capacitors, receptacles containing residual stocks) which has not been decontaminated. Equipment of a type which may contain PCBs shall be treated as if it contains PCBs unless it is reasonable to assume the contrary;</p> <p>(c) 'used PCBs' means any PCBs which are waste within the meaning of Directive 75/442/EEC;</p> <p>(d) 'holder' means the natural or legal person who is in possession of PCBs, used PCBs and/or equipment containing PCBs;</p> <p>(e) 'decontamination' means all operations which enable equipment, objects, materials or fluids contaminated by PCBs to be reused, recycled or disposed of under safe conditions, and which may include replacement, meaning all operations in which PCBs are replaced by suitable fluids not containing PCBs;</p> <p>(f) 'disposal' means operations D 8, D 9, D 10, D 12 (only in</p>	
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			safe, deep, underground storage in dry rock formations and only for equipment containing PCBs and used PCBs which cannot be decontaminated) and D 15 provided for in Annex II A of Directive 75/442/EEC.	
#20	89/391/EEC	Safety and health of workers at work	Safety and health of workers at work	--

A3. Document summaries of other national legislation

A3.1 Fire codes

A3.1.1 Buildings Regulations – Fire Safety (UK)

The purpose of this regulation is to provide guidance on the fire safety requirements for buildings.

A3.1.2 Fire safety code – Electrical machines (IT)

The purpose of this regulation is to provide guidance on the fire safety requirements for electrical machines containing flammable insulation fluids with a volume larger than 1 m³.

A3.2 Electrical installation safety codes

A3.2.1 Electrical Equipment (Safety) Regulations 2016 (UK)

The purpose of this regulation is to implement EU Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the member States relating to the making available on the market of electrical equipment designed for use within certain voltage ranges.

A3.2.2 Real Decreto 337/2014 (ES)

The purpose of this regulation is to establish the technical conditions and safety assurances to which high voltage electrical installations must be subject, in order to:

- Protect people and the integrity and functionality of goods that may be affected by them.
- Achieve the necessary quality in the supply of electric energy and promote energy efficiency.
- Establish the precise standardization to reduce the extensive typing that exists in the manufacturing of electrical equipment.
- To facilitate, from the design phase of the installations, its adaptation to future rationally predictable load increases.

Table 25 – Scope and exclusions of the other national legislation considered in this study.

TAG	Ref.	Short Title	Scope	Explicit exclusions
#15	2001 No. 2954 UK	Control of Pollution (Oil Storage) (England) Regulations 2001 April 2011	require anyone in England who stores more than 200 litres of oil, to provide more secure containment facilities for tanks, drums, Intermediate Bulk Containers (IBCs) and mobile bowzers. This is to prevent oil escaping into the environment.	--
#16	R.D.337/2014 ES	Regulation on technical conditions and safety warranty in high voltage installations and its complementary technical instructions ITC-RAT-01 to 23	Safety, energy, High Voltage Installations	--
#22	DM 15.7.2014 IT	Transformer Fire safety Italian Regulation	Activities having a power transformer	--

A4. Area short description of voluntary certification schemes

A4.1 ISO EN 9001

EN ISO 9001 standard specifies requirements for a quality management system when an organization needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements and aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

A4.2 ISO EN 14001

EN ISO 14001 standard specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance and to manage its environmental responsibilities in a systematic manner.

A4.3 ISO EN 50001

EN ISO 50001 standard specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.

A4.4 ISO EN 26000

EN ISO 26000 standard is intended to assist organizations in contributing to sustainable development by encouraging them to go beyond legal compliance, recognizing that compliance with law is a fundamental duty of any organization and an essential part of their social responsibility. It is intended to promote common understanding in the field of social responsibility, and to complement other instruments and initiatives for social responsibility, not to replace them.

Table 26 – Scope and exclusions of voluntary certification schemes considered in this study.

TAG	Ref.	Short Title	Scope	Explicit exclusions
#24	ISO EN 9001	Quality management	<p>It specifies requirements for a quality management system when an organization:</p> <p>a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and</p> <p>b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.</p>	--
#25	ISO EN 14001	Environmental management	<p>It specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance. It is intended for use by an organization seeking to manage its environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability.</p>	--
#26	ISO EN 50001	Energy management systems	<p>It specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy</p>	--

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TAG	Ref.	Short Title	Scope	Explicit exclusions
			performance, including energy efficiency, energy use and consumption. It specifies requirements applicable to energy use and consumption, including measurement, documentation and reporting, design and procurement practices for equipment, systems, processes and personnel that contribute to energy performance.	
#27	ISO EN 26000	Social Responsibility	it provides guidance to all types of organizations, regardless of their size or location, on: concepts, terms and definitions related to social responsibility; the background, trends and characteristics of social responsibility; principles and practices relating to social responsibility; the core subjects and issues of social responsibility; integrating, implementing and promoting socially responsible behaviour throughout the organization and, through its policies and practices, within its sphere of influence; identifying and engaging with stakeholders; and communicating commitments, performance and other information related to social responsibility.	--

Abbreviation lists

CEN	– European Committee for Standardisation
CENELEC	– Comité Européen de normalisation en électronique et en électrotechnique
CPR	– Construction Product Regulation
ES	– Spain
EU	– European Union
EPBD	– Energy Performance of Buildings Directive
LF	– Large fan
H	– high level of synergy
HV	– High Voltage
L	– low level of synergy
IEC	– International Electrotechnical Commission
IT	– Italy
ISO	– International Organisation for Standardisation
M	– medium level of synergy
MSA	– Market Surveillance Authority
MV	– Medium Voltage
N	– no synergies of synergy
PCB	– polychlorinated biphenyl
PinP	– product in product
PT	– power transformer
REACH	– Registration, Evaluation, Authorisation and Restriction of Chemicals
RHOS	– Restriction of Hazardous Substances
UK	– United Kingdom

References

1. DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for the setting of Ecodesign requirements for energy-related products
2. DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
3. DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
4. DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC
5. DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)
6. DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
7. COMMISSION REGULATION (EU) No 548/2014 of 21 May 2014 on implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to small, medium and large power transformers
8. DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment
9. DIRECTIVE 2014/32/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments
10. DIRECTIVE 2000/14/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors
11. The Electrical Equipment (Safety) Regulations 2016 (implementing the EU LVD)
12. The Control of Substances Hazardous to Health Regulations 1994
13. Building regulations part J (Fire Safety), VOLUME 2 – BUILDINGS OTHER THAN DWELLINGHOUSES
14. EU Construction Products Regulation and CE marking, including UK product contact point for construction products
15. The Control of Pollution (Oil Storage) (England) Regulations 2001
16. Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión y sus Instrucciones Técnicas Complementarias ITC-RAT 01 a 23
17. Commission Regulation (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to Ecodesign requirements for electric motors

18. Commission Regulation (EU) No 327/2011 of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW Text with EEA relevance
19. Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)
20. Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work
21. COMMISSION REGULATION (EU) No 348/2013 of 17 April 2013 amending Annex XIV to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
22. Regola tecnica di prevenzione incendi per la progettazione, l'installazione e l'esercizio delle macchine elettriche fisse con presenza di liquidi isolanti combustibili in quantità superiore ad 1 m3
23. COMMISSION REGULATION (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for ventilation units
24. ISO 9001 Quality management systems -- Requirements
25. ISO 14001 Environmental management systems -- Requirements with guidance for use
26. ISO 50001 Energy management systems -- Requirements with guidance for use
27. ISO 26000 Guidance on social responsibility
28. Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU

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More information
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