Energy Efficiency Compliant Products 2014

EEPLIANT

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ehi association of the European Heating Industry

ehpa european heat pump association

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Background information
This information is issued by PROSAFE and the market surveillance authorities representing 12 EU Member States in the EEPLIANT 2014 Action.
The Action is coordinated by PROSAFE (Product Safety Forum of Europe), a non-profit organisation that brings together market surveillance officers from all over Europe and across the world. Visit www.prosafe.org to learn more. On this website, you will also find more information about the other Joint Actions coordinated by PROSAFE.

Disclaimer
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Abbreviations

AB	EEPLIANT Advisory Board
AEA	Austrian Energy Agency, Austria
ADCOs	Administrative Cooperation Groups
BE	Belgium
BMWFW	Austrian Federal Ministry of Science, Research and Economy
BPG	EEPLIANT Best Practice Guidelines
CCP	Commission for Consumer Protection, Bulgaria
CFL	Compact Fluorescent Lamp
DEA	Danish Energy Agency, Denmark
DK	Denmark
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DRPI	Directive Related Product Information Inputs
EEA	European Economic Area
EEI	Energy Efficiency Index
ECOPLIANT	European Ecodesign Compliance Project which ran from April 2012 to March 2015
EEPLIANT	Energy Efficiency Compliance Project 2014
EEPLIANT2	Energy Efficiency Compliance Project 2 (2016)
EPS	External Power Supply
EU	European Union
FPS Economy	Federal Public Service, SMEs, Self-Employed and Energy, Belgium
ICSMS	Internet-supported information and communication system for the pan-European market surveillance
IPS	Internal Power Supply
IT	Information Technology
IEE	Intelligent Energy Europe
LED	Light Emitting Diode
LT	Lithuania
MCCAA	Malta Competition and Consumer Affairs Authority
MIRS	Market Surveillance Inspectorate of Slovenia, Slovenia
MSA/s	Market Surveillance Authority/ies
MS/s	Member State/s
MSIT	Minister of Science, Industry and Technology, Turkey
NGO/s	Non-governmental organisation/s
NO_x	Nitrogen Oxides
NVWA	Netherlands Food and Safety Authority, the Netherlands
PROSAFE	Product Safety Enforcement Forum of Europe
Ra	Colour Rendering Index (CRI or Ra)
RD-BIS	Regulatory Delivery, Department for Business, Energy & Industrial Strategy, the United Kingdom
SAMTS	State Agency for Metrological and Technical Surveillance, Bulgaria
SWEA – STEM	Swedish Energy Authority, Sweden
TEC	Typical Electricity Consumption
TWh	Terawatt Hour
UOKiK	Office of Competition and Consumer Protection, Poland
UK	United Kingdom
SCRPA	State Consumer Rights Protection Agency, Lithuania
VA	Voluntary Industry Agreement
WPs	EEPLIANT Work Packages

Executive Summary

Introduction

The EU market for electrical products regulated by the Eco-design and the Energy Labelling Directives is huge – many €billions annually. Not only is it the largest market of its kind in the world, it is also one of the most complex with energy efficiency regulations impacting in many product sectors – consumer, commercial and industrial. Suppliers have the responsibility for making sure their products comply with the regulatory requirements at the time of placing them on the market.

Market surveillance authorities (MSAs) are responsible for ensuring the products in the EU market are compliant with the relevant energy regulations. Although the EU is one big borderless market, the MSAs are limited to working within the borders of each member state.

Without some form of centralised coordination, the resulting effectiveness of MSAs is, inevitably, limited. This lack of effectiveness is well known to stakeholders such as consumer bodies and supplier trade bodies who have repeatedly called for improved market surveillance in the EU. Efforts are made at EU level to address this. The **E**nergy **E**fficiency Com**pliant** Products 2014 project, known as *EEPLIANT*, is one of the concrete initiatives underpinning these efforts.

EEPLIANT, funded by a Grant from the EU Framework Programme for Research and Innovation, Horizon 2020, continues the work of its predecessor project, ECOPLIANT, i.e. a highly visual coordination project focussed on delivering the economic and environment benefits of the Energy Labelling and Eco-design Directives by ensuring only compliant products are in the marketplace.

The MSAs taking part came from Austria, Belgium, Bulgaria, Denmark, Germany, Lithuania, Malta, Netherlands, Slovenia, Sweden, and the United Kingdom.

Inspection and testing of products

Testing of products lay at the core of EEPLIANT activities. This was what stakeholders expect MSAs to do. After all, how can the removal of non-compliant products be enforced from the market unless evidence of non-compliance is obtained through inspections and tests?

The product sectors investigated:

Light Emitting Diodes (LEDs) - selected because it was a rapidly developing product that impacts every market. LEDs are highly visible to users and policy makers. Both energy labelling and eco-design requirements applied.

Heaters – selected because the product sector included industrial products that many MSAs had never previously had any experience of working on. Both energy labelling and eco-design requirements applied

Printers - selected because these products are covered by an industry Voluntary Agreement, an Eco-design instrument that MSAs have no previous experience of working with.

Building capacity

EEPLIANT also set out to ensure the sustainability of such actions in the future. It created guidance materials, provided training and posted legacy materials for bringing the less experienced MSA staff up to the best possible operational standards.

Results

LEDs – All 141 models selected for inspection and tests were based on a risk assessment of possible non-compliance so these results do *not* represent a statistical picture of the whole market.

- Up to 54% were non-compliant in respect of packaging information or technical documentation
- Only 14% of the tested models were fully compliant

The most significant problems encountered were ones of insufficient luminous flux (not bright enough) and poor lifetime performance. A substantial number of enforcement measures were taken.

Heaters – a variety of types of combination heaters were tested, the largest were 200kW.

- 100% of the technical files examined were non-compliant
- All products tested complied with Eco-design requirements within the tolerances permitted
- Not all products tested complied with Energy labelling requirements.

Under performing heaters can represent large energy losses. A number of enforcement measures needed to be taken.

Printers – the role of MSAs in respect of the Voluntary Agreement (VA) was explored and some potential non-conforming printers were identified. Feedback was provided to the European Commission that suggested how VAs could be developed to include an effective role for MSAs.

Impacts from EEPLIANT

- A qualitative review of the non-compliances detected during the inspections and testing of heaters - showed potential energy savings from EEPLIANT exceeding the 86GWh savings originally projected.
- Increasing the confidence among purchasers, manufacturers and retailers of the levels of compliance in the EU market.
- Visible enforcement of EU product legislation with resulting reduction in consumer detriment.
- Improving the competitive market (by removing the free-riding non-compliant products).
- Sharing of EEPLIANT's inspection and testing results with all MSAs in the EU, so that they can use them too

Looking to the future

The experiences gained in EEPLIANT have enabled the identification of ways to improve the effectiveness of market surveillance in the field of product energy efficiency . Key amongst these are improving access to authoritative technical expertise and supporting the adoption of good/best practices. But, perhaps the most important, is access to funding that can be used in the most cost-effective manner. The lessons of ECOPLIANT and EEPLIANT suggest that such funding should be directed towards continuing to build capacity and market leverage through the route of collaborative programmes involving the maximum possible number of MSAs.

1. Introduction

1.1. What is EEPLIANT?

The Energy Efficiency Compliant Products 2014 project, known as EEPLIANT, was focussed on supporting the delivery of the economic and environment benefits of the Energy Labelling and Ecodesign Directives by increasing the rates of compliance with them.

This was achieved through coordinating the monitoring, verification and enforcement activities of market surveillance authorities (MSAs) from twelve European Union (EU) Member States.

The activities undertaken were structured around three platforms:

1. One for building of expertise and promoting the development and adoption of common best practices by the MSAs;
2. Another focussed on strengthening the movement towards coordinated pan-EU market surveillance that began with the Intelligent Energy Europe (IEE) funded programme ECOPLIANT (European Ecodesign Compliance Project);
3. And a third one aiming at the outreach and engagement with those MSAs not participating in EEPLIANT, with consumers and the appropriate EU supplier stakeholder associations.

1.2. What is different about EEPLIANT?

Previous EU-funded energy labelling or ecodesign market surveillance programmes with the exception of ECOPLIANT, have been focussed on monitoring and verification activities only. The absence of participation by the responsible national and regional authority bodies (the MSAs) from those programmes had meant that no enforcement actions could be taken.

EEPLIANT is different; it provides that missing link. This coordinated programme has resulted in enforcement actions in respect of non-compliant products. Thirteen of the fifteen participants are legally empowered to enforce the requirements of the implementing regulations of either or both of the Energy Labelling and Ecodesign Directives.

The products examined under EEPLIANT were selected in order to demonstrate that the participating MSAs are actively undertaking market surveillance across a wide spectrum - working in three very different product sectors that include domestic, commercial and industrial products.

Light-emitting diode (LED) lamps

COMMISSION DELEGATED REGULATION (EU) No 874/2012, COMMISSION REGULATION (EU) No 1194/2012

This is a developing technology area of lighting products of particular concern to consumer and commercial users. LEDs offer the potential to deliver significantly reduced energy consumption without loss of performance. Both energy labelling and ecodesign requirements apply. The ecodesign requirements have become much more demanding through Stage 3 (of regulation 1194/2012) that came into force in September 2015.

Printers

A product sector subject to the industry **Voluntary Agreement for Imaging Equipment** – a policy instrument which the MSAs were not familiar with, but keen to examine in respect of their national responsibilities. It is a product sector to which Energy Star Regulation (EC) No 106/2008 was expected to be applicable also.

Space and combination heaters

COMMISSION DELEGATED REGULATION (EU) No 811/2013, COMMISSION REGULATION (EU) No 813/2013

This is a wide-ranging product sector that extends into industrial applications with regulations covering capacities up to 400kW. Both energy labelling and ecodesign requirements apply.

The market surveillance activities in the three product sectors listed above followed the same general format, whereby the participating MSAs worked together to agree and adopt common approaches:

- Making a risk and market analysis;
- Deciding criteria for sampling products;
- Sampling products;
- Conducting document examinations;
- Selecting samples for testing, which involved in some cases also conducting screening tests;
- Testing at a laboratory;
- Taking enforcement action in respect of non-compliant products.

However, product testing, whilst vitally important, was not enough in itself. To ensure the sustainability of such actions in the future, successful product testing will require the MSAs to have sufficiently skilled and experienced staff capacity to be able to carry out their duties in cost-effective ways. To support the development of such skills and to bring the less experienced up to the best possible standard two cross-cutting working groups were created – one to develop *Best Practice* guidance materials and one to provide routes to training and training materials based on the developed Best Practices. A third cross-cutting activity was developed with a focus on communications and dissemination. The figure below displays the interplay of the cross-cutting (horizontal) and the product specific (vertical) activities

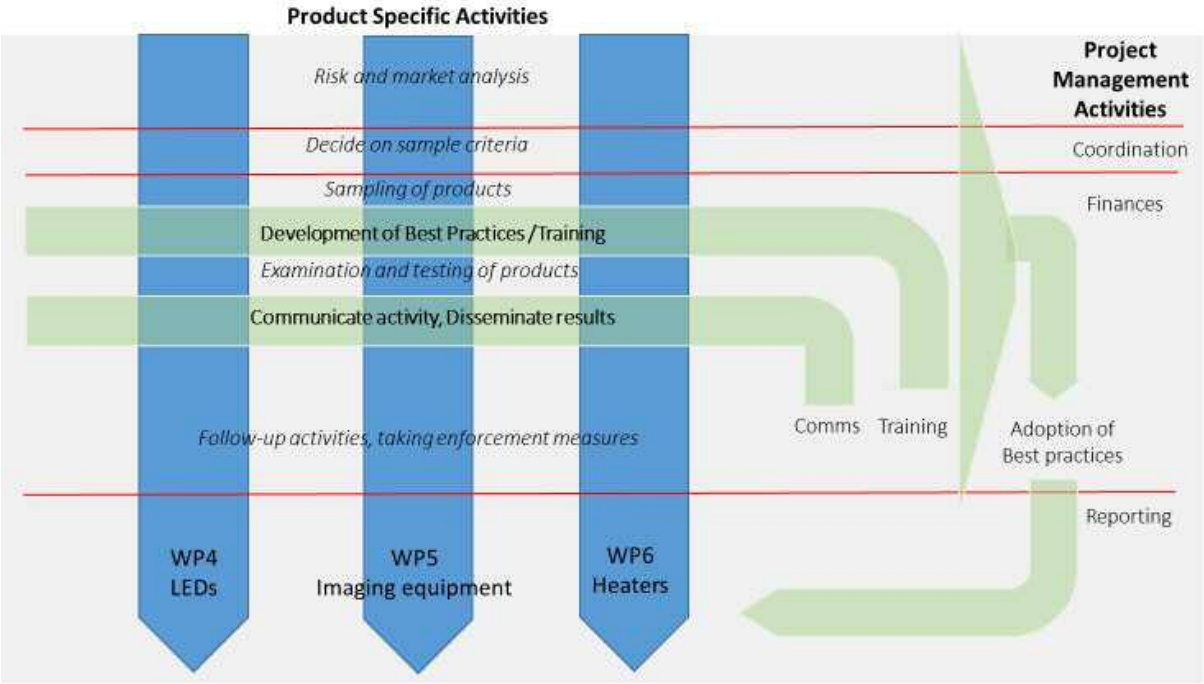


Figure 1 The Interplay Between the Horizontal and Vertical Activities

1.3. Why is EEPLIANT important?

Although Member States (MS) share the same responsibilities for implementing the Energy Labelling and Ecodesign Directives, they are not obliged to undertake the implementation and enforcement of

the relevant regulations in exactly the same ways. The consequences of this are profound: priorities vary from MS to MS, as do budgets, skill levels, and enforcement activities, etc. Apart from reporting requirements in REGULATION (EC) No 765/2008, and any initiatives undertaken by the respective ADCOs, there has been no organised method for building skills or sharing expertise, and only regional sharing and coordinating of work programmes before the two-year ECOPLIANT programme was developed. ECOPLIANT and its successor EEPLIANT have, for those MSAs that have chosen to participate, brought order and shared disciplines. Together they have driven the raising of skill levels and have coordinated programmes that have reached across almost half of the EU market for the product sectors so far examined.

The huge size of the EU market and the relatively small size of the impact that any single MSA is likely to be able to create shows the importance of MSAs working together in coordinated ways. This provides for far more leverage - literally enough to impact the entire EU market. Furthermore, it creates a level playing field for suppliers, who otherwise face competition from cheaper but non-compliant products. As a consequence, non-compliant products are being driven out of the market.

1.4. Who took part?

Participating Organisation	Known as...	Member State
Product Safety Forum of Europe	PROSAFE	Netherlands
Austrian Energy Agency	AEA	Austria
FPS Economy, SMEs, Self-Employed and Energy	FPS Economy	Belgium
Commission for Consumer Protection	CCP	Bulgaria
State Agency for Metrological and Technical Surveillance	SAMTS	Bulgaria
Danish Energy Agency	DEA	Denmark
Office of Legal Metrology of the state of Hessen	HED	Germany
State Consumer Rights Protection Agency	SCRPA	Lithuania
Malta Competition and Consumer Affairs Authority	MCCAA	Malta
Netherlands Food and Consumer Product Safety Authority	NVWA	Netherlands
Office of Competition and Consumer Protection	UOKiK	Poland
Market Inspectorate of the Republic of Slovenia	MIRS	Slovenia
Swedish Energy Agency	SWEA - STEM	Sweden
Regulatory Delivery, Department for Business, Energy & Industrial Strategy	RD	UK

Table 1 List of Organisations Participating in EEPLIANT

Additionally, the following stakeholder bodies were offered an advisory role through membership of EEPLIANT's Advisory Board (AB):

Lighting Europe
EuroVAprint
ECOS – European Citizens Environmental Organisation and EEB – European Environmental Bureau
ANEC – The European consumer voice in standardisation
EHI – European Heating Industry
EHPA – European Heat Pump Association

Table 2 Members of EEPLIANT's AB

1.5. How does it operate?

EEPLIANT was sub-divided into seven activities, termed work packages (WPs). The participation of the MSAs in these WPS varied in function of their national responsibilities and competences. To this end it is worth mentioning that some authorities were responsible for implementing one, but not both, of the Energy Labelling and Ecodesign Directives, and some authorities were responsible for consumer products, but not for commercial or industrial products.

The flowchart listed below represents the logic structure of the work programme. The three core WPs consisting of inspection and testing of products followed by enforcement action, which are located in the middle, ran in parallel and were largely operated independently of each other. The outer structure represents the framework for the project as management, implementation of Best Practice and communication activities are all key to the functionality of the action.

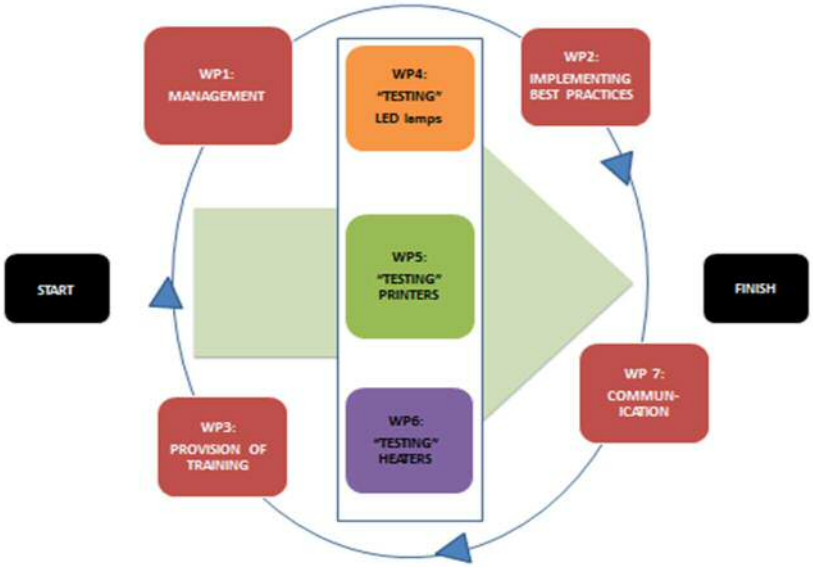


Figure 2 The Logic Structure of the EEPLIANT Work Programme

1.6. What was the timing of EEPLIANT?

The project formally began in March 2015, it finished in the end of June 2017.

2. Building Capacity

Capacity - the building of knowledge, skills and experience amongst the staff and management of market surveillance authorities. Leading to an increase in capability, confidence and effectiveness.

2.1. Developing and implementing best practices

It usually makes more sense to recognise, adapt and adopt existing best practices rather than invent them from scratch. Being able to examine existing practices enables their good (and not so good) points to be examined under real use conditions. Knowledge of their effectiveness is established based on practical experience rather than guesswork.

This was the starting point for EEPLIANT, which had the legacy Best Practice Guidelines (BPG) developed in the predecessor project, ECOPLIANT, and had access to the well-established practices of some of the more experienced MSAs participating in EEPLIANT. Thus, there was a basis for creating a document based on well researched, practical and effective techniques already in daily use by MSAs in parts of the EU.

The updated EEPLIANT BPG[1] was created through a combination of adding a section on energy labelling to complement the existing material on ecodesign, and through inputs from the MSAs participating in EEPLIANT. Best practice case studies were included that were specific for ecodesign and energy labelling market surveillance. It contains chapters on:

- The legal base;
- Organisation and strategy in national market surveillance;
- How to establish inspection programmes;
- How to select products for inspection;
- How to identify EEA-wide product model numbers;
- How to conduct label and document inspections;
- How to conduct compliance verification laboratory tests;
- Sharing of results amongst MSAs;
- How to enforce the provisions of the ecodesign and energy labelling regulations.

Once this document had been created and shared amongst the participants, EEPLIANT had a basis that enabled all participating MSAs to use common methods, protocols and checklists (through implementing the guidelines in their future activities of the project).

All participants were continually encouraged to become familiar with the BPG and to share it with their colleagues. To further reinforce the importance of adopting common best practices by all MSAs, surveys were made of the participants to get a measure of take-up of the recommended practices. The results of the surveys showed that the participants had adopted much of the content of the BPG.

Towards the end of the project, a round table exploration of how the BPG has been used and adopted was undertaken. This produced some useful feedback that reinforced the view that the existing document establishes a base-line that needs to be maintained, but does not need further development in its current guise. Instead, the next stage of development, which will be taken up in the successor project EEPLIANT2 (due to start in September 2017), was seen to be the development of product regulation specific 'toolkits'. The practical basis for such toolkits had become established within EEPLIANT's three product testing WPs. Common data gathering templates and compliance grading guides were developed to support all participants, allowing them to work in as consistent a manner as possible[2].

[1] Copies of the BPG can be downloaded from http://www.eepliant.eu/index.php/knowledge-base

[2] National rules and procedures can vary between different MS. Consequently, harmonisation of approach cannot be fully accomplished.

2.2. Sharing data

The original intention had been for EEPLIANT to adopt and enlarge the database developed in ECOPLIANT. However, an examination of the records for this database made in the early stages of EEPLIANT showed that it was no longer being used by MSAs. Consequently, it was decided to focus on using ICSMS[3] as the database for storing and reporting the outputs from the product testing activities. In the absence of specific templates (Directive Related Product Information inputs - DRPIs) for Ecodesign and Energy Labelling Regulations, the participants entered the results of the three product work packages into the generic ICSMS template. Whilst "best practice" was achieved by ensuring all results were available to all EEA MSAs through ICSMS, the means of achieving this could not be described as "best practice" and will remain as a challenge to be taken up in EEPLIANT2.

2.3. Training - adoption and familiarisation with best practices

The primary objectives for this activity were to develop training tools based on the above-mentioned BPG and to provide training events focussed on supporting the adoption of the guidelines for those MSAs who are still developing the effectiveness of their market surveillance of the Ecodesign and Energy Labelling Directives. A secondary objective was to enable training to be easily accessible and to be available to all EEA MSAs, not just to those formally participating in this programme.

2.3.1. Training tools

The provision of classroom-type training seminars, though effective, was known to incur high travelling and accommodation costs and likely to take place at times that would not always be suitable for would-be trainees. Consequently, it was necessary to ensure that the training materials described later in this Chapter would be created in formats suitable for delegates to access on-line and be readily available in their national training activities. This enables a limitless number of would-be trainees to take control of their own training and accomplish this at a lower cost than traditional classroom-type training. The result is a module comprising of 28 pages of dynamic content introducing the BPG, which was linked[4] from the project website to a customised website, where established e-learning modules were already being accessed by MSA staff trainees working in other non-energy regulatory areas.

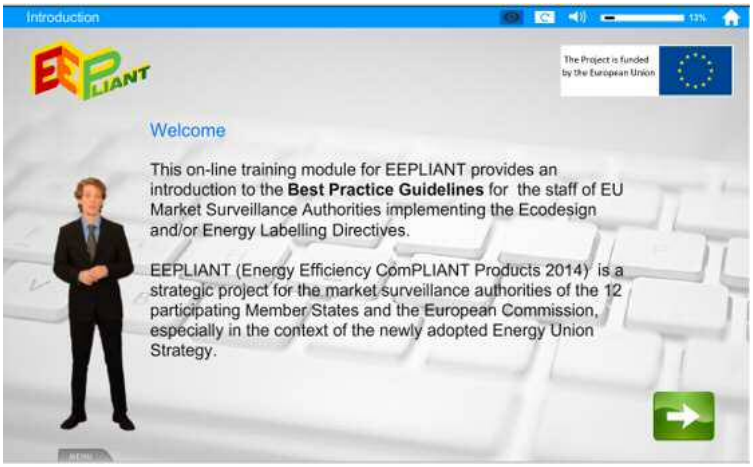


Figure 3 The first screen of the EEPLIANT training module

[3] ICSMS is the internet-supported information and communication system for the pan-European market surveillance operated by DG GROWTH who had specifically identified it as the information system meeting the obligations of Article 23 of Regulation 765. Article 23 requires the Commission to provide such an electronic system for archiving and exchange of information. Additionally, it requires Member States to provide results of testing carried out, provisional restrictive measures taken, contacts with the economic operators concerned and justification for action or inaction.

[4] Can be accessed by any user via: https://www.e-learningwmb.com/hosting/prosafe/login.php

Feedback from participants regarding the e-learning form of training was mixed. On the positive side, 62% [5] reported that they, or colleagues, have used it. Concern was expressed about the use of spoken English by the avatar. This, for non-English native speakers, was only possible to follow if they had good familiarity with spoken English. This feedback underlined the importance of developing materials that could be assimilated at the pace dictated by the user and in various other languages.

Besides the e-learning module, the main training legacy of EEPLIANT is the compilation of four MS PowerPoint presentation materials comprising 124 slides in total. The basis of the work was laid out by the predecessor project, ECOPLIANT, but the materials were further developed and improved under EEPLIANT. A copy of the tool will continue to be available for download through the tenure of EEPLIANT2 and beyond, until at least 2022[6].

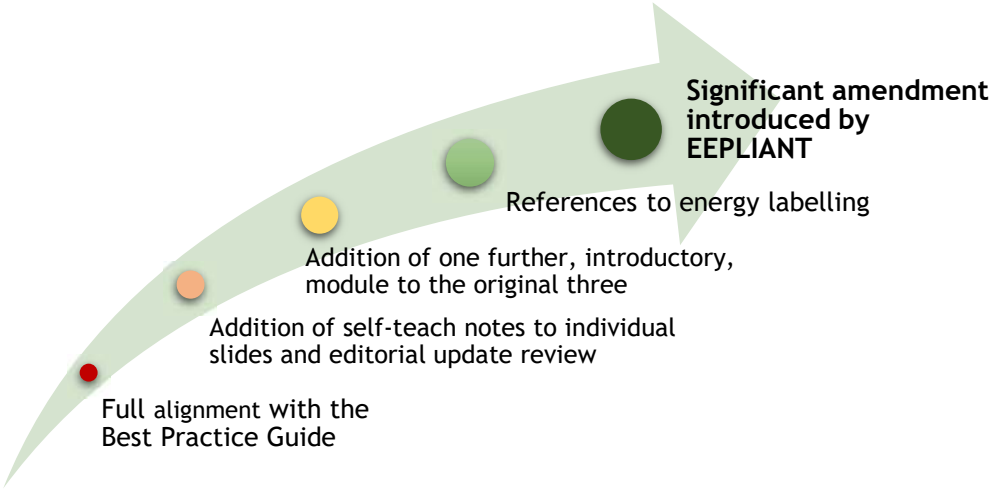


Figure 4 EEPLIANT upgrades added to the existing training materials for market surveillance

2.3.2. Training Events

The project organised three plenary training events[7] where all participating MSAs and other MSAs from the EEA were invited to send staff who could benefit from the training as part of their career development.

Training 1

The **first event** used selections from the main training tool was as follows:

- Modules A & B of the training tool: *Introduction to the EU regulatory framework, Introductions to EEPLIANT; Cooperation, Strategy and Inspection;*
- Module C: *Selecting and identifying products, inspection and testing procedures;*
- Module D: *Sharing results, enforcement, local and cross border specifics.*

Practical examples presented by the participants were used to reinforce the materials being presented from the main tool. This was very much following the style and content of the Best Practice Guide, where case studies are incorporated to demonstrate how the advice contained in the Guide is used in practice.

[5] Some of those that had not used it had tried to, but were unable to because this type of tool may need certain operating software, such as Java, to be downloaded first and these downloads may not be permitted by the IT rules operated by some authorities for security reasons.
[6] http://www.eepliant.eu/index.php/knowledge-base/category/wp3-training
[7] The first two events were held in Brussels at the following dates: 26 November 2015, 13 May 2016, whilst the third provided at the test laboratory of the Swedish Energy Agency, Stockholm, from 1 to 2 February 2017.

Figure 5 Display of the four training modules from A to D

Training 2

The feedback received from the participants following the first training was integrated in the content of the **second event**, which focussed on the following case studies:

- Demonstration of e-learning and existing training tools;
- Case Study: Engaging with difficult and challenging suppliers within the legal system (Germany)
- Case Study: 5 bad examples of how not to do it … and maybe some lessons to learn! (Sweden)
- Case Study: Document inspection examples (Netherlands)
- Case Study: Resource management experiences (Slovenia)
- Case Study: Experience of surveying energy labels (United Kingdom)

The feedback from this event was very clear – whilst there was little interest in classroom style basic training, there was a need for information and guidance in respect of laboratory testing; this being a topic that some MSAs have very little, if any, experience of even though MSAs are frequently responsible for commissioning the testing of products.

Training 3

As a consequence, the **third event** turned the spotlight to more case studies from the MS and an exploration of laboratory testing, as presented below:

- Case Study: Low level Market Surveillance (Belgium)
- Case studies: MSAs conducting their own screening tests on Standby and External Power Supply (EPS) (Denmark, Lithuania);
- Case Studies: Building Capability in Product Testing (United Kingdom);
- Guided tour of the product test laboratory of the Swedish Energy Agency, with a particular focus on the testing of washing machines, lighting, TVs and standby energy consumption;
- Group discussion: future possible developments in training and best practice materials – product specific "toolkits"

3. Inspection and testing of LEDs

3.1. Scope

This activity carried out a comprehensive market surveillance campaign on LED lamps, including coordinated monitoring, verification and enforcement actions in line with the regulations for energy labelling (874/2012, supplementing Directive 2010/30/EU) and Ecodesign for directional and non-directional lamps (1194/2012, 244/2009) (Figure 6). The work followed a risk based approach designed to detect, and then remove, as many non-compliant products as possible, and thus did not result in a statistically valid picture of the market in the participating countries. The activities undertaken included document and packaging inspections, followed by laboratory testing (Figure 6).

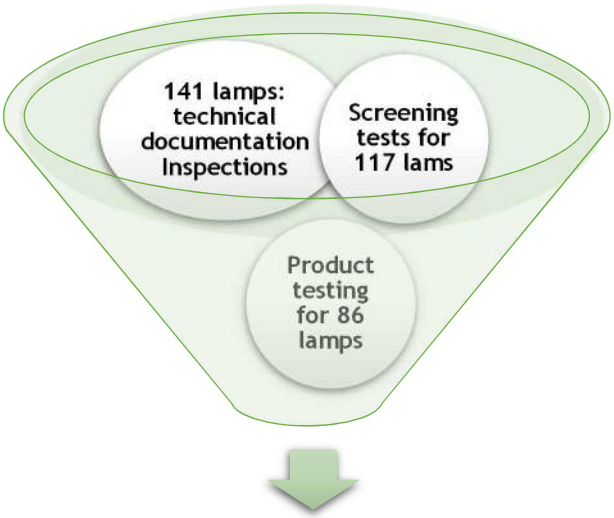
Figure 6 The Scope of the Activity

Prior to the full lab testing, simplified low cost screening checks were conducted to support the effective identification and testing of potentially non-compliant products. Criteria were set for the selection of lamp models for testing in order to ensure maximum effectiveness. These were:

- Coverage of the essential most common types of LED lamps used in households;
- Broad mix of established and new sales brands;
- Important typical sales channels (electronic markets, supermarkets, DIYs, web stores etc.);
- Focus on new lamps recently put on the market;
- Other characteristics such as very low price, incorrect or incomplete technical declaration, etc.

The screening tests were carried out in the laboratories of three of the participating MSAs and involved inexpensive test equipment as seen in Figure 7.

Figure 7 Basic Test Equipment for Screening Tests: Test case and Ulbricht Sphere



Enforcement actions undertaken by MSAs against those products that were non-compliant with the relevant legislation

Figure 8 Comprehensive market surveillance action on LED lamps

The activity focussed on the most common types of LED lamps available on the EU market (Figure 9):

- Non-directional lamps: bulbs with E27 and E14 sockets and candles with E14 sockets;
- Directional lamps: mains voltage spots (GU10 and E27 sockets), low voltage spots (G5.3 sockets) and replacement lamps for integrated mains voltage spots (G9 sockets).

Figure 9 The Types of LED Lamps Examined

3.2. Who participated?

1. **AEA – Austria** - Leader[8]	2. FPS Economy – Belgium
3. SAMTS - Bulgaria	4. ENS – Denmark
5. HED – Germany	6. SCRPA - Lithuania
7. MCCAA – Malta	8. NVWA – The Netherlands
9. UOKIK - Poland	10. MIRS - Slovenia
11. STEM - Sweden	12. RD – United Kingdom
13. **PROSAFE**	

Table 3 Project Partners Cooperating for the LED Market Surveillance Activities

[8] The activities in Austria were arranged in a cooperation with Federal Ministry of Science, Research and Economy BMWFW (Austrian MSA, participating outside of the Grant Agreement)

3.3. Results

3.3.1. Document Inspections

Document and information checklists were used for the inspection of packaging, declaration of conformity and technical documents for the 141 LED lamps. The main results of these measures are summarised as follows:

- 45% of the LEDs inspected were non-compliant regarding packaging information. The main problems encountered were: no information on equivalence to incandescent lamps, on dimmability, on nominal lamp lifetime and on switching cycles.
- A declaration of conformity was missing for 37% of the products checked. Incorrect information concerning the applicable regulation and standards was seen.
- 54% were non-compliant as a result of their technical documentation. Information regarding the applicable regulation and standards was incomplete, missing altogether or the test report was not supplied.

It should be remembered that the testing focussed upon potentially non-complaint lamps, thus the percentages indicated above do not provide a statistically valid picture of the overall market.

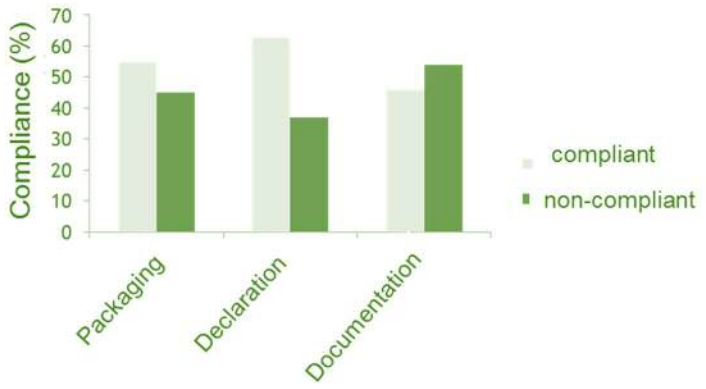


Figure 10 Results of Examinations of Documentation

3.3.2. Laboratory tests and their results

86 models of lamps (25 directional and 61 non-directional lamps) were tested[9]. The results show problems concerning quality and general performance as many products were non-compliant with ecodesign legislation, which required enforcement measures.

The most frequent issues are related to lamp brightness and lamp lifetime, with a large number of lamp models providing lower brightness or shorter lifetime than declared by manufacturers. Small issues concerning energy efficiency declaration and negligible problems concerning excess energy consumption were detected. Only twelve of the tested models were fully compliant, whilst for the rest the following non-compliances were noted[10]:

Initial measurements (0 hours):

- 47 lamps were non-compliant concerning initial luminous flux (incorrect declaration): the flux was either lower or higher than declared;
- 16 lamps were wrongly marked for electric power;

[9] The key testing parameters were: Luminous Flux; Power and power factor; Colour temperature; Colour rendering; Colour consistency; Lumen maintenance and Lamp survival factor (after 6000 hours); Energy efficiency index (EEI)
[10] It should be noted that some lamps showed non-compliance for more than one parameter.

- 10 lamps' colour temperature was inadequate;
- 2 lamps did not declare the correct colour rendering;
- 2 lamps demonstrated measured coloured rendering outside the tolerances permitted;
- For 34 lamps, the Energy efficiency index (EEI) was outside the permitted tolerance. In nine of these cases, lamps were declared for the wrong efficiency class too.

Measurements after 6000 hours:

- 15 lamps (17%) failed concerning lumen maintenance requirements;
- 19 lamps (22%) failed lamp survival requirements.

3.4. Enforcement measures

The implementation of enforcement measures was a central part of the project, as appropriate follow-up actions were required against all lamps found to be non-compliant with the ecodesign and labelling legislation.

Although EU Member States have their individual approaches for market surveillance enforcement, it was decided that some level of harmonization should be attempted. Subsequently, a matrix was developed identifying the different types of non-compliance encountered, then providing recommendations for appropriate enforcement measures for those situations.

The most common measures taken were: voluntary sales stop by the manufacturers/importers[11], and voluntary withdrawal and changes to the documentation and packaging.

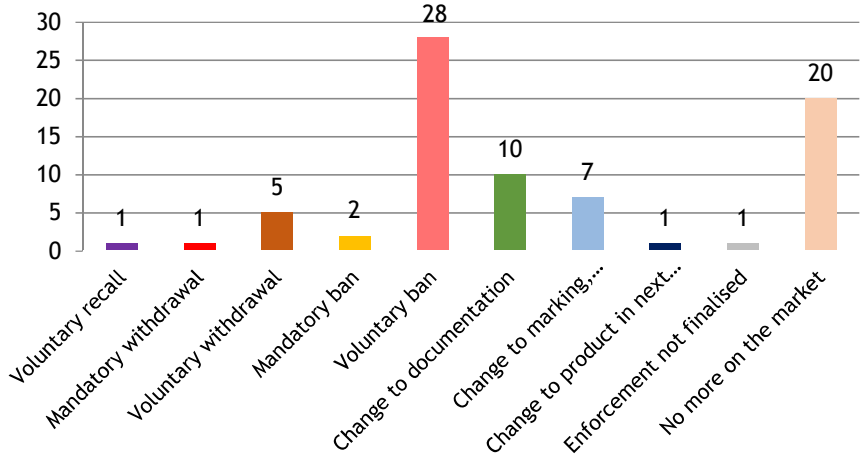


Figure 11 Enforcement Measures Taken

3.5. Socio-economic impact

Quality and performance problems may affect the confidence of consumers in LED technology, which in turn could lead to increased demand for older inefficient incandescent, halogen or Compact Fluorescent Lamp (CFL) technology. Unfortunately, such lamps are still available in some markets, where standard incandescent products are still being phased out.

Similar negative effects were observed in the buyer behaviour during the early stages of CFL technology, when many consumers switched back to standard incandescent lamps as a result of problems encountered with CFL lamp quality.

[11] Products already on the market may still be sold by retailers but no additional products are allowed to be put on the market by manufacturers and importers.

The use of halogen lamps, standard incandescent lamps or CFL in place of LED lamps can increase energy consumption by twenty to several hundred per cent. The majority of CFL lamps available today are significantly less energy efficient compared to their LED equivalents.

The greatest impact of the market surveillance action on LEDs concerning energy consumption and energy efficiency was the ability to detect and remove a significant number of non-compliant products from the EU market. The removal of such problematic products helps to maintain consumer confidence in LED technology, and gives a clear signal to manufacturers and importers that non-compliant and poor-quality products will not be accepted on the EU market.

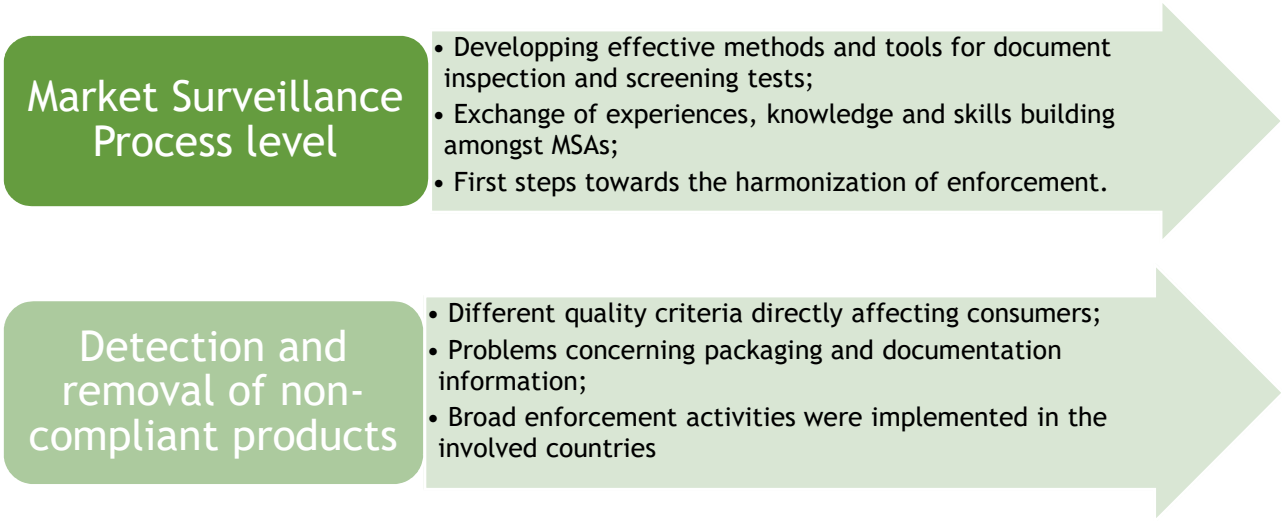


Figure 12 EEPLIANT Benefits and Impact

3.6. Policy recommendations

The EEPLIANT comprehensive campaign on LEDs showed a number of shortcomings in the current legislation and technical standards for lighting, which reduce the efficiency of the market surveillance measures, and, at the same time, have negative effects for consumers. The most important points and recommendations for regulatory changes are presented below.

Consolidation of all ecodesign requirements in one single regulation for lighting products

Currently, the ecodesign requirements for lighting are spread across three different EU regulations. This makes the application by MSAs cumbersome. Consequently, the intention to unify the legislation into one comprehensive regulation is very much supported.

Making lifetime requirements for lamps more effective

- Time period for testing of life time parameters

Life time requirements for lamps are an essential part of the ecodesign legislation. However, the current criteria require a very long testing period of 6000 hours. Typically, LED lamp models have been sold out by the time the lab testing is completed. Thus, despite the extensive effort put into testing, the options for enforcement measures are limited. Therefore, it is recommended to shorten the period for lifetime testing to a maximum of 3000 hours - combined with the use of enforced temperature stress regimes or similar approaches that accelerate the aging of lamps[12].

[12] Such an approach was mentioned in early legislation drafts but has not been further elaborated since.

- Including switching cycles in life time testing

Some screening tests supported the view that the switching of lamps at high frequency does not have a significant impact on lamp life. However, there are indications that switching combined with typical warming and cooling cycles may have a significant impact. It is therefore recommended to include switching in the lifetime testing. Switching cycles should be specified in a way that allows typical warming and cooling cycles for the lamps.

Removal and addition of selected requirements

A few requirements in the current legislation seem ineffective, whilst other more important items are missing. For example, the requirements concerning starting time and warm-up time seem rather irrelevant for the LED technology and should be deleted.

The problem of flicker is widely acknowledged among experts and has been confirmed for many lamps during screening testing carried by EEPLIANT. Thus, a requirement limiting maximum flicker should be included in the revised legislation.

Product information relevant for buyers

Most lamps available today only provide a very basic colour rendering quality (just slightly above the required minimum standard of Ra 80). This was also the case for most of the products selected and tested under EEPLIANT. Present legislation does not require any information concerning colour rendering on the lamp packaging[13]. This complicates consumers' selection of good products. Thus, it is recommended to introduce an information requirement for colour rendering on lamp packaging.

Avoiding gluing of different lamp components

Disassembly of lamps during the EEPLIANT checks showed that essential lamp components are glued together. Such gluing impedes recycling. The new EU legislation for lighting (currently in development) intends to support the strategy of circular economy. Therefore, it is recommended to check and include possible requirements which prohibit the gluing of components whenever this type of joining technique can be avoided.

Implementing measures to avoid long term sales of products which are not compliant with the legislation

Products not compliant with current ecodesign legislation may still be sold on the market until stocks in the EU retail sector are exhausted. Current legislation only prohibits the placing on the market of products, but not the sales of products which have already been placed on the market. This causes confusion and reduces the efficiency of the market surveillance measures. A well-known example is the theoretical phase-out of incandescent light bulbs. Such products are still available on the EU market today, although the official phase-out was implemented many years ago. It is recommended that the ecodesign framework legislation is amended, with a supplementary requirement allowing the application of a complete sales ban for product groups where this measure is appropriate.

[13] Information requirements on colour rendering are only requested for technical documents

4. Inspection and testing of Imaging Equipment

4.1. Scope

The objective of this activity was to develop and carry out an action for coordinated monitoring, verification and possible enforcement of Imaging Equipment (printers, copiers, faxes, scanners and MFDs) which are subject to a Voluntary Industry Agreement (VA) recognised by the European Commission under the Ecodesign Directive (2009/125/EC).

4.2. Who participated?

1.	**AEA – Austria**
2.	**FPS Economy – Belgium**
3.	**SAMTS - Bulgaria**
4.	**STEM - Sweden**
5.	**RD – United Kingdom - Leader**
6.	**PROSAFE**

Table 4 Project Partners Cooperating for the Imaging Equipment Market Surveillance Activities

4.3. Description of work and tasks undertaken

The participating MSAs reviewed each of the VA requirements to facilitate a focus on documentation (and later testing) activities. Given the large number of product environmental design requirements in the VA, and the potential ambiguity in some requirements, it was decided that the documentation and test activities should focus on the ENERGY STAR compliance requirements, where these were relevant to the VA v5.2 requirements for the newer products placed on the market after 1st January 2015.

Forty imaging equipment (IE) models were identified on the market for documentation checks and formal ENERGY STAR testing. VA signatories are not required to ensure that their entire range of imaging equipment models meet the VA requirements. Instead, the requirements apply to a pre-defined percentage of all products, i.e. it is based on a weighted average of sales. As such, it was necessary for the participants to identify which products were being used by the signatories to the VA to meet their overall VA compliance targets. The VA includes a requirement on its Independent Inspector to disclose a list of such products.

The participants compiled a list of IE models that were first placed on the market in 2015, and which appeared likely to be used by signatories to meet their VA compliance targets. The EU ENERGY STAR database was used to develop the list as it contained the date when products were first placed on the EU market and, given that the VA requirements are based around the ENERGY STAR specification, would likely contain many of the products that signatories were using to meet their VA targets.

It was necessary to wait almost a year before submitting the product list to the Independent Inspector for confirmation. This delay could not be avoided because signatories have until the middle of March in the year following applicable VA requirements to submit compliance reports to the Independent Inspector. The latter then confirmed that the products were included within the signatories' portfolio of VA products. The list of product types that were to be purchased by EEPLIANT for testing can be seen in the table below.

Participating MS	Product Type	Marking Technology	Cost Bracket: Low cost IE for domestic use	Cost Bracket: Medium speed and cost office IE	Cost Bracket: High speed and cost office IE	Totals
Austria	MFD	Inkjet	5			10
	MFD	Laser	1	1	1	
	Printer	Inkjet		1		
	Printer	Laser	1			
Bulgaria	MFD	Inkjet	4			10
	MFD	Laser	1	1		
	Printer	Inkjet	1			
	Printer	Laser	1	1	1	
Sweden	MFD	Inkjet	4		1	10
	MFD	Laser	1	1		
	Printer	Inkjet	2			
	Printer	Laser			1	
United Kingdom	MFD	Inkjet	2		1	10
	MFD	Laser	2			
	Printer	Inkjet	2			
	Printer	Laser	1	1	1	
Total	**MFD**	**Inkjet**	**15**	**0**	**2**	**40**
	MFD	**Laser**	**5**	**3**	**1**	
	Printer	**Inkjet**	**5**	**1**	**0**	
	Printer	**Laser**	**3**	**2**	**3**	

Table 5 Breakdown of Product Numbers and Type

4.3.1. Document inspections

The participants took steps to conduct documentation checks on each of their ten assigned products.

It was recognised that the participating MSAs would not have a mandate to request documentation for all of the VA requirements because the VA is not a legally enforceable instrument. Instead, they concentrated efforts on requesting information for ENERGY STAR and Network Standby compliance.

The results of these checks showed that IE manufacturers provided a high response rate to requests for documentation around Ecodesign No. 801/2013 (Standby power) compliance.

A slightly higher response was witnessed when requests were made for documentation surrounding ENERGY STAR compliance. No potential non-compliances with the requirements of the Commission Regulation (EU) No. 801/2013 (Network Standby) or Commission Decision (2014/202/EU) (ENERGY STAR) were witnessed where data was provided in documentation.

The participants were not able to secure significant amounts of data concerning product compliance to all requirements in the VA due to both a supposed inability to legally request documentation and, where the data was requested, a low response rate.

4.3.2. Compliance testing

In total, 40 IE products covering 37 individual models were sent for testing to an accredited laboratory. The following parameters were to be tested:

- Typical Electricity Consumption (TEC) of laser based imaging products measured in kWh/week based on the EU ENERGY STAR v2.0 test procedure for imaging products;
- Sleep and Standby/Off Mode power demand of inkjet based imaging products based on the EU ENERGY STAR v2.0 test procedure for imaging products;
- The availability of duplex printing in laser based IE;
- Default Delay Time to Sleep of inkjet based imaging product;
- External Power Supply (EPS) efficiency, for products shipped with those devices, based on the test procedure listed in the EU ENERGY STAR v2.0 specification for imaging equipment.

The results of the testing can be seen in Figure 13. An overall pass mark of 85% was observed across all relevant ENERGY STAR tests.

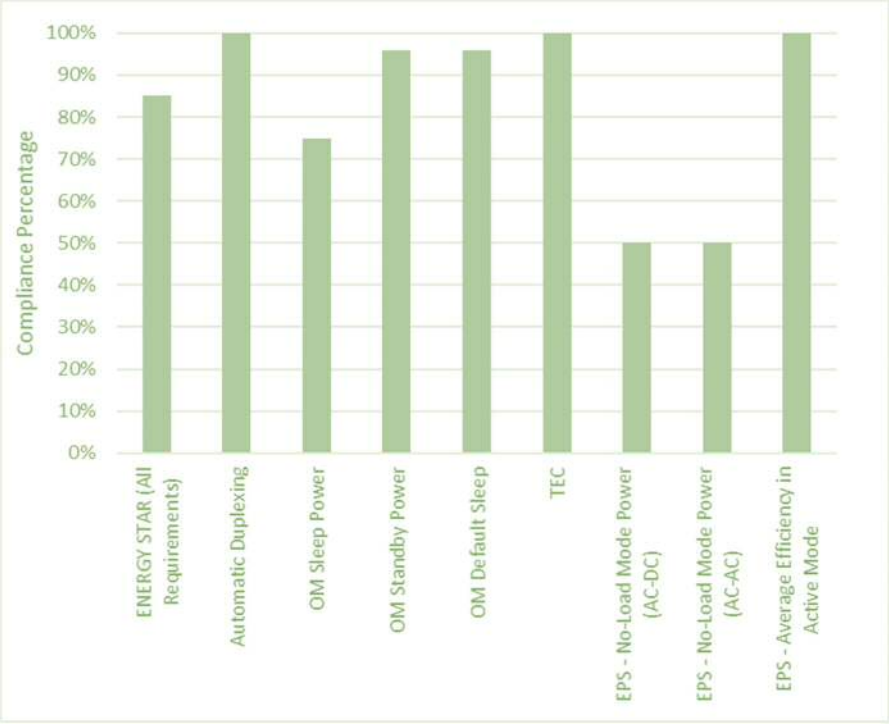


Figure 13 Summary of Compliance Rates to each ENERGY STAR Test

A total of three IE models, were shown to be (potentially) non-compliant with one or more of the ENERGY STAR v2.0 specification requirements. The potential non-compliances included:

- The sample tested of one model not meeting the required sleep mode allowance and not having an EPS with a no-load power demand state;
- The sample tested of one model failed to enter sleep mode;
- Four samples, of the same imaging equipment model, were confirmed to not have the IPS nameplate needed to apply additional adders to the sleep allowance. And one of these four samples also did not meet the required standby allowance.

It is uncertain what impact these potential non-compliant products would have on each signatories' overall VA compliance status, as overall compliance is based on a sales weighted approach. To understand the impact, it would be necessary to have sales data for each non-compliant model as well as overall sales data for the relevant signatory. This data was not available to the participating MSAs.

4.4. Enforcement Measures

The VA sets out a process for allegations of non-compliance. Any allegations must be submitted with a €4,000 fee to be held in escrow. The VA's Independent Inspector's investigation begins once the escrow amount is in place.

In the event of the allegation not being upheld by the Independent Inspector's investigation, the costs are recovered from the alleging party by way of the escrow. That party is also responsible for additional costs incurred beyond the amount of the escrow. In the event of the allegation being upheld by the Independent Inspector, the escrow amount is refunded to the alleging party and all investigation costs are paid by the non-compliant signatory to the VA.

Overall, the participating MSAs remained concerned that they could face the levy of a charge (the €4,000 fee held to be in escrow) if they raised an allegation of potential non-compliance via the VA process. Discussions with EuroVAprint[14] in May and June 2017 resulted in the organisation agreeing that EEPLIANT participants could step outside of the VA process to raise an allegation of non-compliance with individual VA signatories.

Because the completion date of this EEPLIANT project was reached before all enforcement options could be explored, the participating MSAs are likely to share the potential non-compliance results with the individual VA signatories. It is understood that no enforcement action is possible unless it is shown that the products are also non-compliant with specific regulatory requirements.

4.5. Identifying shortcomings in the functioning of the VA that could impact the work of the MSAs

The participants reviewed and tracked deficiencies in the functioning of the VA as the project progressed, where these could impact the ability of MSAs to undertake effective surveillance activities on the VA. Some points of attention are identified below:

- Manufacturers have two months and two weeks after the end of the annual (January to December) reporting period to provide their VA compliance reports to the Independent Inspector, i.e. they must submit their reports by mid-March of the following year. Future VA's could include a requirement that product documentation detailing compliance to each VA requirement is published when products are first placed on the market. MSAs could then undertake documentation checks and product level compliance checks as soon as products are placed on the market rather than delaying for up to 15 months to do so.
- The VA compliance status of signatories is determined by a formula based on the percentage of qualified units in scope and placed on the EU market. As such, MSAs compliance activities are limited to product specific checks rather than overall signatory compliance, unless sales data for individual products and total sales data per signatory can be obtained. Currently, this sales data is not available via the VA initiative.
- The VA includes two exemptions against some of the VA requirements for products that are sold in small numbers of less than 5000 units per year. The EEPLIANT participants did not have access to sales data for products and so could not determine if any such exemptions applied to specific products. Publication of a single document detailing overall compliance to each VA requirement would help to alleviate any issues in this area.
- Version 5.2 of the VA only applies to IE first placed on the market between January 2015 and December 2015, as Version 4.1 of the VA remains in force for products placed on the market between January and December 2014. Analysis conducted in April 2016 suggested that of all products registered in the EU ENERGY STAR database, 11.3% were within scope of v5.2 of the VA when filtered

[14] EuroVAprint ASBL is a non-profit association grouping all major manufacturers of imaging equipment that operate in Europe. The association provides the legal and administrative means to supervise the implementation and monitoring of the VA.

for year placed on the market and technical attributes e.g. product type, size and speed. Of the products in the EU ENERGY STAR database that have technical attributes which meet the scope of the VA, 21.1% were listed as first being placed on the EU market in 2015; therefore, they were subject to the VA v5.2 requirements. This low-level availability of products within the scope of v5.2 of the VA presents challenges for MSAs when they are attempting to select and purchase products for compliance testing purposes.

- A significant number of higher cost imaging equipment products are provided as part of a printing/imaging solution e.g. leased, rather than as discrete products. It is therefore difficult to identify how MSAs could secure these higher cost products for compliance testing.
- With regards to the VA process for settling allegations of non-compliance, MSAs were concerned about the potential of losing all of the €4000 escrow amount if a potential non-compliance allegation was not upheld.
- The VA contains approximately 15 product specific environmental criteria and 13 information provision requirements. During documentation checks it was noted that VA signatories use multiple publications to state compliance with the VA requirements. This results in significantly more effort being required during documentation checks. It would be very useful if VA signatories were to publish their stated compliance to the VA requirements in a single document.
- The MSAs recognised that they did not have a legal remit to conduct documentation checks on products involved in a VA. This limited their ability to check signatories' VA compliance status. Policy makers may wish to consider adapting legislation in the area to ensure that MSAs have a legal remit to request documentation from signatories to a VA.

4.6. Monitoring impact

It was not possible to estimate any energy savings from the work on printers as no non-compliant products were known to have been removed from the market within the duration of this project.

However, this does not necessarily lead to the conclusion that the market surveillance on printers did not have an impact. Its most tangible impact is expected to be one of influencing the development of future guidelines for self-regulation measures concluded by industry under Directive 2009/125/EC of the European Parliament and of the Council.

5. Inspection and testing of Heaters

5.1. Scope

The objective of this activity was to carry out a market surveillance action for coordinated monitoring, verification and enforcement of heaters, subject to the Commission Delegated Regulations 811/2013 (energy labelling) and 813/2013 (Ecodesign requirements).

These regulations cover several different types of heaters. The MSAs decided to focus on four types:

- Electric boilers with a thermal output up to 70 kW;
- ("Small") Gas boilers with a thermal output up to 70 kW;
- ("Big") Gas boilers with a thermal output up to 400 kW;
- Heat pumps with a thermal output up to 70 kW.

All boilers were combination heaters.

The work comprised inspection of technical documentation, laboratory testing and in-situ testing as can be seen in Figure 14 below.

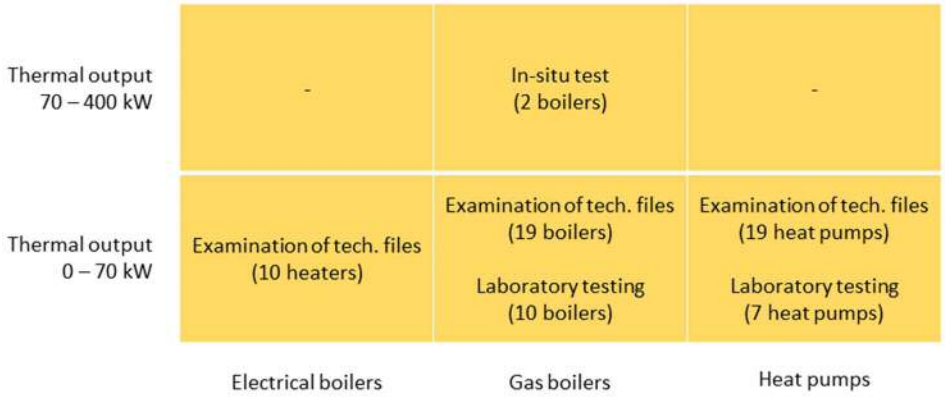


Figure 14 The scope of the Market Surveillance Activities on Heaters

5.2. Who participated?

1. **FPS Economy – Belgium**
2. **CCP - Bulgaria**
3. **DEA – Denmark - Leader**
4. **NVWA – Netherlands**
5. **SWEA - Sweden**
6. **RD – United Kingdom**
7. **PROSAFE**

Table 6 Project Partners Cooperating for the Heaters Market Surveillance Activities

5.3. Work Package Activities

Work Package 6 undertook the following activities:

- Inspections of technical documentation for 48 heaters (10 electric boilers, 19 "small" gas boilers, and 19 heat pumps).
- Testing at an accredited laboratory of 10 "small" gas boilers and 7 heat pumps.
- Testing in-situ of two "big" gas boilers.
- In addition, the authorities undertook a survey to examine the heat system installers' knowledge about the regulatory requirements for energy labelling of packages (of heaters and temperature controls).

5.4. Results

The participating MSAs acquired technical files for 48 heaters for inspection. They found non-conformities in every technical file (including omissions or errors in the product file or the energy label). These observations were shared with the suppliers. This resulted in the documentation being corrected in 20 out of the 48 cases, meaning that the MSAs could close these cases without further any action. The remaining 28 cases prompted a more extensive dialogue, including use of legal procedures implying that the authority formally requested the supplier to correct the documentation. Some of these cases had not been closed at the time of producing this report, but the MSAs expected that the suppliers would make the necessary corrections, without having to defer to stronger measures.[15]

In reaction to these results, the participating MSAs were invited by the Association of the European Heating Industry (EHI) and the European Heat Pump Association (EHPA) to help to train their members to prepare compliant technical documentation. A first training event took place in Brussels and focussed on 'typical errors and lack of information in the technical files'. These project presentations were also shared with all their member manufacturers.

5.4.1. Laboratory tests, gas boilers 0 – 70 kW ("small" gas boilers)

The project included testing of 10 "small" gas boilers, i.e. those with a thermal output up to 70 kW. These were sampled by the participants according to the distribution in Table 7. The participants focussed on products with a high market share to raise as much awareness about EEPLIANT activities as possible.

Country	Number of gas boilers
Belgium	2
Bulgaria	2
Denmark	1
The Netherlands	2
Sweden	1
United Kingdom	2
Total	10

Table 7 Distribution of gas boilers amongst the participating MSAs

The participants sampled the boilers during late spring and summer 2016. The boilers were sent to an accredited test laboratory and tested during the months August to October 2016.

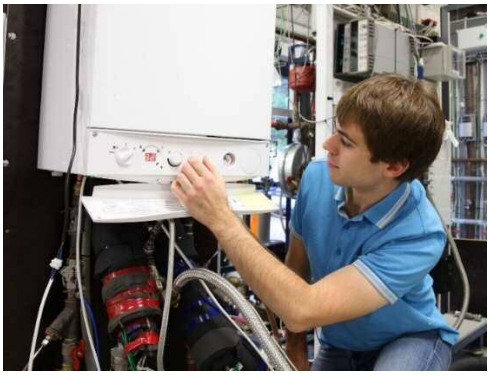


Figure 15 Gas boiler is being adjusted for testing

[15] It is illegal to sell a product with non-compliant technical documentation and the authority is able to ban the sales in such cases.

The test results were encouraging. All 10 boilers complied with the Ecodesign minimum requirements, and the measured space heating energy efficiency matched the declaration on the energy label in all cases.

Potential non-conformities with the energy labelling requirements were identified in five cases, were a mismatch was found between the measured and the declared values:

- Tap water efficiency for 1 boiler;
- Sound pressure level for 2 boilers;
- NO_X emission for 3 boilers.

NOTE: The term "potential non-conformity" means that the findings are based on testing only one sample. The legislation requires testing of 3 more samples to establish a non-conformity if the first test shows potential problems. In all the cases with potential non-conformities, the results were discussed between the MSA and the supplier, and all cases were closed by the supplier modifying the energy label, the product fiche or the technical file in accordance with the measurements.

These results were regarded as encouraging. The tests showed that the modern (energy class A) boilers are very efficient and convert 93 – 94% of the energy in the gas to space heating. (The energy efficiency for hot water production is 75 - 85%.) It was also promising that all 10 gas boilers were already able to meet the requirements for NOx emission, even though these requirements do not become mandatory until September 2018.

5.4.2. Laboratory tests, heat pumps

The project also tested seven heat pumps with a thermal output up to 70 kW. They were sampled by the participants according to the distribution in Table 8. The sampling scheme reflects that heat pumps are still a new and emerging technology in most European countries.

Country	Number of heat pumps	
	air-to-water	**brine-to-water**
Belgium	1	
Denmark	2	1
Sweden	1	2
Total	7	

Table 8 Distribution of gas boilers amongst the participants of the Heaters Activity

The samples were sent to an accredited laboratory and tested during the second half of 2016 and beginning of 2017. The test cycle took several weeks to complete for each of the air-to-water heat pumps as it was decided to measure the performance of the heat pumps under colder, average and warmer climate conditions for medium and low temperature application. In total: six combinations each requiring measurements in five set points, each measurement taking a full day in laboratory[16].

All in all, it was encouraging to find that all seven heat pumps met the Ecodesign minimum requirements. Furthermore, the measured seasonal space heating energy efficiency matched the declaration on the energy label for five of the seven heat pumps.

Potential non-conformities with the energy labelling requirements were identified in five cases, where a mismatch was found between the measured and the declared values:

- Energy efficiency for one climate zone and one temperature application for two heat pumps;
- Tap water efficiency for one heat pump;
- Sound pressure level for three heat pumps.

[16] The test cycle was significantly shorter for brine-to-water heat pumps as these were only tested under average climate conditions for low and medium temperature application, in total 2 combinations.

All potential non-conformities were discussed between the MSAs and the supplier, and solutions were agreed. Most cases were closed by the supplier modifying the energy label, the product fiche or the technical file in accordance with the measurements.

5.4.3. Gas boilers 0 – 400 kW ("big" gas boilers)

The purpose of this was to test the feasibility of a method for in-situ testing of energy efficiency for "big" gas boilers (with an output exceeding 200 kW). Such boilers are generally very difficult and expensive to examine, because only few laboratories in Europe have the capacity to test such a high heat output. Moreover, this type of boiler is normally made to order. Meaning that it is difficult, if not impossible, to sample the product by random selection or anonymously.

The feasibility was examined by testing two 200 kW boilers: one in a school in Denmark, and one in an office building in the United Kingdom. The method used is based on the indirect principle where the energy efficiency is calculated from measurements of the input energy and the losses (Figure 16). The result was that this was possible as regards the efficiency, though with a higher uncertainty than in a laboratory. However, the exercise also proved that the method cannot be applied to all cases, since the site has to fulfil certain conditions. Furthermore, the method only applies to measurement of full-load and part-load efficiency and not tap water efficiency, NO_X or sound power level.

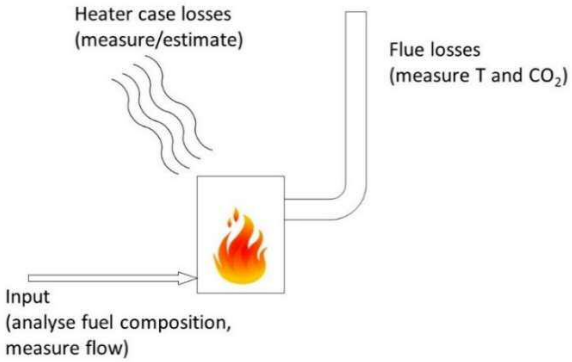


Figure 16 Measuring the energy efficiency of a gas boiler using the indirect method

5.4.4. Installers of heating products

The survey undertaken by the participants showed that installers generally knew little about the energy label for “packages”[17]. The results suggest that more information needs to become available about the energy labelling of packages, both for installers and consumers, to allow the benefits to be fully realised.

5.5. Conclusions

5.5.1. Socio-economic impact

No products were removed or withdrawn from the market as a result of the heaters market surveillance activities. This implies that no direct energy savings will be achieved. However, it may be necessary to stop the sales or withdraw products from the market as a result of the work, if the suppliers refuse to correct the documentation according to the MSAs’ requests.

The tests showed that three of the non-compliant models would consume more energy than declared: two heat pumps and one gas boiler. For these three products, the declared tap water efficiency exceeded the measured value. For the other ten non-compliant products, there will not be any energy-related consumer detriment. These results arise from activities in a sub-set of EU MS, but it is likely

[17] When a heater is sold together with another device like for instance a temperature control or a solar heater, it becomes a "package" and the installer must produce the energy label to the consumer.

that the insights are relevant to the other MS. It is possible to estimate the implications for energy consumption in the EU provided that the EEPLIANT test results were representative across the EU. These will be biased estimates based on very small samples, and as such it should be treated with caution. Nevertheless, they do provide an indication of the potential size of the issue.

Based on these test results and publicly available information, this Activity has estimated that one year's sales of non-compliant products over their lifetime (15 years) cause a total additional energy consumption of around 4 TWh. Using average gas and electricity prices from Eurostat, this implies that European consumers would spend around €500 million on additional gas and electricity and that the products emit an additional 1,2 million tCO_2.

With on-going surveillance and appropriate enforcement action suppliers are more likely to ensure their products are compliant and EEPLIANT assumes that this will cause the main indirect impact of the Heaters Activity. The effect is very difficult to estimate, but an indicative estimate using experiences from one of the participating MSAs suggests that campaigns like this of EEPLIANT could save the EU society as much as one quarter of the indicative (detrimental) figures shown above.

No attempt has been made to estimate any "spill-over effects", where economic operators in other product areas (e.g., related areas like oil-fired heaters, or completely different such as whitegoods) learn about the market surveillance campaign and improve the performance of their products, but it is likely that there will be a similarly beneficial effect caused by the activities. These benefits will only be realised if market surveillance is an ongoing activity, and is seen to be so, and that appropriate enforcement action is undertaken.

5.5.2. Recommendations

A number of observations on the legislation and test methods were made during the Action. Some of these were raised directly with the ADCO group and clarified. Those conclusions suitable for a broader audience are to be published in the FAQ maintained by the European Commission, or in the upcoming revision of the Guideline. Both are published on the European Commission's website.

Measurement tolerances laid down in the regulations ought to be reviewed

For gas boilers, the given tolerance band on the energy efficiency measurement (+/- 8%) is considered to be too wide. The tests showed that all the measured efficiencies equalled the declared values within 1 - 2% for all boilers. Conversely, the tolerances on the noise measurement and on the NO_X emission measurement seem to be narrow and close to the achievable measurement uncertainty. MSAs should be aware of this when they are testing sound pressure levels or NO_X emissions.

Labelling requirements for packages

These requirements are difficult to enforce in practice. The regulation requires that the installer shall supply the label to the consumer during the sales process, but the authorities are not always able to check it. The consumer is not obliged to keep material from the installer, and neither are installers required to do so for quotations.

The current definition of "package" in the regulation implies that almost all gas boilers and heat pumps become "packages", because they incorporate an integrated temperature control. This may confuse consumers, because what they see as one product is labelled both with a product and a separate package label. Therefore, extra information activities are needed to ensure that consumers are fully able to appreciate the additional contents of the package label.

Finally, EEPLIANT observed that not all manufacturers seem to be aware that they are obliged to supply test settings for a heat pump within ten days. Many manufacturers are also unaware of the differences between the requirements in the Ecodesign Directive and the Energy Labelling Directive. There would be value in raising the awareness among manufacturers about this requirement

6. Dissemination and Communication activities

Dissemination of results had always been planned to be a key feature of EEPLIANT. The results from the product focussed activities have been disseminated to all EEA MSAs via ICSMS.

Additionally, the outputs from the document inspections, the results of testing and the enforcement actions (exploitation) taken by each MSA will be drawn to the attention of the Energy Labelling and Ecodesign ADCOs, who will communicate them to all the MSAs that make up their membership.

These MSAs, in turn, will be encouraged to exploit these results at their national level. This action, in conjunction with the earlier sharing amongst participants is seen as playing a key role in maximising the impact of the programme thorough the increase in enforcement actions that will follow. An overview of the dissemination activities that have taken place is shown below:

	OUTPUT	DISSEMINATED BY OR VIA	DISSEMINATED TO	INTENDED EXPLOITATION
1.	**Results of document inspections and laboratory tests**	Participating MSAs	Suppliers of the non-compliant products	Non-compliances corrected, removal of non-compliant products from the markets of the participating MSAs
		ADCOs and the ICSMS database	Non-participating MSAs for onward dissemination to suppliers of the non-compliant products	
2.	**Outline of results of document inspections and laboratory tests and, where appropriate, results of enforcement actions**	Advisory Board members, other EU trade bodies	Suppliers and other market operators	Suppliers of non-compliant products to spontaneously take their own action to correct, or remove non-compliant products from the market in response to the knowledge that MSAs are actively pursuing suppliers of non-compliant products
		Advisory Board members, other EU User and Environmental NGOs	Policy makers, purchasers and users of energy consuming products	Build confidence in the implementation of the energy labelling and ecodesign regulations

Figure 17 Overview of Dissemination Activities

The Work Programme was developed to ensure that wider communication beyond dissemination amongst MSAs was achieved too. The goal was to communicate (and so enable further dissemination) to all relevant stakeholders, from the professional and industry associations of manufacturers and economic operators, to consumer and environmental NGOs, societal and other interested stakeholders, such as the European Standards Bodies.

The WP used two main routes of communication to reach the goals of promoting the project and its findings. One was the targeted communication to the key stakeholder communities, which was primarily accomplished through use of EEPLIANT's Advisory Board (AB).

The AB members, which included the EU bodies representing key target groups such as national supplier associations, provided an excellent conduit for informing their members of the project, its progress and its findings. Other AB members represented societal bodies who were able to similarly act as an information conduit to their national membership.

The other main route was the wider communications activities made through newsletters, news releases, the website and Twitter accounts. These meant that individual market actors, industry associations, non-profit organisations, media and the general public were all being informed about the activities of market surveillance authorities in the field of energy label and ecodesign market surveillance in Europe.

6.1. Project website

The project website www.eepliant.eu was created to inform all interested stakeholders about the project actions, plans, achievements and individual deliverables. It contained regular news updates, informing the visitors on project activities, including the laboratory tenders, project events and meetings, etc. Each relevant outcome, such as new events, meetings, documents, etc. were uploaded to the news section.

The website also contains a link to the e-learning portal aimed both for the surveillance authority professionals and for external interested stakeholders, as well as providing access to selected literature and external sources of information. The main language used is English, with documents downloadable in other languages too. The website will be maintained for at least 3 years following the end of EEPLIANT.

Figure 18 Home site of the project website www.eepliant.eu and Front page of the 4th Newsletter

6.2. Project newsletter

Newsletters were scheduled to be released at the start and again upon achieving specific results in the project's testing activities. In total, four newsletters have been published each in English and a number of other languages.

The newsletters have been shared with the members of the project's AB, published on the EEPLIANT website[18], shared via the project's Twitter account[19], distributed to EU-level stakeholders, and to the national level stakeholders by the individual project partners.

[18] http://eepliant.eu/index.php/newsletters
[19] https://twitter.com/EEPLIANT

Each edition has brought updates on the project activities: from the planning stage, the preparation of the testing, through sharing of the preliminary achievements and key outcomes, to the surveillance actions organised by the project partners, and the overall lessons learned.

6.3. Press releases

Two project press releases have been delivered in English and a number of other languages to inform the expert and general media about the project plans, and the final overall achievements. They too are published on the project website[20].

Both press releases have been shared with journalists centrally on the project level and with journalists on the national level by the individual project participating MSAs.

6.4. General media and articles

A number of articles have been published in printed and online media, informing about the individual project achievements. Some articles focused on specific project actions, e.g. on the testing of LEDs, others informed about the EEPLIANT market surveillance goals and achievements, both internationally and in selected countries.

21

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Figure 19 Articles in the foreign media describing the EEPLIANT activities: Austria and Bulgaria (from left to right)

6.5. Social media presence

The www.twitter.com/eepliant account has been live since June 2015 with the frequency of several new items being published every week.

Over 400 tweets to more than 280 followers had been made by the end of June 2017 from this account. These inform the professional audience, such as the industry associations, civic organizations, individual manufacturers, experts, policymakers, authorities and interested consumers, on deliverables made available online, planned events and activities, progress on the testing activities (e.g. announcement of laboratory tenders), retweets of other stakeholder messages' announcing their participation to the project's Advisory Board, etc.

[20] http://eepliant.eu/index.php/newsletters
[21] https://www.elektrojournal.at/elektrojournal/oesterreichische-energieagentur-teilnahme-eu-weiter-marktueberwachung-149363
[22] http://news.bnt.bg/bg/a/zapochnakha-proverki-na-blizo-300-proizvoditeli-i-trgovtsi-na-boyleri-v-strana

6.6. National events

Each national project partner was tasked to deliver a presentation at a relevant event. More than fourteen events have taken place where the EEPLIANT project presentation has been delivered or where the project activities have been discussed in full detail with industry and civil society representatives.

Figure 20 EEPLIANT is presented at national conferences in Sweden and Slovenia (from left to right)

6.7. International event appearances

EEPLIANT has been present at several international events and conferences, such as the ECEEE 2017 Summer study on energy efficiency, France[23]. The project partners presented the achievements, discussed project plans, actions, and shared the market surveillance experiences specific to the EU ecodesign and energy label legislations with other stakeholders.

[23] https://www.eceee.org/summerstudy/

7. Impacts

The main, tangible, impact of this project was to detect and enforce cases of non-compliant products from the product categories identified in EEPLIANT. Since the participants have the legal authority to take action to remove non-compliant products from the market, then it follows that their exploitation of the results has been achieving exactly that.

7.1. Expected impacts

A number of expected impacts were identified when this project was first conceived. Each of these is discussed, in turn, below.

7.1.1. Generating energy savings by eliminating non-compliant energy consuming products

EEPLIANT was funded by grant from the EU's Horizon2020 programme. It was designed to respond to a Call that specified "[for market surveillance proposals] *every million Euro of EU support is expected to generate savings of at least 15 GWh/year of energy losses avoided from non-compliance."*

The original estimation was that the programme proposed would achieve a saving of 86 GWh for a budget of €2.5. It has not been possible to robustly quantify the energy savings due to products being withdrawn, modified and relabelled as a result of EEPLIANT actions. This is primarily because insufficient market data has become available to the MSAs on which reliable calculations can be based, and partly because the full impact of the actions taken on suppliers has not been disclosed by them. However, a qualitative review of the non-compliances detected when inspecting and testing of heaters and the impact that they could have in the market shows potential energy savings[24] far exceeding the 86GWh originally projected.

7.1.2. Generating an increase of confidence among purchasers, manufacturers & retailers

That same Horizon2020 Call also required that the actions of EEPLIANT "...*should result in an increase of confidence among purchasers, manufacturers and retailers.*" The MSAs participating in EEPLIANT recognised that delivering this impact was very important; they were aware that stakeholders had long voiced concerns that the enforcement authorities are not undertaking sufficient market surveillance. Thus, they set about ensuring a high level of visibility of their actions through asking EU level stakeholder representatives to become part of the EEPLIANT programme through taking up a role in the Advisory Board. Additionally, one work package was developed specifically to increase the visibility of this programme to purchasers (both consumer and non-consumer), manufacturers and retailers.

Only by ensuring that all concerned bodies could "see" effective enforcement taking place could we expect the required increase in confidence.

Has this been achieved? We believe so. Informal feedback from stakeholders in the AB and amongst those attending EEPLIANT's Final conference shows that the work of this project is resulting in an increase of confidence among purchasers and manufacturers.

[24] The impact of Heaters Activity was described in Deliverable D6.4.

7.1.3. Enforcement of EU product legislation

Another requirement of the Horizon2020 Call was that EEPLIANT should *"…contribute to the enforcement of EU product legislation."* Delivering this impact was exactly the purpose of this project. The 13 of the 15 participants, who are national authorities, have been doing just that by having taken highly visible enforcement actions across the lighting, printing and heating product sectors. About 200 products have been subjected close examination, with the majority having been sent to laboratories for testing. This work has resulted in:

- 61 enforcement measures being taken for LEDs;
- 28 enforcement measures being taken for heaters;
- 3 potentially non-compliant products being brought to the attention of the Independent Inspector responsible for auditing the Imaging Equipment Voluntary Agreement.

The figures for enforcement measures for LEDs and heaters represent something like 50%[25] of the products examined. In many cases for LEDs these measures resulted in products being withdrawn from the market, though many were no longer on sale anyway. For heaters, no products have yet had a sales ban or was withdrawn yet the majority were served a legal notice requiring them to correct technical documentation, energy label and/or product fiches.

The enforcement impacts of EEPLIANT were never meant to be confined to the actions of this project. Effective enforcement requires MSAs to have the right skills, knowledge and experience and this project had a substantial impact on building those capacities.

MSAs responsible for all or parts of the Energy Labelling and Ecodesign Directives need to have a remarkable breadth of expertise ranging from in-depth technical knowledge of close to 30 different product sectors with a corresponding expertise in document examination and legal procedures. Right now, this factor alone is known to be a substantial barrier for those MSAs who do not have dedicated energy label and ecodesign compliance staff. The Energy Label Evaluation report[26] states that *"…common best practice, guidelines and manuals, as well as common projects could make the involvement* [of national authorities] *easier"*. And that is exactly what this project achieved through its provision of:

- Publishing Best Practice Guidelines;
- Training programmes (including an always available on-line facility) in the application of Best Practice;
- Shared and harmonised project activities based on the implementation of Best Practice.

7.1.4. Reduction in consumer detriment

EEPLIANT delivers a positive impact for all users, be they domestic consumers or professional operators of energy consuming products, since it has ensured that a number of non-compliant products have been withdrawn from the market. In this context, these are products that have been delivering less performance than the purchasers thought they were buying.

The results for LEDs are clear. Close to 50% of the models tested failed in some way to deliver the promised performance. Most, if not all, can no longer be purchased.

Similarly, enforcement actions that have resulted in energy performance declarations being corrected, as has happened for heaters, ensures that purchasers will get the performance that they have paid for – not the reduced performance that they would otherwise have unwittingly purchased.

[25] It must be emphasised that the samples examined and tested in this project were not a random sample taken from the market. Instead, they were selected by the MSAs following a risk analysis for possible non-compliance. Therefore, the results are *not* representative of the EU market for those product sectors.
[26] Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive (ENER/C3/2012-523)

This example from the results of testing heaters, demonstrates the level of financial detriment for a heat pump purchased with a declared (and, therefore, expected) tap water efficiency of 96%, but which could only produce 87% efficiency when measured. The impact of this for the owner over the fifteen-year lifetime of the product is an unexpected increase of more than €900 in running costs.

7.1.5. Enforcement improves the competitive market

EEPLIANT makes a positive impact for compliant suppliers. Such suppliers have been amongst the strongest voices calling for more effective market surveillance since they face unfair competition from non-compliant, but lower cost, products. Removal of non-compliant products (and the product selection made by the MSAs was targeted on products that judged to be of higher risk of being non-compliant) restores fair competition to the market place.

7.2. Measures to maximise impact

The overall goal and planned impact is not only in identifying, sanctioning or removing specific non-compliant products from the market. It is also to exploit the results in such a way that they lead to achieving a higher level of compliance by improving stakeholder understanding of the individual legal requirements, of the trends in non-compliance detected, and by reaching an agreement with them on how these trends should be avoided for other products that have not been tested by the project. The work done in providing training to EU heater industry representatives is an example of direct action being taken to deliver this impact.

Dissemination and exploitation of results by other EEA MSAs

The most effective impact is for the responsible authorities to take enforcement action against non-compliant products. Whilst this has been done in the MS of those MSAs taking part in this project, it could represent less than half of the EU market for those products that are sold right across the EU.

Therefore, one way to increase the impact of EEPLIANT is to ensure its results are available to all the remainder of the EEA MSAs responsible for enforcing these same regulations. This has been done by uploading all possible results into ICSMS, as described in Section 2.2 on page 15. Since all EEA MSAs have, in theory, access to ICSMS, and since this is the official tool for informing them, then it follows that this should be the best possible route for sharing the results of EEPLIANT. Those (other) MSAs attending the next meeting of the Energy Labelling and Ecodesign ADCOs will be informed of this too, which should maximise any continuing exploitation of the results.

8. Looking ahead

8.1. What is a good result for market surveillance?

The previous section provided details of the positive impacts that EEPLIANT has been making. By the measurements and targets that were set out at the beginning of the project it can be judged that EEPLIANT has been very successful. This, we can claim, is a *good* result.

However, it could equally be argued that a *good* result should look rather different.

Indeed, a *very good* result would show that only low levels of non-compliance were found; there were no products needing to be removed from the market; there was no significant consumer detriment and there were no energy savings to be claimed as part of the success. In other words, the EU market is a compliant market.

We are not there yet, but we should be reminded that the good result we should be striving for looks very different to the good results we claim today.

8.2. The practical challenges and some suggestions

8.2.1. Access to authoritative technical expertise/Centres of (skills) excellence

Currently, an MSA responsible for enforcing both the Energy Labelling Directive and the Ecodesign Directive has to cover some 30 different product sectors. Products which range from the comparatively simple, to some that are so large and complex that only a major industrial body would be able to test. It is perhaps unrealistic to expect that any authority will ever have sufficient expertise to match all of these 30 product sectors.

This challenge was experienced in this project too. Some participants had never inspected or tested LED lamps prior to this project, whereas a small minority had built up considerable experience and had operated their own test equipment for LEDs. Consequently, the expert minority were able to provide technical leadership and supervision. They could be seen to be acting as 'centres of excellence'.

The necessary expertise for imaging equipment was supplied by the coordinator, PROSAFE, who ensured that the facilitator they appointed to support that work package had the necessary authoritative technical expertise.

Clearly, MSAs are likely to often need to be able to access an independent source of authoritative technical expertise. Ideally, this should come from within the ranks of the MSAs themselves. Perhaps, in the future, different MSAs could build specialisations in different product sectors thus sharing the burden at the same time as taking forward the collaborative working agenda.

8.2.2. Supporting adoption of good/best practices by making it the easiest route

National rules will always impose some limitations on the level of harmonisation that can be achieved by MSAs. However, the development the toolkits described in Section 2.1 on page 14 could create a situation that will lead to MSAs all (eventually) adopting the same ways of data gathering and data evaluation simply because using the toolkits will be the easiest way for them to go about their tasks. This "bottom up" approach thus delivers a working level of harmonisation without the need for any "top-down' edicts.

8.2.3. Supporting ICSMS

Toolkits should have data gathering processes based on the need to ensure excellent compatibility with ICSMS. Take up of toolkit content should therefore lead to increasing numbers of MSAs using ICSMS – especially if it becomes routine for data to auto transfer into ICSMS. However, such an outcome may require further work on optimising the gateways into ICSMS.

8.2.4. Financial support for market surveillance

The work and achievements of EEPLIANT, and its predecessor ECOPLIANT, would not have been possible without EC funding. The largest single budget item for this funding is the cost of obtaining the samples and testing them. Without this central funding, some MSAs will not have sufficiently large budgets to enable them to undertake and product testing at all. The reality is that maintaining a significant and effective market surveillance presence across the EU within the current policy scenario cannot be achieved without some form of central funding support.

That said, then it is equally necessary to ensure that such funding is used in the most cost-effective manner. The lessons of ECOPLIANT and EEPLIANT suggest that such funding should be directed towards continuing to build capacity through the route of collaborative programmes involving the maximum possible number of MSAs. The EU is a single market place and the work of market surveillance should be directed in the same way i.e. wherever possible and practicable product sectors are dealt with through single coordinated/collaborative actions.

ECOPLIANT and EEPLIANT also demonstrated that pan-EU coordinated actions require project administrative and coordination support. These can be substantial multi-disciplined programmes that, themselves, require another set of skills to manage effectively. If such skills cannot be deployed from within the ranks of the MSAs, then they will need to find elsewhere.

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