# What's on? Compliance of televisions with energy labelling and ecodesign regulations

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# Abstract

The 2014 evaluation of the energy label prioritised the need to address market surveillance to recoup the estimated 10 % of potential energy savings lost as a consequence of poor enforcement. ComplianTV was initiated to address these needs specifically for televisions (TVs), given the recent entry into force of the TV related regulations and the specific challenges that exist in this market - for example the market size, the breadth of suppliers, the energy impacts and the complexities around the standardisation and measurement process. ComplianTV supports the market transformation of TVs towards more energy-efficient products. The project works alongside the EU energy labelling (1062/2010) and ecodesign (642/2009) regulations for TVs in a number of ways: ensuring that noncompliant products are identified and removed from the market, engaging in dialogue with all stakeholders, improving performance through competition and guiding consumers towards the most efficient products available. The project aims to support the activities of national Market Surveillance Authorities (MSAs) and an overall increased culture of compliance among manufacturers and retailers. So far the project has assessed 162 TV models, identified a number of non-compliant products and created and published the results in a publically accessible database. It has identified standardisation anomalies and produced guidelines for TV testing and recommendations for future policy development; it has inspected the compliance of 100 physical and 100 online shops across 5 countries finding non-compliance rates of 41 % and 74 % respectively and it has Thibault Faninger ComplianTV Project Coordinator BIO by Deloitte 185 avenue Charles de Gaulle 92200 Neuilly-sur-Seine France tfaninger@bio.deloitte.fr

established a detailed dialogue with MSAs, manufacturers and retailers across Europe. The project is delivering an improved compliance rate of future TVs through a detailed discussion and remedy action process with non-compliant manufacturers and retailers, by means of returning to the retailers and checking manufacturer's products to verify the implementation of remedy actions; capacity building with European testing laboratories on the TV testing issues and standardisation anomalies uncovered; and national and European workshops with MSAs sharing project outputs.

# Introduction

This paper constitutes the main outputs from ComplianTV<sup>1</sup> – an Intelligent Energy Europe funded project running from April 2013 until September 2015. The main project outputs are explained in the proceeding sections: product testing, the online and in-store retail shop labelling inspections, and the various activities to strengthen the community of stakeholders e.g. MSAs, manufacturers, retailers, policy makers and consumers.

# Energy Labelling and Ecodesign Regulations: Do the TVs comply?

# METHODOLOGY, PRODUCT SELECTION AND TARGETTING

The project had planned to purchase and test 201 TVs (units) against the technical and information requirements of the energy labelling and ecodesign regulations for TVs. The testing

<sup>1.</sup> www.compliantv.eu

was divided into 3 batches. Batch 1 constituted 60 models, batch 2, 40 and batch 3, 62 – the remaining 39 models were reserved for step 2 testing whereby 3 additional units are purchased and tested to confirm or otherwise the suspected non-compliance after step 1 testing. The testing was performed by VDE and IPI in Germany and Re/genT in the Netherlands. The measurements were made in line with IEC 62087 *Methods of measurement for the power consumption of audio, video and related equipment* and EN 50564:2011 *Electrical and electronic household and office equipment – measurement of low power consumption*.

To provide clarity to the market and to consult on due process with the MSAs, it was necessary for the project team to set out and declare how it interpreted certain specific requirements from the energy labelling and ecodesign regulations for TVs and how it would assess the compliance of TVs in general. These were set out and validated in April 2014 within a document called Test Method Interpretations, Tolerances and Communication of Results<sup>2</sup>. As well as providing clarity on the process for step 2 testing, the document also importantly established clear terminology with respect to the term "non-compliant". This simultaneously recognised the importance and position of the MSAs with respect to enforcement, and defined the project's use of non-compliant as referring to a conformity check performed by the project against the requirements specified.

A market analysis was conducted based on data from the online retailer Amazon, a price comparison portal and available market statistics data. Based on the results of the market analysis and online research, a product selection methodology was created. The criteria encompassed technical aspects and economic aspects. Based on the established selection criteria, a list of TVs to be tested was completed and published<sup>3</sup>.

The first batch constituted 57 LCD TVs and 3 plasmas, with a split of 36 major brand TVs and 24 other brand TVs. The major brand TV manufacturers are defined by the project as LG, Panasonic, Philips, Samsung, Sony, TCL, Thomson and Toshiba. The screen sizes of the 60 models were split evenly between 4 size groups: <32", 32", 33-42", >42". These were the most commonly bought TVs by consumers between 2012 and 2014. Models <16" and >55" were excluded as they lay outside these ranges. The project team was keen to take an intelligence led approach from batch to batch. Therefore, the results of the first batch of testing were used to inform the model selection and targeting approach for batches 2 and 3. For example, there was a great targeting of other brand TVs in batches 2 and 3 as they were found to have a higher instance of failures. Therefore, the proportion of major brands to other brands evolved in the second and third batches from 36 and 24 in batch 1, to 12 and 28 in batch 2, and 27 and 35 in batch 3. The impact of the batch 3 sample was further enhanced by the use of GfK data showing where the models were sold: it was the project team's ambition to maximise the reach of the results.

After step 1 testing of batch 1, 43 TVs were declared compliant with the technical requirements with 17 identified as suspected non-compliant. The project team established a dialogue with the respective manufacturers to provide the test results and if required – to clarify the test procedures. The results regarding the 17 suspected non-compliant cases were further clarified:

- Five models were declared as non-compliant: the non-compliance was accepted after step 1 in the case of four models. One model progressed to step 2 testing, which subsequently failed.
- Six models were declared as compliant: given the complexity of testing a TV, there were instances of communication with the manufacturers and clarification of queries which resulted in the testing reports being updated. For one specific model, step 2 was initiated and passed.
- The compliance status of six models could not be clarified: the additional units required for step 2 testing for five models could not be purchased from the market. Three additional units for one model were purchased, however on delivery they showed clear signs of use, and were rejected. There were no other retailers found selling this model of TV.

In summary, setting aside these six models for which compliance could not be determined, the results of the TVs under test for batch 1 showed:

- 49 (LCD and plasma) models comply with the technical requirements in 642/2009 and 1062/2010; and
- 5 TVs were non-compliant in respect to technical requirements in 642/2009 and 1062/2010.

Furthermore, the overall evaluation of the test results revealed the following trend:

- The highest compliance rate came from the two highest price segments (both 100 %). The lowest two price segments, <400 Euro and 400–800 Euro, had the lowest compliance rates (73 % and 88 % respectively).
- Out of the 5 non-compliant cases, one was declared energy class A+, three A and one B.
- None of the non-compliant cases originated from the major brands.
- Of the five models that failed, 4 models failed the automatic power down requirement and one model failed the peak luminance ratio.

# Inspecting TVs In-store and Online for Energy Label Display

# METHODOLOGY AND RETAILER SELECTION

The objective of this exercise was to check a sample of retailers across 5 Member States to understand their level of compliance with the display and proper use of the energy label. The inspections were divided into two rounds. For each round, each project team partner visited 20 stores in their respective country. The second round constituted a repeat inspection of all stores

<sup>2.</sup> http://www.compliantv.eu/eu/about-the-project/all-documents/

<sup>3.</sup> http://www.compliantv.eu/eu/product-testing/product-selection/

from the first round, after a discussion period about the findings and implementation of the agreed remedy actions with the retailers involved. Project partners from France, Germany, Austria and the Czech Republic all delivered 20 in-store and 20 online inspections, with the UK partner conducting a further 20 in-store inspections and the Belgium partner 20 online inspections: totalling 200 inspections from rounds 1 and 2 – 100 each for in-store and online.

For the in-store inspections, retailers were divided into 4 categories: electronic superstores, department stores, supermarkets and electronic specialists/independents. Each national partner was allowed to use local intelligence and national priorities in selecting what proportion of each store type made up the sample of 20 and their geographical location - with the exception that at least 2 of the stores visited had to be electronic superstores and a minimum of 12 of the stores visited had to be the other 3 store types. Labels should conform entirely to the format specified in annex V of EC regulation 1062/2010<sup>4</sup> and be placed on the front of the TV, clearly visible. Instances of non-compliance were characterised into 4 classifications: placement issues when the label was either hidden or otherwise obstructed from view, format issues when the label was graphically amended, in the wrong colour, size or otherwise not following the regulated format, application issues when the label did not match the model it was affixed too, or otherwise missing in its entirety.

For the in-store inspections, data was collated for both unboxed and boxed TVs. In terms of classification of non-compliance, where there is a number of boxed TVs, with one model un-boxed and fully labelled, all of the related boxed TVs with the same model number shall be recorded as correctly labelled. Where there is an unboxed TV price marked but without an energy label (or even if there is no example unboxed, but still priced), all the associated boxed TVs of that same model number shall be recorded as a non-compliance (missing), the number of which is dependent on the number of boxed TVs for sale. Furthermore, data was collated at both the individual unit level and at the model level, where many units of the same model were for sale – such as can be the case for boxed TVs.

For the online inspections, retailers were selected by the national partners with central organisation and communication so as not to duplicate on international retailers. For each store, 20 TVs were selected, drawn from a stratified random sample which specified an equal share across 4 different screen size groups and proportional mix of brands. In order to be considered correctly labelled at the time of the inspection, if the seller was not displaying the energy label, TVs needed to display the following 4 pieces of energy related information, in this specified order, according to Annex VI of EC regulation 1062/2010: (1) energy efficiency class, (2) on-mode power consumption, (3) annual power consumption and (4) visible display size.

Instances of non-compliance were characterised into 3 classifications: format issues, where the energy related information was not displayed in the right order or some information was missing, the displayed label did not fit the colour, or the



Figure 1. Non-compliant TVs in-store. In round 1 conducted at the end of 2013, 41 % of TVs were found non-compliant (using the unit level assessment) in 100 stores across 5 countries (n=5,854).

format which is required from the regulation; application issues where the label did not match the model; or otherwise the TV was missing both the label and the energy related information.

# **RESULTS OF IN-STORE INSPECTIONS**

Consumers on average are likely to find energy labels missing on 4 out of every 10 models sold<sup>5</sup>. With a sample size of nearly 6,000 TVs the non-compliance rate was 41 % (at the individual unit level). Out of the 100 stores inspected, nearly half were electronic specialists, with the remainder being electronic superstores, department stores and supermarkets. On average, superstores had the highest level of compliance (64 %) and supermarkets the lowest (42 %). The pre-dominant reason for non-conformities was TVs missing the energy label (88 %) followed by formatting issues on 8 %. For the five countries studied, you were most likely to find the highest proportion of compliant TVs on sale in Germany (78 %) and least likely in the UK and France (44 %).

The issue of non-compliance was more prominent for boxed TVs, where 79 % seen were non-compliant, as opposed to unboxed TVs where this number was 31 % (according to the unit level assessment). Out of all the non-compliances seen, boxed TVs represented 40 % despite only representing 21 % of the total sample size. Most of the boxed TVs inspected were found in the electronic superstores (62 %), followed by the supermarkets (20 %).

# **RESULTS OF ONLINE INSPECTIONS**

A total of 2,002 TVs were inspected, and a 74 % non-compliance rate was found regarding the display of energy labels on TVs. Over 80 % of the non-compliant cases were due to formatting errors – essentially some of the information either missing or presented in the wrong order to the consumer. This issue varied across the five countries studied, with Germany having a 53 % non-compliance rate and the Czech Republic a 95 % non-

<sup>4.</sup> http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:314:0064: 0080:EN:PDF

<sup>5.</sup> http://www.compliantv.eu/eu/energy-label-display/monitoring-in-the-stores/





Figure 2. Non-compliant boxed TVs. With no example model labelled; all TVs were counted non-compliant.

Table 1. Comparison of Retailer TV Labelling Compliance across studies 2012–2014.

Report No	Year	Activity	Compliance Rate
1	2012	UK National Measurement Office Compliance Project	13 %
2	2013	Come on Labels Project	63 %
3	2013	German National Survey	76 %
4	2013	Italian National Survey	85 %
5	2014	MarketWatch Project	70 %
6	2014	ComplianTV Project	59 %

Sources: Report 1 http://www.come-on-labels.eu/download-library/nmo-label-compliance; Report 2 http://www.come-on-labels.eu/ displaying-energy-labels/status-of-appliance-labelling; Report 3, 4 www.energylabelevaluation.eu/tmce/Literature\_report\_Energy\_Labelling\_Ecodesign\_2013-12-18\_Ecofys.pdf Report 5 http://www.market-watch.eu/shops/.

compliance rate – the rates for France, Austria and Belgium ranged between 78 and 81 %. The declaration by retailers of the on-mode and annual power consumption and energy efficiency class were compared with those made by the manufacturer for all 2,002 products. 285 cases of discrepancy were identified (14 %). The declaration of on-mode power consumption had the highest discrepancy rate (130 cases) with energy efficiency class the lowest (52 cases).

# IS LABELLING COMPLIANCE IMPROVING IN-STORE?

Retailers' compliance with requirements specified in the regulation has been assessed in a number of studies and projects, carried out by both MSAs and civil society organisations (see Table 1). Data gathered by ComplianTV in 2013 and 2014 suggests that TV retailer labelling compliance has seen a fairly rapid increase, and is currently levelling out between 60–85 %. Several projects have shown variations between different types of retailers in their labelling compliance. It should be noted that the methodology for the projects and studies referenced were not identical in each case. ComplianTV saw variation in the compliance rates of physical stores when assessing compliance by 'model' (68 % compliance when counting each different product as one compliance or non-compliance) and 'unit' (59 % compliance when counting multiple units for sale as multiple compliance or non-compliance, see Figure 3).

Compared with other product categories, TVs currently show compliance rates below some white goods but show a significantly higher compliance rate compared to those of wine storage appliances and air conditioners (subject to labelling regulations since 2010 and 2011 respectively).

# Strengthening the Community: Sharing Project Outputs

The outputs of the project are designed to either empower and/ or strengthen those actors, stakeholders and audiences that are involved in the TV market – whether they are the makers, the sellers, the purchasers or those that set policy for them, test them or enforce their laws and regulations. Table 2 highlights how the many outputs from ComplianTV served to help a wide and varied group of TV stakeholders in Europe.

# PRODUCT DATABASE

The objective for the database is to make the data from product testing available to MSAs. In order to allow a quick overview of the tested TV models, the front page of the database displays the overall compliance as well as the energy efficiency class, both declared (by the manufacturer) and measured (by the laboratory). Then, for each model, there is the possibility to have several further testing criteria displayed in individual factsheets. The goal was to develop an online tool, which was both informative and succinctly arranged.

# TEST REPORT TEMPLATE

ComplianTV has utilised the skills and experience within the consortium to draft, refine, test and implement a product test reporting template – for the benefit primarily of laboratories



Figure 3. Studies of labelling compliance rates of multiple product groups including TVs Data is from physical shops only.

Table 2. How ComplianTV project outputs get shared with stakeholders and audiences.TV Labelling Compliance across studies 2012–2014.

	MSAs	Manufacturers	Retailers	Laboratories	Policy Makers	Consumers
Product Database	Ŋ	Ø		Ø		
Test Report Template	Ŋ	Ø		Ø		
Guidelines		Ø	V	Ø		
Consumer Leaflets			V			N
Workshops	M	Ø	Ŋ	V	M	
Policy	Ø	Ø	Ø	Ø	Ø	
Recommendations						

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Note         Base of the standard         Standard <td></td> <td></td> <td>REDUCT TESTING     Overall compliance (%):</td>			REDUCT TESTING     Overall compliance (%):
Image: Section of the sectin of the section of the section	Countries where model Prand many Product Islams Etheral	erzy Efficiency Class Overall	Stand-by/off mode power consumption compliance
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No.	LG 47U/7605-28 ES A+	- A- 🗸	Remety actions: Identified Issues Pending
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Tit       Series (W)	Samsung PS43F4500AW UK B		Energy efficiency class B B
13     850     Mathematical Biology     Mathematical Biology <td>Samsung DE19ES4000W PR B</td> <td>5 B V</td> <td><b>Botmicel specifications</b></td>	Samsung DE19ES4000W PR B	5 B V	<b>Botmicel specifications</b>
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19     Tarsile     417.03     17     Ar     Ar     Ar       20     Tarsile     245.03     FR     A     A     A       21     Tarsile     245.03     FR     A     A     A       22     Tarsile     255.03     FR     C     C     A       23     Namere     E00.048     C     A     A       24     Masser     UTMACHANCELLO     FR     A     A       25     Masser     E00.0484     Masser     Colditional Anticipational Anticipatio	Thomson 32HT4253 DE A	A* No result 1	Display technology LCD
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28 Penesonic TX-L38668 UK A+ A+ V		- A- V	

Figure 4. Screen shots from the ComplianTV online product database showing 1) the summary view and 2) the model view. Source: www. compliantv.eu/eu/product-database.



Figure 5. Input power consumption over time for a TV: on the left with no dynamic power variation and on the right with special dynamic power variation.

and MSAs. In order to maximise transparency and benefit for all stakeholders, the project team will publish the test report template (in its final version) for the benefit of those who would save time and money in using it, including MSAs and laboratories.

## **GUIDELINES & LEAFLETS**

Various resources have been produced by the project team to serve MSAs, laboratories, retailers, manufacturers and European consumers:

- Guidelines for product testing.
- Guidelines for conducting in-store and online shop inspections.
- Brochures on how to display energy labels in-store and online.
- Consumer leaflet on understanding the TV energy label.

#### WORKSHOPS

The production of guidelines is supplemented by the action of hosting national and international workshops across a range of topics including the preparation, delivery and evaluation of in-store and online shop inspections, the outputs of the project in general and more specifically, the experience from the compliance testing of products.

### **REVIEWING THE REGULATIONS: HOW CAN THEY BE IMPROVED?**

The project team were able to learn and understand a considerable amount about the European regulations used to implement standards and verify conformity. What follows are the observations and recommendations for improving the current suite of ecodesign (642/2009) and energy labelling (1062/2010) regulations.

# **On-mode Power Consumption**

During the testing programme a different power consumption curve was measured in response to the "Dynamic Broadcast Content". This was a new behaviour for on-mode power consumption, not previously experienced by the laboratory team. Figure 5 demonstrates this behaviour with the graph on the left showing a typical power consumption curve and the graph on the right showing this new observed power consumption behaviour.

# Automatic Power Down

The testing programme identified that there was a lack of a measurement tolerance for the verification of the 4hr automatic power down requirement within the ecodesign TV regulation and furthermore that it was unclear whether or not the TV had to complete the power down process within the 4 hrs or to have started it.

# Peak Luminance Ratio

The experience from testing over 160 individual models demonstrated the complexity of verifying TV performance against this requirement. On account of the flexibility provided for in the regulation, the lack of a defined unified test pattern makes the independent testing and verification process longer and more costly: complicating the issue for MSAs and laboratories.

#### Energy Efficiency Index (EEI) and annual power consumption

For the calculation of the EEI and the annual on-mode energy consumption, the TV energy label regulation 1062/2010 defines the calculation formula where  $P_{basic}$  depends on the number of tuners in the TV. However, there is no explicit definition or explanation in the regulation (e.g. whether it is based on hardware or on functionality).

The energy label also states that "the luminance of the television in the home-mode or the on-mode condition as set by the supplier, is automatically reduced between an ambient light intensity of at least 20 lux and 0 lux". This requirement creates a grey area because any reduction of the power consumption between any light intensity of at least 20 lux, and 0 lux, will make a television compliant.

The project team recommended if such a requirement is maintained, that the levels of the light intensity should be set more precisely, and the required power consumption reduction should be quantified.