

About Swan labelling of

Audio and video equipment

Final review draft, 14 February 2008

Background for ecolabelling



Nordic Ecolabelling

In 1989, the Nordic Council of Ministers decided to introduce an official voluntary ecolabelling scheme, the Swan. The organisations/companies listed below administer the Swan ecolabelling scheme on assignment from their respective national governments.

For further information, please visit the respective Web sites:

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Quotations may be made as long as Nordic Ecolabelling is stated as the source.

Swan labelling of products for audio and video equipment: Background

071/Final draft, 14 February 2008

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1 Summary

At the meeting of the Nordic Ecolabelling Board on 29-30 oktober 2007 it was decided that the criteria should be revised with regard to:

- Extension of the product group to cover a larger segment of the market including video conference equipment.
- Harmonisation with the EU Flower for television equipment.

The work of revision was carried out as a secretariat task. Ove Jansson of SIS Ecolabelling was project leader.

The most requirements are harmonized with The EU Ecolabelling Board (EUEB) proposed revised criteria for televisions.

Readers wanting more detail regarding the overall revised draft are welcomed to contact project leader Ove Jansson at SIS Ecolabel, +48 8 55 55 24 41 or ove.jansson@ecolabel.se

In the proposal we specifically ask for comments about the energy consumption requirements, the flame retardant requirements and the extension of new products categories. Every response to the proposal will be evaluated and consideration will be given in the final criteria proposal to the comments of the reviewing bodies.

2 Introduction

The Criteria document was confirmed for the first time, version 1.0, 1999-12-02, with a period of validity up to 2002-12-01. The product group comprises television sets, video players, both VHS and DVD, television sets combined with VHS, DVD or PC, and complete stereo systems.

When developing the criteria the aim was to cover as large a range of video and audio equipment as possible.

Since the latest criteria were decided, technology has developed at a rapid pace. Several of the products that were then classed as marginal are currently sold in far greater volumes (and may be expected to increase in future years) thanks to technological progress.

The focus on climate change the latest years have given us more reason to think in new ways. Therefore we suggest to wider the product group with video conference equipment. We see that this kind of equipment lower the travel with airplane and cars witch is closely connected to the increase off climate gases in the environment.

Picture and sound quality, combined with design and price, are the most important factors for customers. If the environmental arguments, assisted by the Swan ecolabel, are to occupy a more prominent position at retail outlet level, it is important that the Swan criteria are matched to the development of technology. For the product group to be successful, when technological progress in the field is so rapid, it is also

important to have criteria and documentation requirements that ensure short application times.

The product group do not have any significant license holders in the past years. We have the goal that this revision will change that.

3 Other environmental schemes and legislation

Systems for communicating environmental arguments in the sector

There are a number of other environmental and energy labelling systems that have criteria for AV products.

Energy Star: (Energy Star is a program operated by the United States Environmental Protection Agency, aimed at promoting energy-efficient products). Energy Star only has requirements for energy consumption in standby and is not used to any great extent on the Nordic market.

More information regarding the latest criteria can be found on:

http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductCategory&pcw_code=HEF

GEEA label

GEEA is a joint operation between the energy authorities in France, Switzerland, Sweden, Austria, Denmark, Finland, Germany and The Netherlands. The Energy Arrow is a self-declaration and at present it does not cost companies anything to use the logo. The organisation is entitled to withdraw the licence if it transpires that the criteria are not met. The only Nordic country that has actively chosen to market the Energy Arrow is Denmark.

See more information on: <http://www.efficient-appliances.org/Home.htm>



The EU Flower (television sets only)

The EU Flower criteria were established in the autumn of 2001. The EU Ecolabelling Board (EUEB) is working to revise the criteria for televisions and is planning to make a decision about the in April 2007. See more information on

http://ec.europa.eu/environment/ecolabel/product/pg_television_en.htm

The Flower criteria only cover television sets. SHARP Electronics have several models licensed by the EU Flower.

4 The Market

The market is changing so quickly so it's hard to get an overview regarding 2007 so early in the year. This documentation will be updated with an overview of the market before the criteria is decided.

5 Choice of product group

The potential

The differences in energy consumption between different television sets with the same performance. If consumers are persuaded to purchase more energy-efficient appliances, the reduction in energy consumption per appliance would mean major global energy savings. The potential for energy saving for products such as VCRs, DVDs and set-top boxes, although the amount of energy saved is small compared with television sets.

Video conference equipment

From 1970 to 2004 global emissions of greenhouse gases caused by transportation increased by 120 percent, while total emissions increased by 70 percent. The Intergovernmental Panel on Climate Changes (IPCC) states that the total global emissions must be reduced by 60 to 80 percent in order to stabilize the greenhouse gas concentration in the atmosphere. In order to address this challenge, Nordic Swan see that ecolabelling of videoconferencing systems can reduce unnecessary business travel by the increase of videoconferencing.

AV products contain flame retardants and heavy metals. Together with other electronic products they cause a waste disposal problem.

Relevance

This will mainly be due to a change of technology in the field, but also to more and more households having a second or third television set.

The globalisation make business travel more frequent with have a connection with the increase of climate gases in our environment, until the flight industry develops new and more effective planes and fuel we still see a relevance for video conference equipment.

Controllability

The success of the ecolabelling will probably depend on how the energy consumption requirement is formulated. Home electronics appliances are manufactured in a small number of places for a global market. This means that, if compliance with the requirements it is to be a practical proposition, requirement levels and testing methods should be coordinated as far as possible.

The main driving force for the home electronics sector is the trend towards new technologies and the introduction of these technologies to the mass market. If it is to be worth while ecolabelling products in this field, the criteria must take this trend into account as the main driving force of the industry.

6 Background for delimitation of product group and requirements

The most requirements are harmonized with The EU Ecolabelling Board (EUEB) proposed revised criteria for televisions. Therefore we include their discussion papers as appendixes in this document and only explain the differences.

6.1 Valid EU-flower license for televisions

We would like to make it easy for manufactures that already have the EU-flower license for products to apply for a nordic swan license. So if they have a valid license they only have to send a copy of that and the documentation needed to fulfill quality and regulatory requirements for the nordic swan. Except for requirement R9 regarding flame retardants where Nordic Swan have a stricter requirement in this draft, see point 6.9 for more details.

6.2 Specific requirements for Televisions/Televisions in combination with other equipment

See appendix 1 and 2.

6.3 Passive Standby

See appendix 1 and 2.

6.4 Max energy consumption

See appendix 1 and 2.

6.5 Energy Efficiency

See appendix 1 and 2.

6.6 Specific requirements for Videoconferencing Systems

In this revision have we been in contact with manufactures of this kind of equipment to get reasonable limits for the requirement.

Because this is a new requirement it is important to get more information. We hope that this review can give that.

6.7 Specific requirements for DVD/HD-DVD/Blue-Ray-players and Stereo systems

The requirements are based on GEEA (www.efficient-appliances.org) from the 1 january 2007. We have in this product definition included HD-DVD and Blue-Ray players.

6.8 Specific requirements for Set Top Boxes

The requirements are based on EU CoC: Code of Conduct on Energy Efficiency of Digital TV Service Systems - *Version 5*, 5 October 2006. More information:

(http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative.htm)

More information can be also found on GEEA (www.efficient-appliances.org).

6.9 Heavy Metals and Flame Retardants

See appendix 1 and 2.

The EUEB latest discussion paper has this motivation regarding their requirements for the DBDE flame retardant:

Much has been said within various EUEB meetings concerning DBDE. Some commentators want the ecolabel to respect the conclusions of the formal risk assessment and the amendments made to the Restriction of Hazardous Substances (RoHS) Directive¹, whilst others ask for an outright exclusion. We offer a solution that hopefully satisfies both parties.

DBDE is not a pure substance. It contains impurities of other poly-BDEs that are themselves prohibited from use via the RoHS Directive where this exclusion includes their presence in concentrations greater than 0.1% in other homogenous substances. Consequently DBDE producers purify DBDE to remove contaminants such that its purity is within the requirements of Commission Decision 2005/618/EC.

Our understanding is that poly-BDE impurities remain in DBDE up to but not exceeding 0.1%. The ecolabel could follow the example set by Commission Decision 2005/618/EC and establish its own purity requirement. If the ecolabel were to require that substances identified in the RoHS Directive must not be present in other substances in a concentration of say >0.01%, then the impurities (other poly-BDEs) present in DBDE will effectively mean that DBDE cannot be used in an ecolabelled television.

The Nordic Swan ecolabelling suggestion in this draft is following the stricter view and excludes Deca-BDE totally. This is harmonised with other Nordic Swan criteria with requirements on plastic and flame retardants.

6.10 Requirements regarding mercury content in displays

See appendix 1 and 2.

6.11 Requirements on design

See appendix 1 and 2.

6.12 Requirements regarding life-time extension

See appendix 1 and 2.

6.13 Requirements on operating instructions

See appendix 1 and 2.

6.14 Quality and regulatory requirements

This requirements are standard in all nordic swan criteria. The pupose is to ensure that ecolabelled products will continue to follow the requiremanets in the criteria and that the regulation of the nordic swan is followed by the license holder.

¹ Four amendments have been made: 2005/618/EC; 2005/717/EC; 2005/747/EC; 2006/310/EC



Revising the Ecolabel Criteria for Televisions – Third Discussion Paper

Overview

Background

Broad agreement for the direction the proposals are developing in has been reached with the AHWG and EUEB. Alterations to the manner in which the ecolabel deals with on mode energy consumption and information to consumers have been warmly received.

Having discussed the second discussion document with stakeholders in late 2006, they advised that two issues warranted further attention: eco-design and mercury.

This discussion paper provides an update regarding the issues. It is divided into three sections.

Section 1 provides a Table summarising the status of proposals and their development since the second discussion paper in Autumn 2006.

Section 2 covers proposals that have largely been agreed through AHWG and EUEB discussions. We provide a summary of discussions and our proposals. If more detail is needed, readers are asked to refer to earlier discussion documents.

Section 3 discusses the main issues that require more attention, namely mercury in lamps, eco-design, also known as design for environment. To this section is included a short discussion regarding flame-retardants.

This paper is to be read in conjunction with the draft proposals dated June 2007 circulated with this paper.

We welcome comment on our proposals. Please feel free to pass these documents onto colleagues if you think they would wish to keep abreast of the work.

Schedule

Our anticipated schedule to completing the revision exercise is:

- Discussion of these proposals at the September 2007 EUEB
- Revised proposals circulated in October 2007
- Final Discussion of the proposals at the December EUEB
- Vote on the proposals at the December Regulatory Committee

Acknowledgments

We wish to thank the members of the AHWG and other stakeholders from Government, Industry and NGOs for their assistance lent in developing the draft proposals discussed here.

Terms and abbreviations

AHWG	ad-hoc working group
CRT	Cathode ray tube
EEL	Energy efficiency index
EICTA	European Information & Communications Technology Industry Association
EuP	Energy using products Directive
FPD	flat panel display
LCD	liquid crystal display
PDP	plasma display panel
RoHS	Restriction of Hazardous Substances Directive
WEEE	Waste electrical and Electronic Equipment Directive

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Section 1 - Summary of proposal development

Criterion	2 nd Discussion Paper	AHWG Nov 2006	EUEB Dec 2006	Comments
Energy				
Off switch	Retain for CRT televisions Delete for digital televisions	Retain for CRT televisions For flat panel televisions, require soft-off switch and deep sleep modes (soft off puts television into lower energy state than stand-by)	The new generation of televisions (high definition and digitally enhanced) do not have such a switch because of their functionalities that require the television to remain in a sleep mode. There was general support for “soft” off switches and the “deep sleep” mode.	Analogue televisions to have on-off switch, digital televisions to have soft on-off switch and deep sleep mode.
Passive stand by <=1W	<=0.8W	Keep <=1W	AHWG preferred to keep ≤1W saying that there are more important issues to address. Harmonised with other television criteria.	Retain at ≤1W
Active stand by<=9W	Adopt limits set by GEEA: Terrestrial connected <=8W Cable connected <=7W Satellite connected <=9W	Active standby uses <1% of total energy. Delete the criterion	Content for requirement to be deleted	Deletion agreed
EEL<=65%	Existing requirement is not applicable to non-CRT televisions. Development of new IEC test method noted. Proposal based on energy efficiency per unit screen area for all television types (proposed 0.04W/cm ²)	Approved the change to W/cm ² . Some concerns whether 0.04W/cm ² is too strict or not.	Plasma typically uses more energy than a liquid crystal display. Should limits be set (ie. 0.04W/cm ²) which are difficult for plasma machines to achieve? In principle the European Commission would support the more stringent energy requirement of 0.04W/cm ² . It would not support a maximum screen size. Understood from the ad-hoc working groups that energy use per cm ² would be a good way ahead and in line with the EuP study.	See section 2 and previous discussion paper for details
Life time extension	Retain as is – 2 year guarantee and 7 year part availability	Retain as is.	The lifetime guarantee should remain unchanged.	See section 2 and previous discussion paper for details
Take Back and Recycling		AHWG asked for the existing criterion to be replaced with a new eco-design proposal.		See discussion in Section 3
Overview (individual criteria are	Existing criterion is a mix of topics some of which have been superseded by legislation (WEEE	Rewrite to embrace eco-design principles.	Agreed a rewrite to capture eco-design would be helpful.	See discussion in Section 3

Revising the Ecolabel Criteria for Televisions – Third Discussion Paper

covered in Sections 2 & 3)	and RoHS). In need of an overhaul.			
User Instructions	Redrafted	Welcomed redraft. Slight edits suggested.	User information is very important and should be strengthened and clearly visible (not on the back page of a manual). The consumer needs to be aware of energy and cost savings. Develop and provide a template to include key issues to bring the information together and avoid dispersion in the user manual.	See section 2, previous discussion paper for full detail and Appendix 1 for example
Environmental Declaration	Retain but reference to new ECMA-370 standard	Some say delete. Some say retain	Two viewpoints. Some thought that ECMA 370 would be relevant for Green Public Procurement. Others would not support the inclusion of this criterion asking that it be deleted.	See discussion in Section 2
Information on the Ecolabel	<ul style="list-style-type: none"> • High energy efficiency in all modes. • Saves money by being energy efficient 	Include eco-design aspects.	Information provided should promote: <ul style="list-style-type: none"> • high energy efficiency • reduced CO₂ emissions • designed to facilitate recycling 	See discussion in Section 2
Other Issues (New)				
Mercury in lamps	<=4.5mg per lamp	Prefer mercury use per unit screen area (Hg/cm ²).	Agreed Hg/cm ² was preferable. Suggested setting a maximum amount of mercury, to limit the size of screen that could be labelled.	See discussion in Section 3

Section 2 – Issues with Broad Agreement

1 Product Group Definition and Criteria Lifetime

Proposal

The **product group** ‘televisions’ shall comprise: Mains powered electronic equipment, the primary purpose and function of which is as a device that receives, decodes and displays television transmission signals.

Appliances that use other power sources such as batteries are excluded.

The product criteria should have a **three-year lifetime**. Any longer would mean the ecolabel risks its criteria becoming obsolete. Any shorter and the ecolabel would not be able to keep up with the revision schedule.

2 Energy Savings

2.1 On-off Switches

Many FPD televisions now have “soft” on-off switches¹, which enable a “deep sleep” mode, whereby power consumption is reduced to a lower level than that for passive stand-by, typically around 300mW. In this state the screen and many other functions are off. The difference to a conventional hard on-off switch is that a television can be brought out of this deep sleep mode into a more active state by an external signal, such as to download programme data through the digital tuner. The user can put the television into this deep sleep state either by pressing the soft on-off switch on the television or on the remote control, depending on the television’s design. The television can also be set such that if the user puts it into a conventional (passive) standby mode, of around 1W power use, it automatically drops into the deep sleep mode after a defined period of inactivity.

Proposed criterion

Analogue televisions shall have an on-off switch that turns the television to zero energy consumption. The switch shall be clearly visible.

Digitally-enabled flat panel display (FPD) televisions shall have a soft on-off switch that puts the television into passive stand by mode. The switch shall be clearly visible. The television will be programmed to automatically go from passive standby mode to the deep sleep mode after no more than one hour if there is no user interaction and in this mode the energy consumption shall be no more than 300mW.

Information on energy saving and operational modes will be given in the user instructions.

Assessment and verification. The applicant shall declare that their television is compliant with the requirements and provide photographic evidence regarding the on-off switch. For FPD televisions, the applicant shall declare that the television automatically goes from passive standby to deep sleep after one hour if there is no user intervention and that the television complies with the 300mW requirement. Clear details shall be provided in the user manual accompanying the television, a copy of which shall be provided to the awarding Competent Body.

¹ There is no mechanical switch, it is electronic with no moving parts and is therefore safer in terms of fire risks than the switch described above.

2.2 Passive Standby²

Proposed criterion

Note: That 'as delivered' in the Assessment requirements refers to the settings the TV has when literally taken out of its packaging.

The passive standby consumption of the television shall be $\leq 1.0W$.

Assessment and verification: The television will be tested for its passive standby power consumption in its condition as delivered to the customer, according to IEC 62087. A test report will be provided by the applicant to prove that the television meets the requirement.

2.3 Active standby³

The current criterion states that televisions with an integrated digital receiver/decoder (IRD) shall have an active standby of no more than 9W. This mode is actually only used for a very short time, (a few minutes each day) and only accounts for a small fraction of the total energy used by a television, less than 1% in a 24-hour cycle. The television then drops back into another lower power mode, such as passive standby or deep sleep mode. Some televisions do not have a separate active standby mode; they download data when the television is in the on-mode.

Proposal

Delete the current criterion for active standby.

2.4 Energy Efficiency

The current energy efficiency index (EEI) criterion is only applicable to CRT televisions. There are problems trying to apply it to FPDs. With this in mind we devised an alternative requirement drawing on a new dataset. The new approach won the AHWG's approval. There was some disagreement regarding the level at which the requirement is set at – some people thought that $0.04W/cm^2$ is too strict. It is certainly the case that PDPs would find the requirement difficult to attain.

Figure 2.1 shows power consumption data normalised to power consumed per $1cm^2$ of screen area.

² Passive stand-by: the television is connected to a power source, produces neither sound nor vision, and is waiting to be switched into another modes on receipt of a direct or indirect signal, e.g. from the remote control.

³ Active stand-by: the television is connected to a power source, produces neither sound nor vision, and is exchanging/receiving data with/from an external source.

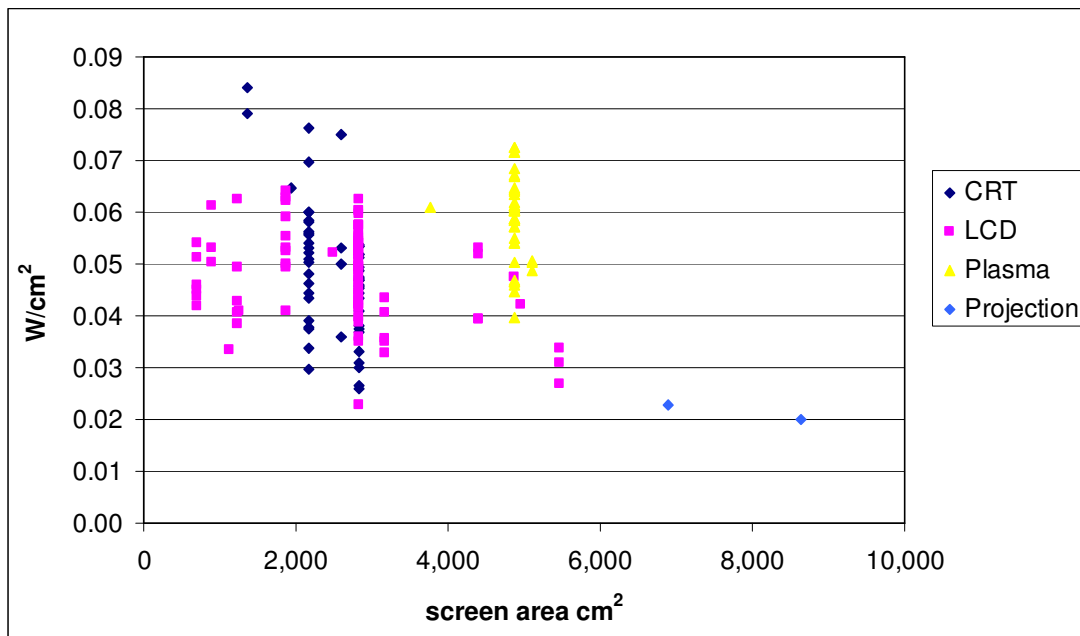


Figure 2.1 On –mode power consumption per cm² (W/cm²) vs. screen area (cm²)

Having agreed with the AHWG the general approach, the question is ‘at what level should the exclusion hurdle be set?’ In considering this we need to remember that typically the whole criteria set for a given product group is typically set such that around 20% of products can comply. We need to bear this in mind so that we are not overly strict with this one criterion alone. If an exclusion hurdle was set at:

- 0.050 W/cm², 48% of the TV sample would comply – arguably this is too high a level.
- 0.040 W/cm², 16% of the TV sample would comply – arguably this is too low a level

We propose to set level whereby 20% of the sample complies – 0.042 W/cm².

In terms of test methods, the standard used in the existing criteria, EN50301, is now obsolete as of 1st July 2006. As such the revised IEC62087 standard⁴ shall be used.

The television is to be tested ‘as delivered’ – that is in the same condition as taken out of its delivery box. This is in accordance with the new IEC62087 method. Test laboratories should not make changes to these settings such as altering the brightness of lamps. If the television has an eco-mode, this function can be engaged for testing purposes – so long as clear instructions are provided in the User Manual showing consumers how to adjust their TV into the eco-mode state.

Proposed criterion

The television will have an on-mode power efficiency equal to or less than 0.042 W/cm² screen area.

Assessment and verification: The television will be tested for its on-mode power consumption in its condition as delivered to the customer, according to IEC62087. A test report will be provided by the applicant to demonstrate that the television meets the requirement.

⁴ Available as a draft, soon to be formally adopted

3 Lifetime extension

Discussions at the AHWG have provided a general consensus that this criterion should be retained as it stands.

Proposed criterion

The manufacturer shall offer a commercial guarantee to ensure that the television will function for at least two years. This guarantee shall be valid from the date of delivery to the customer.

The availability of compatible electronic replacement parts shall be guaranteed for seven years from the time that production ceases.

Assessment and verification: the applicant shall declare the compliance of the product with these requirements.

4 User instructions

Consumers can be provided with a lot of useful information through the user instructions. This is important in informing them of the environmental impact of their television's use and how this can be reduced. Having this information in one place within the manual would help communicate the information clearly.

The AHWG agreed to have the environmental information in one very visible and accessible location in the user manual, including information on:

- Power consumption in the various modes (on, passive etc) and average annual energy consumption
- How to reduce energy use through energy efficiency and thus reduce cost
- Repair, maintenance and proper end-of-life disposal.

Manufacturers would have flexibility in wording, style and layout of the User Instructions.

Proposed criterion

The television shall be sold with relevant user information that provides advice on its proper environmental use. The information will be located in a single, easy-to-find place in the user instructions as well as on the manufacturer's website. The information will include but not be limited to:

- a) The television's power consumption information in the various modes; on, passive standby and deep sleep
- b) Average annual energy consumption, following EICTA guidelines.
- c) How to reduce power consumption when the television is not being watched by being energy efficient, covering at least:
 - i) By using the on/off-switch on an analogue television energy use will be reduced to zero
 - ii) Other televisions should be put in their lowest standby mode to reduce energy use, but that they still draw some power even in this standby state
 - iii) Furthermore, turning the television off at the wall will reduce energy use to zero for all televisions, and is recommended when the television is not being used for a long time, e.g. when on holiday
 - iv) Reducing the brightness of the screen will reduce energy use
- d) Energy efficiency reduces energy consumption and thus saves money by reducing electricity bills

- e) Repair information regarding who is qualified to repair televisions, including contact details as appropriate
- f) End-of-life instructions for the proper disposal of televisions at civic amenity sites or through retailer take-back schemes as applicable to be compliant with the WEEE Directive, rather than simply throwing the television away
- g) Information that the product has been awarded the flower (the EU eco-label) with a brief explanation as to what this means together with an indication that more information on the ecolabel can be found at the web-site address <http://europa.eu.int/comm/environment/ecolabel>

Assessment and verification: The applicant shall declare compliance of the product with these requirements and shall provide a copy of the instruction manual to the Competent Body assessing the application.

An example is given in Appendix 1 as an illustration of how the User Information could appear in the user manual, on the manufacturer's website, at point of sale and/or other location. It is there to prompt discussion as to how environmental information may be best presented to the consumer.

5 Environmental Declaration

The current criterion refers to the ECMA TR70 environmental declaration. This was combined with the IT ECO declaration in June 2006 creating the new ECMA 370 Type II environmental declaration. Unlike the Ecolabel it does not set a pass/fail level; it is a reporting template for manufacturers to declare the environmental characteristics of their company and product.

From discussions with stakeholders the need for a Type II environmental declaration, as well as proof of compliance with the Ecolabel criteria from an applicant, appears superfluous to the needs of the Ecolabel and as such our proposal is to delete this criterion.

Proposal

Delete the current criterion for an environmental declaration.

6 Information appearing on the Ecolabel

It was generally agreed at the AHWG and EUEB that the key issues to communicate to the consumer through 'Box 2' are that the television:

- is energy efficient and therefore has reduced CO₂ emissions compared to a similar non-labelled televisions.
- has been designed with the environment in mind so that it can be repaired or recycled easily.

Proposed criterion

- High energy efficiency
- Reduced CO₂ emissions
- Designed to facilitate repair and recycling

Assessment and Verification: The applicant shall declare the compliance of the product with this requirement and shall provide a copy of the ecolabel as it appears on the packaging and/or product and/or accompanying documentation.

Section 3 – Update on Other Issues

7 Mercury in Lamps

7.1 Background

The AHWG agreed that the ecolabel needs a criterion that deals with mercury in backlighting lamps of LCD TVs. We have spoken with manufacturers and others to gather information on the amount of mercury per lamp and the number of lamps per screen (based on size). Whilst data is scarce, what we have is nonetheless helpful to informing a proposal.

Two options have been considered:

- The AHWG favoured mercury efficiency option that would set a limit for the amount of Hg per unit screen area,
- A limit on the amount of Hg per lamp and an upper limit restricting the total amount of Hg per screen.

7.2 Discussion

a) Amount of Mercury per Unit Screen Area

Our investigations have revealed information⁵ suggesting the mercury content of lamps in LCDs can range from 2.5mg per lamp to 5mg (RoHS maximum limit). We have used this information and other data provided by business⁶ regarding the number of lamps by screen size to devise a proposal. In doing so we have assumed a 'typical' mercury content per lamp of 3.5 mg.

Achieving compliance with the criterion requires producers to find a balance between the number of lamps used and their mercury content for a given screen size. This approach will enable televisions of various sizes, to attain the Ecolabel.

We have constructed the following graphs.

- Figure 7.1 shows the amount of mercury against screen area (cm²), and
- Figure 7.2 shows the amount of mercury per cm² against screen area (cm²)

As expected, Figure 7.1 shows an increase in the total amount of mercury, for larger screen sizes. This is not surprising as more lamps are required for large screens. This has a direct impact to on energy consumption as a significant proportion of energy consumed in an LCD television is due to the lamps (as much as 70%).

However, Figure 7.2 shows a trend for less mercury (fewer lamps) per unit screen area in larger televisions. The graph shows that the amount of mercury per cm² of screen gets noticeably less for larger screen sizes. This is due to larger televisions making better use of reflected light within the LCD panel.

⁵ Personal Communication, April 2007

⁶ Confidential data

Figure 7.1 Amount of mercury (mg) versus screen area (cm²)

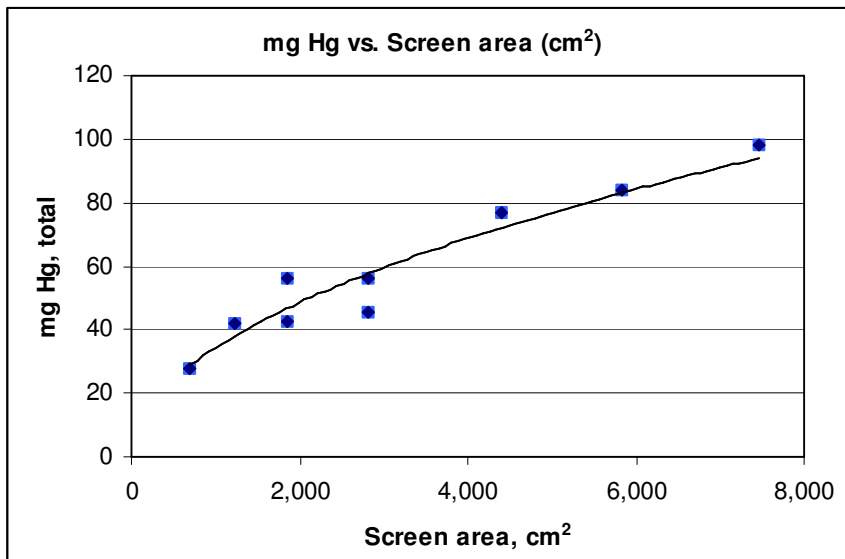
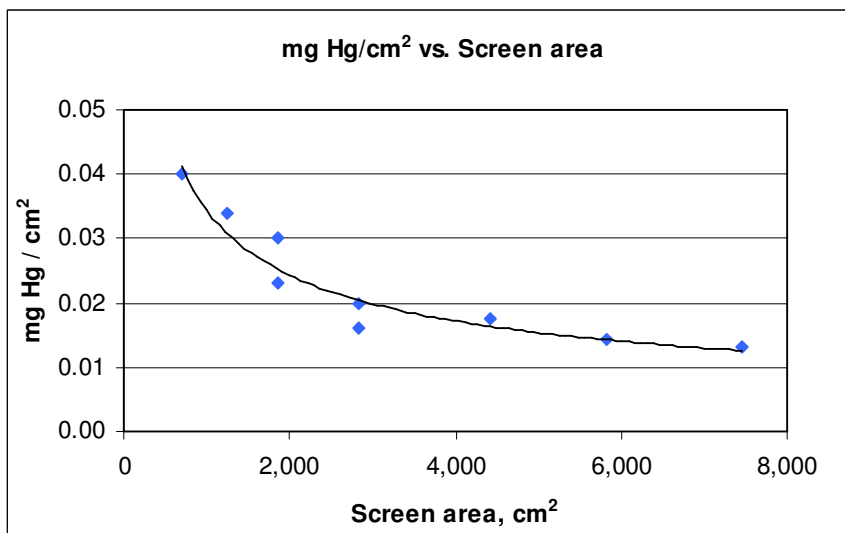


Figure 7.2 Amount of mercury per screen unit area (mg/cm²) versus screen area (cm²)



There is problem with the approach though. The analysis shows an undesirable outcome in that large LCD screens actually do rather better than small ones in terms of Hg per cm². In other words a requirement based on this approach would favour large screens. Having discussed the issue with some of the AHWG members, we came to the conclusion that the approach is unhelpful and further enquiry along these lines is not warranted.

b) Limit Mercury per Lamp

The RoHS Directive⁷ sets a maximum limit of 5mg Hg per lamp. At the 2nd AHWG we proposed a criterion of 4.5mg Hg per lamp. Whilst we were hopeful that the EuP TV study would be helpful in this regard, the recently published EuP reports for TVs do not contain data. Indications are that the amount of Hg per lamp varies between 2.5mg to 5mg.

⁷ http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00190023.pdf

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

"Annex: Applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1): 1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp."

Recognising that the absence of data is less than helpful, but that nonetheless the AHWG is keen to set a requirement, we propose a limit of 3.5mg per lamp. Further we propose an upper limit to the absolute amount of Hg contained in a screen of 75mg. This in effect will limit the ecolabel to LCD TVs of screen size approximately <116cm (<46”).

Proposed criterion

The mercury content of the lamps used to illuminate screens shall be $\leq 3.5\text{mg}$.

Taken together, the lamps will contain no more than 75mg Hg in total.

Assessment and verification. The applicant shall provide a signed declaration that their television complies with these requirements. This shall include documentation on the mercury content of lamps from suppliers.

8 Design for the Environment

8.1 Background

The two AHGWs agreed that the existing criteria are somewhat ambiguous and hard to verify in many places, even if their sentiment is good in terms of reducing material use and encouraging increasing recycling rates.

Since the first set of criteria were adopted in 2002 the WEEE⁸ and RoHS⁹ Directives have come into force which capture some of the recycling and hazardous substance elements of the existing television criteria. For example, under the WEEE Directive one has to remove mercury-containing lamps and other components from the appliance and subsequently treat them. There is still scope however to include design for environment criteria into the proposals and this was encouraged by many of the AHWG participants. In formulating our proposals we have taken the views of stakeholders into account, have referred to the Ten Golden Rules in EcoDesign¹⁰, the work of the EuP studies¹¹, ECMA 341 “Environmental design considerations for electronic products”¹² and ECMA-370 the Eco-declaration¹³ and undertaken our own research¹⁴.

As has been covered previously the key impact from televisions in a life cycle sense is the energy consumed in the use phase, ca. 90%. Reducing this is a key tenet of the Ten Golden Rules (GR3). There are however other eco-design aspects that can be addressed as well. These cover easy disassembly for repair and recycling, materials and fixtures that can be recycled and facilitate recycling and the gathering of more information on substances used within the television. These are discussed below.

8.2 Take-back and recycling

Under the WEEE Directive manufacturers ultimately have responsibility for the collection and treatment of the products at end-of-life:

“It seeks to achieve this by making producers responsible for financing the collection, treatment, and recovery of waste electrical equipment, and by obliging distributors to allow consumers to return their waste equipment free of charge”¹⁵.

⁸ Waste electrical and Electronic Equipment Directive http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00240038.pdf

⁹ Restriction of certain Hazardous Substances Directive http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00190023.pdf

¹⁰ http://www.md.kth.se/~conrad/EcoDesign/10_GR_notesOH+front.pdf

¹¹ www.ecotelevision.org

¹² <http://www.ecma-international.org/publications/standards/Ecma-341.htm>

¹³ <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

¹⁴ e.g. <http://www.pre.nl/ecodesign/ecodesign.htm#10>, <http://www.epa.gov/dfe/>, <http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/design.html>, <http://www.environment.gov.au/settlements/industry/corporate/dfe.html>

¹⁵ UK Department of Trade and Industry DTI <http://www.dti.gov.uk/innovation/sustainability/weee/page30269.html>

Therefore the first requirement of the Take-back and recycling section in the existing criteria is now covered by legislation. In line with other product groups it was felt unnecessary by the AHWG to repeat in the Ecolabel criteria.

There were concerns at the AHWG that newer Member States will not be able to implement the WEEE Directive as quickly as others. We are unable to influence this progress through the Ecolabel however, and as such the best route to encourage consumers to recycle rather than dispose of their old televisions is via clear user instructions regarding repair and recycling. This is dealt with elsewhere in our discussion paper.

8.3 Disassembly report

Whilst some stakeholders advised that disassembly reports are not used by recyclers as recycling often involves crushing rather than disassembly, we think there is benefit in retaining a requirement. It is better therefore to ensure that televisions can be dismantled, if so desired, with easy-to-identify connections using the tools usually available to recyclers. Furthermore, information is available from the manufacturer should a recycler require it, in the form of exploded diagrams, for example, labelling the components.

There was concern that a television should not be easy to disassemble by a member of the public due to health and safety issues. Therefore we propose that the requirement asks that a professionally trained technician or recycler is able to undertake the work, as opposed to a member of the public. Further to this, extending the product's lifetime should be promoted through easy repair. For example, worn out parts such as lamps should be easily accessible and easy to remove and swap by a trained technician.

8.4 Incompatible and hazardous materials and recycling rates

The AHWG discussed that the phrases "*incompatible and hazardous materials shall be separable*" and "*technically recyclable*" are ambiguous or confusing and are certainly hard to verify. The sentiment behind them is now also encapsulated to some extent in the WEEE Directive. It stipulates that 75% of the mass per television is to be recovered (collected, recycled and or incinerated) and 65% re-used or recycled.

What the Ecolabel criteria should encourage is a greater level of recycling than the 65% minimum through eco-design. The focus should therefore be on the ability to *dismantle* the television to enable recycling, and thus encouraging the recycling market, rather than stating that a certain percentage of the material has to be recyclable. In fact one AHWG stakeholder commented that their products can already meet this¹⁶.

8.5 Plastic parts

The AHWG agreed that we no longer need to state the exclusion of lead and cadmium in plastic parts as these are now excluded via the RoHS Directive. Likewise it was generally agreed that we should retain the criteria on compatible polymers and separable metal inlays.

What is proposed is that applicants are to gather information on the nature and amount of hazardous substances within their products, from Material Safety Datasheets for example, in accordance with the Dangerous Substances Directive 67/548/EEC and subsequent amendments and the Globally Harmonised System of Classification and Labelling of Chemicals (GHS). This would then allow for the collection of such data for the Ecolabel in future revisions.

Therefore it may be better to re-word the current criteria 3 (b) to (f) such that all materials can be easily separated to enable recycling; fixings such as screws or snap-fixes shall be used instead of glues where possible. In moving to this kind of wording it would encompass the existing criteria on

¹⁶ Personal communication

separability and recyclability by weight, thus clarifying the criteria set. This would allow dismantling for separate material recycling as well as repair and maintenance.

Proposed criterion

The manufacturer shall demonstrate that the television can be easily dismantled by professionally trained recyclers, using the tools usually available to them. This is to enable

- The undertaking of repairs and replacements of worn-out parts
- Upgrades to older or obsolete parts and
- Separation of parts and materials, ultimately for recycling.

To facilitate this

- Fixtures within the television shall allow for this disassembly, e.g. screws, snap-fixes, especially of parts containing hazardous substances.
- Plastic parts shall be of one polymer or be of compatible polymers for recycling and have the relevant ISO11469 marking if greater than 25g in mass.
- Metal inlays shall not be used that cannot be separated.
- Data on the nature and amount of hazardous substances in the television will be gathered in accordance with the Dangerous Substances Directive 67/548/EEC and subsequent amendments and the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

Assessment and verification: A test report will be submitted with the application detailing the dismantling of the television. This shall include an exploded diagram of the television labelling the main components and identifying any hazardous components. This can be in written or audio-visual format. Information regarding hazardous substances shall be provided to the awarding Competent Body.

9 Heavy Metals and Flame Retardants

Flame retardants (FRs) are a frequent discussion point for the ecolabel attracting a wide range of views from stakeholders. The discussion points are well known so are not reproduced here. Interested readers may wish to refer back to our November 2006 TV discussion paper.

Most recently, FRs were discussed during the criteria finalisation process for Heat Pumps at the April 2007 EU Ecolabelling Board and Regulatory Committee meetings. After much discussion, a form of words was agreed that are now embedded in the Heat Pumps criteria. We propose to adopt the same text.

Proposed criterion

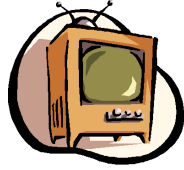
Cadmium, lead, mercury, chromium 6+ or poly-brominated biphenyl (PBB) or poly-brominated diphenyl ether (PBDE) flame retardants, as listed in Article 4 of Directive 2002/95/EC of the European Parliament and Council, may not be used in the television, taking into account the tolerances specified in Commission Decision 2005/618/EC amending Directive 2002/95/EC. This requirement for flame retardants shall take account of subsequent adaptations and amendments made to that Directive regarding the use of deca-BDE.

Assessment and verification: A certificate signed by the television producer declaring compliance with the requirement shall be submitted to the awarding Competent Body.

Appendices

Appendix 1: User Instructions example

Appendix 1 – User Instructions example



Example TV Ecolabel User Information For the InterTV 32” LCD TV



This Television has been designed and manufactured to be energy efficient and has been awarded the European Ecolabel, more information about which can be found at http://ec.europa.eu/environment/ecolabel/index_en.htm

Energy Use

The following information describes the power consumption for this television set in its various modes: on, passive standby and off. It then shows the likely levels of annual energy consumption using industry agreed usage patterns. Finally it indicates how much it would cost to use per year, firstly if standby modes are used when the set is not being watched and secondly if it is turned off properly, such as at the wall, also known as “hard off”.

Power Mode	Power Consumption	EICTA use guidelines	Annual Energy Consumption	Cost per Year 0.08 Euros / kWh
	Watts	Hours / day	kWh / year	Euros / Year
On	100	4	146.0	11.68
Passive Standby	1	20	7.3	0.58
Hard Off (at Wall/Plug)	0	20	0	0
TOTAL annual cost : standby				€ 12.26
TOTAL annual cost : hard off				€ 11.68

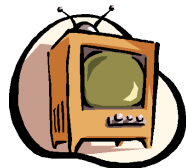
A European average energy cost to the consumer of €0.08 / kWh has been used, but a more appropriate figure for the country or region of use could of course be used instead.

The calculations above can likewise be performed for another television with different power consumption figures in order to show the saving in energy and money that can be achieved, using the equation in the box below.

$$\text{Annual Energy Consumption (kWh/year)} = \text{Power Consumption (W)} \times \text{Use (Hours/day)} \times 365 \div 1000$$

$$\text{Cost per Year (€)} = \text{Annual Energy Consumption (kWh/year)} \times € 0.08$$

For example, another 32” LCD TV with a higher power consumption of 150W in the on-mode and 3W in the passive standby mode would have a total annual cost (off) of €17.52. Comparing the costs when the TVs are off shows a saving of €5.84. This is equivalent to a saving of 73kWh per year, or approximately 32kg of CO₂ per year, using European averages. With over 30 million televisions sold annually in Europe, this could amount to over 955,000 tonnes of CO₂ saved across the EU.



Example TV Ecolabel User Information **For the InterTV 32” LCD TV**



Energy efficiency

Energy efficiency can be improved by the user applying some simple measures to reduce energy consumption further, thus saving energy and money.

- Putting the television in its lowest standby mode when not in use will save energy and money
- Turning the television off at the plug when it is not in use, say at night, or when on holiday, will further bring energy use down to zero.
- Reducing the brightness of the television will also reduce energy consumption – set it to an appropriate level for the room it is in.

Repair, maintenance and recycling

This television has been designed so that it can be easily repaired or upgraded. Likewise this eco-designing allows for the set to be easily recycled when it reaches the end of its useful life.

If the television becomes faulty then we provide a parts and repair service so that you can keep using your television – it is generally better environmentally to mend televisions where possible and extend their lifetimes.

When you feel the time has come to get a new television, you can either bring it back to us for recycling, or take it to your local Civic Amenity Site for disposal and recycling. If it still works properly, then you could maybe consider donating it to a charity.



Revising the Ecolabel Criteria for Televisions – Fourth Discussion Paper

October 2007

1. Background

The EU Ecolabelling Board (EUEB) considered the proposed revised criteria for televisions (draft of June 2007) at its meeting, September 2007. Whilst there was broad agreement for the thrust of the proposals, a number of remarks were made particularly regarding the requirements for energy consumption.

This fourth discussion paper supports the final draft proposals. It discusses the significant changes made providing background supporting the individual requirements. Readers wanting more detail regarding the overall revised draft are guided towards earlier discussion papers available from the Commission or the report authors (contact: phil.dolley@aeat.co.uk or james.cadman@aeat.co.uk).

2. On-off Switches

Hard off switch

Those expressing a view at the EUEB, expressed a preference to require **all** televisions to be equipped with a hard off switch – a switch that when activated would result in the television's energy consumption being reduced to zero watts. The concern voiced was that products generally are placing an increasing burden on energy consumption across the EU due to stand-by consumption and that the Ecolabel ought to address the issue.

Consequently the proposal has been altered to reflect this desire – all ecolabelled televisions are to be equipped with a hard off switch.

Soft off switch

In the June draft, we proposed that televisions equipped with a soft-off switch that places the television into stand-by mode, should be programmed such that after an hour's non-use they fall into a deep sleep mode whereby their energy consumption is reduced to 300mW.

This requirement had been discussed at an earlier AHWG meeting with the proposal for 300mW being made by a member of the AHWG. Data we have suggests that the level is not only achievable but is reached by many televisions within our sample whose deep-sleep consumption varies from 200mW to 800mW with the average being 380mW. The limit is achievable by CRT, LCD and plasma televisions.

EUEB members were concerned though that the limit is too strict and suggested a (slightly) higher limit was appropriate. Given that it is not the intention to be overly restrictive with this one criterion (the greater life cycle impact is from a television's on-mode), we propose a revised requirement of 400mW.

3. Energy Consumption

Maximum Energy Consumption

From the very beginning of the revision process, there was a divide between groups who wanted to set a limit on absolute energy consumption (whether via measured consumption or screen size) and those that thought the scope of the television ecolabel ought to include all televisions and their applications and that therefore no requirement ought to be set.

At the EUEB, Competent Bodies expressed a preference to set a new requirement for the maximum energy consumption for the ecolabel. In broad terms the view expressed was that the CBs foresee televisions becoming ever larger and using more energy. Whilst accepting the current market situation, they want to put a marker down saying to producers that if they wish to market even larger screens they need to innovate.

Referencing to our sample of CRT, LCD, plasma and projection TVs, our analysis is as shown below.

Exclusion rate (%)	Watts
10	288
15	256
20	224
25	170
30	157

A requirement for televisions to have a maximum energy consumption <260W would enable 85% of our television sample to pass the requirement. The 15% of televisions that do not satisfy the requirement include some (i.e. not all) of the plasma televisions with screen size >42" (107cm). It is important to note that some 42" plasma screen televisions have energy consumption <200W so this requirement is not discriminatory against plasma technology; it can be achieved.

Energy Efficiency

The EUEB and AHWG are in broad agreement regarding the approach that links energy consumption to screen area.

For the updated proposals we have taken account of remarks concerning the energy consumption attributable to a television's tuner circuitry in a similar manner to that adopted for the EuP Television study and the US EPA. Commentators have remarked that all televisions have a tuner circuit that draws a similar amount of energy regardless of screen size. If account of this is not made they argue, small screen televisions will be unfairly treated.

We have made an allowance in our data for a television tuner's energy consumption of 11W – in essence the tuner's consumption is subtracted from the entire television's consumption. The resultant residual consumption is then processed to reveal the consumption per unit area as before.

Handling the data in this manner reveals the following.

Exclusion Hurdle (W/cm ²)	% of sample that pass
0.037	21
0.040	29
0.042	35
0.045	45

Our proposal is to set the requirement at 0.04 W/cm² meaning that 29% of our sample pass the requirement. Some stakeholders may consider this to be generous (and others the reverse!). The reality is that in combination with all the other requirements, we estimate that fewer than 15-20% of televisions could achieve all the Ecolabel's requirements. This is level in keeping with the Ecolabel's ethos of being achievable but challenging.

Relating the requirement to television technology, CRT, LCD, projection and plasma¹ screens can achieve the standard as can examples of small, medium and large screens. Consequently, whilst challenging, the proposed requirement is balanced and fair.

¹ The best plasma screen in our sample achieves 0.037 W/cm².

4. Mercury

The 3rd discussion paper outlined that a mercury efficiency criterion (mg Hg per unit screen area) was not a viable approach for the ecolabel. In short, large screen LCDs use mercury more efficiently than small screens.

Hence the EUEB agreed that the way ahead was to:

- a) set a limit on the amount of mercury per lamp,
- b) set a limit restricting the total amount of mercury in a screen.

Within the EUEB, the majority favoured a limit per lamp of 3.5mg. We have retained this requirement as being realistic for the ecolabel.

Regarding the upper limit, we have retained from our earlier proposals the limit of ≤ 75 mg Hg per screen. Producers have commented that the requirement will limit LCD screen size to a maximum of 46" (117cm). Whilst producers would prefer a higher limit, CBs generally supported the 75mg hurdle with some suggesting a stricter requirement.

On balance, we believe 75mg to be an acceptable compromise.

5. Ecodesign

The aim is to move more towards to a situation where eco-design and the associated knowledge of the materials used in televisions is more complete thus assisting television recycling. In fulfilment of this, ideally manufacturers would identify any substance classified as hazardous via Directive 67/548/EEC and its amendments.

The proposal is that details regarding the use in a television of a hazardous substance(s) will be reported to the CB in the application pack with details identifying the material, the quantity used and location within the television. Details will also be provided via the disassembly test report.

There is no pass/fail as such regarding this criterion; no substances are excluded, other than by existing Law and Criterion 5 governing substances identified via the RoHS Directive. Further clarification will be provided in the user manual.

The exploded diagram would label the main components; receiver, screen, electronic boards, lamps etc. It is not intended that the individual parts, for example, those on circuit boards be listed. Any hazardous substances, as per 67/548/EEC, would be identified, whether they are main components or otherwise. This would be done to assist separation and recycling.

In summary, the requirements of Criterion 4, are;

- The requirement is applicable to all materials (not just plastics),
- There is no lower limit in terms of the weight of substances and materials considered,
- That verification is in the form of a television producer's declaration supported by a bill of materials identifying hazardous substances, their quantity and location within the television.

6. Flame Retardants

Two issues regarding flame retardants (FRs) were raised at the EUEB.

The first was that the R-phrase requirement in the existing criteria should be reinserted and that this should be associated with an updated verification requirement. This we have done. The second point is more involved concerning the ecolabel's handling of Deca-bromo-diphenyl-ether (DBDE).

Much has been said within various EUEB meetings concerning DBDE. Some commentators want the ecolabel to respect the conclusions of the formal risk assessment and the amendments made to the

Restriction of Hazardous Substances (RoHS) Directive², whilst others ask for an outright exclusion. We offer a solution that hopefully satisfies both parties.

DBDE is not a pure substance. It contains impurities of other poly-BDEs that are themselves prohibited from use via the RoHS Directive where this exclusion includes their presence in concentrations greater than 0.1% in other homogenous substances. Consequently DBDE producers purify DBDE to remove contaminants such that its purity is within the requirements of Commission Decision 2005/618/EC.

Our understanding is that poly-BDE impurities remain in DBDE up to but not exceeding 0.1%.

The ecolabel could follow the example set by Commission Decision 2005/618/EC and establish its own purity requirement. If the ecolabel were to require that substances identified in the RoHS Directive must not be present in other substances in a concentration of say >0.01%, then the impurities (other poly-BDEs) present in DBDE will effectively mean that DBDE cannot be used in an ecolabelled television. Anecdotal evidence suggests that little, if any DBDE production would meet this requirement.

We have therefore devised a new proposal.

7. Roadmap for the Next Revision

The television market is fast moving with the promise of new technology in the near future. Comments made at the EUEB suggested that work for the ecolabel and EuP should forge links. In this regard, one suggestion was that the television ecolabel could, with reference to the EuP television study, identify the technology areas the ecolabel would address at the time of the next revision exercise.

Consequently, listed below is certain design areas that will be addressed at the next revision. The list is not meant to be exhaustive – other issues will be considered too.

At the time of the next revision, work in support of updating the ecolabel criteria will consider the following issues:

- *Back-light Unit technology – to include dimmable BLUs and the status of light emitting diodes*
- *Mercury content of fluorescent lamps*
- *Total mercury content of screens*
- *Luminous efficacy of plasma screens*
- *Lead-free plasma televisions*
- *Power supply unit efficiency (>80% and <1W standby)*
- *Materials selection, recycled content and possibility of using bioplastics*

² Four amendments have been made: 2005/618/EC; 2005/717/EC; 2005/747/EC; 2006/310/EC