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**COMMISSION STAFF WORKING DOCUMENT**

**IMPACT ASSESSMENT**

*Accompanying the document*

**Report from the Commission to the European Parliament and the Council on the  
voluntary ecodesign scheme for games consoles**

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## Executive Summary Sheet

### A. Need for action

#### Why? What is the problem being addressed?

"Sound and imaging equipment" has been identified as a candidate product group for possible Ecodesign measures in the Ecodesign Working Plan 2008-2011. The main problem is that game consoles, video players/ recorders and projectors can improve their environmental performance, but that the market penetration of energy efficient products is lower than it could be.

The manufacturers of games consoles have proposed a self-regulatory initiative. The key question for this impact assessment is whether the current trends of increasing energy efficiency in this product group need to be backed up by a voluntary agreement as an alternative to a regulatory intervention. The question of whether introducing mandatory ecodesign and/or energy labelling measures are merited is posed for all products considered.

#### What is this initiative expected to achieve?

The initiative should contribute to the achievement of the EU 20/20/20 targets, and specifically to reduce the EU's energy consumption. Regulatory and/or self-regulatory measures under the Ecodesign regime must improve the environmental performance of products with regard to their whole life cycle. Sound and imaging equipment are energy-using products, which currently consume around 8.5TWh electricity per year. The most appropriate options on how to improve environmental performance and to reduce energy consumption have been explored.

#### What is the value added of action at the EU level?

In the absence of harmonised requirements at EU level, regulations at national level would create regulatory obstacles to the free movement of such goods within the internal market. The objective of measures under the Ecodesign Directive is to ensure the functioning of the internal market by requiring products to reach an adequate level of environmental performance, which cannot be sufficiently achieved by the Member States acting individually. Therefore measures for sound and audio equipment could be adopted.

### B. Solutions

#### What legislative and non-legislative policy options have been considered? Is there a preferred choice or not? Why?

The following legislative and non-legislative measures have been considered:

- No EU action
- Self-Regulation (Voluntary Agreement under the Ecodesign Directive)
- Ecodesign Implementing Measures
- Energy Labelling Measures

For game consoles, the impact assessment identified self-regulation as a preferred option, provided that some mitigating measures to minimise risks are considered. Self-regulation should be given priority where such action is likely to deliver the policy objectives faster, or in a less costly manner, especially in markets that are changing rapidly. Where the conditions for a self-regulation are not met, or where the level of ambition proposed by the signatories is not adhered to, or if the process is unjustifiably delayed, the second preferred options would be joint mandatory energy labelling/ecodesign measures.

For video-players/ recorders and projectors, the market analysis has shown that the market for product groups will gradually decline.. Their electricity consumption is decreasing steadily. The analysis shows that there are little environmental benefits from any of the policy options, which gives little weight to the argument of pursuing anything other than the BAU scenario. The preferred option is therefore no action.

#### Who supports which option?

A public consultation took place during the preparatory study phase, and recently on the self-regulatory initiative

plus other regulatory options, including a public survey in autumn 2012, and the Ecodesign Consultation Forum on 9 November 2012.

Many stakeholders supported the initiative by the console industry. The overall opinion from Member States was rather reserved as to whether it would be worthwhile to endorse a voluntary agreement, and Member States overall concluded that the proposed level of ambition should be raised. Environmental and Consumer NGOs supported regulation, rather than a voluntary agreement solution.

Concerning video recorders/players and projectors, most stakeholders preferred 'no action', provided that market data would support it.

### **C. Impacts of the preferred option**

#### **What are the benefits of the preferred option (if any, otherwise main ones)?**

The preferred option will provide annual energy savings of 1 TWh already by 2020, increasing to 1.1 TWh by 2025. Consumers will profit from reduced electricity consumption. The annual electricity savings will be around 200 Million Euros. Environment and the climate will also benefit, as the resulting CO2 savings will be 0.45 Mt/year.

Within a self-regulatory initiative, manufacturers themselves are the drivers and will also benefit. Other benefits or costs are considered to be negligible.

#### **What are the costs of the preferred option (if any, otherwise main ones)?**

The preferred option will not incur high additional costs as manufacturers themselves have already factored in the changes needed in their production plans, minimising the detrimental impacts and downtime costs.

As none of the manufacturers is based in the EU, no significant direct negative impacts in economic, social or environmental areas are expected.

#### **How will businesses, SMEs and micro-enterprises be affected?**

SMEs and micro-enterprises will not be affected. The products in scope are not manufactured in the EU.

#### **Will there be significant impacts on national budgets and administrations?**

No.

#### **Will there be other significant impacts?**

No other significant impacts are expected. The endorsement of a voluntary agreement in the EU may encourage similar self-regulatory processes in other jurisdictions (US, Australia)

### **D. Follow up**

#### **When will the policy be reviewed?**

A review by the end of 2017 is built-in the voluntary agreement on games consoles. The Commission will closely monitor the implementation of the voluntary agreement.

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## **1. PROCEDURAL ISSUES AND CONSULTATION**

### **1.1. Introduction**

The Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the Commission to set ecodesign requirements for energy-related products ([ErP], hereafter referred to as the Ecodesign Directive)<sup>1</sup> is to be implemented by the European Commission through regulations or self-regulations for the product groups identified in the relevant Ecodesign Working Plans. A product, or a group of products, shall be covered by ecodesign implementing measures or by self-regulation (viz. criteria in Article 19, Ecodesign Directive), if the ErP represents indicatively significant sales volumes, while having a significant environmental impact and significant improvement potential (Article 15, Ecodesign Directive). The impacts of potential policy measures are assessed in line with the requirements of the Ecodesign Directive, together with possible measures under the Energy Labelling Directive 2010/30/EC<sup>2</sup>.

Compared to other Ecodesign Regulations the energy savings potential of this product group is relatively moderate. For sound and imaging equipment energy savings amount to around 2.5 TWh per year; this compares to 215 TWh per year for the Ecodesign Regulation on Space Heaters, and 16 TWh per year for the Ecodesign Regulation on Computers.. The analysis presented in the report is considered proportionate to these anticipated impact magnitudes.

A special feature of this impact assessment is that it also assesses whether an industry proposal for self-regulation can be considered as an alternative policy measure.

### **1.2. Organisation and timing**

The Ecodesign Working Plan for 2009-2011 identified "sound and imaging equipment" as one of the ten priority product groups. The Commission carried out a technical, environmental and economic analysis in preparation for these potential initiatives, hereafter referred to as the preparatory study<sup>3</sup>. Stakeholder consultation meetings were organised in the Commission's premises in Brussels on 2 April 2009, 18 December 2009 and 14 June 2010 to discuss the preliminary results of the preparatory study. The study identified three product subgroups: video players and recorders, projectors, and game consoles, and concluded in 2010 that these products met the criteria of Article 15 of the Ecodesign Directive. The product groups present a significant volume of sales on the market, they have a significant environmental impact and energy consumption, and present a significant potential for improvements.

An Impact Assessment study for "sound and imaging equipment" was carried out from March 2012 to March 2013, providing the European Commission with technical and economic background.

After several meetings between the Commission and the manufacturers of game consoles<sup>4</sup>, the manufacturers presented in August 2012 a draft self-regulation measure, i.e., an industry proposal for a voluntary course of action.

From early October 2012 the Commission held a public consultation exercise, and the official Ecodesign Consultation process, concerning possible regulations, including the proposed self-regulation. Comments were received up to and including February 2013. The full text of the industry proposal and the public survey documents are available on: [http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index\\_en.htm](http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index_en.htm).

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<sup>1</sup> OJ L 285, 31.10.2009

<sup>2</sup> OJ L 153, 18.06.2010

<sup>3</sup> See <http://www.ecomultimedia.org/>

<sup>4</sup> The last meeting took place on 19 June 2012 in Brussels between the Commission and Microsoft, Nintendo, and Sony.

A draft Impact Assessment was submitted to the Impact Assessment Board on 29 April 2013. The present document takes into account the recommendations by the Board, mainly regarding the presentation and comparison of the options. In particular, a revised version of the Voluntary Agreement was submitted by industry in November 2014 which has been considered acceptable by the different Commission services, as reflected in the associated inter-service consultation<sup>5</sup>.

### 1.3. Consultation process

Stakeholder insights on sound and imaging products were previously gathered via the preparatory study, which included a dedicated website, taking into account input from relevant stakeholders including manufacturers and their associations, environmental NGOs, consumer organizations, EU Member State experts, experts from third countries and international organizations for e.g. the International Energy Agency (IEA).

As part of a further Impact Assessment (IA) study providing technical assistance from external consultants<sup>6</sup>, a specific public Stakeholder Consultation exercise on the actual draft self-regulation for game consoles was carried out in autumn 2012. Stakeholders were invited to comment on individual product surveys and draft findings of the IA, including policy options for the three 'sound and imaging' product groups.

The **Ecodesign Consultation Forum** met on 9 November 2012. It is the key consultation tool for all considered Ecodesign implementing measures; it is foreseen in Art. 18 of the Directive and provides for a procedure of recognition of candidates for participation that ensures a balanced representation of interests. Comments from Member States and stakeholders were received up to and including February 2013.

In summary, the **Member States** welcomed the initiative by consoles manufacturers, but its opinion was rather reserved whether it would be worthwhile to endorse the proposal as voluntary agreement under the Ecodesign Directive, on account of the energy saving potential at 1 TWh/y, which was found to be insufficient. **NGOs** indicated that in general regulation is preferable over self-regulation. An influential report by the US based National Resources Defense Council on the energy consumption of games consoles<sup>7</sup> was discussed with manufacturers and led to some changes in their self-regulatory initiative. **Industry** was, naturally, supportive of the industry proposed approach and levels. On video players/recorders and projectors, there was general agreement in the consultation of a downward trend in the video recorder/player market overall, and that respondents preferred the policy route of no action.

The results of the public consultation are summarised in Annex I. The minutes of the Consultation Forum, the discussion document, and a short summary of the written comments received can be found in Annex II.

Internal consultation: All relevant Commission services (ENER, ENTR, ENV, CNECT, SANCO, CLIMA, COMP, SG, and TRADE) were consulted on drafts and relevant documents. Impact Assessment Steering Group Meetings concerning this product group took place on 23 February 2012, 7 November 2012, and 22 February 2013. At the last meeting, the Impact Assessment Steering Group was consulted on a final draft of this IA.

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<sup>5</sup> See consultation Ares(2014)2108118 de la DG GROW

<sup>6</sup> Ricardo-AEA with RPA, PE International, Intertek

<sup>7</sup> <http://www.nrdc.org/energy/game-consoles/files/video-game-consoles-IP.pdf>

## 2. PROBLEM DEFINITION

### 2.1. Introduction

The underlying problem, determined by the preparatory and the IA studies, can be summarised in the following way: cost-effective and energy efficient technologies for efficient equipment and technical solutions exist within the sound and imaging product market, but their market penetration is lower than it could be. The dominant aspect for improving the environmental performance of sound and imaging equipment is the energy consumption, and therefore the ecodesign proposals within this assessment focus on this aspect.

### 2.2. Product scope

The product scope was well defined in the preparatory study, covering three product subgroups: video players and recorders, projectors, and game consoles. A short description of the three individual product groups, including trends, can be found in Annex III. As for other electronic equipment, such products are and will be subject to quick technology developments and market changes, i.e. due to changes in data storage and transmission.

The key question for this report is whether the current trends of increasing energy efficiency considering the increasing performance of consoles should be backed up by a voluntary agreement, or whether there is a need for introducing mandatory ecodesign or energy labelling measures.

### 2.3. Market failures

Barriers to the market uptake of more efficient sound and imaging products are largely due to the following market failures:

PROBLEM	DRIVER
Market prices for electricity do not reflect the real costs and benefits to society ('externalities')	Not all environmental costs are included in electricity prices – therefore consumer (and producer) choices that are made on the basis of lower electricity prices do not reflect the environmental costs to society, meaning less than optimal social welfare may result.
Information failure - incomplete information on running costs/ cost savings	Information on running costs/cost savings can be obtained only with difficulty. Power demands of computing components are closely correlated to levels of computing performance. The higher power demanding products provide significantly more processing power and therefore require more power to deliver the higher level of gaming functionality. Generally, there is little awareness of the energy consumption and the associated costs.
Efficient products carry a substantial additional price, which is not enforceable on the market	Energy consumption is not a decisive factor for purchasing decisions. For projectors, whilst more efficient lamp systems exist or are in development ( e.g. LED/Laser ) that could result in a step change in product energy efficiency, these most efficient lamp systems would require an increase in product price that is disproportionate to the cost of energy that would be saved during the lifetime of the product. Typically a modulated mercury vapour lamp system will be three times as expensive to buy as the metal halide or halogen discharge lamps they replace (e.g. 330Euros as opposed to

	108 Euros for a schools or office conference room projector). For games consoles the key purchase driver is functionality (gaming experience) rather than environmental performance. Therefore, there are insufficient drivers to support such a step change in energy efficiency, and insufficient incentives exist for manufacturers to optimise the environmental performance of sound and imaging equipment.
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Table 1: Market failures

The consequences of these problems are that innovation is not sufficiently encouraged, and that energy costs are higher than economically necessary. In conclusion, there is an untapped potential for this product group to contribute to achieve the Europe 2020 targets.

#### 2.4. Related initiatives at European Union and Member State levels

EU-level initiatives aiming to improve the environmental impact of products include legislation on standby/off-mode power consumption (Commission Regulation (EC) No 1275/2008), and on the power consumption of external power supplies (Commission Regulation (EC) No 278/2009), furthermore on waste ("WEEE")<sup>8</sup>, or on hazardous substances ("RoHS")<sup>9</sup>.

Regulation EC 1275/2008 requires that products covered within its scope, which include sound and imaging equipment, have to comply with a maximum power limit of 0.5 Watts in January 2013 (with some additional allowances available for extra functionalities) when operating in standby or off mode. A revision to address network standby is currently in progress (Committee vote on 21 March 2013), and is considered in the baseline scenario.

Initiatives in related product areas involving the same industrial sector include:

- Voluntary agreement for complex set top boxes, accepted by Commission Report COM(2012) 684 final<sup>10</sup>
- Voluntary agreement for imaging equipment (printers), accepted by Commission Report COM(2013) 23 final<sup>11</sup>

The experience of these recently accepted Voluntary Agreements, including their impact assessments<sup>12</sup> for more complex products with more signatories, can be partly used as a reference model.

In related product areas, there are also the following initiatives to consider:

- Draft Ecodesign Regulation for computers (Committee vote on 28 February 2013)
- Simple Set Top Box regulation (EC No 107/ 2009)
- EU ENERGY STAR label addressing the energy efficiency of computers

In addition, there are also some requirements in national ecolabels such as the Blue Angel, or the Nordic Ecolabel addressing products such as video player /recorders and projectors.

<sup>8</sup> Waste Electrical and Electronic Equipment Directive, 2012/19/EU

<sup>9</sup> Restriction of Hazardous Substances Directive, 2011/65/EU

<sup>10</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0684:FIN:EN:PDF>

<sup>11</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0023:FIN:EN:PDF>

<sup>12</sup> SWD(2012)391 and 392 final; SWD(2013) 14 and 15 final)

## **2.5. Legal basis for EU action**

Article 16 of the Ecodesign Directive provides the legal basis for the Commission to adopt an implementing measure for this product category. Recitals 16, 17, and 18, Article 17 and Annex VIII provide for the recognition, under certain conditions, of voluntary agreements as a valid alternative to EC regulation.

With regard to subsidiarity, regulatory intervention at the national level would hinder the free circulation of goods in the internal market, and would impose a much higher burden on producers. The market failures outlined above are not specific to one individual country in the EU and are pan-European in scope; therefore it is proportionate to intervene at the EU level in this instance.

## **2.6. Who is affected by ecodesign requirements and how?**

Manufacturers, suppliers and importers of energy-related products have to take account of environmental aspects in the design and development stages. When products are covered by implementing or self-regulation measures, manufacturers and suppliers will also have to achieve minimum energy efficiency standards for products placed on the European Union market. There would be a further need to provide documentary proof of compliance entailing product testing. Market Surveillance Authorities have to check compliance. Finally consumers would be affected by any price increase associated with redesigned products – although they may realise a benefit from improved energy efficiency over the life time of the product's use.

## **2.7. Market Situation for Sound and Imaging Equipment**

There are no EU manufacturers of game consoles, projectors or mass-market video players/recorders. Almost all mass-market video players/recorders (DVD/Blu-Ray), projectors and game consoles are assembled in China. Only very few (below 5,000 units per year), high-quality video player/recorder products are made in Europe by a very small number of SMEs for niche markets. This means that EU manufacturers are practically not affected, and importers and retailers which are unaffected by modifications to products will also not be concerned. Annex IV provides more specifics about this particular product group.

## **2.8. Baseline scenario**

For the purposes of conducting the impact analysis, a baseline scenario, also commonly known as “No New Policy Action” or “Business As Usual – BAU” has been estimated for each product area within the Sound and Imaging Group.

A check of available market data by the IA study found that in 2012 roughly around 50 million video players and recorders, 12 million game consoles and 2 million projectors were sold in the EU. The video player/recorder products which are predominant on the market already have low energy consumption, and projectors have a low market size. However, game consoles have a relatively high energy consumption and an important market size. The combined electricity consumption of sound and imaging equipment is estimated to have been approximately 8.5 TWh in 2010 in the EU-27 (comprising of 4 TWh for video players/recorders and projectors, and 4.5 TWh for games consoles). By 2020 the electricity consumption for the three product groups is forecast to increase to 13 TWh in EU27 (comprising of 2 TWh for video players/recorders and projectors, and 11 TWh for games consoles). The BAU scenario for the three product groups is presented in the figure below.

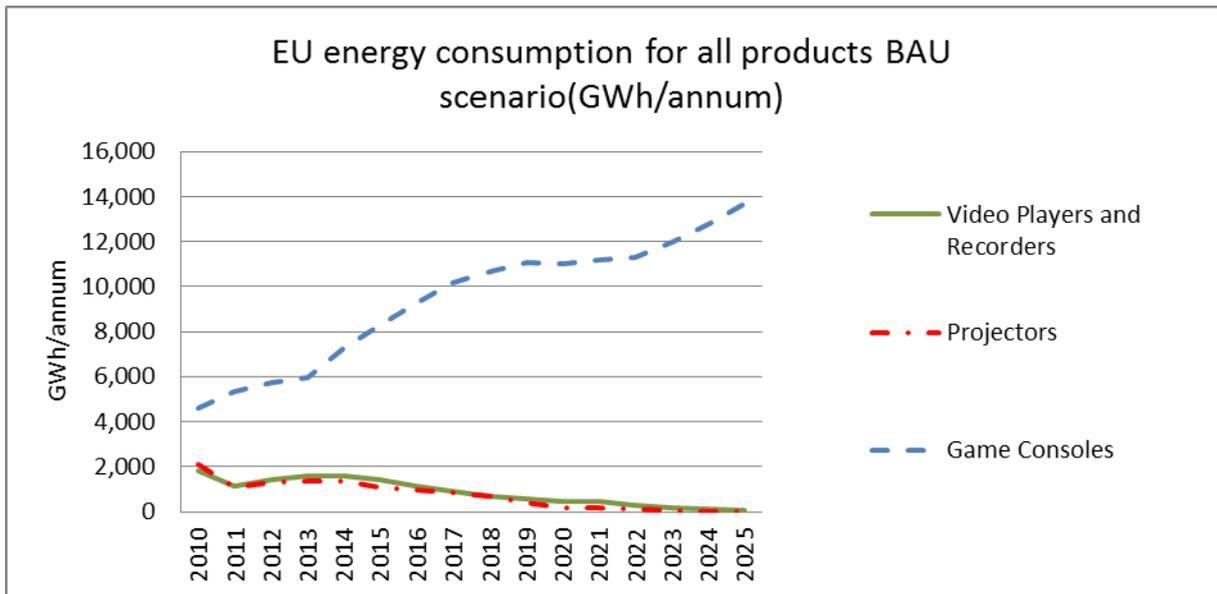


Figure 1: Business as Usual - EU Energy Consumption for all Products

An important factor for modelling scenarios is the forecast of the market situation. This forecast shows that the markets are changing very rapidly, and explains the surprising decrease of energy consumption for some products.

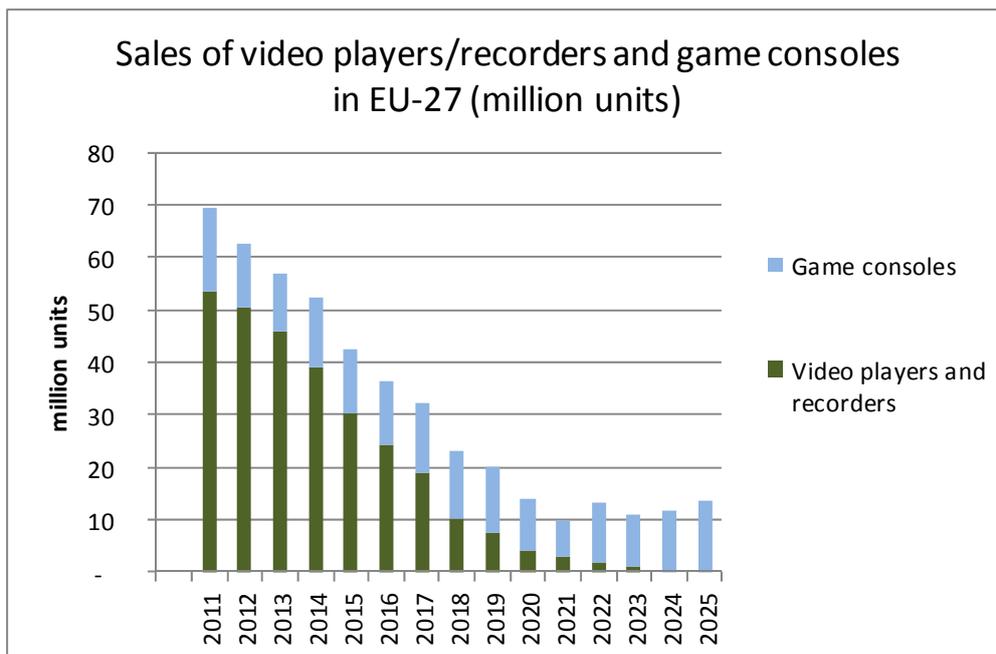


Figure 2: Sales of products EU-27 (million units)

Figure 2 shows a significant decrease for video players/ recorders. The forecast in the IA study found that video players/ recorders will effectively disappear from the market. Please note that this diagram excludes sales of projectors, as no future sales figures for projectors are available from industry experts; however, experts note that projectors are expected to follow the same downward trend as video players/ recorders. The sales figures are currently dropping by up to 10% per year, and this decrease will continue as other technologies increasingly substitute these products. The stakeholder consultation confirmed the trends, and industry associations representing the manufacturers at the Consultation Forum regretted by affirmed these trends. These important facts have to be taken into account in this Impact Assessment.

Detailed figures for the three individual product groups are included in Annex V. Further assumptions for the baseline scenario (i.e. sales, lifetime, use, efficiency) are included in Annex VI.

## **2.9. Improvement Potential**

Sound and imaging equipment overall has a potential to reduce in use electricity consumption, i.e. by increased hardware, optimised chip sets, and changes in power management. However, this is subject to qualifications. The improvement potential for game consoles is difficult to identify because of their multi-functionality and their complex architecture. A potential to achieve additional improvements in the energy efficiency of game consoles exists through a better integration of hardware and software. It is also difficult to define the saving potential in an objective way, as it depends on the gaming performance. For new video players/ recorders, the improvement potential has been nearly exhausted. For projectors, improvements in efficiency from current levels are not possible within the constraints of a low lifecycle cost solution. More efficient projector bulbs cost around three times more than standard bulbs, but do not proportionately reduce electricity consumption, cost-wise. An overview for all product groups is included in Annex VII.

## **3. OBJECTIVES**

For sound and imaging equipment products fulfilling the ecodesign criteria, the general objective is to correct market failures and to reduce energy consumption in a proportionate and cost-effective manner, in line with the EUs environmental priorities, and to contribute to the EU objective of saving 20% of the EU's energy consumption by 2020, while safeguarding the free movement of goods.

The specific objectives are:

- to create incentives for manufacturers to design energy efficient models,
- to facilitate the removal of lowest performing products from the market,
- to satisfy the provisions of the Ecodesign Directive, avoiding negative impacts on the functionality of the product; and
- to generate cost savings for end-users.

The operational objectives are, in the case of game consoles:

- to agree by 2013 on representative operational modes for energy performance,
- to develop by 2014 appropriate test measures for energy performance,
- to make sure by 2014 that buyers can access appropriate performance information and so foster an effective market, driven by competition on energy performance; and
- that voluntary agreements or regulations could achieve these objectives without having a significant negative impact on functionality, safety, affordability of the product, industry's competitiveness, the free movement of such products within the internal market, and the administrative burden imposed on the internal market, and Member States.

## 4. POLICY OPTIONS

### 4.1. Game Console Policy Options

Each policy option is discussed in detail below, including the reasoning behind selecting each specific power demand requirement.

#### 4.1.1. *Option 1: No new EU action/ Baseline*

This option is included in the analysis not only for comparison purposes, but also as a viable option in its own right (see also baseline scenario in section 2.7). This option implies that barriers will persist for realising the potentials to improve the energy efficiency of game consoles.

#### 4.1.2. *Option 2: Industry Proposal – Self-Regulation*

At the beginning of August 2012, three game console manufacturers presented to the Commission an already quite comprehensive “Draft Outline proposal to further improve the energy consumption of game consoles”. This draft industry proposal is silent on its purpose, and is not considered by the Commission as a 'Voluntary Agreement' ready for immediate recognition. However, except for the monitoring and reporting part, it does contain all essential elements, and is therefore regarded as sufficient to commence the evaluation of the admissibility of this initiative as an alternative to an implementing measure. According to Annex VIII No. 6 monitoring must be established in partnership with the Commission services. Therefore, monitoring procedure has not yet been included within the initial industry proposal. The proposal can be found at the following web link: [http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/files/console\\_maker\\_proposal\\_en.pdf](http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/files/console_maker_proposal_en.pdf)

The principles of the proposal are a result of world-wide negotiations by the console manufacturers following globally possible regulatory initiatives. So far neither self-regulation nor mandatory requirements exist anywhere in the world. Similar discussions regarding self-regulation recently took place in Australia and New Zealand, and the US Environmental Protection Agency is working on an ENERGY STAR specification for game consoles. After many years of unsuccessful attempts to address the consumption of the extremely varying game play modes, which depend strongly on the gaming performance, all global discussions were reduced in 2012 to a simplified approach, with requirements on the two operational modes ‘media playback/streaming’ and ‘navigation’, which are also simple to test. The present industry proposal to the Commission is based on these modes. In its latest version, the Voluntary Agreement drafted by industry takes a commitment to look into possible metrics for the gaming mode, with a view to exploring maximum energy consumption requirements for its revision in 2017.

The rationale for addressing the environmental impact of game consoles through self-regulation is underpinned by the following characteristics of this product group:

- There are only three main console manufacturers.
- The energy consumption of these devices is impacted not only by their design but also by the way that software interacts with the devices.
- The competition between the manufacturers is very strong. Therefore very little information regarding product attributes and energy performance openly available prior to launch of a new product generation, released every seven years or so.

The requirements are specified as follows:

Industry proposal	Tier 1 2013	Tier 2 2017
<i>Media Playback mode</i>	90.0W	70.0W
<i>Navigation mode</i>	90.0W	70.0W
<i>Additional functionality allowance NUI=Natural User Interface</i>	20.0W	15.0W
<i>Auto-power down to stand-by mode after one hour of inactivity</i>		

Table 2: Game consoles Option 2 Requirements

The industry proposal includes a comprehensive approach to tackling the power demands of some of the power modes found in game consoles, but not their main function of 'game play', which could not be included at this stage, so as not to restrict the gaming performance. Furthermore, the proposal considers existing and future standby regulations. However, there are several aspects of the proposal which require additional investigation, i.e. that media playback is limited to some specific media formats.

#### *Assessment against Annex VIII of the Ecodesign Directive*

As a basic condition, voluntary agreements under the Ecodesign Directive need a high level of environmental ambition, and need to demonstrate that they are likely to deliver the policy objectives faster, or in a less costly manner, than mandatory requirements. In line with Article 17 of the Ecodesign Directive, voluntary agreements or other self-regulation measures presented as alternatives to implementing measures in the context of this Directive shall be assessed at least on the basis of Annex VIII. As explained, the consoles manufacturers, aware of the fact that the draft proposal is not fully compliant with the Directive, expressed their commitment to amend the proposal in order to fulfil the Annex VIII criteria, i.e. its No. 6 on Monitoring and Reporting.

#### *4.1.3. Option 3: Mandatory ecodesign requirements*

This option aims at improving the environmental impact of game consoles by setting mandatory maximum levels for their power consumption.

Based upon the technical concept of the industry proposal, but considering also the preparatory study options, additional information, stakeholder comments and recent technical analysis including the draft ENERGY STAR specifications, several potential sub-options with varying thresholds for power demand/energy consumption and timings have been explored. The most robust sub-option, from a technical perspective, has been taken forward for assessment. It proposes more stringent limit values as the industry proposal in two tiers for 2014 and 2017, and further “power supply” and “power management” requirements. In the absence of any widely accepted energy performance metrics for the gaming mode, it is currently not possible to propose requirements for this mode.

Overview table with the main requirements:

Regulatory option	Tier 1 2014	Tier 2 2017
<i>Media Playback mode</i>	70.0W	50.0W

<i>Navigation mode</i>	70.0W	50.0W
<i>Additional functionality allowance (NUI)</i>	7.0W	5.0W
<i>Internal power supply</i>	85% minimum efficiency at 50% of rated output and 82% minimum efficiency at 20% and 100% of rated output, with Power Factor > 0.9 at 100% of rated output.	
<i>Power management</i>	Power down to network standby after 1 hour of inactivity.	

Table 3: Game consoles Option 3 Requirements

The Tier 1 power demand value of 70W for media playback and navigation mode has been suggested for use within a mandatory measure, as at least one of the current game consoles can already meet this requirement, if applied as of today. On the other hand, it is very ambitious, as two current consoles would possibly be banned. The Tier 2 limit of 50W for media playback and navigation mode was included, as it was clear that other products on the market which offered similar functionalities such as notebook gaming PCs could already meet these requirements. 2017 was considered a reasonable time for game console manufacturers to include energy efficient architectures into their products so that media playback could be offered at 50W or less. The modelling of this option has, however, not considered the future possibly extended performance or functionalities of subsequent generations of game consoles, as they are impossible to predict.

#### 4.1.4. Option 4: Mandatory energy labelling

The mandatory EU Energy Label usually aims to categorise products by efficiency class, applying an A to G categorisation. Energy labelling has advantages in terms of transparency, consumer information and consistency with approaches for other products. A mandatory energy label may offer an effective means of encouraging the market toward more energy-efficient game consoles: in a horizontal way, helping consumers by giving them a further purchasing criterion to choose between the different models, and in a vertical and chronological way by stimulating manufacturers to improve their new consoles, to place them into the better labelling classes.

However, there are only three main product models of games consoles, one produced by each manufacturer, and the product architectures and gaming performance vary widely between the three different products. This means that there are considerable differences in functionality and power consumption between the products of each manufacturer, which may make the application of an across-the-board categorisation unrepresentative.

The labelling thresholds for A-G levels for game consoles have been developed using the power demand requirements in media playback and navigation mode of 90 W, 70 W and 50 W. These thresholds correspond to the labelling classes G, E and C respectively. The formula to calculate the label class would be as follows:

Specific Energy Consumption Index (SEC) = (0.5 x (Media Playback (W) + Navigation (W))).

The following table shows the energy labelling option and its classes. The proposal includes a Tier 2, reducing the labelling thresholds by 15 W to 20 W after three years, to set a strong incentive that improvements are necessary even to keep the same class for the product.

Mandatory Energy Labelling Requirements	Label Class	SEC Tier 1 (2014) < (W)	SEC Tier 2 (2017) < (W)
Media Playback mode combined with Navigation mode	<b>A</b>	<b>30</b>	<b>15</b>
	<b>B</b>	<b>40</b>	<b>25</b>
	<b>C</b>	<b>50</b>	<b>35</b>
	<b>D</b>	<b>60</b>	<b>45</b>
	<b>E</b>	<b>70</b>	<b>55</b>
	<b>F</b>	<b>80</b>	<b>60</b>
	<b>G</b>	<b>90</b>	<b>70</b>

Table 4: Game consoles Option 4 Requirements

4.1.5. Further Discarded Options

Considering the specific situation that none of the manufacturers is based in Europe, and that other international negotiations are on-going, two further options have been considered for the EU, not to opt for regulation alone. These other options are not under the control of the Commission, and depend on other developments and stakeholders. These alternative options could be progressed in parallel to the other options outlined in this Impact Assessment, but cannot be analysed further here.

Option 5: Internationally-Recognised Agreement

The potential for an international agreement on game console energy efficiency was discussed in 2012 via the initiative of Australian authorities, under the IEA banner within the “4E” Implementing Agreement. An international agreement could involve - as a minimum, for example - the EC, the Australian DCEEE, and the Californian Energy Commission. One advantage of this approach would be less variation in requirements among countries, so that impacts on competitiveness of EU firms would be minimised. However, negotiations between Australia and industry and for Energy Star specifications have slowed down, and no concrete plans are known. . As an international Agreement is not considered as a viable option in the near future, no detailed modelling of this approach has been developed.

Option 6: EU ENERGY STAR coverage

The voluntary EU ENERGY STAR label usually aims to qualify the top performing 25% of the market at the time the specification becomes active, but the specification for game consoles is still at the draft stage. In principle ENERGY STAR is considered a worldwide well-recognised incentive, which is often used as a criterion for public procurement; however, this public procurement element is not very relevant for game consoles. The 25% approach is also problematic when there are solely three products on the market; the incentive for industry to manufacture qualifying products would be low, and the approach bears the risk that none of the products would qualify for the label. Furthermore, as the EU - ENERGY STAR agreement is currently in the process of being re-negotiated, this option is discarded from further analysis.

Option 7: Combination of Options 3 (Ecodesign Regulation) and 4 (Energy Labelling Regulation)

An option combining ecodesign with energy labelling would represent the most extensive regulatory approach. However, as both options tackle the efficiency of the same operational

modes, effects of both regulations may absorb each other rather than adding on significant benefits, whilst requiring the administrative burden of both. Therefore this option is discarded from further analysis at this stage, without excluding it as a possible legislative way forward at a later stage.

#### 4.1.6. Summary and level of ambition of the game console options

For game consoles, manufacturers have proposed voluntary requirements. An important task of this impact assessment is to contrast the level of ambition of the industry proposal option with possible mandatory options. The following table summarises the levels:

	Policy Options							
	1 No action	2 Industry proposal		3 Ecodesign		4 Energy Labelling		
Requirements in Watt ( $\leq$ W)		Tier 1 2013	Tier 2 2017	Tier 1 2014	Tier 2 2017	Label Class	SEC Tier 1 2014	SEC Tier 2 2017
Media Playback mode		90	70	70	50	A B C	30 40 50	15 25 35
Navigation mode		90	70	70	50	D E F G	60 70 80 90	45 55 60 70

Table 5: Summary Game consoles Requirements

The table indicates that minimum efficiency levels for all options are structured in a similar way. The levels under Option 3 are 20 W stricter than under Option 2, which is considered ambitious, but not extremely different. The timing of their entry into force is also similar; however the industry proposal would apply already by 2013. Industry self-requirements are therefore phased in faster than under Options 3 and 4. Option 4 reflects the same approach using the same power modes, but the labelling classes are set in a challenging way, assigning many consoles currently on the market to the lowest energy classes, which means that the “pull” effect of such an option can be considered ambitious.

Stakeholder views: Nearly three quarters of respondents of the public survey stated that there was no need for policy action in Europe. The following preferred policy option was the industry proposal. Further, the stakeholder survey preferred self-regulation over an international agreement. The consultation results showed a strong disagreement (>90 %) with the proposed levels and found them too stringent. Member States supported self-regulation provided that the level of ambition is raised. NGO respondents suggested that regulation would deliver results more quickly and cost effectively.

## 4.2. Video Players/ Recorders Policy Options

### 4.2.1. Option 1: No new EU action/ Baseline

In addition to the information provided in section 2.7 baseline scenario, this option can be characterised by a clear downward trend in sales. The trend will continue due to technological shifts towards the separation of the hard/optical drive from the product and toward streaming

clients, removing the need for these products. 93% of the stakeholders agreed to the broad view of the market. More technical details can be found in Annex IV on the market situation.

#### 4.2.2. Option 2: Self-regulation via a voluntary agreement

No self-regulation initiative has been taken forward by industry. Drastic decreases in sales do not militate in favour of self-regulation. Therefore this option is discarded from further analysis.

#### 4.2.3. Option 3: Mandatory Ecodesign requirements

Policy options with ecodesign requirements were developed in the preparatory study in 2010, and were subject to stakeholder consultation. The IA study checked the policy requirements for products currently on the market, and found that the majority of products already met these requirements. Therefore, the requirements have been re-assessed in light of new technical information and industry feedback. The revised and more stringent proposals, with updated timelines, were subjected to the public stakeholder survey, and subsequently considered for purposes of this assessment. The option is considered ambitious and feasible within a least life cycle cost (“LLCC”) approach.

Operating mode	Product	Thresholds 2014
On play	Video player	SD $\leq$ 8W HD $\leq$ 15W
	Video recorder	$\leq$ 20W
Live pause	Video recorder	$\leq$ 20W
Fast start	Video players and recorders	$\leq$ 8W
Off mode or standby equivalent power condition	Video players and recorders	$\leq$ 0.5W with hard on switch $\leq$ 0.3W without hard on switch
Fast start enabling	Video player	Disabled by default.
	Video recorder	Fast start mode restricted to 4 hours or only when the TV is on
Auto power down (APD) enabling	Video players and recorders	APD requirements enabled by default.
Time to enter standby/ off/ equivalent from conditions not providing on-mode functions after no user interaction	Video players	0.5 h
	Video recorders	3.0 h

Table 6: Video Players/Recorders Option 3 Requirements

#### 4.2.4. Option 4: Mandatory energy labelling

The mandatory EU Energy Label usually aims to categorise products by efficiency class, applying an A to G categorisation. Energy labelling has advantages in terms of transparency, consumer information and consistency with approaches for other products.

However, the already very low level power demand of a few Watts in these products means that an energy efficiency label would display the best label class for almost all of the mass market devices. As the differences in power consumption between products are often very small, it would be artificial to develop and apply labelling classes in one-watt steps or similar.

The introduction of a labelling scheme would therefore not be in line with Article 11 of the Energy Labelling Directive, which stipulates that the steps of the energy classification should correspond to *significant* energy and cost savings from the end-user perspective.

This option is therefore discarded from further analysis.

4.2.5. *Option 5: EU ENERGY STAR coverage*

The US ENERGY STAR label currently includes a “Home Audio & DVD” specification; however it covers wider products than just the sound and imaging products addressed in this impact assessment. In principle, this label may provide a low-cost mechanism to influence market transformation toward greater energy efficiency in Europe. However, the strength of the current EU ENERGY STAR label is its use in public procurement, which is not a major driver for the video player/ recorder market, and therefore it is unlikely that there would be sufficient incentive for industry to manufacture products which would qualify for the EU ENERGY STAR. In addition, as the difference between the worst and best performing products on the market may only be 2 W to 3 W, notable savings would not be expected in the event that a label did see a significant uptake in Europe. For these reasons, this policy option is not considered further.

4.2.6. *Summary of the Video Players/ Recorders Policy Options*

From the five policy options considered for video recorders/players, three have been reasonably discarded from further analysis, and two will be taken forward for investigation in more detail. In addition to the discard justifications given here, the market data and the low energy consumption of these products (the power demand to play a DVD is often already below 10 W), support limiting the analysis to a smaller number of options.

Stakeholder views: There was general agreement in the consultation of a downward trend in the video recorder/player market overall and the majority of respondents preferred ‘no action’.

**4.3. Projector Policy Options**

4.3.1. *Option 1: No new EU action/Baseline*

With no EU action, the baseline scenario is characterised by a clear downward trend in sales, because projectors will be increasingly substituted by widescreen televisions. More technical details can be found in Annex IV on the market situation.

4.3.2. *Option 2: Self-regulation via voluntary agreement*

No self-regulation initiative has been taken forward by the projector industry. Decreases in sales do not militate in favour of self-regulation. Therefore this option is discarded from further analysis.

4.3.3. *Option 3: Mandatory Ecodesign requirements*

This option is based on reassessed and updated policy scenarios from the preparatory study. The requirements proposed below are based upon an assessment of available technologies. The option is considered ambitious and feasible.

Operating mode	(2014)		
Off/Standby/Networked Standby mode	0.5/1.0/1.0 W		
On mode	Total projected light output (lm)	Efficiency requirement	
	X <sup>13</sup> < 1,500	W/ lm	0.150

	$1,500 \leq X < 2,500$	0.120
	$2,500 \leq X < 4,000$	0.110
	$4,000 \leq X < 5,000$	0.100
	$5,000 \leq X$	0.090

Table 7: Projectors Option 3 Requirements

Correction coefficients would apply to those efficiency limits depending on the projector specifications (product categories, lamp technology) as follows:

Projector specifications	Correction Coefficients
Wide aspect	1.1
Multi lamp and Xenon lamp	1.3
Solid state light source	2.0
Home theatre projectors	2.0
Short throw projectors	1.3

Table 8: Projectors Option 3 Correction Coefficients

#### 4.3.4. Option 4: Mandatory energy labelling

A label for projectors would be complex but feasible. It could assist in identifying low quality, poor performance products coming to the market. To date there have been no detailed discussions regarding the details of such a label. The modelling of the labelling option is therefore based on the requirements and on simplified assumptions suggested in the preparatory study, i.e. that this label would result in a 5% per annum improvement in efficiency from 2016 onward.

#### 4.3.5. Summary of the Projectors Policy Options

Three of four policy options considered for projectors will be taken forward for investigation in more detail. The market data support to limit the analysis.

Stakeholder views: There was general agreement in the consultation of a downward trend in the projector market, and the majority of respondents preferred ‘no action’.

## 5. IMPACT ANALYSIS

The overarching aim of this section is to assess the overall energy and carbon savings against other parameters such as economic and social impacts, thereby identifying the possible trade-offs. This helps to ensure that consideration of environmental, economic and social impacts are all factored in to the options analysis.

The Table below gives an overview of the options retained for in-depth analysis.

Game consoles	Video players / recorders	Projectors
<ul style="list-style-type: none"> <li>Option 1 No EU action</li> <li>Option 2 Industry Proposal - Self Regulation</li> <li>Option 3 Mandatory Ecodesign</li> <li>Option 4 Mandatory</li> </ul>	<ul style="list-style-type: none"> <li>Option 1 No EU action</li> <li>Option 3 Mandatory Ecodesign</li> </ul>	<ul style="list-style-type: none"> <li>Option 1 No EU action</li> <li>Option 3 Mandatory Ecodesign</li> <li>Option 4 Mandatory energy labelling</li> </ul>

Table 9: Retained options: Game Consoles, Video Players/ Recorders and Projectors

The assessment is implemented in line with the criteria set out in Article 15(5) of the Ecodesign Directive, taking into account the impacts on manufacturers, including SMEs. The aim is to find a balance between achieving the appropriate level of ambition and associated benefits for the environment/ user (due to reduction of life-cycle costs) on the one hand, and the potential burdens for manufacturers, etc, on the other. Throughout, it should be ensured that negative impacts to the user are avoided - in particular in relation to affordability and functionality.

## 5.1. Economic impact

### 5.1.1. Impact on Industry in general

As explained in section 2.6, EU manufacturers will not be affected, practically. Costs related to improved technology and production, and re-design, will accrue to non-EU manufacturers, although the scale will depend on each individual option, and the product scope and the type of exemptions applied.

The policy options assessed would have the following supply-chain related cost implications:

#### *Game consoles:*

It has not been possible to quantify the costs to manufacturers. The IA study assumes that Option 2, the Industry Proposal for Self-Regulation, would not incur high additional costs, as manufacturers themselves have undoubtedly considered the 2013 requirements in their current console design. For the 2017 requirements, an industry will have time to adapt to the changes needed thus minimising the detrimental impacts and downtime costs.

Option 3 (Mandatory Ecodesign requirements) may require changes to products. The IA study estimates that the impact could represent a significant proportion of manufacturing costs per unit, but that the required changes will add little to the final price, to consumers. This is explained further below.

Some of the game console manufacturers have claimed that the first tier requirements would necessitate significant product changes. To suitably assess costs, additional information is required from manufacturers regarding the power demand values for new generations of game consoles. The proposed second tier in 2017 may require slightly more efficient components. However, it is difficult to anticipate what changes would be needed in future game consoles as manufacturers have been unable to supply any additional data. No information regarding future details is available, due to the strong competition between the three global players. It is assumed that 60% of the market would require changes (based on the fact that the new Nintendo Wii U console is expected to already meet most of the 2017 proposed requirements).

To get a feeling for costs, the retail price for a console can be assumed to be approximately €360, as given in the preparatory study. Manufacturers have suggested that the costs of including separate efficient components to support the media playback functionality could be up to approximately 40 € per product unit. Assuming that the manufacturers can absorb part of the additional costs, the required changes should represent an increase of less than 10% in the final price to consumers, and this may reduce with time, in line with greater market penetration of these more efficient components into the game consoles sector. The higher energy efficiency ambitions of the mandatory Ecodesign requirements would become the “new norm” immediately after the adoption of the Regulation, which might even result in

lower price increases per product unit, owing to mutual competition between the manufacturers, and their respective suppliers.

On the other hand, consumers should save energy from more efficient components, at the same time as benefiting from greater functionality. In terms of electricity savings, the IA study estimates the typical electricity savings to an average consumer should amount to around 1.30 Euros per year, i.e. approximately 8 Euros over the product's typical six-year lifetime. When discussing costs it has to be further considered that the retail price may be a strategic price which is only a part of the calculations, as costs may be recuperated by the prices of the games for the specific consoles. The increase in manufacturing cost of around €40 roughly represents the price of one additional video game. Therefore it is impossible to estimate more precisely the impacts on the buyers and the affordability of consoles.

Option 4 (Mandatory Energy Labelling) would incur very minor additional costs to display the energy classes on a label, but would not incur extra costs in production. Manufacturers are able to set the pace of any efficiency improvements they wish to implement.

#### *Video players / recorders:*

With Option 3 being implemented in 2014, negligible additional supply chain costs are assumed, as the levels suggested for a regulation would not require substantive changes to mass market products, since there is little scope for improvement, as previously discussed. The main improvement options identified are: a) changing the architecture to make the hard disk drive external to the product, a trend that is already underway; and b) using energy-optimised chip sets for new generations of products. Changes of this kind will be minimal, and will be low/no cost. If regulatory requirements were also applied to high-end products, there is a risk that the costs would be disproportionate, and that the limits would constrain innovation and quality. Therefore, in the regulatory scenario assessed, it has been assumed that high-end products are exempt.

#### *Projectors:*

Option 3 could result in an increase in manufacturing costs, reflected in the consumer increase in product price to cover improved efficiency power supplies, and improved light efficiencies. At least 75% of the market would require such changes. However, no significant design changes would be necessary to achieve the requirements, so there is little associated cost for producers. The affordability is difficult to forecast, both with regard to how manufacturing costs could be passed through to consumers, and regarding the competition of more expensive projectors with screens.

Option 4 would not be expected to incur significant supply chain costs.

#### *5.1.2. Costs related to assessment of conformity/ compliance costs*

Option 2 for all product groups: Voluntary agreements would imply costs of certification, but industry would minimise the costs by adapting existing measurements or certification processes that are fit for purpose. Moreover, under a voluntary agreement industry would be expected to factor in changes to product design into the normal manufacturing cycle, so the need for re-assessment of conformity will be minimised.

Option 3 for all product groups: Assessing the conformity with Ecodesign requirements, including product testing, implies costs for manufacturers. Costs estimates developed for the impact assessment from Ecodesign requirements for televisions range from 500€ (self-certification) to 1000€ (external laboratory) per sample product/ model. The costs of assessing conformity for set-top boxes have been estimated to be between 500€ and 2000€. For the purpose of the requirements considered under this IA, a range between 500€ and 800€ for

conformity assessment of the power consumption can be considered realistic. In comparison with the sales figures, the costs would be in the area of one-hundredth of one Eurocent per unit, i.e., negligible.

Option 4 for all product groups: Concerning mandatory energy labelling, product testing would also have to be undertaken. Costs for attaching the energy label have been estimated to be of order of 0.1 € per product unit.

Further remarks on compliance costs:

There may be a need to reassess compliance with other applicable requirements ("Low Voltage Directive" and "EMC Directive"). Therefore, although the costs may increase, the energy consumption test could be undertaken in conjunction with other compliance requirements, to minimize costs.

It is not expected that the costs for game consoles and projectors would exceed the estimates produced for TVs and set-top boxes. Similarly, because consoles and projectors are produced in large batches to the same specifications, conformity assessment costs are not expected to represent a significant proportion of the total running costs.

However, for high-end Video Players/Recorders equipment manufactured in small volumes, costs may be more significant. This is why the test procedure provides for the testing at product family level – a manufacturer/integrator may choose to test at a higher aggregated level of products, provided that he reports the values of the highest-consuming model within that product family.

Administrative costs, defined as the cost of providing information in order to meet legal obligations, are expected to be negligible.

#### *5.1.3. Administrative costs for Member States*

A regulation is directly applicable in all Member States. This ensures that there are no costs for national administrations for transposition of the implementing legislation into national legislation. However, Member States carry the costs for carrying out the verification procedure for market surveillance purposes, including testing. The resulting costs are expected to be similar to those for other products covered by Ecodesign, i.e. for set-top boxes typical costs have been between €400 and €800 per product test. The costs for Member States under a mandatory energy labelling schemes are expected to be of a similar magnitude. For voluntary agreements, there will be no direct cost implications for Member States, but some indirect costs for monitoring.

#### *5.1.4. Impacts on trade and competitiveness*

The manufacturers of the products considered in this impact assessment are very much predominantly based outside of the EU. As the EU market is important (imported volume of products in the EU-27 in 2008: approximately 5.5 billion € of video game consoles and video games; approximately 1.3 billion € of projectors), it is not expected that a regulation will deter manufacturers from stopping imports into Europe.

Both ecodesign and energy labelling regulations will apply to all manufacturers equally, so in that sense there would be no expected impacts on their competitiveness. Furthermore, the regulatory options are not expected to lead to a relocation of economic activity, to impact investment decisions, or to have significant impacts on trade and thus on importers. However, it needs to be acknowledged that there may be a delay in the introduction of new products into the EU markets, so EU retailers may be affected by “time to market” delays. There is further a small potential that importers into the EU could be disadvantaged if ecodesign requirements were set with excessive stringency so as to require the development of different models of

games console for the EU market. Stringent requirements could further encourage “grey market” imports from other regions where no energy efficiency measures exist.

The main risk with a voluntary agreement relates to its successful uptake by industry. In other words, if 100% of industry subscribes to the agreement, the impacts on trade will be minimal. If, on the other hand, one manufacturer reneges, then impacts on trade and their competitive position may be more likely. However, the consultation undertaken for this impact assessment revealed 100% support for the agreement. Thus, impacts on trade are not expected to be significant.

#### *5.1.5. Impacts on innovation*

Overly stringent ecodesign requirements may incur excessive cost to manufacturers and could thus limit innovation. For high-end products, costs could be disproportionate and the limits would constrain innovation and quality. However, as the level of stringency and the timing of Option 3 are in general not overambitious, negative impacts on innovation can be excluded.

Requirements for games consoles are expected to have a positive impact on games console innovation as manufacturers will be required to consider energy efficiency of their products in more detail. The added research on energy efficiency could result in fewer resources being available for other research areas though.

For video players/recorders and projectors, innovation will affect these products in the sense that the product is being replaced by another product or a service – that of screens or on-line streaming.

#### *5.1.6. Costs for SMEs*

There are currently no game console manufacturers head quartered in the EU. There are a significant number of games developers and games publishers in the EU however. These game developers and game publishers could be impacted by the proposed power down requirements in that they will need to ensure that future games support auto-save. Impacts on these companies are expected to be small as the proposed requirements are only applicable to future games where programming can be more easily tailored to support auto-save.

High-end, high-quality video player / recorder products are made in Europe by a very small number of SMEs for niche markets. Manufacturing in Europe is below 5,000 units per year. Due to the small volumes, it is difficult for these SMEs to procure energy efficient chips (minimum order is 1 million pieces per lot), plus there are issues regarding the quality of energy efficient single chips for the high-end market. Assumed that strict ecodesign requirement without exemptions would be set, costs for these SMEs would rise.

For projectors, there should be no competitive advantage to, or negative impact on, any of these players as a result of the suggested requirements. Where SMEs are involved in projector manufacturing, their market niche is the higher specification. In terms of installation for specialist applications, SMEs would not be impacted by the shift from projectors to televisions, as they would simply shift to installing the new product instead.

## **5.2. Reporting and verification**

Under a regulatory approach, requirements would need to be met by all products meeting the definition of being “placed on the market”. Verification would be performed by market surveillance authorities on the basis of an established procedure. In the case of Option 2 (Industry Self-Regulation), the monitoring of a Voluntary Agreement will be performed by the Commission (for more details see section 8). As the draft voluntary agreement for game consoles contains only three signatories, the verification of the self-regulatory measure is considered manageable.

### **5.3. Social Impacts**

#### *5.3.1. Impacts on jobs*

For the regulatory policy options assessed, the risk of job losses is expected to be very low, because the staged approach and timings allow manufacturers to adapt to Ecodesign requirements in a timely manner, and - more importantly - because there are only a small number of SMEs involved in the manufacturing of products under consideration. Although price increases are not expected to be significant, there may be some impacts on small-scale retailers, as these retailers may be less able to bear the costs if manufacturers increase their prices. However, high-volume retailers may be more able to support the price increases, such that consumers will not be affected.

The main SME job impact would be in the area of high-end video players/ recorders. From data in the IA study, the manufacturing of such products in Europe is below 5,000 units per year. Whilst product prices are high, quality is also a very powerful driver in this market segment, and it may be a struggle to find a balance between energy efficiency requirements and performance. This could place such companies at a disadvantage, compared to the mass-market manufacturers. In addition, if Blu-ray requirements are overly stringent, there is a risk of loss of jobs in Europe, due to the closure of existing Blu-ray manufacturing (potentially 6,000 posts).

#### *5.3.2. Affordability of equipment*

In principle, significant price increases are not expected, in order to achieve the assessed policy options. Prices are not expected to change to such an extent that affordability could be negatively affected, especially in declining markets such as projectors and video players.

#### *5.3.3. Impact on the functionality of equipment*

The implementation of any of the options considered here would not have a negative impact on the functionality of the products addressed. This aspect was also the reason why no option has been proposed for game consoles which would regulate the game play mode, which could be disadvantageous for the gaming performance. As mentioned previously, the only products that could have difficulties in meeting regulatory requirements are high-end video players/ recorders used for professional applications.

### **5.4. Environmental Impacts**

#### *5.4.1. Annual energy consumption*

The electricity consumption for all product groups was analysed and estimated through a modelling exercise, with model development advised by technical experts within the product groups.

Following this modelling, the combined electricity consumption of all sound and imaging equipment is estimated to have been approximately 8.5 TWh in 2010, in the EU-27. By 2020 the electricity consumption for the three product groups is estimated to increase to 12.8 TWh.

Product groups individually are forecast as follows:

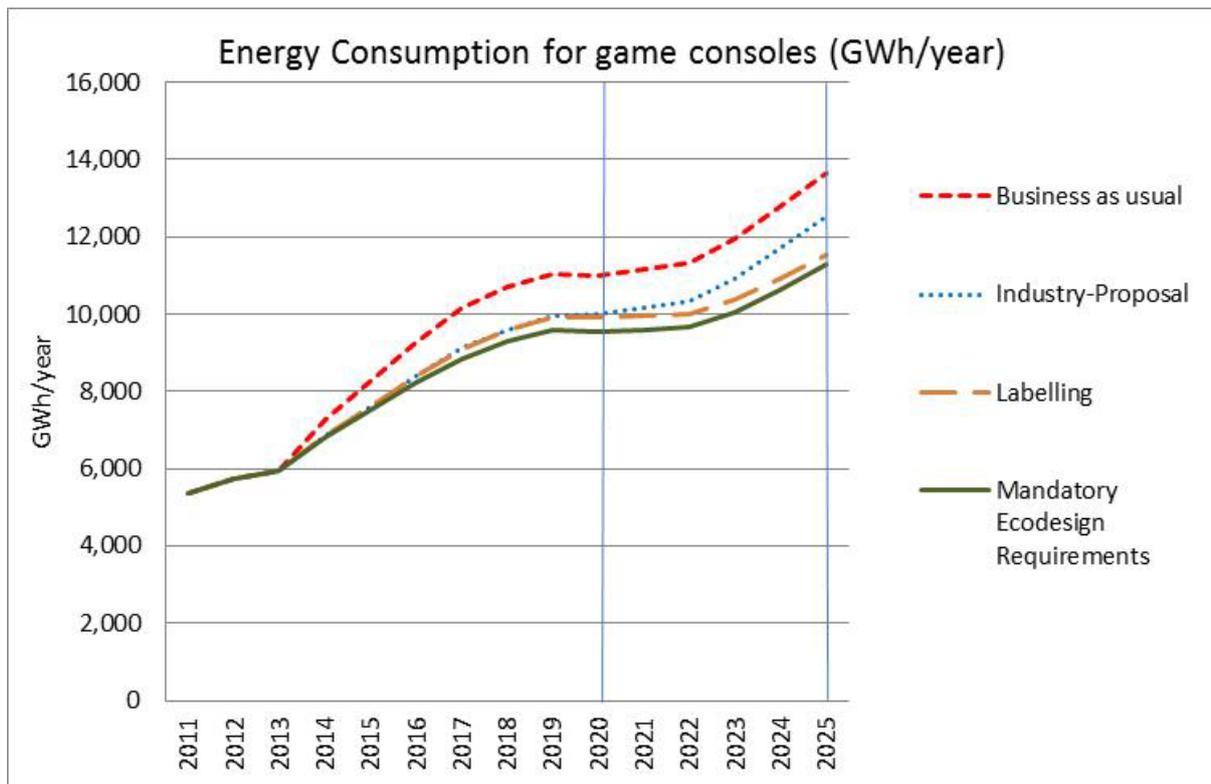


Figure 3: Evolution of Energy Consumption Game Consoles

The annual electricity consumption of game consoles is estimated to have been approximately 4.6 TWh in 2010 in the EU-27, and is estimated to increase to 11 TWh per year in 2020 (BaU). Figure 3 shows that the energy consumption increases uniformly for all options. None of the options achieves a significant change of the energy consumption, or a turnaround. The reason for this trend for all options is that the overall functionalities, processing power, and gaming performance, which is the purpose of these products, will increase strongly. This increase in overall energy consumption is despite the fact that relatively little additional power is needed to ensure strongly improved performance, and that the consoles become relatively much more efficient. Not even the most ambitious option can reverse this trend. By 2020, the saving potential of all intervention options is similar, with a very small advantage for the ecodesign option. By 2025, the two mandatory regulation options achieve 16%/ 18% energy savings, i.e., roughly double the savings of the industry proposal, which achieves energy savings of 8%.

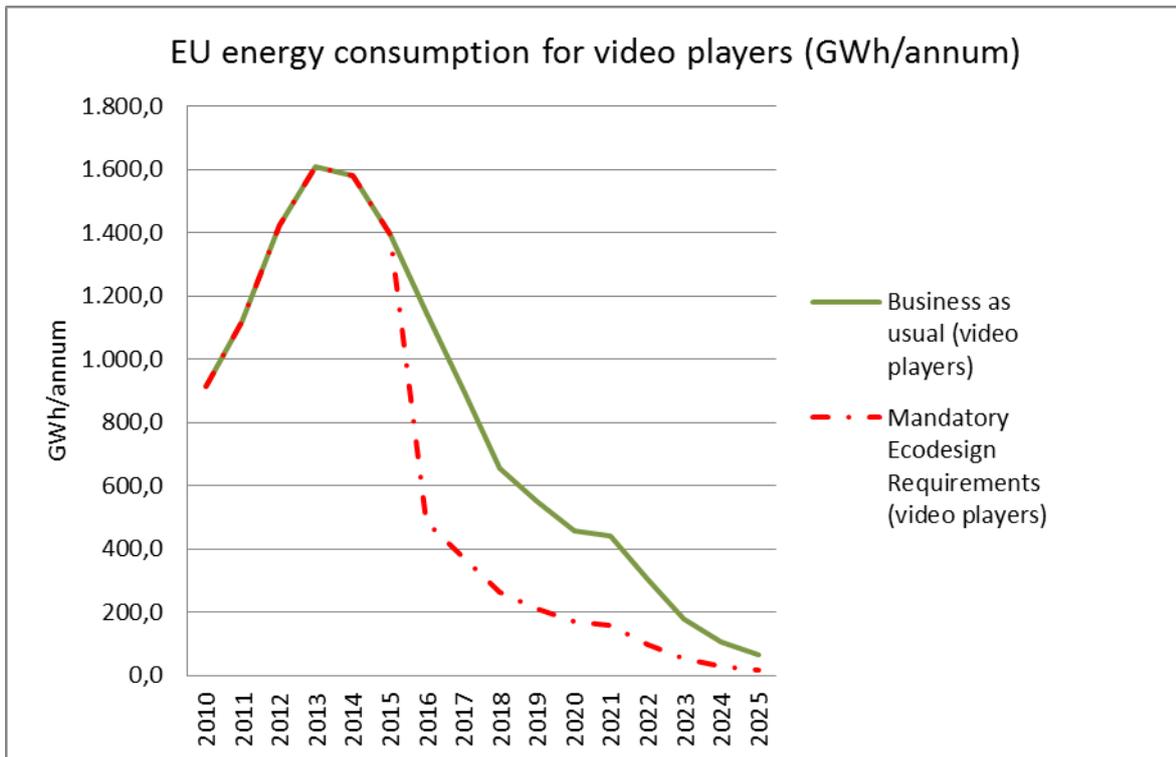


Figure 4a: Evolution of Energy Consumption Video Players

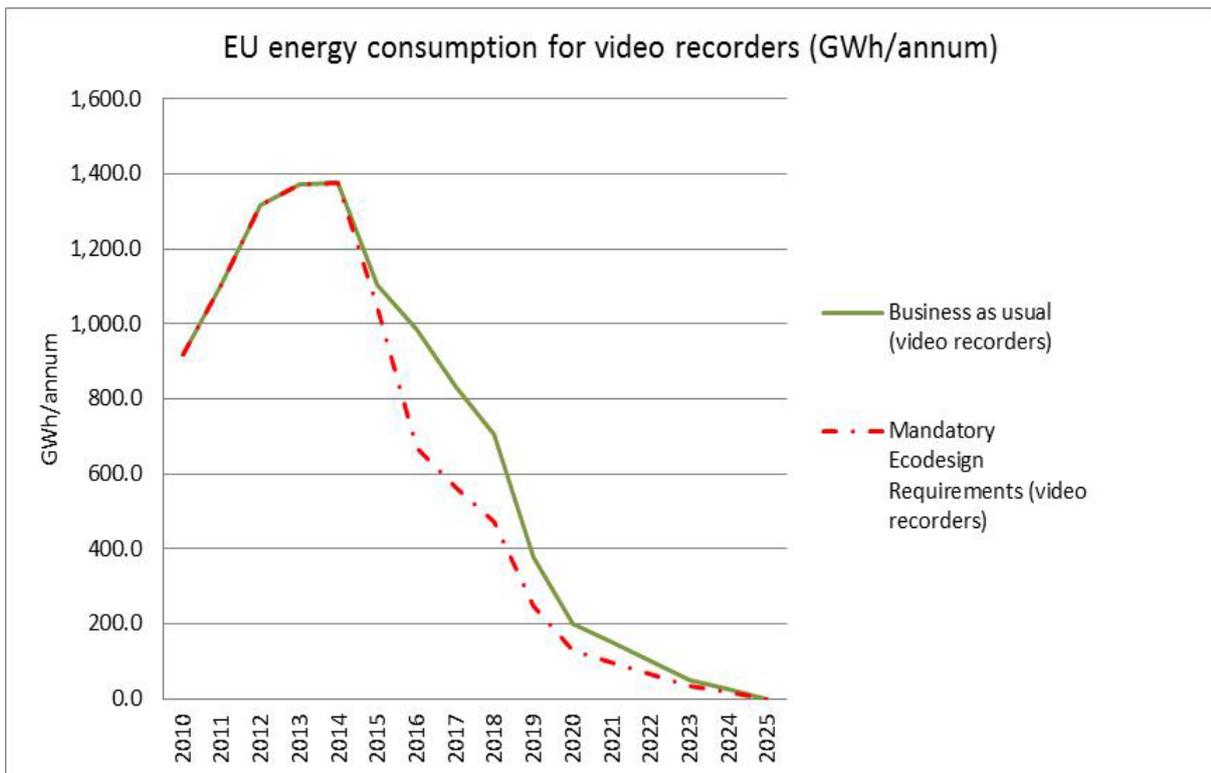


Figure 4b: Evolution of Energy Consumption Video recorders

The electricity consumption of video players and video recorders are displayed in figures 4a and 4b and table 5. The energy consumption in the “business as usual” option is forecast to drop steadily, and falls towards zero by 2025. A mandatory ecodesign Option 3 would add to the decrease in energy use, and would provide for a stronger decrease in 2015 and 2016, but would regress towards the BAU curve in the longer term. The total annual energy saving

estimated of around 0.25 TWh per year in 2020 is substantially lower than the 10 TWh per year estimated in the preparatory study, resulting from the revised assumptions regarding the development of the market. Sensitivity analysis has shown that if the decrease in sales is assumed to be slower, the saving to be achieved by the ecodesign requirements option would be below 0.5 TWh per year for video players in the next three to five years. The assumption of a continuous decline as such is considered robust, and has been confirmed during the consultation.

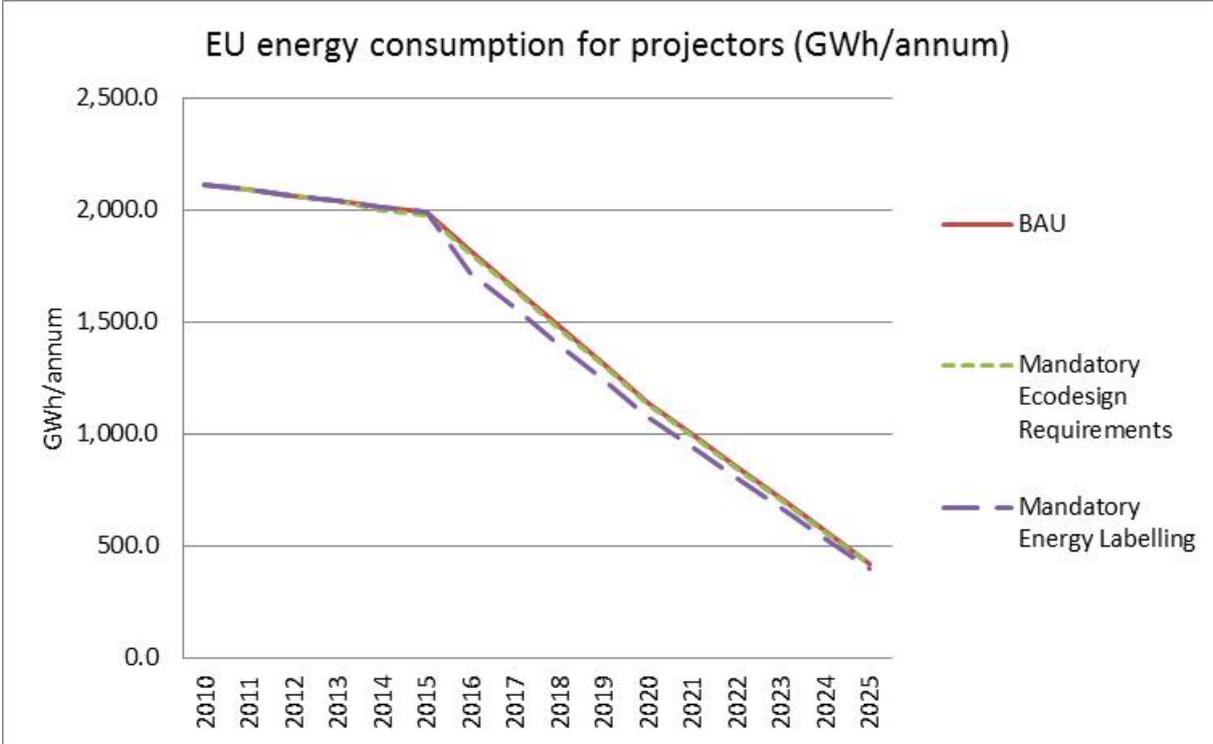


Figure 5: Evolution of Energy Consumption Projectors

According to modelling predictions, the electricity consumption of projectors decreases from 2.1 TWh per year in 2010 to around 1 TWh per year in 2020. Figure 5 shows that regulatory options would have no significant effects, and would not add to the constant decrease of electricity consumption of projectors. Sensitivity analysis has shown that if the decrease in sales is assumed to be slower, the saving to be achieved by the ecodesign requirements options would not deviate for projectors. The assumption of a continuous decline as such is considered robust, and has been confirmed during the consultation.

The table below demonstrates the potential electricity savings, as estimated from the modelling exercise, for the years 2020 and 2025.

The table below demonstrates the potential electricity savings, as estimated from the modelling exercise.

Table – Annual Electricity Savings vs. BaU:						
	2020			2025		
	Use	Savings	%	Use	Savings	
	GWh/a	GWh/a		GWh/a	GWh/a	%
<b>Game consoles</b>						
BAU	11,016			13,662		
Policy option 2 - Industry Proposal	9,997	1,020	9.3	12,540	1,122	8.2
Policy option 3 -	9,555	1,461	13.3	11,267	2,395	17.5

Mandatory Ecodesign Requirements (Regulation)						
Policy option 3 - Mandatory Labelling	9,902	1,115	10.1	11,538	2,124	15.5
<b>Video players / recorders</b>						
BAU	660			65		
Policy option 3 - Mandatory Eco design Requirements (Regulation)	298	360	54.5	15	50	76.9
<b>Projectors</b>						
BAU with network standby	1142			423		
Policy option 3 - Mandatory Eco design Requirements (Regulation)	1137	6	0.5	421	2	0.5
Policy option 4 - Mandatory energy labelling	1081	62	5.4	401	23	5.4

Table 10: Annual Electricity Savings 2020 and 2025

The above table demonstrates that the greatest potential for energy savings comes from the most ambitious options, i.e. ecodesign and labelling.

The ecodesign Option 3 for games consoles has the greatest saving potential, estimated to achieve 1.5 TWh savings per year by 2020 increasing to 2.4 TWh per year by 2025. The voluntary agreement Option 2 saves 1.0 TWh per year by 2020 and 1.1 TWh per year in 2025. The relatively greatest potential for energy savings (in % of the baseline) stems from video players/ recorders regulation, followed by the game consoles regulation. In proportionate terms there appears to be little benefit from moving towards regulation or labelling for projectors, as the margins are negligible.

It is important to consider that for game consoles, all policy options (including the baseline) involve increased energy consumption over time. The increase is due to an expected increase in the power demand and usage of new game consoles. This is in stark contrast to the other two products whose total energy consumption is expected to decrease over time. This is an important point to consider when assessing policy options.

#### 5.4.2. Annual CO<sub>2</sub> emission savings

Electricity production causes substantial environmental and human health damages and associated external costs, which vary widely depending on how and where the electricity is generated. The external costs are based upon different components, associated with the production of electricity: climate change damage costs associated with emissions of CO<sub>2</sub>, damage costs (such as impacts on health, crops etc.) associated with other air pollutants (NO<sub>x</sub>, SO<sub>2</sub>, PM, NH<sub>3</sub>), and other non-environmental social costs for non-fossil electricity-generating technologies. In this assessment, the most common indicator, CO<sub>2</sub>, is used. The table below demonstrates the potential CO<sub>2</sub> savings for 2020 and 2025, as estimated from the modelling exercise.

Table – Annual Carbon (Mt CO<sub>2</sub>) Savings vs. BaU:

	2020			2025		
	Use	Savings		Use	Savings	
	CO2 eq/a	CO2 eq/a	%	CO2 eq/a	CO2 eq/a	%
<b>Game consoles</b>						
BAU	4.406			5.465		
Policy option 2 -Industry Proposal	3.999	0.408	9.3	5.016	0.449	8.2
Policy option 3 -Mandatory Ecodesign Requirements (Regulation)	3.822	0.584	13.2	4.507	0.958	17.5
Policy option 3 -Mandatory Labelling	3.961	0.446	10.1	4.615	0.849	15.5
<b>Video players / recorders</b>						
BAU	0.264			0.0260		
Policy option 1 - Mandatory Eco design Requirements (Regulation)	0.119	0.145	54.9	0.006	0.020	76.9
<b>Projectors</b>						
BAU with network standby	0.457			0.169		
Policy option 1 - Mandatory Eco design Requirements (Regulation)	0.0.455	0.002	0.4	0.168	0.001	0.6
Policy option 2 - Mandatory energy labelling	0.0.432	0.025	5.5	0.160	0.009	5.3

Table 11: Annual CO2 Savings 2020 and 2025

Proportionally, potential carbon savings from policy intervention in these product groups are the same as the energy savings above, since the carbon savings are directly linked to energy savings.

#### 5.4.3. Accumulated electricity cost savings

The accumulated electricity cost savings, triggered by the policy measures assessed, depend on the timing of implementation for the products placed on the market from 2010 to 2025.

Electricity cost savings and carbon savings for all product groups were analysed and estimated through a modelling exercise, with model development advised by technical experts within the product groups. These models are based on best estimates and assumptions, and should therefore be assumed to be indicative of the potential savings that can be achieved through the various policy scenarios. Changing these assumptions may affect the overall

absolute impact of the options, but the relative ranking of the options is not expected to be significantly affected. Details about the modelling assumptions can be found in the IA study.

The table below gives an overview of the accumulated electricity savings, related avoided CO2 emissions, and cost savings over the period between 2010 and 2025:

<b>Accumulated:</b>	<b>Electricity consumption (GWh)</b>	<b>Electricity savings compared to BAU (GWh)</b>	<b>Avoided CO2 emissions<sup>14</sup> compared to BAU (Mt)</b>	<b>Price of Electricity savings<sup>15</sup> (Million Euro)</b>	<b>Price of Avoided CO2 emissions (Million Euro)<sup>16</sup></b>
<b>Game consoles</b>					
Policy option 1 - Business as usual (BAU)	150,280				
Policy option 2 – Industry Proposal	138,807	11,472	4.59	2,060	69
Policy option 3 – Regulation	132,641	17,638	7.06	3,170	106
Policy option 4 – Labelling	135,694	14,585	5.83	2,630	34
<b>Video recorders/players</b>					
Policy option 1 - Business as usual (BAU)	23,465				
Policy option 3 – Mandatory Ecodesign	19,314	4,151	1.66	750	25
<b>Projectors</b>					
Policy option 1 - Business as usual (BAU)	23,287				1
Policy option 3 – Mandatory Ecodesign	23,190	97	0.039	20	4
Policy option 4 – Mandatory labelling	22,684	603	0.214	110	

Table 12: Accumulated Electricity Savings

Consumers will experience the benefits of these energy savings through usage of more efficient game consoles in terms of medium- to long-term reduced energy costs. However, this will come at the short-term upfront expense of purchasing the more energy-efficient consoles. The magnitude of these savings will depend on individuals' console usage, and variation in energy prices, which are historically volatile.

For game consoles, the above table indicates that Options 2, 3, and 4 all have the potential to create electricity savings and carbon savings, compared to the baseline. The most ambitious scenario is the regulatory option, which creates the most savings.

For video recorders/ players, only the regulatory scenario (Option 3) has been modelled, relative to the baseline, and both electricity and carbon saving are also observed.

For projectors, Options 3 (regulation) and 4 (labelling) are modelled relative to the baseline. A regulation is not expected to achieve substantial savings relative to the baseline. The reasons for this limited impact are explained in section 4.3.3 and 4.3.4.

#### 5.4.4. Non Energy-in-use Impacts

The most significant environmental impact of video recorders, projectors and game consoles occur as a consequence of energy consumption in the use phase: the related energy generation emissions, their impact on air and water quality, and the resulting depletion of energy resources. These impacts have been assessed using the indicators ‘energy consumption’ and ‘CO2 emissions’.

There are a number of other environmental impacts associated with the constituent materials of the products, predominantly at end of life and during the production of materials, i.e. hazardous waste generation/ incineration, persistent organic pollutant emissions, heavy metal emissions to air, and particulate matter and dust emissions. These aspects were discussed in the preparatory study, but have not been modelled or analysed further within this impact assessment. The clearly observed miniaturisation and light-weighting trends for the products in the scope, coupled with the identified market trends, do not suggest focusing on material issues which become less and less significant.

## 6. COMPARISON OF THE POLICY OPTIONS

### 6.1. Summary of quantified impacts

The following table summarises the estimated electricity and carbon savings attributable to the preferred policy options compared to the business as usual scenario.

<b>Table – Annual Electricity and Carbon (Mt CO2) Savings vs. BaU:</b>				
	<b>2020</b>		<b>2025</b>	
	<b>Electricity Savings (GWh/a)</b>	<b>Carbon Savings (Mt CO2 eq/a)</b>	<b>Electricity Savings (GWh/a)</b>	<b>Carbon Savings (Mt CO2 eq/a)</b>
<b>Game consoles</b>				
Policy option 2 -Industry Proposal	1,020	0.408	1,122	0.449
Policy option 3 -Mandatory Ecodesign Requirements (Regulation)	1,461	0.584	2,395	0.958
Policy option 4 -Mandatory Energy Labelling	1,115	0.446	2,124	0.849
<b>Video players / recorders</b>				
Policy option 3 - Mandatory Eco design Requirements (Regulation)	360	0.145	50	0.020
<b>Projectors</b>				
Policy option 2 - Mandatory Eco design Requirements	6	0.002	2	0.001

(Regulation)				
Policy option 3 - Mandatory Energy Labelling	62	0.025	23	0.009

Table 13: Summary of quantified annual impacts 2020 and 2025

Table 13 shows that the saving potential of games consoles is much more significant than for the two other product groups. The different options will be discussed per product group.

## 6.2. Multi-criteria analysis

The following table summarizes the potential impacts of the options, and assesses them on a relative scale from 1 (low) to 3 (high), with 0 indicating negligible impact. Negative impacts (costs for industry, risk of job losses) score negative figures.

Comparison of impacts	Economic compatibility (costs for industry)	Environmental impact (electricity / CO2 / electricity cost savings)		Social compatibility (risk for job losses in SMEs)	Effectiveness to deliver objectives	Efficiency	Coherence
		Medium term '2020'	Long term '2025'				
<b>Game consoles</b>							
Policy option 1 - BAU	0	0	0	0	0	0	0
Policy option 2 – Industry Proposal	-1	2	1	0	1	2	1
Policy option 3 – Regulation	-3	2	2	0	2	0	0
Policy option 4 – Labelling	-1	2	2	0	1	1	0
<b>Video players / recorders</b>							
Policy option 1 - BAU	0	0	0	0	0	0	0
Policy option 3 – Regulation	-1	2	1	-1	1	0	0
<b>Projectors</b>							
Policy option 1 - BAU	0	0	0	0	0	0	0
Policy option 3 – Regulation	-1	0	0	0	0	0	0

Policy option 4 - labelling	0	1	1	0	0	0	0
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For games consoles, the medium term environmental impact of options 2, 3 and 4 is considered to be similar, as expected energy savings are in a similar range (1 TWh/a for option 1, 1,4 for option 2 and 1,1 for option 3). The cost for industry of option 2 is difficult to quantify, but it is assumed to be negligible as manufacturers have already factored-in the proposed requirements in their console designs. The cost for industry of option 4 is equally difficult to quantify. At a minimum it will consist of the cost of testing plus the cost of attaching the energy label, but it is considered not to be very significant.

Table 14: Multi-Criteria Analysis

The policy options have been compared in terms of economic, environmental and social impacts, and of effectiveness, efficiency and coherence. The above table indicates that some options may be preferred, according to the Multi-Criteria Analysis.

In terms of economic impacts, an ecodesign regulation for game consoles would imply the highest costs for manufacturers; other regulatory or self-regulatory options imply more moderate costs for manufacturers.

The environmental impacts have been assessed for the “long-term”, i.e., by 2025, but also for the “mid-term”, i.e., by 2020, as the delivery time is an important factor for assessing self-regulatory actions. The self-regulation option for game consoles comes into effect earlier, and thus already provides the same savings as the other options in the mid-term. However, it must be noted that the long-term regulatory interventions which kick in later would have more positive impacts.

Social impacts, via measures for this product group, are negligible. For high-end video recorders/ players, Ecodesign measures bear a small risk of putting related SME producers out of the market. Therefore this ecodesign option scores slightly negative.

In terms of effectiveness, all retained options for game consoles and video players/recorders score well. The reason for this good performance is that they would all remove the least efficient products from the market, thereby sensibly reducing energy consumption, and creating savings for users. However, Options 3 and 4 for consoles are superior to Option 2, as they would double all savings (energy, CO2 and to users).

With regard to efficiency, the self-regulation Option 2 for game consoles would be more efficient than Options 3 and 4. This is because the costs imposed on manufacturers and authorities would be lower. On the other hand, the less stringent voluntary approach would reduce energy savings more slowly, and it would benefit users less. The voluntary agreement, as yet not finalised, bears some risks that its effectiveness could be lower, i.e. if the monitoring and reporting scheme could not be agreed upon. However, this risk is considered low, and the overall efficiency of Option 2 can be deemed higher than either Options 3 or 4. The efficiency of all options is considered negligible for video players/ recorders and projectors, since these are products that are estimated to soon become extinct.

In terms of coherence with other EU policies, only the self-regulation Option 2 for game consoles scores positively. All other options have a neutral score. The reason for this is that all products will be covered by the horizontal standby regulation, which will achieve significant savings. Additional regulations present a risk for possible overlaps.

### 6.3. Comparison of game consoles options

This sub-section discusses in more detail the key question of this Impact Assessment, namely whether the current trends and saving potentials of consoles need to be backed up by a voluntary agreement, or whether there is a merit in introducing mandatory ecodesign or energy labelling measures.

As none of the options outlined previously achieves a turnaround in the energy consumption, all regarded options need to be assessed thoroughly, and even the “no-action” Option 1 remains of interest, and should be considered. The currently moderate energy consumption of around 6 TWh per year, and the identified low maximum improvement potential of less than 20% over 12 years, makes it questionable if consoles represent a significant potential for improvement in terms of their environmental impacts.

The regulatory option with ecodesign measures leads in the long term - by 2025 - to most savings, and provides therefore the highest environmental benefits, but has also the highest economic and social impacts. One risk with mandatory Ecodesign requirements is that they might not be proportionate. Overly stringent requirements may incur excessive costs on manufacturers, and thereby indirectly on consumers, and may limit innovation. Furthermore, game console manufacturers could choose to sell de-featured game consoles to the EU market if legal requirements are too stringent. This may encourage “grey market” imports of fully functional game consoles from other regions, where no energy efficiency measures exist. Finally, as the boundaries between products for gaming become more and more blurred, with many gaming facilities provided by mobile devices and computers, a relatively inflexible legal framework could shift gaming to devices outside the regulated scope.

The energy labelling option has similar effects to the ecodesign option, but will be slightly less effective concerning environmental impacts and savings. This policy option provides the manufacturers with some flexibility. Well-designed labelling classes are considered a strong incentive for manufacturers to improve their products, in order to obtain ratings in the best labelling classes. For consumers, a mandatory labelling scheme provides a clear structure, and increases consumer awareness of energy efficiency in game consoles over the longer term. For users of game consoles, obviously the most important issue is the gaming performance, plus all the different technical features and game play functionalities that the consoles offer. Therefore, for users, the influence of an energy label should not be overestimated. The effectiveness of how any mandatory energy label can contribute to stimulate improved energy efficiency would depend on the way that the label was finally developed and applied. One risk similar to the ecodesign option is that new products coming onto the market could escape from the labelling system, where these new products blur the boundaries between products.

The self-regulation option has the lowest economic and social impacts, but leads in the long term only to savings lying in the middle between “no-action” and the regulatory options. However, it has the advantage that it is already as effective as the regulatory options in the short- and medium-terms. The fact that technology developments and market changes for such electronic equipment are very rapid suggests that referring to the medium-term forecast rather than to the long-term forecast might be more reliable. Therefore the environmental benefits of the self-regulatory option by 2020 can be considered comparable. To visualise that in 2020 the saving potential and the environmental impacts are equal to the regulatory options, a vertical line has been included in figure 3 (chapter 5.4.1). The assessment confirms that the industry proposal fulfils in principle the condition of Recital 18 of the Ecodesign Directive, i.e., that self-regulation should be given priority, where such action is likely to deliver the policy objectives in a faster, or in a less costly manner. The fact that there are only

three manufacturers potentially facilitates monitoring, and decreases the risk of 'free-riding' by a significant part of the sector.

However, a self-regulatory option has also a number of risks. In the absence of any legal obligation, there is a risk that the self-imposed requirements will not be met, and that it will not result in any change(s) in the market. Possible intended loopholes in a voluntary agreement, such as specific media formats, unanticipated additional functionality or other features not listed etc., could be utilized fully. It would be more difficult to address other environmental aspects than is typically done via an ecodesign regulation. Further, manufacturers could choose to leave the agreement at any time. One manufacturer leaving or defaulting on the agreement would mean a failure rate of 1/3, with clear implications for the agreement's credibility.

## 7. CONCLUSIONS

### *Game consoles:*

This impact assessment finds that the self-regulation Option 2 provides the most advantages, has the best cost-benefit ratio, and provides the best energy efficiency improvements. In the multi-criteria analysis, Option 2 (self-regulation) has an equal medium-term score to Option 4 (energy labelling) over the long-term. Option 2 generates almost comparable savings to the alternative of mandatory ecodesign or energy labelling requirements, it provides flexibility, and it enables quicker updating of target levels, and has a lower administrative burden. The self-regulation option comprises a contribution of 1 TWh per year energy savings to the 20/20/20 target, with commensurate greenhouse gases reductions of 0.45 Mt CO<sub>2</sub> eq/ per year, and saves consumers annually up to 200 Million Euros, and has no significant impact on the competitiveness of industry or on employment. Considering Recital 18 of the Ecodesign Directive, namely that priority should be given actions that are likely to deliver the policy objectives faster and in a less costly manner, it is suggested to consider the industry proposal as the preferred option. Furthermore, a self-regulation option does not break new ground. The recently accepted two other Ecodesign Voluntary Agreements on Complex Set-Top Boxes and on Imaging Equipment support that ecodesign self-regulation is a viable way forward, and lessons can be learned from these.

However, to minimise the outlined risks, some mitigating measures should be considered:

- As a matter of course, the industry self-regulatory proposal has to be amended as soon as possible to become a Voluntary Agreement complying with all provisions similar to legal ecodesign requirements, i.e. Annex VIII of the Ecodesign Directive 2009/125/EC. Such amendments must update the industry proposal of August 2012, and must consider as far as possible information on the next generations of games consoles. Potential loopholes need to be closed.
- To back up the added value, the level of ambition of the proposed thresholds should be reviewed and adapted to technical progress. It must prove an energy savings potential equal or higher to that analysed in this impact assessment.
- Monitoring and reporting: The current industry proposal does not contain a well-designed monitoring system. As the nature of voluntary instruments inherently provides less ex-ante certainty than mandatory instruments, the monitoring and the testing system needs to go beyond minimum monitoring conditions, and must display information similar to an Energy Labelling approach (see also next bullet). It must consider all relevant power modes and allowances, and also be consistent with ENERGY STAR and other international agreements. Good monitoring examples

from other Voluntary Agreements should be considered. Potentially there is a role for the newly-formed CEN/CENELEC TC 100X Committee to be involved in the definition of new measurement standards, which could form the basis of an international agreement. Furthermore, it is suggested that the proposal, and especially the monitoring system, should be reviewed by the end of 2017. If the monitoring system is not sufficiently transparent, and if it does not ensure the display of information similar to an Energy Labelling approach, the Commission could consider applying mandatory energy labelling. This approach would combine the quick savings from the industry self-regulatory proposal with the long-term savings of the labelling approach.

Where the conditions for a self-regulation are not met, or where the level of ambition proposed by the signatories is not kept, or if the process is unjustifiably delayed, the second preferred option would be a mandatory energy labelling measure on game consoles, possibly also in combination with an ecodesign regulation, provided that both instruments would be fully complementary. A mandatory approach is likely to provide the greatest energy savings of all policy options. Updates of product and market information should be considered before proposals are made. As most of the technical preparations and consultations are carried out, the adoption of an energy-labelling or ecodesign measure should be feasible within a relatively short time frame.

#### *Video-Players and Recorders:*

The market analysis indicates clearly that this product group will die out over time. A mandatory ecodesign option would achieve additional savings in comparison to the “business as usual” option, which are significant when accumulated over the next decade, but at a potential cost to the economy. Moreover, a regulation would disproportionately affect SMEs manufacturing high end products. In conclusion, the preferred option for this product group is therefore Option 1, “No action”.

#### *Projectors:*

The situation for Projectors is similar to that of Video-Players and Recorders. Projectors are a product group that is predicted to become extinct. Electricity consumption of projectors is decreasing steadily. The analysis shows that there are little environmental benefits from any of the policy options, which gives little weight to the argument of pursuing anything other than the “BAU” scenario. The preferred option is Option 1, “No action”.

## **8. MONITORING AND EVALUATION**

It is important to consider the need for the monitoring and evaluation of any action, whether it is regulation (ecodesign or labelling) or following an industry proposal.

For any regulation, it is appropriate to review the scope, definitions and limits after a reasonable period of time, also taking into account the speed of technological development, and input from stakeholders and Member States. Compliance with the legal provisions will follow the usual process of the New Legislative Framework regulations. Compliance checks would mainly be implemented via market surveillance, carried out by Member State authorities, ensuring that the requirements are met. For the monitoring of the Voluntary Agreement, this situation is presently still undetermined, as discussed below.

Firstly, it is not yet clear if the industry proposal for a self-regulation initiative will lead to a Voluntary Agreement.

Secondly, the detailed procedure for monitoring and reporting for game consoles is not yet ready, and would need to be added subsequently to the Agreement. The development of a monitoring and testing system is included, with details as a condition for the self-regulation option to become the preferred option.

Thirdly, for a 'global' non-EU group of products, 'international' monitoring solutions should be considered. As included in the operational objectives, an (international) framework for gathering information regarding the energy efficiency of game consoles should be created if possible, including appropriate (international) test standards;

Finally, the Commission's general requirements on Voluntary Agreements, and especially on their monitoring, are still at a discussion stage (draft guidance under discussion). These requirements will be considered as far as applicable.

Therefore, it is not possible at this stage to include specific information about the monitoring system in this Impact Assessment. The operational objectives included in this Impact Assessment will serve as indicators for the monitoring. The following draft minimum requirements from the Commission can be outlined:

- a framework for gathering information about energy efficiency of consoles based on the representative operational modes for energy performance,
- agreed testing and measurement methods and appropriate test standards,
- a Steering Committee to continuously follow the progress and results of the agreement,
- independent inspection,
- data collection and transmission, and
- annual reporting.

A possible key performance indicator could be the average energy consumption of consoles placed on the market, i.e. by a specific energy consumption index based on the representative operational modes.

The first reporting period should start in July 2013.

The members of the Consultation Forum will be consulted on an annual basis to take stock and monitor the results of a Voluntary Agreement. Member States wishing to verify the reported information will be granted access on demand to the background data, and on that basis they will be able to perform checks/ tests on products.

The Commission, assisted by the Committee on the Ecodesign of Energy-related Products, will, in the light of the reports submitted and input from the Consultation Forum, consider whether the objectives of the Voluntary Agreement are being met. If the Commission considers that the Voluntary Agreement is failing to achieve its objectives, it will consider proposing a regulation instead.

## 9. ANNEXES

### 9.1. Annex I - Summary Public Consultation

A public Stakeholder Consultation exercise, inviting the views of stakeholders on the Sound and Imaging Equipment Impact Assessment went live on 5 October 2012 and lasted for four weeks. It was widely announced using all available stakeholder lists, i.e from the Ecomultimedia-project. The survey documents are available on the following webpage:

[http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index\\_en.htm](http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index_en.htm)

54 replies to the three questionnaires were received. Participation was well balanced with a slight majority from industry.

Summary:

*Game consoles:* Nearly three quarters of respondents stating there was no need for policy action in Europe. The preferred policy options, supported by the consultation, were the industry proposal, an international agreement, and mandatory ecodesign requirements (regulation). Industry respondents were, naturally, supportive of the industry proposed approach and levels, whereas NGO respondents suggested that regulation would deliver results more quickly and cost effectively.

*Video players/recorders:* There was general agreement in the consultation of a downward trend in the video recorder/player market overall. Over half of respondents preferred the policy route of no action, but to re-evaluate the market in 3 to 4 years. Just under half the respondents preferred a regulatory route was pursued. The exemption for high-end products was supported by the majority.

*Projectors:* There was general agreement in a downward trend in the sales market for projectors. Respondents' preferred policy route, by a slight margin, was mandatory ecodesign requirements (regulation). The next preferred route was the no action option. Labelling was not deemed appropriate.

Some more details:

For video recorders/players, approximately half of respondents were manufacturers of main market video recorders and players, and from other industry representatives. For projectors, approximately half of the respondents were projector manufacturers. For games consoles, over half the respondents were manufacturers and independent technical experts. Other respondents included environmental NGOs representing about 20% of responses.

Games consoles

The vast majority (over 75%) of respondents agreed that certain policy options could be dismissed. The need for policy action in Europe was questioned, with nearly 75% of respondents stating there was no need. The preferred policy options, supported by the consultation, were the industry proposal, as a second preference the International Agreement and thirdly the Mandatory Eco design Requirements (Regulation). Industry respondents were, naturally, supportive with the industry proposed approach and levels, whereas NGO respondents suggested that regulation would deliver results more quickly and cost effectively.

Video recorders/players

The vast majority (over 75% of respondents) agreed with the policy options assessed, and agreed with those policy options that were discarded from further analysis. Just over half of respondents preferred the policy route of no action (but to re-evaluate the market in 3 to 4

years). Just under half the respondents preferred a regulatory route was pursued. The exemption for high-end products was supported by the majority. There was general agreement in the consultation of a downward trend in the video recorder/player market overall.

### Projectors

Nearly all respondents agreed that the policies not developed further within the impact assessment were appropriate to dismiss. Overall, views on the need for policy action were mixed. The preferred policy route of respondents, by a slight margin, was mandatory Eco design requirements (regulation). The next preferred route was the no action option. Labelling was not deemed appropriate as a policy option. There was general agreement in a downward trend in the sales market for projectors.

## 9.2. Annex II - Minutes Consultation Forum

### Draft Minutes/Summary Record of the Meeting

**Subject:** Meeting of Consultation Forum under Article 18 of the Ecodesign Directive – Product Group Sound and Imaging Equipment

**Place and date:** Brussels, 9 November 2012

**Chair:** Kirsi Ekroth-Manssila

**Participants:** See separate list of participants

#### 1. Welcome and Introduction

**The chair** opened the meeting. The occasion to convene this meeting was the submission of an industry proposal for the important product group 'game consoles' (agenda item 3). She thanked the console manufacturers Microsoft, Nintendo and Sony (in the following: the manufacturers) for making this proposal available and for their willingness to explain it. She further explained that the Commission uses this opportunity to update the Forum on the state of play concerning the entire product group 'sound and imaging equipment video player and recorder, projectors, and game consoles (agenda item 2). She referred to written comments received in advance of the meeting from the Netherlands/Hans-Paul Siderius and from Sweden, and distributed as paper copies. The agenda was adopted.

#### 2. Presentation and Discussion of the state of play of Sound and Imaging Equipment, focus on Video Players/Recorders and Projectors

**The Commission** gave a short introduction into the ecodesign priority principle for self-regulation and its impact assessment procedures, followed by an introductory presentation of the state of play of the product group in general. The Commission's consultant presented the preliminary findings of the Impact Assessment study with an emphasis on the recently closed public consultation. The consultation documents contain policy options for the three product groups, and the consultation extends to the assessment of the options put down there. The presentations and consultation documents are available on CIRCA.

**The manufacturers** asked about the number of respondents of the consultation. They remarked that they had provided information and a model that should be reflected in the study, and asked to clarify the energy savings. **ECOS** found the preliminary findings assuming a strong decrease of some products and their disappearance by 2025 quite radical. **ECOS** assumed for example for video players only a 1% decrease per year but no steep decline, and asked to assess this aspect more carefully. **The Commission** responded to review these aspects. **ECOS** underlined that these products would clearly be candidates for ecodesign requirements, and expressed their preference for a regulation. Furthermore, **ECOS** asked if a decision has already been taken, or if another meeting would be convened before a decision. **The Chair** answered that this meeting is the moment to consult stakeholders before any decision will be taken, and that there are currently no plans for an additional meeting.

**DigitalEurope** regretted but confirmed the clear decline in the market for video recorders and players. One reason for players is the increasing availability of online streaming, and for recorders that TVs sold today often have an USB drive connection. **High End Society** confirmed the clear decline for physical discs superseded by online streaming. **DigitalEurope** confirmed the same developments in the projectors market, specifically in Europe. Projectors including for example those in classrooms are being replaced by large screens, and the decline

will continue. **ECOS** referred to the current economic crisis and remarked that it is hard to say whether this is the real reason for market decline.

**Sweden** suggested considering projectors in the ecodesign regulation for TVs to decrease administrative burden.

**The Commission** noted a very predominant agreement on the preliminary findings, and invited the Forum to provide further information particularly on market developments to be considered in the impact assessment. The Commission clarified that the criteria to propose ecodesign measures are not market developments, but environmental impacts. If there are clear indications of a decreasing market for video players/recorders and projectors, likewise their impacts will go down. This must be taken into account in the impact assessment, and for the decision making if ecodesign measures would make sense.

**The chair** concluded this agenda item and invited participants to send written comments by the end of November.

### **3. Presentations and Discussion Game Consoles**

**The Commission** gave an introductory presentation about that state of play of game consoles, and introduced the Draft Outline Proposal received from the game consoles manufacturers. The proposal and other policy options like mandatory ecodesign or energy labelling have been issued via and subject to the public consultation. The Commission explained that it is an explicit task of the Forum to contribute to assessing voluntary agreements and other self-regulation measures. So far the industry proposal is not considered as a 'Voluntary Agreement' ready for immediate recognition, but sufficient to commence the evaluation of the admissibility of this initiative as an alternative to an implementing measure.

**The manufacturers** subsequently presented the proposal in detail. The proposal and the slides are available on CIRCA. **The Chair** opened the floor for discussion.

**ECOS** commented on procedural and technical aspects. Questions were raised how the proposal will be implemented, how its targets will be reviewed and updated, how stakeholders will be involved and how transparency will be ensured, how monitoring and reporting will be done, what sanctions will be imposed in case of non-compliance, and if arrangements are made if new products enter the market. Furthermore, ECOS stated that improvements on the levels and requirements of applications would be possible, i.e. that the proposed thresholds for navigation and media play could be lower, that requirements on auto power down and power supply are missing, and very importantly that non-energy requirements on recyclability, recoverability etc. are fully lacking.

**Sweden** welcomed the initiative from industry, the proposed definitions, and remarked that an intensive use should be assumed. Sweden compared the electricity consumption with large TVs which had been reduced to for example 43W, and found 90W proposed by industry too high, and suggested to introduce a dynamic approach with progressive limits as included in the Dutch proposal. Furthermore, Sweden raised questions about the format of the agreement, how requirements would be fulfilled, and how sanctions would be imposed. If these concerns cannot be allayed, Sweden suggest to introduce regulatory and progressive approach, and to start also considering recyclability issues.

**The UK** echoed Sweden and welcomed the draft proposal, but asked for a more ambitious proposal, and urged manufacturers to go beyond BAU. The UK remarked further that tier 1

would be too short and tier 2 too long, and identified a lack of details about future monitoring. The UK further suggested to reflect about software issues and to involve games developers.

**ISFE – the Interactive Software Federation of Europe** responded to this issue and remarked that software developments are completely separated issues. Interactive software is published on a multitude of different hardware and virtual platforms and not just on consoles. It usually allows for online play between players from around the world. Focusing only on software produced for consoles would heavily distort these markets. ISFE highlighted the importance of global standards, and cautioned against EU standards only which would have a negative impact on the user experience and, consequently, on their revenue streams.

**Denmark** welcomed the proposal as an important first step and noted three challenges. Firstly, the relatively high energy consumption, secondly, that many units are not being switched off by users and that auto power down is missing, and thirdly, that game consoles are also used for other purposes (for screening, DVDs etc.). Denmark suggested to refine the proposal and to set lower requirements already several years in advance.

**France** found the proposal not ambitious enough and asked whether the voluntary agreement would meet all requirements of annex VIII.

Representatives of **the manufacturers** replied to the remarks. They explained that game consoles cannot be compared with TVs or with computers, or with media players, which work differently. Game consoles would be already relatively energy efficient and, its energy consumption within one generation always decreases significantly compared to the launch phase. The chip technology can reduce the consumption, but not of the whole console system, and therefore of not more than 35%. System components use less power together than if used separately. The manufacturers underlined their commitment to save energy, but that even with scaling architecture the system does not allow for more savings, and that its consumption cannot be as low as for a particular media player. Survey information would suggest that around 95% of the users switch their products off.

The manufacturers expressed concerns that they could not afford further development costs. To cut energy consumption in half, a completely different system and different operation management would be necessary. The costs for such a product would be extremely higher leading to unrealistic long payback periods for consumers. Manufacturers stated that their products can barely meet the 90W power cap, that the proposal is pretty ambitious, and that they don't know how to get to more ambitious levels. Manufacturers further referred to the international dimension and their engagement for an agreement with Australia under the IEA mechanism. Manufacturers also expressed their commitment to update and refine its proposal, to consider the reasonable alternatives suggested by the Netherlands, and to add missing elements i.e. on a review process, on noncompliance, or monitoring.

In a second round of discussion, introduced by an additional presentation of the manufacturers, **ECOS** challenged the information provided by the manufacturers, remarked that unfortunately only very little information is available how future generations of consoles will look like, and that it is not possible to check the information. ECOS also called for a fair and comprehensive comparison with gaming PCs. ECOS, astonished about information provided by the manufacturers that the power use of one console model can decrease significantly revision by revision, suggested to launch a console directly at a revision 3 or 4 level, and called for ambitious targets of energy efficiency to be achieved already very early

on in the product phase. ECOS assumed that it would not be difficult and with limited additional costs for all manufacturers to improve the energy consumption of consoles.

**Germany** asked about consumer information and stated that it is important to have energy consumption provided on the product, and called for a better reporting and monitoring.

**Denmark** noted that it is difficult to discuss future figures, but asked to better address the performance of the products. Denmark suggested developing the requirements aiming at least life cycle costs.

**The chair**, referring to information that the one console consumes only 40W, whereas the other high definition consoles consume 70-90W, challenged the proposed thresholds and asked whether there is perhaps room for technological improvements.

**The manufacturers** reacted to the comments. They explained that the primary function of consoles will remain gaming, and that the increased gaming performance can result in higher power consumption. With more power for gaming, 70-90W would be needed for functions with lower power use like media and navigation modes. The proposal is targeted on a more efficient architecture a new console must use, which will ensure energy savings in all modes. Manufacturers explained that they provided as much data as they can and that the proposal is more ambitious than business as usual, but that they are unable to say more about future levels for competition reasons.

Referring to the lower consumption of one console, manufacturers explained that a different chip architecture accounts for their consumption. Other consoles would not be able to meet the 40W, and if such a requirement would be set, architecture of their consoles would have to change completely. Manufacturers stated lower thresholds would be infeasible. They would not be able to recuperate the costs for developing such products, and they expressed that there is a risk that a whole gaming department would have to shut down. Manufacturers added that their proposal already considers the next Wii generation which could also require the proposed thresholds. Furthermore, a regulation in this regard would restrict innovation.

Regarding other environmental issues beyond energy, the manufacturers explained that they use limited components. They would buy their components from a global market, and environmental aspects should be regulated rather at industry wide level than for a product group. Concerning recyclability, plastic parts etc. manufacturers expressed preference for a more horizontal approach like in the WEEE and RoHS Directives.

#### **4. Conclusion – next steps**

**The chair** thanked the manufacturers for their contributions and asked whether they are willing to include more details into the proposal and to amend it. **The manufacturers** expressed their commitment to meet the ecodesign self-regulation criteria, and added that they are aiming for a global agreement, not just for Europe. **The chair** acknowledged that for this product group consistent global standards could be more advantageous than European standards, and supported the work towards a global agreement. **ECOS** remarked that an international agreement would not be a constraint not to meet the ecodesign criteria for a voluntary agreement. **The chair** made clear that a self-regulatory initiative, which has under certain conditions a clear priority, must comply with the criteria of Annex VIII. The Commission will assess the proposal on this basis, and the parties of the Consultation Forum shall contribute to assessing it.

Before concluding the meeting, **the chair** thanked the participants for their important input, and invited the Forum to comment on the industry proposal and specifically to reply to the following questions: Does the parties support this self-regulatory initiative, can the proposal be considered as voluntary agreement, and which amendments would be required? The chair, recalling agenda item 2, encouraged participants to send comments also on Video Players/Recorders and Projectors. The deadline for written comments is **30 November 2012** to the functional mailbox [ENTR-ECODESIGN@ec.europa.eu](mailto:ENTR-ECODESIGN@ec.europa.eu).

**The Commission** asked to keep the deadline for all comments related to the impact assessment process to allow the Commission to make swift progress with its impact assessment before the end of this year; important comments on the self-regulatory initiative will also be considered after. **The chair** closed the meeting.

Discussion Document of 4 October 2012

### **WORKING DOCUMENT FOR THE ECODESIGN CONSULTATION FORUM ON SOUND AND IMAGING EQUIPMENT (ENTR LOT 3), 9 NOVEMBER 2012**

This Working Document is not a Draft Ecodesign Regulation for the product group "Sound and Imaging Equipment" (video players and recorders, projectors, game consoles). Rather, it is a discussion note: (1) explaining the state of play; and (2) introducing voluntary courses of action for games console by the industry sector.

#### 1. STATE OF PLAY

Background: The Ecodesign Directive 2009/125/EC establishes the framework for the setting of ecodesign requirements for energy-related products. The first Working Plan of the Ecodesign Directive adopted on 21 October 2008 lists the product groups which have been considered as a priority for implementing measures in 2009-2011. This list includes 'sound and imaging equipment'. A preparatory study for this product group was launched in January 2009. The final report of the study was published in December 2010, on the dedicated Project Webpage: <http://www.ecomultimedia.org/>. The study concluded that sound and imaging equipment meets the criteria of Article 15 of the Ecodesign directive, i.e., that the product group presents a significant volume of sales on the market, has a significant environmental impact and energy consumption, and presents a significant potential for improvements. The preparatory study identified at that time an estimated energy saving potential of around 15 TWh/year in 2020.

Since the finalisation of the preparatory study, the Commission has followed the developments in the market for consumer electronics in general. The experience with other products like televisions has shown that both the technological development and market developments and consumer behaviour have been quite different from what was expected in preparatory studies. Technological developments are occurring often at such a fast pace that many products from the leading producers would have met the projected energy efficiency levels even in the absence of Ecodesign requirements.

Recently, the Commission has launched an Impact Assessment Study to support the preparation of its Impact Assessment, which is mandatory for all Commission proposals. One task of this study is also to reassess and update the forecasts of the preparatory study. The work is on-going, and includes a public stakeholder consultation. The first preliminary results of the Impact Assessment Study give the following picture:

Video Players and Recorders: A re-assessment of the analysis of the preparatory study completed in 2010, which estimated a highest saving potential of up to 10.6 TWh/year in 2020, has concluded that the market for video players and recorders is in more rapid decline than previously thought. There is a shift from disc-based systems to internet-connected and other systems, from hard disk drive to USB-powered solutions, and also a shift toward media streaming, removing the need for a hard disk altogether. Already in the mid-term by 2025, it is forecast that there will be no new sales of video recorder/player products, except for small volumes of niche, high-end products.

Projectors: The market for projectors with a saving potential of 0.6 TWh/year is also in more rapid decline than was previously thought. Indications are that projectors in many applications will continue to be replaced by widescreen televisions, which can now be as bright as projectors. It is considered likely that sales of projectors will continue to decrease until there are no new sales of projector products other than those required for large auditoriums and e-cinemas by 2025. The improvement potential for the main component, i.e., the lamp, is furthermore limited. Ultra high-pressure (UHP) discharge lamps have little scope for cost-effective step changes in efficiency levels, and the efficiency developments for solid state lamp (SSL) systems using light-emitting diodes (LED) are slower than predicted.

Video game consoles: The energy saving potential was estimated in the preparatory study as up to 3.7 TWh/year. Although recently a decrease in sales of the current generation of game consoles has been observed, it has been concluded from present data that the market for game consoles is continuing to grow, with more products held in stock, with increasing functionalities, such as motion-detecting peripheral devices, expanding the potential audience for game consoles. Game consoles were identified as one of the largest category of energy use in households (besides the TV) in the home entertainment area. Sales of the next generation of consoles, anticipated to be on the market in around 2014, are expected to exhibit similar sales patterns and volumes as witnessed for the current generation of high definition game consoles.

The Impact Assessment Study will refine the preliminary findings, and will include a public stakeholder consultation, starting in October 2012. The questionnaire will be available on CIRCA, and the DG ENTR website link to the online questionnaire will be: [http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index\\_en.htm](http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/sound-imaging/index_en.htm). The study will run until the end of 2012, and will support the Commission's subsequent Impact Assessment.

Subject to the result of this Impact Assessment, and further opinion exchange, the preliminary results suggest to pursue ecodesign parameters for game consoles only.

***Members of the Consultation Forum are invited to comment on the state of play for this product group. They are also invited to contribute to the Impact Assessment study.***

## 2. INTRODUCTION INDUSTRY PROPOSAL

Background: The Ecodesign Directive gives priority to alternative courses of action, such as self-regulation, by the industry sector(s) concerned (recital 18). As a basic condition, such action needs a high level of environmental ambition, and needs to demonstrate that it is likely to deliver the policy objectives faster, or in a less costly manner, than mandatory requirements. Proposals for voluntary agreements (self-regulation) are recognised as a valid alternative to regulation if their assessment against the criteria of Annex VIII is deemed satisfactory (Article 17), taking into account the feedback from the Consultation Forum.

The product group 'game consoles' is unusual, in that none of the manufacturers is based in Europe, and that only three manufacturers represent this entire product sector. Therefore, the approach described in this paper is also unique. The manufacturers of game consoles presented a draft proposal for a voluntary course of action in August 2012, and they confirmed that it could be circulated publicly forthwith, and could form part of the official consultation process. In a nutshell, the industry proposal is detailed, and contains defined energy performance requirements, including test procedures, measurements and verification test methods. The proposed main requirements are two tiers of power caps for two operational modes, (a) the media playback and (b) the navigation mode. The proposed thresholds for both modes are 90W for 2013 and 70W for 2017. The proposal is enclosed with this note.

***In accordance with Article 18 of the Ecodesign Directive, it is a task of the Consultation Forum to assess voluntary agreements and other self-regulation measures. Members of the Consultation Forum are therefore invited to assess the 'Draft Outline proposal to further improve the energy consumption of Game consoles'.***

The Commission would like to make some additional remarks to be taken into account when assessing the initiative:

General and procedural:

- (1) The Commission had several meetings with the three manufacturers in the industry sector concerned, namely Nintendo, Microsoft, and Sony. The industry sector believes that an implementing ecodesign measure is not justified, and considers a voluntary self-commitment to be the best way to achieve energy savings for game consoles. The latest version of the industry proposal is silent on its purpose as to whether or not it comprises a self-regulation, within the meaning of Article 17 and Annex VIII of the Ecodesign Directive.
- (2) At this stage, the industry proposal, with the heading "draft outline proposal", is not considered by the Commission as a 'Voluntary Agreement' ready for immediate recognition. However, the Commission considers it as a draft sufficient to commence the evaluation of the admissibility of this initiative as an alternative to an implementing measure, and has decided to submit it to the Consultation Forum.
- (3) All self-regulations must be assessed at least on the basis of the criteria in Annex VIII to the Directive. The parties of the Consultation Forum need to contribute to this assessment using these criteria as their reference.
- (4) One contested question is if this product group really meets all the criteria specified in Article 15 of the Ecodesign Directive, notably whether or not game consoles have a significant environmental impact, and improvement potential. Where a product

meets the criteria, it must be covered either by legislation or via self-regulation to the same extent, which therefore excludes a 'no action' option.

- (5) The Commission will consider the industry proposal as an option in the already-commenced Impact Assessment process, and has asked the external consultants to take it into account in the Impact Assessment study. The industry proposal is also included in the public stakeholder consultation.

Technical:

- (1) The manufacturers disagreed with some findings of the preparatory study. The manufacturers provided data comprising a corrected analysis, and their own assumptions, including their estimation of an energy savings potential of some 30% less, at about 2.6 TWh/year (see also the Annex to the proposal: "Energy Savings").
- (2) The manufacturers argue that the energy efficiency of the main operating status of a console, i.e., the operational game play mode cannot be regulated, due to the particular console architecture. The manufacturers also argue that approaches suitable for computers, such as 'TEC' (Total Energy Consumption) allowances are also not applicable, and that energy consumption restrictions of the game play mode would compromise the important high and progressive user performance. Instead, the manufacturers propose to regulate other modes than the game play mode, considering that game consoles are a multi-function media device.
- (3) The level of ambition of the proposed self-commitment has to be assessed. The main questions for this assessment are: (i) whether the overall energy performance of the product can be represented by the proposed operational modes; (ii) if the proposed power caps and its timing are adequate; and (iii) whether other significant environmental aspects need to be considered.

International:

- (1) No specific regulations on the performance of game consoles in other countries or regions are known. The United States is discussing a draft test method and performance requirements for EnergyStar, and in Australia a possible voluntary agreement is being considered, with the same industry representatives. All discussions came down in 2012 to the same approach with requirements on the two operational modes media playback/streaming and the navigation mode, as proposed to the Commission. However, discussions regarding the power cap levels for these two modes are on-going.
- (2) As none of the manufacturers are based in Europe, new ways could also be pioneered to trigger action during the design phase. For example, mechanisms with improved transparency could be specified, which would allow the monitoring of continuous improvements of products, i.e. by making publicly available the power consumption of all models in the relevant modes.
- (3) The potential for an international agreement on game console energy efficiency is being explored, possibly brokered by the Australian Department of Climate Change and Energy Efficiency (DCCEE) under the International Energy Agency banner within the 4E - Efficient Electrical End-Use Equipment Implementing Agreement. An international agreement could involve as a minimum, for example, the European Commission, the Australian DCEEE and the Californian Energy Commission, which are currently involved in the discussion.

### Summary of written comments received after the meeting:

The Commission has received comments from five Member States (DE, FR, NL, DE, UK) and a joint comment from Environmental NGOs (ECOS, EEB, Friends of the Earth Europe, WWF EPO, CAN Europe and INFORSE Europe).

The written comments correspond to the oral comments at the meeting. In summary, the Forum welcomed the initiative by consoles manufacturers, but its opinion was rather reserved whether it would be worthwhile to endorse the proposal as voluntary agreement under the Ecodesign Directive. The Members of the Forum predominantly found that the proposed level of ambition should be raised, and remarked that the initiative does not yet comply with some of the criteria of Annex VIII of the Directive, like monitoring and reporting. Concerning video recorders/players and projectors, the Forum predominately supported 'no action', provided that updated market data would support it.

### **9.3. Annex III – Product scope description**

Game consoles: A game console is a mains powered stand-alone device which is marketed as a product providing video game playing as its primary function through an external screen. It includes the current generation consoles – Xbox360, PS2&3, Wii, and the next generation of game consoles. Nintendo has released a new game console, the Wii U, to the EU market in late 2012 whilst Sony and Microsoft are not expected to release new consoles until late 2013 or early 2014. There has been a continued growth in the usage of game consoles for functionalities other than gaming, such as video streaming. In addition the availability of motion-detecting peripheral devices (Kinect, Move etc.) is likely to have been responsible for expanding the potential audience for game consoles. Remark: The large variation in power demand during active use amongst the current game consoles on the market is primarily due to the amount of processing power provided by each product. Power demand is closely correlated to computing performance of the GPU and CPU due to factors such as increasing transistor numbers and frequency of operation. Higher power demanding game consoles (PlayStation and X-Box) offer significantly more processing capability and therefore require more power to deliver the higher level of gaming functionality.

Video players / recorders: including DVD players / recorders, Blu-ray (BD) players / recorders and hard disc drive (HDD) based devices. A video player/recorder is a standalone device whose primary function is to decode videos to an output audio/video signal. It is mains powered, has no tuner, and does not have a display for viewing video. In the future, the shift from disc-based systems to internet-connected systems will mean that a significant proportion of mains-powered devices are being replaced by battery-powered mobile devices. In addition, HDD-based systems are shifting from internal to external HDDs that could for example be USB powered, which are out of the scope of this impact analysis.

Projectors: including school projectors, office projectors and home cinema projectors. A projector is a mains powered, optical device, for processing analogue or digital video image information, in any, broadcasting, storage or networking format to modulate a light source and project the resulting image onto an external screen. For projectors, more recent research has suggested that a large share of projector sales is now being replaced by sales of more affordable and equally bright LED backlit TVs – addressed via the Ecodesign TV Regulation (EC) No 642/2009. In addition, it is important to note that the highest efficiency lamps (mercury vapour UHP) are being completely phased out, under pressure from eco-labelling schemes due to their mercury content – this provides less opportunity for efficiency improvements in the medium term.

#### 9.4. Annex IV - Market Situation for Sound and Imaging Group

Almost all mass-market video players/recorders (DVD/Blu-Ray), projectors and game consoles are assembled in China. Integrated circuits and other components are produced mainly in South East Asia. Most components are manufactured in the following locations:

	Video player / recorders	Projectors	Game consoles
Component manufacture location	<ul style="list-style-type: none"> <li>• Myanmar and China (Lenses)</li> <li>• China and Korea (trays)</li> <li>• China and USA (chips)</li> </ul>	<ul style="list-style-type: none"> <li>• China</li> </ul>	<ul style="list-style-type: none"> <li>• Canada, China, Singapore, South Korea, Taiwan, Thailand, USA (Microsoft Xbox 360)</li> <li>• Canada, China, Japan, Singapore, South Korea, Taiwan (Sony PlayStation 3)</li> <li>• Canada, China, Singapore, Taiwan (Nintendo Wii)</li> </ul>

*Game Consoles:* The share of the EU market is as follows:

Manufacturer	2012 sales	2012 stock
Sony	40%	45%
Microsoft	33%	22%
Nintendo	27%	33%

Almost all mass-market *video players/recorders* (DVD/Blu-Ray), projectors and game consoles are assembled in China. Video recorder manufacture is declining. There is a shift toward separation of the hard/optical drive from the product – as has been observed in new generations of products released recently (which would no longer be classified as video recorders as a result).

In addition to the information provided in chapter 2.7 baseline scenario and in chapter 4.2.1 baseline option, the market situation for video recorders can be described as follows:

- It is highly likely that the downward trend in sales will continue. By 2025 there will be no new sales of optical disc based video recorder player products (except for small volumes of niche high end products / modules for repair purposes).
- A continued shift from disc based systems to internet connected TVs and other systems, resulting in a significant proportion of mains powered devices being replaced by battery powered mobile devices.
- Hard disk drive (HDD) based systems continue to shift from internal to external HDDs that could, for example, be USB powered, and toward streaming clients, removing the need for a hard disk altogether.
- The developments towards technology improvements for a product that becomes extinct are limited. However, a main natural driver is the miniaturisation. More compact

designs create barriers to heat dissipation, and therefore manufacturers are likely to focus on higher energy efficiency to reduce undesirable heat.

*Projectors:* The main brands are Epson, Sony Toshiba, Dell, Canon and Hitachi. Design is carried out mainly in America and Europe, by Japanese owned companies. Research and development into DLP light engines is headed by Texas Instruments, whilst LCD light engine development is led by Canon and Sony.

In addition to the information provided in chapter 2.7 baseline scenario and in chapter 4.3.1 baseline option, the market situation for projectors can be described as follows:

- Many projectors will continue to be replaced by widescreen televisions (which can now be as bright as projectors) in applications such as small to medium office conference rooms and schools.
- Projector products using ultra high-pressure (UHP) discharge lamps will continue to perform at the average efficiency levels predicted by the preparatory study, with little scope for cost effective step changes in efficiency levels.
- Solid State lamp (SSL) systems (LED/Laser) will continue to improve in efficiency at a slower rate than predicted in the preparatory study, performing in line with home cinema projectors.
- Expected sales of projectors will continue to decrease until there are no new sales of projector products other than those required for large auditoria and E-Cinema by 2025. This latter category is expected to account for less than 200,000 unit sales a year will therefore not qualify for possible ecodesign measures.

Further remarks on a possible mandatory ecodesign option for projectors: The reassessment has shown that one key assumption about the projected light output efficiency in the preparatory study was too optimistic. Therefore these efficiency requirements have been modified accordingly. Furthermore, the requirements proposed below for this option are based upon an assessment of available technology. It appears that whilst improvements in efficiency from current levels are possible, they are not possible within a least lifecycle cost solution. More efficient projector bulbs cost around three times more than standard bulbs, but do not save proportionately on consumption. Costs would have to be passed onto the consumer, and as energy savings would not be very large, it is unexpected that consumers would be willing to pay the extra for a more efficient projector – especially when there are alternative, and more affordable products available.

**9.5. Annex V – Stock developments of the 3 individual products groups**

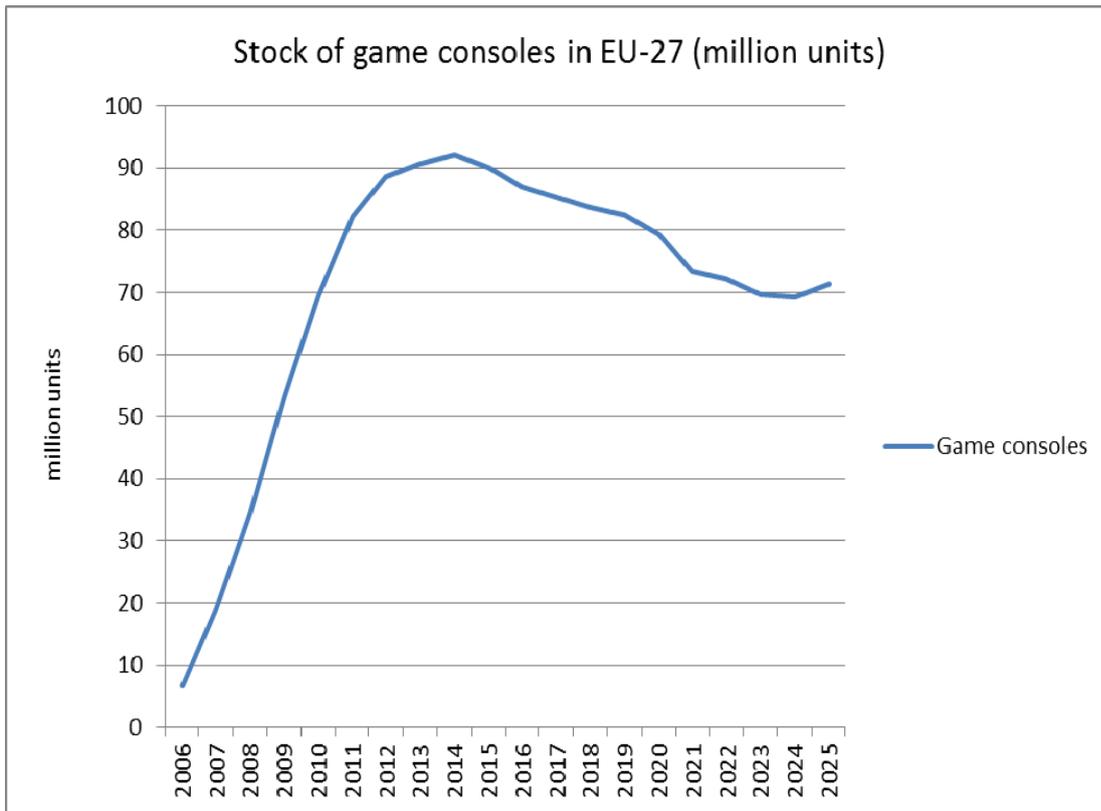


Figure AV1: Stock of games consoles EU-27 (million units)

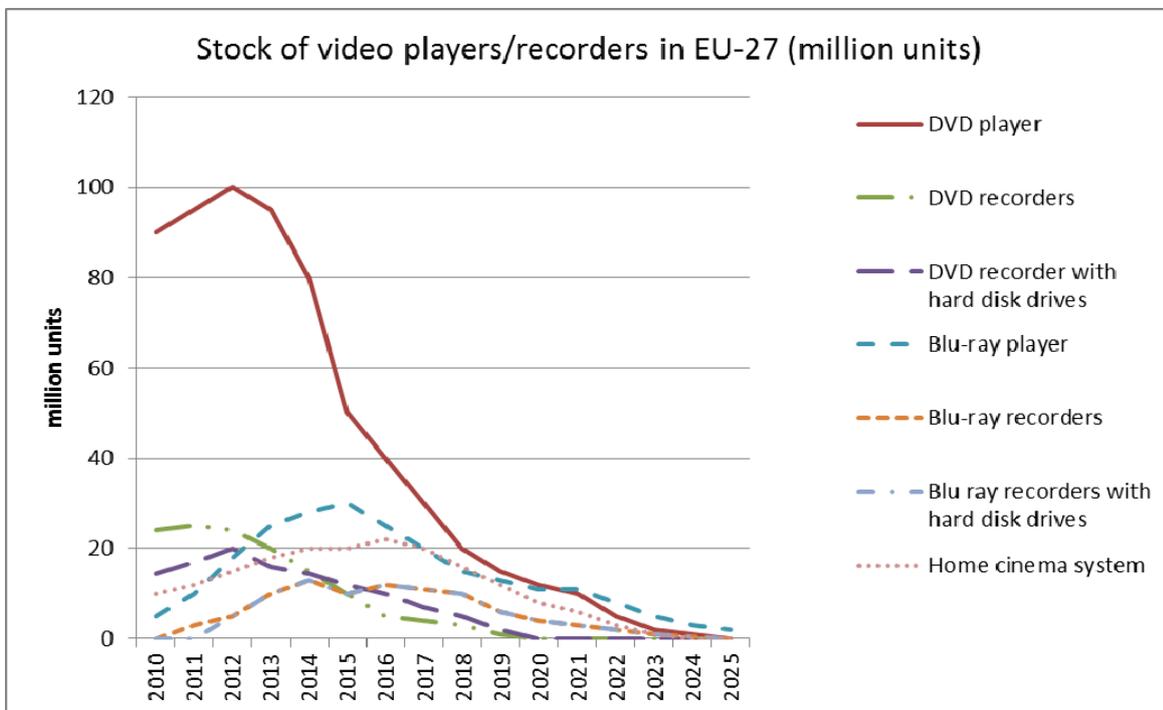


Figure AV2: Stock of video players/recorders in EU-27 (million units)

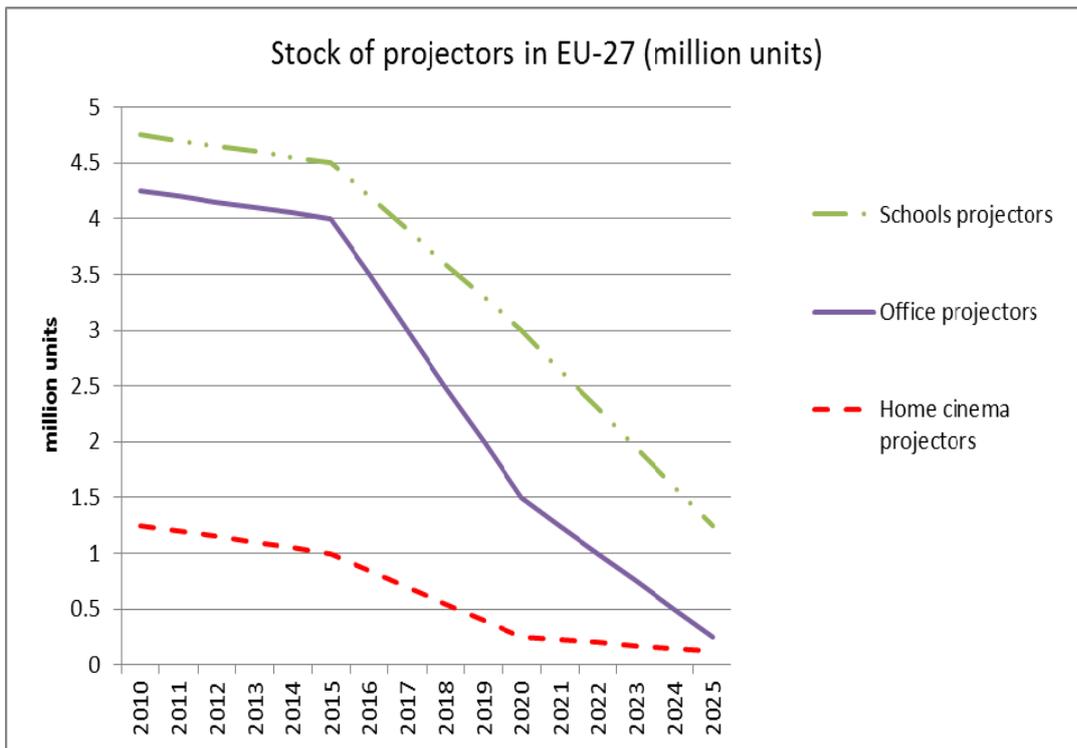


Figure AV3: Stock of projectors EU-27 (million units)

## 9.6. Annex VI - Assumptions

The baseline scenario is based on the following assumptions:

**Sales:** In 2010, *game console* sales were estimated to be around 17.7million. By 2025 it is predicted that this figure will reduce to around 9.8 million. Sales of the current generation of game consoles are starting to decline. However, this decline is not as rapid as previously thought due to new innovations such as motion controllers and improved video on demand technologies continuing to capture consumers' interest. For *video players/recorders* predictions suggest that by 2025, there will be no new sales of Blu-ray players and recorders with 2 million Blu-ray players in stock. There are assumed to be no new sales of HDD or DVD players. Projector annual sales are expected to drop off to 1.62 million.

**Lifetime:** The average economic lifetime is assumed to be 6 years for video players and recorders, projectors and game consoles. The main driver for replacement of game consoles is the release of a new generation of products (although the original console may still be retained for some time subsequently). For low-cost projectors, the replacement driver can often be lamp failure, although higher value projectors are often refurbished and have a secondary life of around 2 years (dictated by lamp life). For video players / recorders the main driver for replacement includes fashion and new technology trends.

**Use:** Game consoles with power management settings in place are assumed to spend on average around 22.0 hours per day in standby (or networked standby), 1.4 hours per day in active use and 0.60 hours per day in idle/inactive states. For non-power-managed consoles, an additional 0.4 hours in idle are assumed, with a corresponding reduction in time spent in standby. DVD/Blu-ray video recorders assumed to spend 0.75 hours per day in a play mode, 0.25 hours per day in a record mode, 18 hours in standby, and the remaining time between on-idle and fast start modes. Projectors are assumed to spend different times in on- and standby-modes depending upon application (Home cinema 0.5 hours on, 20 hours standby, Office (portable) 1.5 hours / 0.8 hours, School 3 hours on-play mode / 4-6 hours standby).

**Efficiency:** It is assumed that the unit efficiency of the products covered will be increasing due to the Eco-design regulation on standby/off mode and to a lesser extent to external power supplies.

**Auto Power Down (APD):** This is a standard feature for projectors and video players and recorders and is included in the BAU usage profile. For game consoles, there is some potential for improvement in APD in the policy scenarios considered with shorter periods of inactivity before power down envisaged. APD functionality is expected to be included in all new generations of consoles launched to the market from 2012 onwards and is included in all current game consoles that support high definition media play back.

**Standby and Network Standby requirements are included in the baseline:** For games consoles, including Network Standby requirements in the baseline has the effect of lowering total energy consumption of the product group from 2016. This reduction ranges from 10% to 15% compared to a future scenario that excludes network standby requirements. Including Network Standby requirements in the baseline is therefore reducing the overall energy consumption of the baseline, and is a noteworthy driver that is reducing baseline energy consumption. It is not however, having a highly significant impact on its own, and further policy measures can achieve more. Network standby accounts for estimated savings of 2.2 GWh per annum by 2025.

For projectors, the energy efficiency improvements created by Network Standby requirements would be expected to prevail in a baseline that excludes the requirements, due to existing lamp technology and movement towards 1W standby. Therefore, a baseline considering

Network Standby achieves little improvement to energy efficiency than would be expected to prevail without Network Standby.

Further details on the assumptions and on the assumptions of the modelling of the policy options is available via the Impact Assessment Study.

## 9.7. Annex VII – Improvement Potential

Game Consoles
<ul style="list-style-type: none"><li>– Reducing the power demand - standby, inactive or active use.</li><li>– Increasing hardware flexibility to perform less computationally intensive tasks with some of the processing resources disabled – e.g. media playback is often much higher in game consoles than in standalone media devices.</li><li>– Reducing the duration and frequency of auto-wake events.</li><li>– Implementing and improving auto power down functionality, to enable the console to automatically enter a low power state (normally standby or networked standby) if there is no user input for a predefined time.</li></ul>
Video Players / Recorders
<ul style="list-style-type: none"><li>– Changing the architecture to make the hard disk drive (HDD) external to the product (attached by USB). This reduces power consumption and enables sourcing of efficient HDDs.</li><li>– Using energy-optimised chip sets (mass market only – not high end, which have multi-chip configurations). The highest integrated chip solutions (system on chip or similar) integrate all components of an electronic device into a single chip. This assists with light-weighting but may result in some waste implications as repair of single chip solutions is not possible.</li><li>– Offering energy efficient quick-start modes and quick-start not enabled as default.</li></ul>
Projectors
<ul style="list-style-type: none"><li>– Offering eco mode as standard available feature</li><li>– Using more efficient lighting modules</li><li>– Using optimised lens solutions</li><li>– Using efficient light path beam splitting optics</li></ul>