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Recommendations based on lessons learnt within ComplianTV, regarding the draft Ecodesign and Energy Label Regulations on electronic displays

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1. Introduction

The following recommendations are results of issues observed during the evaluation of the implementation of the Regulations regarding Energy Labelling (1062/2010) and Ecodesign (642/2009) within the ComplianTV project and have been discussed with key stakeholders during an expert workshop. The lessons learnt in the context of product testing and market surveillance shall provide a basis for policy recommendations for future Ecodesign, Energy Label and Energy Star developments.

This document depicts a number of lessons learnt from activities which have been carried out within the ComplianTV project. Some of the recommendations which are illustrated in this document may also be tackled within Standardisation Bodies and not in the Regulations regarding Energy Labelling (1062/2010) or Ecodesign (642/2009). The members of the project consortium do not have a particular suggestion regarding this issue.

Within the ComplianTV project, three laboratories have tested about 200 TV units against the requirements of the Ecodesign Regulation 642/2009. Furthermore, the execution of shop surveys in five different EU Member States has brought valuable evaluation results on the implementation of the Energy Labelling Regulation 1062/2010. The expertise which was gained during this process serves as a basis for the policy recommendations, which are compiled in this document. More details on these activities are available on the project website: www.compliantv.eu.

2. Recommendations and review of the draft Ecodesign (Commission Regulation 642/2009) and Energy Label (Commission Delegated Regulation 1062/2010) Regulations

2.1 On-mode power consumption

- For the verification of the home-mode, the default settings are used and everything is documented. When a different mode than the "home-mode" is selected, the second selection process is named using various different wordings, as observed by laboratories during the tests. The Ecodesign Regulation as well as the draft Regulation do not address and do not define the wordings to be used in the second selection process, while harmonisation would be welcome.

- There are several terms used by manufacturers for the Automatic Brightness Control (ABC) sensor, including "eco sensor" and "light sensor". The availability of the ABC function should be clearly recognisable in the menus. Therefore, **the ABC function should be present in the technical documentation/product fiche to facilitate the work of test houses.**

- ComplianTV identified that the volume setting has an impact on the power consumption. In particular, setting the speaker volume to a lower level at delivery or in "home mode" can result in considerably lower on-mode power consumption. This is due to the fact that the standard IEC 62087, section 11 requires the sound level to be "audible" during the testing, which is subjective.
  In theory, this issue could be solved by specifying, where appropriate, a quantified minimum sound level, which would be a requirement similar to the Ecodesign Regulation brightness setting requirements regarding the peak luminance ratio at delivery/"home mode", in order to avoid a too dark (and less power consuming) setting by the manufacturer (for PLR, see section 2.3 of this document). **However, from a practical point of view, there could be limitations** because the testing procedure could be much more costly and difficult (additional equipment required) for laboratories, which could lead to a disproportionate approach.

- **There is no input signal connectivity specified to carry out the testing. ComplianTV recommends to specify that the HDMI input signal is to be set when the TVs are tested**. To ensure standardised test patterns, the first/main HDMI signal shall be set as default input signal for testing. The use of different input signals may influence the measured power consumption of the tested appliance.

- The laboratories observed different TV behaviours during the measurements and this raised the issue of the possibility of the TV to detect a test procedure and adapt its power consumption accordingly. Such phenomenon was not proven within the ComplianTV tests, but some tested TVs gave the impression that they detect a test situation, especially the "Dynamic Broadcast Content" [acc. to IEC 62087 ed.2, clause 11.6] and reduce energy consumption in order to achieve better test results. **To avoid any loophole, this issue (ability of TVs to detect test situations) should be tackled within the Ecodesign Regulation**, by forbidding such functionality, clearly against the spirit of the Regulation.

  The draft Ecodesign Regulation already takes this recommendation into account under Annex V, point 17: *"A display automatically recognising a situation of on-going compliance test and reacting to it to achieve a different result, in any of the verification points from 1 to 10, has do be considered not compliant."*

- A possible "copy/paste" mistake has been spotted in Annex IV, 1 (b) of the draft Ecodesign Regulation which states:

  "Measurements shall be made with the Automatic Brightness Control function, if such a function exists, made inactive by an ambient light measured at the ABC light sensor of a level of 300 lux, or more."

  While the requirements in Ecodesign Regulation 642/2009 and in the draft Energy Label Regulation (Annex IX, 2.1 (b)) are:

  "Measurements shall be made with the Automatic Brightness Control function, if such a function exists, made inactive. If the Automatic Brightness Control function exists and cannot be made inactive, then the measurements shall be performed with the light entering directly into the ambient light sensor at a level of 300 lux, or more."

  It is recommended to harmonise the definition and wording of this process in both the draft Ecodesign Regulation and in the draft Energy Label Regulation.

2.2 Automatic Power Down (APD)

- Televisions require a transition phase in order to switch from on-mode to standby/off-mode (which is variable across brands and models). The Ecodesign Regulation 642/2009 did not stipulate unambiguously:

  - Whether after 4h the television should already have switched (i.e. have finished switching) to a low power state (i.e. standby or off-mode); or
  - After 4h the television should have started switching to a low power state, which is to be reached within a defined transition phase.

  It should be stipulated whether the transition phase should be considered within or beyond the 4 hours (together with a defined measurement tolerance), and if the transition phase is to be considered beyond the 4 hours, it should also stipulate the maximum duration allowed for the transition phase (as it is variable).

  The Ecodesign draft Regulation, Annex II, point 3 covers the above-mentioned recommendation by specifying the time frame for the TV to reach a low power state: "*within 4 hours in on mode following the last end-user interaction and/or at the end of an on-going function that may extend beyond the 4 hour window (e.g. recording) the electronic display shall complete an automatic switch from on mode standby mode, or, off mode, or, another*

condition which does not exceed the applicable power demand requirements for off mode and/or standby mode".
The ComplianTV consortium acknowledges that the chosen option (transition phase considered within the 4 hours) appears as the most relevant one, from the testing procedure point of view.

- However, no tolerance is specified for the APD measurement. The Ecodesign Regulation 642/2009 and the draft Ecodesign Regulation accept tolerances for on-mode and standby power consumption, and peak luminance ratio as follows:
  - for on-mode power, 7% respectively 5% over the limit are accepted [according to Annex III, 2. (a), respectively Annex V, 1. (a)]
  - for standby power consumption, 20% is accepted [0,10 W over the 0,50 W limit, according Annex III, 2. (b), respectively Annex V, 1. (b)]
  - for the peak luminance ratio, 60% is accepted as a measured value while the limit is 65% [according Annex III, 2. (c) and Annex V, 6. (a) and (b)]

  Consequently, **the ComplianTV consortium recommends that a tolerance** (e.g. 2% of the 4 hours, i.e. 5 minutes as round number) **shall be included for the APD measurement**.

- In Annex I, point 3 of the draft Ecodesign Regulation, the verification procedure for the APD was explicitly added, which is acknowledged by ComplianTV. However, as such requirements only rely on software programming, **it should be discussed whether three additional units shall be tested in case the first unit does not comply with the requirements**, as it is highly likely that the three additional units would fail as well. For instance, Annex I, point 5 specifies the verification procedure regarding the home mode requirements, and three additional units are not required in that case.

2.3 Peak Luminance Ratio (PLR)

- The definition of a unified test pattern for PLR testing is lacking. To ensure comparable test conditions across all models and brands, the definition of a unified test pattern for PLR would be required. Moreover, **a harmonised test pattern** (without the possibility of having different PLR results by manufacturers depending on the test pattern used) **would improve the cost efficiency of TV testing and market surveillance activities**.

2.4 Hard-off power switch

- A revision of Ecodesign Regulation 642/2009 or the testing standard should be the implementation of the terms "accessible" and "inaccessible" for the hard-off power switch of televisions. This is due to the fact that the current term "visible" is not sufficiently explicit about the usability of a hard-off power switch (e.g. power switch on the bottom side of a TV).
  The draft Ecodesign Regulation states in Annex VII requirements for (1) visibility and (2) accessibility. It also defines viewing distances within which both additional requirements have to be fulfilled.

2.5 EEI and annual power consumption

- For the calculation of the EEI and the annual on-mode energy consumption, the 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).
If the same principle is maintained for the calculation of P_{basic} in the future Energy Label Regulation, ComplianTV recommends that the Regulation should provide specific definitions for televisions with one tuner or multiple tuners.
The draft Energy Label Regulation, Annex III, point 1 defines a single fixed value for the P_{basic} equivalent value (20 W) for all kind of televisions, whatever the number of tuners. In that case, the definition of one vs. multiple tuners is not required anymore.

- The Energy Label Regulation 1062/2010, Annex II, point 3 (a) 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. In a testing perspective, **ComplianTV recommends, 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**.
  The draft Energy Label Regulation, Annex III, point 3 (a) addresses the luminance reduction by including the following requirement, which is in line with the above recommendation: "*the luminance of the display in the home-mode/standard mode as set by the supplier, is automatically reduced between an ambient light intensity, measured at the Automatic Brightness Control (ABC) sensor of the display product, of 35 lux and 3 lux, and the average on-mode power requirement of the display product is reduced by at least 15% through this reduction in display luminance"*.
  In this context, ComplianTV acknowledges the definition of the required reduction of energy consumption which has been made in the draft Energy Label Regulation. However, this is not the case in the draft Ecodesign Regulation, where Annex II, point 6.1 (i) states: *"the manufacturer shall confirm the power reduction due to ABC by measuring and declaring the average on-mode power demand of the electronic display at an ambient light intensity, measured at the Automatic Brightness Control (ABC) sensor of the display product, of, 100lux, 35 lux, 12 lux and 3 lux."*

- Annex II, point 2 of Energy Label Regulation 1062/2010, respectively Annex III, point 2 of the draft Energy Label Regulation stipulates the formula for the annual on-mode energy consumption E (respectively AE) in kWh calculated as E = 1.46 × P. The Regulation should define clearly the formula parameters, for the sake of clarity.

  - The time parameter 1.46 represents 1460 h – the average time per day of watching television (4 h) in one year (365 days).

  - ComplianTV recommends updating the formula as follows: "E = 1.46 $\frac{\text{kWh}}{\text{W}}$ × P (W)", where units are specified and the conversion of Wh to kWh is considered as well.

2.6 Publicly available information

- Annex I, point 5 (2) of the Ecodesign Regulation 642/2009 respectively Annex II, point 6.4. of the draft Regulation state that: "from 12 months after the publication of the Regulation in the Official Journal of the European Union the manufacturer shall make publically available on free-access websites the following information […]".
  The ComplianTV consortium recommends the specification of a time frame for the information to be publicly available.

2.7 Other miscellaneous comments

In the draft Ecodesign Regulation:

- Article 3 states:
  "Compliance of electronic displays with the applicable ecodesign requirements shall be measured in accordance with the methods set out in Annex III".
  The numbering of the corresponding Annex should be adapted accordingly (Annex IV).

- Article 9 states:
  "Checking of electronic displays for compliance with the applicable ecodesign requirements shall be carried out in accordance with the verification procedure set out in Annex III to this Regulation."
  The numbering of the corresponding Annex should be adapted accordingly (Annex V).

- Annex V addresses the verification procedure for single unit under point 1 (a) and (b) and for 3 additional units under the same points. The ComplianTV consortium recommends to differentiate the verification procedures, as follows:
  - 1 (a) and (b) shall address the verification procedure for single units;
  - 1 (c) and (d) shall address the verification procedure for the three additional units;

- Annex II, point 3 has a numbering issue: 3.2 and 3.3 are missing. All associated cross-references should be double-checked (e.g. in Annex V, point 9). Similarly, in Annex V, point 10, there are references to Annex II, points 4.2 and 4.3 which do not exist.

- In Annex IV, point 3, the previous point (a) was removed: *"Measurements shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods."* Was this amendment intended? For what purpose?

- In Annex V, all numbering cross-references should be checked: for instance, point 1 (b) states *"do not exceed the applicable limit values set out in points 2.2.1., 2.2.2. and 2.2.3 of Annex II by more than 0.10 Watt",* which seem incomplete as the limits should also apply for off-mode condition in section 2.1.

In the draft Energy Label Regulation:

- Annex X, point 3 states *"If the result referred to in point 1 is not achieved"*, instead of *"If the result referred to in point 2 is not achieved"*.

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