

Defining an effective compliance framework for the application of the Ecodesign Directive to large industrial products

A summary of progress from the European INTAS project

Challenges in the implementation of the Ecodesign directive for large industrial products

The revised European Ecodesign Directive took effect in 2009, setting minimum energy efficiency levels for 40 categories of widely-used products. The aim of the Ecodesign Directive together with the Energy Labelling Regulation is to help reach the targeted 20% increase in energy efficiency in 2020. It is estimated that a correct implementation of the Directive would yield energy savings of 600 TWh per year in 2020¹, leading to an associated reduction of 40% in European greenhouse gas emissions compared to 1990 levels.

Each European member state has established legal bodies responsible for the market surveillance of products covered by the Ecodesign directive, as translated in national legislation. These Market Surveillance Authorities (MSAs) are tasked with informing manufacturers and importers about their ecodesign obligations as well as conducting some verification checks. As a basis the checks typically involve verifying that the mandatory product documentation provided by manufacturers is compliant with the Ecodesign requirements. In some cases, MSAs order the physical testing of products in independent laboratories. Products that are found to be non-compliant incur the risk of being removed from the market. There are however limitations to the effective market surveillance of products across all market segments:

- National MSAs have limited resources and are typically responsible for the implementation of several directives and legislations besides Ecodesign.
- Some manufacturers and importers are not properly informed about the energy efficiency and documentational requirements applying to their products.
- Large and very large products cannot always be verified by means of testing in independent laboratories due to their size. They can also be very expensive or impractical to transport to and from laboratories.
- Industrial product markets are relatively opaque with predominately business-to-business trade, meaning MSAs are not aware of all products being manufactured, imported and installed.

These factors threaten the correct implementation of the Ecodesign directive by increasing the risk of non-compliant, inefficient products making their way to the market. They also impact another core responsibility

¹ Economic benefits of the EU Ecodesign Directive, Ecofys

of MSAs, which is to ensure that all market suppliers on the market compete on a level-playing field. This is especially true for very large products.

Investigating solutions

European-level initiatives are ongoing to reinforce collaboration between national MSAs and provide them with shared tools to improve Ecodesign market surveillance across borders. The EU-funded INTAS (Industrial and tertiary product Testing and Application of Standards) project is one of these initiatives. Bringing together 16 partners including 11 national MSAs and cooperating organizations, INTAS investigates ways to improve the effective Ecodesign market surveillance of large industrial products. As a pilot action the project is looking specifically at large fans and power transformers, chosen for their significant energy consumption: the combined Ecodesign potential in energy savings for these two product categories alone reaches an estimated 44 TWh per year in 2020, equivalent to the electricity consumption of 7 million Europeans.

Building on a first phase documenting the existing compliance framework and resources available to MSAs, manufacturers and independent testing laboratories, the INTAS project just concluded its second phase in April 2018. Project partners assessed processes and methodologies by which MSAs can identify, select and evaluate large transformers and fans regarding energy performance issues. This work was conducted in collaboration with all relevant stakeholders including manufacturers, other MSAs, independent laboratories and purchasers of very large products in order to propose a methodology acceptable to all. The main activities and results of this phase are summarized here.

1 Screening methodologies to identify products for compliance assessment:

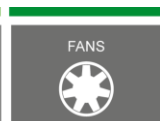
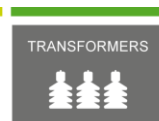
Through information exchange with market actors INTAS developed some recommendations to identify all relevant products being placed on the market. These include to have producers and importers inform MSAs when an order for an industrial product destined to be installed in their jurisdiction is placed, or else having the risk of 3rd party verification pre-placing into service which will be costly for the final client. MSAs should also work together with customs, ports and road network operative to be informed of the import of products. End-users (such as grid operators in the case of power transformers) could also inform the local MSA when placing orders. All identified products could be integrated in a database, from which a sampling algorithm could help select products for inspection and testing.

2 Identification and classification of product types and related documentation requirements:

INTAS developed checklists for use by MSAs, guiding them through the inspection of product documentation provided by manufacturers to establish their compliance with Ecodesign requirements.

3 Evaluation of energy performance verification and testing methods:

INTAS partners made a concrete assessment, including testing exercises, of methods available to MSAs to verify the energy-efficiency of fans and power transformers across the full size range, from small to very large. The investigated methods included both those already sanctioned by legislations

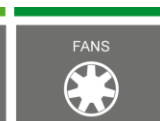
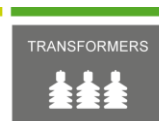


and standards and some with no regulatory recognition at the time being. They also correspond to various levels of required MSA resources and inconvenience to the manufacturers and end-users, which scale with the size of products being verified:

- Documentation (visual) inspections of nameplates and technical documentation, applicable to all products.
- Independent laboratory testing, especially for medium sized products according to the scope of the relevant regulations for transformers and fans.
- Evaluation of testing done at the manufacturer factory's laboratory, considered as witness testing performed by a MSA, in cases where testing by independent laboratory measurement equipment is not feasible. To minimise disruption to the manufacturer's operations witness testing by the MSA could be carried out at the same time as a Factory Acceptance Test, routinely performed by manufacturers at the demand of the customer (for large products).
- On-site testing making use of a movable laboratory to make tests at manufacturer premises. In-situ testing at the place of product installation. These options were considered for big products or in the case where the transportation of the product to the laboratory is impractical.
- Additional methods considered for fans only: Energy performance estimation and modelling based on design engineering and computer simulations; Scale-model and reduced speed testing as a basis for documenting and verifying large products; Evaluating the manufacturer's quality assurance systems for the part relating to compliance with Ecodesign requirements for fans; Product-in-product approach for motors being part of a fan.

These methods were evaluated by INTAS partners through testing exercises on 42 power transformers and 7 large fans, involving independent laboratories, manufacturer laboratories and MSAs in Spain, Romania, Portugal, Poland, Italy, Denmark and Austria. The main findings are that:

- All investigated options have been verified in general to be applicable, reliable and cost-effective, considering their specific pros and cons depending on the product size. Some other methods still have some potential and it is worthwhile for future considerations. The exception is in-situ testing, which is the most disruptive and costly testing method and should be considered a last-resort verification method.
- A large number of power transformer manufacturers have not implemented Ecodesign Directive technical documentation requirements into their production routines: 35% of the documentation checks conducted in the testing exercise showed that the documentation was either not correctly provided or non-compliant. Due to the small evaluated sample this fraction can however not be considered representative of the market as a whole.



- Witness testing at manufacturer laboratories (during Factory Acceptance Tests organized for clients) has good potential for very large products.
- The assessments of a manufacturer's Quality Assurance system also shows good potential if conformity assessment procedures are part of the ISO 9001 system.
- For fans, scale model and reduced speed testing are considered very viable options to assess the energy performance of large products which would otherwise be very expensive or impossible to test due to laboratory limitations.

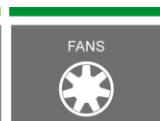
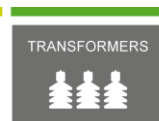
4 Evaluation of the potential for multiple regulation testing:

All product categories subjected to Ecodesign requirements are also covered by other regulations in the topics of Energy, Safety, Workplace and Environment. INTAS examined 19 relevant EU Directives, 12 EU regulations, 6 national legislations and 8 voluntary certification schemes to assess possibilities to conduct joint market surveillance actions alongside Ecodesign testing. The main incentive is that multiple regulation testing would make market surveillance more resource-efficient. Unfortunately, the INTAS evaluation concluded that no real options exist to do multiple regulation testing for either fans or power transformers. It was however found that relatively simple tasks such as document inspections and visual inspections of rating plates could be delegated to other official bodies in charge of controls in contexts typically having the large industrial products installed.

Taking all these results into account, the INTAS project prepared flowcharts to guide the improved market surveillance of large fans and power transformers. A simplified version is shown below. The full draft flowcharts can be consulted on the INTAS project website, as all public reports prepared by the project.

<u>Steps for verification</u>	<u>Options</u>
0. General information	- Information on requirements - Information meetings to market actors, guidelines, ...
1. Product screening / sample selection	a. Product identification b. Product classification
2. Documentation inspection	Compliance with product information & technical documentation requirements in Regulation
3. Testing	Testing at 3rd party lab. Testing at manufacturer's premises In-situ testing

Check list



Next steps

- **Until September 2018: Validation of the market surveillance methodologies for fans and power transformers**

The INTAS partners will apply the developed draft methodologies to real market surveillance cases, with the involvement of MSAs part of the project consortium. A broader consultation phase is also ongoing with the organization of National Focal Point meetings in 10 countries. These meetings are organized by INTAS partners to present the project activities and draft methodology to local stakeholders (manufacturers, end-users) and to collect their feedback. The combined information obtained from the real market surveillance cases and the National Focal Point meetings will allow INTAS to refine the proposed methodologies before their finalization and publication.

- **October 2018: Formulation of policy recommendations for effective market surveillance of industrial products**

Lessons learned from the INTAS actions on large fans and power transformers will be translated in policy recommendations to improve the Ecodesign market surveillance, and where applicable, will draw recommendations for other industrial products falling under ecodesign. The recommendations will look at both the near future (within the current regulatory framework) and the longer term (with an evolution of the regulatory framework).

- **February 2019: Organisation of the INTAS final conference in Brussels**

Final project results and policy recommendations will be presented and discussed at this event, with details to be confirmed.

More information about the project and available channels to be involved in the stakeholder consultation phase are available on the project website: <http://www.intas-testing.eu/>

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About the INTAS project

Funded under the European Horizon 2020 programme, the INTAS started in March 2016 and will end in February 2019. The project is coordinated by WIP Renewable Energies (Germany) and brings together 16 partners from 11 countries. By acknowledging the current lack of expertise, experience, and resources available across Europe for the verification and testing of large fans and power transformers, INTAS provides technical and cooperative support, as well as capacity building activities, to MSAs in charge of enforcing Ecodesign regulations. It also supports 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. By doing so, INTAS will 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

Economic and Food Safety Authority - Portugal



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TRANSFORMERS



FANS

