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COMMISSION STAFF WORKING DOCUMENT

Accompanying document to the

Commission Regulation implementing Directive 2005/32/EC with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies

IMPACT ASSESSMENT

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IMPACT ASSESSMENT

Lead DG: DG TREN

Associated DG: DG ENTR

Other involved services: SG, LS, DG ENV, DG COMP, DG ECFIN, DG INFSO, DG MARKT, DG SANCO, DG TRADE

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EXECUTIVE SUMMARY

Background

The Ecodesign Framework Directive 2005/32/EC ("Ecodesign Directive") lists products which have been identified by the Council and the European Parliament as priorities for the Commission for implementation, including consumer electronics and office equipment (Article 16). Such equipment is often powered by external power supplies (EPS), converting electricity of the mains power source to power with characteristics specific to "primary load products", as e.g. mobile phones or notebooks. The power conversion efficiency and the no-load condition power consumption of EPS are an important aspect for the energy performance of primary load products, and EPS are one of the priority products groups considered for implementing measures under ecodesign.

The Spring Council 2007 called for thorough and rapid implementation of the five priorities[1] set by the Energy Council on 23 November 2006[2], based on the Commission's Action Plan on Energy Efficiency. The priorities include to "dynamically and regularly improve and expand the scope of minimum efficiency requirements for energy-using products, including standby-loss reduction", by "fully utilizing the Eco-Design Directive". The strategy of adopting minimum energy performance standards for equipment and appliances was welcomed by the European Parliament[3].

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1 Brussels European Council 8/9 March 2007, Presidency Conclusions, 7224/07.

2 TTE (Energy) Council on 23 November 2006, 15210/06.

3 European Parliament resolution of 31 January 2008 on an Action Plan for Energy Efficiency

Approach for setting ecodesign requirements

The approach for developing the regulation for EPS and the impact assessment was structured in the following four steps.

Step 1: assessment of the criteria for ecodesign implementing measures as set out in Article 15(2a)-15(2c) of the Ecodesign Directive, taking into account the ecodesign parameters identified in Annex I of the Ecodesign Directive;

Step 2: consideration of relevant Community initiatives, market forces and environmental performance disparities of EPS on the market with equivalent functionality as set out in Article 15(2) of the Ecodesign Directive;

Step 3: establishing policy objectives including the desirable level of ambition, the policy options to achieve them, and the key elements of the ecodesign implementing measure as required by Annex VII by the Ecodesign Directive;

Step 4: environmental, economic and social assessment of the impacts, with a view to the criteria on implementing measures set out in Article 15(5) of the Ecodesign Directive.

Summary of the results

Step 1

In order to assess the criteria for ecodesign implementing measures as laid out in Article 15(2) of the Ecodesign Directive, the Commission has carried out a technical, environmental and economic study for external power supplies ("preparatory study") which follows the provisions of Article 15(4a) and Annex II of the Ecodesign Directive.

With regard to the criteria established by Article 15(2) of the Ecodesign Directive, the following main results have been established for the Community:

Article 15 (2a) :	Annual EPS sales	approx. 600 mln.
	EPS in use	approx. 2 bln.
Article 15 (2b) :	Environmental impact	
	EPS use-phase electricity consumption	17 TWh
Article 15 (2c) :	Improvement potential EPS use phase electricity consumption by 2020	9 TWh

The main environmental aspect is the electricity consumption of EPS in the use phase, i.e. the losses associated to the conversion of mains power to power suitable for a particular primary load described by the "average active efficiency", and the no-load power consumption. In a no-action scenario, the electricity consumption is expected to increase to annually 30.6 TWh by 2020, because the annual sales and the EPS in use in the Community are expected to almost double.

The improvement potential is due to the fact that technical solutions exist which reduce the no-load electricity consumption and improve the active average efficiency of EPS compared to the market average, while providing the same functionality and reducing the life-cycle cost. This leads to a wide disparity of electricity consumption of the EPS available on the market. Technologies which reduce the electricity consumption of EPS in the use-phase imply also lower material content/weight, which lead to a reduction of the environmental impacts related to production, distribution and disposal of EPS. Further reduction could be triggered by reducing the amount of EPS placed on the market/in use, which could be facilitated by standardised connectors.

Though being small when looked at in isolation for a single EPS, no load power consumption and power conversion losses of EPS lead to an electricity consumption which is approx. half of the total electricity consumption of Denmark when multiplied by the number or EPS used in the Community, and the improvement potential is of the order of the total electricity consumption of Lithuania.

Step 2

Market take-up of EPS with improved environmental performance is prevented by barriers which are linked to the fact that EPS are an accessory usually sold together with the primary load product. Little incentives exist for the manufacturers of the primary load products to deliver energy efficient EPS to the user, because an additional cost may arise for acquiring EPS with advanced environmental performance. Even when usually the additional cost is very small per EPS unit, this can nevertheless be important for price sensitive markets. Cost-effective improvement potentials are therefore often not realized.

On Community level several initiatives related to EPS have been launched. The no-load power consumption of EPS is implicitly addressed by Commission Regulation (EC) No 1275/2008[4] of 17 December 2008, which sets maximum power consumption levels for the standby and off-mode power consumption of household and office equipment, including primary load products operated together with EPS. However, the active average efficiency is not covered, and the no-load requirements for EPS should be more demanding than standby/off-mode requirements for primary load products.

Several voluntary initiatives address both no-load and active average efficiency: the Commission's Code of Conduct for EPS, the Energy Star programme for office equipment, and the Ecolabel. However, these programmes address only a very limit subset of primary load products operated by EPS, and/or only a limited amount of manufacturer takes part in them.

Several initiatives were taken in the Member States to raise awareness for standby and off-mode electricity consumption, which, for primary load products operated by EPS, to some extent are relevant for the no-load power consumption of EPS. However, these initiatives do not address the active average efficiency of EPS, and awareness-raising alone cannot solve the problem leading to market failure. Furthermore, the Ecodesign Directive implies that legislative action on EPS cannot be taken on Member State level, and the Member States expect that a harmonized legislative framework is set, the legal basis being Article 95 of the Treaty.

[4] OJ L 339, 18.12.2008, p. 45.

Standardization of EPS connectors, and in particular mobile phone EPS which are particularly relevant due to the large sales volume, so far has not happened on a larger scale, although for mobile phones suitable USB interfaces exist. A spontaneous move towards such interfaces is on-going, including a voluntary standardisation initiative of the mobile operators, which procure approx. 80% of the mobile phone/handsets. In addition, an official Commission standardisation mandate is being elaborated.

Conclusion of Step 1 and Step 2

EPS are placed in large quantities on the Community market. The electricity consumption due to conversion losses and no-load power consumption of EPS is significant, and significant improvement potentials exist, which are linked to wide disparity of electricity consumption of EPS with identical functionality.

On the other hand, voluntary Community programmes and related initiatives in the Member States, and the market forces do not address no-load power consumption and the active average efficiency of EPS properly.

It is concluded that the criteria for ecodesign implementing as set out in Article 15(2) of the Ecodesign Directive are met, and EPS shall be covered by an ecodesign implementing pursuant to Article 15(1) of the Ecodesign Directive.

Step 3

Further to Annex II of the Ecodesign Directive, the level of ambition for improving the electricity consumption of EPS is determined by an analysis of the least life-cycle cost for the user. Furthermore, benchmarks for technologies yielding best performance, as developed in the preparatory study and the discussions with stakeholders during the meeting of the Ecodesign Consultation Forum on 22 February 2008, are considered. The results are reflected in the objectives that the implementing measure aims to achieve, in particular the market transformation that would lead to the realisation of the improvement potentials.

The policy options considered include "no action", self-regulation, ecodesign requirements on EPS set in the context of implementing measures on individual primary load products, labelling, and an ecodesign regulation on EPS, and their appropriateness to achieve the objective was analysed. However, due to the clear mandate of the Legislator, the depth of the analysis for options other than an ecodesign implementing measure is proportionate for an implementing legal act, and the focus is on the assessment of its key elements taking into account the preparatory study and the input from stakeholders.

Step 4

An assessment of the implementing measure is carried out. In particular, sub-options for the intensity of the measure, i.e. timing for the staged setting of ecodesign requirements for no-load condition power consumption and average active efficiency are analysed, taking into account the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on manufacturers including SMEs.

Conclusion on Step 3 and Step 4

A comparison of the options shows that the appropriate policy option for realising the improvement potential is a regulation setting ecodesign requirements for no-load condition power consumption and average active efficiency of EPS. The requirements of the regulation should be set in two stages, which become effective one year and two years, respectively, after the regulation has entered into force. This approach ensures:

– that the environmental impact of EPS is reduced, leading to important savings of electricity consumption in the use phase, and energy consumption further life-cycle phases, CO2 emissions and waste, while reducing the life-cycle costs;

– that, compared to a "no action" scenario, by 2020 the regulation will lead to annual savings of 9 TWh of electricity consumption in the Community, corresponding to 3.6 mln tons of CO2 emissions, and additional 118 PJ gross energy savings related to production/distribution of EPS due to reduced material content/weight;

– a clear legal framework ensuring fair competition;

– that requirements for EPS are harmonized in the Community, leading to a minimization of administrative burdens and costs for the economic operators;

– that no disproportionate burdens for manufacturers are created due to transitional periods which duly take into account re-design cycles, and synergies with legislation in other parts of the world, including USA and China.

Monitoring

Monitoring of the impacts will mainly be done by market surveillance carried out by Member State authorities ensuring that the requirements are met. The appropriateness of scope, definitions and concepts will be monitored by the ongoing dialogue with stakeholders and Member States.

SECTION 1: PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

Organisation and timing

This action is one of the priorities of the Action Plan on Energy Efficiency[5] for adoption by the Commission[6].

The regulation is based on the Directive 2005/32/EC of the European Parliament and of the Council establishing a framework for the Commission to set ecodesign requirements for energy-using products[7], in the following abbreviated as "Ecodesign Directive". An energy-using product (EuP), or a group of EuPs, shall be covered by ecodesign implementing measures, or by self-regulation (cf. criteria in Article 19), if the EuP represents significant sales volumes, while having a significant environmental impact and significant improvement potential (Article 15). The structure and content of an ecodesign implementing measure shall follow the provisions of the Ecodesign Directive (Annex VII).

5 COM(2006)545 final.
6 COM(2008)11 final.
7 OJ L 191 of 22.7.2005, p. 29.

The Commission has carried out a study on "battery chargers and external power supplies" in preparation of a possible ecodesign implementing measure. On 22 February 2008 a meeting of the Ecodesign Consultation Forum established under Article 18 of the Ecodesign Directive was held (details are provided below). Article 19 of the Ecodesign Directive, amended by Directive 2008/28/EC[8], foresees a regulatory procedure with scrutiny for the adoption of ecodesign implementing measures.

Impact Assessment Board

The opinion of the Impact Assessment Board was given on 1 September 2008. This final version of the impact assessment report reflects its recommendations as follows:

– The administrative costs related to conformity assessment were clarified.

– The presentation of the environmental impacts was further clarified.

– The relation to Commission Regulation (EC) No 1275/2008 of 17 December 2008 was further clarified.

Transparency of the consultation process

External expertise on EPS was gathered in particular in the framework of a technical, environmental and economic analysis (in the following called "preparatory study") carried out by a consortium of external consultants[9] on behalf of the Commission's Directorate General for Energy and Transport (DG TREN). The preparatory study has followed the structure of the "Methodology Study Eco-design of Energy-using Products"[10] (MEEuP) developed for the Commission's Directorate General for Enterprise and Industry (DG ENTR). MEEuP has been endorsed by stakeholders and is used by all ecodesign preparatory studies. The battery charger and EPS preparatory study has been developed in an open process, taking into account input from relevant stakeholders including manufacturers and their associations, environmental NGOs, consumer organizations, EU Member State experts, experts from third countries (e.g. USA, Australia) and international organizations as e.g. the International Energy Agency (IEA). The preparatory study provided a dedicated website[11] where interim results and further relevant materials were published regularly for timely stakeholder consultation and input. The study website was promoted on the ecodesign-specific websites of DG TREN and DG ENTR. An open consultation meeting for directly affected stakeholders was organised in the Commission's premises in Brussels on 15 December 2006 for discussing the preliminary results of the study.

In addition, the initiative was discussed in meetings of Commission staff with stakeholder representatives, and with international partners, e.g. the US Environmental Protection Agency managing the Energy Star programme for EPS, the IEA "Implementing Agreement Energy Efficient End Use Equipment", during bilateral meetings of Commission services with delegations from APEC, China, Korea etc.

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8 OJ L 81 of 20.3.2008, p. 48.

9 "Preparatory Studies for Eco-design Requirements of EuPs, Battery chargers and external power supplies Lot 7", Bio Intelligence Service, final report of 23 January 2007; documentation available on the DG TREN ecodesign website http://ec.europa.eu/energy/efficiency/ecodesign/eco_design_en.htm

10 Methodology Report, final of 28 November 2005, VHK, available on DG TREN and DG ENTR ecodesign websites

11 www.ecocharger.org

On 22 February 2008 a meeting of the Ecodesign Consultation Forum on EPS was held. Building on the results of the preparatory study, the Commission services presented a "working document" suggesting ecodesign requirements related to EPS[12]. On 22 January 2008 the working document was sent to the members of the Consultation Forum, and to the secretariats of the ENVI (Environment, Public Health and Food Safety) and ITRE (Industry, Research and Energy) Committees of the European Parliament for information. The working document was published on DG TREN's ecodesign website, and it was included in the Commission's CIRCA system alongside the stakeholder comments received in writing before and after the meeting. The minutes of the Consultation Forum meeting are included as Annex I.

Outcome of the consultation process

The positions of the main stakeholders, as expressed before, during and after the Consultation Forum meeting on 22 February 2008 as a reaction to the Commission services' working document can be summarised as follows.

The **Member States** support "horizontal" ecodesign legislation on EPS as defined in the working document, including "chargers" e.g. for mobile phones, but excluding battery chargers e.g. for separate accumulators. The suggested levels for power consumption requirements and the staged timing were in general considered appropriate. A mandate to the European Standardization Organizations on the standardization of interfaces is supported.

The general approach to set mandatory requirements in the framework of ecodesign is largely supported by **Industry**[13] associations. The European Information & Communications Technology Industry Association (EICTA) welcomes ecodesign legislation on EPS, supports the proposed requirements for the use phase energy consumption, and welcomes the consistency with criteria of the voluntary US Energy Star programme on EPS, underlining that the approach to make Energy Star criteria mandatory cannot be taken for potential ecodesign implementing measures related to more complex products. However, for EPS used for mobile primary load products such as mobile phones and MP3 players the requirements for active efficiency have been criticised as being too demanding, implying a risk that the life cycle environmental impact could be negatively affected. Furthermore, the technical feasibility of compatibility of EPS by standardization of EPS interfaces was questioned, and, with a view to manufacturers operating at European level only, concerns were expressed on the timing for the first stage.

The Federation of National Manufacturers Associations for Luminaires and Electrotechnical Components for Luminaires in the European Union (CELMA) suggested that halogen lighting transformers should be covered by lighting specific implementing measures, including transformers built into luminaires. Magnetic transformers cannot comply with the requirements suggested in the working document and a transition period longer than one year is necessary. Furthermore, exemptions for special applications as e.g. humid operating conditions should be foreseen.

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12 Available on DG TREN's ecodesign website

13 See e.g. contributions of ORGALIME and CECED to the consultation of Directive 92/75/EEC, available on http://ec.europa.eu/energy/demand/legislation/domestic_en.htm#consultation; "CECED vision on Energy Efficiency" of 1st July 2007, available on www.ceced.eu; letter of EICTA to DG TREN of 28 March 2007 related to the termination of the industry self-commitment of consumer electronics (cf. footnote 21)

Environmental and Consumer NGOs welcome the requirement for the use phase energy consumption, but the scope should be extended to halogen lighting transformers with output power beyond 250W (foreseen for EPS). The Consumer NGOs support a mandate to the European Standardization Organization for standardization of EPS interfaces, while Environmental NGOs have expressed concerns that this approach is too lengthy and may not deliver the desired results timely, asking for including the standardization specification in the implementing measure itself instead. Further issues raised include the role of requirements for providing relevant information to consumers.

Further details on these issues are given below.

SECTION 2: PROBLEM DEFINITION

Market failure

The underlying problem can be summarized in the following way. The significant aspect for improving the environmental performance of EPS is the life cycle energy consumption, and in particular their electricity consumption in the use phase. On the other hand, cost effective technical solutions exist on the market leading to low power consumption of EPS in the "no load" condition (corresponding to "off mode" as defined in IEC 62301 related to "standby"), and increasing the efficiency in "active mode" (expressed in terms of the "average active efficiency" at several load points), but the market penetration of advanced EPS with good environmental performance is lower than it could be.

EPS are an accessory delivered together with a certain primary load product, but it may be feasible[14] to make EPS compatible to each other at least for some power output characteristics/primary load products, thereby extending the lifetime of EPS and reducing the amount of EPS needed/placed on the market.

The barriers to a more widespread use of advanced EPS are largely due to

– cost increments,

– lack of awareness

– un-harmonised EPS connectors.

Cost increments

EPS are an accessory usually not produced by manufacturers of the primary load products, but supplied by manufacturers of EPS as requested by manufacturers of the primary load products. Prices for EPS with low output power are in the range 1 EURO – 3 EURO. For higher output power typical EPS prices can be in the range 6 EURO – 30 EURO. As of 2008 incremental costs for EPS with advance energy performance are below 1 EURO, while for higher output power this figure can be larger (see Section 5). This cost increment is small in absolute terms, but it can be a fairly high percentage premium, and even small cost factors can have a substantial impact on the net profit, in particular in the highly competitive markets for electronics products.

[14] Legislation established in China; "Machbarkeitsstudie zur Normung von Akkus und Anschlüssen an akkubetriebenen Geräten für Ladegeräte", Verbraucherrate des DIN Deutsches Institut für Normung e.V., 2005.

Lack of awareness

Users are often not aware of the electricity consumption of the products powered by EPS and the associated costs. In particular, the properties and the energy performance of EPS are usually not of interest at all for the user because the purchasing decision is related to the primary load product only, and the energy performance of an EPS is not a criterion to purchase a certain primary load/EPS package. On the other hand, without specific demand manufacturers of primary load products do not have an interest to reduce the operating costs of the EPS/primary load package, which are paid by the user.

The consequence is ***market failure***, because, as a consequence of these effects, manufacturers of primary load products often do not opt to endow their products with EPS having advanced environmental performance. For some particular primary load products (e.g. notebook computer) this situation is alleviated to some extent by the preference of users for light weight primary load/EPS package, because advanced EPS can have a weight advantage.

Incompatibility of EPS

An EPS has to be compatible to the specifications of the charging circuitry and the battery of the primary load product, and the primary load product/EPS package is designed, tested and certified/verified together. Therefore currently a certain EPS usually cannot be used for a primary load product differing from the one it was sold together with, and with each new primary load product a new EPS is placed on the market, while EPS belonging to a product not in use any more is redundant. On the other hand it may be feasible, at least for certain subgroups of EPS, in particular mobile products with low voltage EPS, to specify standardized connectors and further relevant product parameters which leads to compatibility, while duly taking into account other considerations, in particular safety aspects. Ultimately standardised connectors could result in less EPS being placed on the market, and environmental impacts related to production/distribution/waste may be reduced.

Related initiatives on Community and Member State level

On Community level several initiatives related to EPS have been launched. The no-load power consumption of EPS is implicitly addressed by Commission Regulation (EC) No 1275/2008[15] of 17 December 2008, which sets maximum power consumption levels for the standby and off-mode power consumption of household and office equipment, including primary load products operated together with EPS. However, the active average efficiency is not covered, and the no-load requirements for EPS should be more demanding than standby/off-mode requirements for primary load products.

Several voluntary initiatives address both no-load and active average efficiency: the Commission's Code of Conduct for EPS, the Energy Star programme for office equipment, and the Ecolabel. However, these programmes address only a very limit subset of primary load products operated by EPS, and/or only a limited amount of manufacturer takes part in them.

[15] OJ L 339, 18.12.2008, p. 45.

Several initiatives were taken in the Member States to raise awareness for standby and off-mode electricity consumption, which, for primary load products operated by EPS, to some extent are relevant for the no-load power consumption of EPS. However, these initiatives do not address the active average efficiency of EPS, and awareness-raising alone cannot solve the problem leading to market failure. Furthermore, the Ecodesign Directive implies that legislative action on EPS cannot be taken on Member State level, and the Member States expect that a harmonized legislative framework is set, the legal basis being Article 95 of the Treaty.

In addition, a voluntary initiative for standardisation of mobile phones on a suitable USB interfaces has been launched in the beginning of 2009 by mobile phone operators, which procure approx. 80% of the mobile phone/handsets. If this initiative is successful the major part of the environmental improvement potential related to standardisation of connectors could be achieved, because mobile phone EPS account for the largest share of EPS placed on the market, and are therefore the primary load group for which standardisation could deliver the biggest impact.

Baseline Scenario

In order to carry out a technical, environmental and economic analysis the preparatory study has considered EPS categories typical for several primary load products (mobile phone, notebook computer etc.), with a detailed analysis of representative models of each category. In particular the study has, amongst others, provided the following key elements:

– electricity consumption (power conversion losses) in the no-load condition and in active mode at several load points;

– usage patterns typical for the various equipment categories;

– the bill of materials, weight, packaging etc. in order to evaluate the life cycle environmental impact of EPS;

– the installed base ("stock"), the annual sales, and the typical life time;

– technologies yielding reduced electricity and material consumption, and the costs effects for applying them compared to the current "market average".

The structure of the methodology of the technical, environmental and economic analysis is displayed in Annex II.

Analysis for the year 2009

The preparatory study and the impact assessment study have shown that the significant environmental aspects related to external power supplies are due to energy consumption in all life cycle stages. Applying the market forecasts of the preparatory study, for **2009** it is estimated that in EU-27 the stock ("installed base") and sales are **2007 and 611 million** units EPS[16], respectively, with a **total (primary) energy consumption of 238 PJ**, of which **17.3 TWh** are due to electricity consumption in the **use phase in the EU-27** (stock)[17]. The share of the total energy consumption related to the several primary load product categories powered by EPS is depicted in Figure 1.

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16 as defined in the regulation, excluding "battery chargers" (output of the charger directly physically connected to the battery)

17 here and in the following "electricity consumption" means the sum of energy losses due to the conversion of electricity from the mains power source (expressed as "active efficiency"), and of no load energy consumption. The energy consumption of the primary load product is not considered.

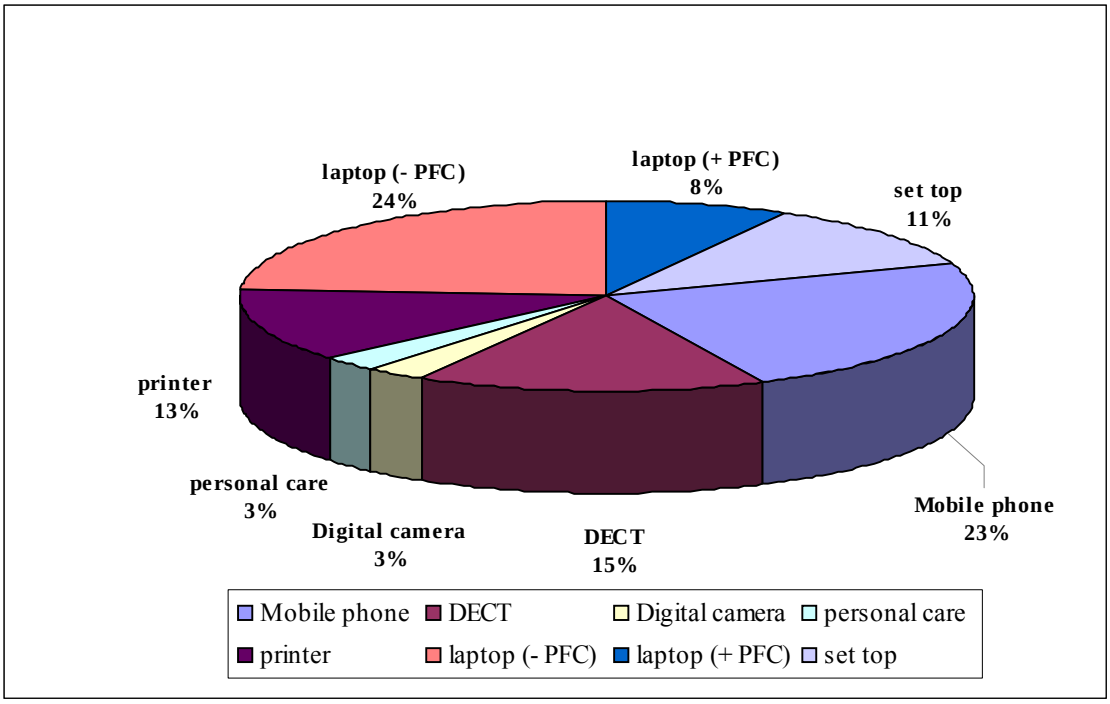

Figure 1: Shares of total energy consumption in primary load product categories powered by EPS in 2009 (where "+PFC"/"-PFC" means with/without power factor correction respectively; "set top" means set top box and modems).

Scenario for 2020 and impact of Commission Regulation (EC) No 1275/2008 setting ecodesign requirements for standby/off-mode

The baseline scenario for estimating the future evolution of the energy/electricity consumption related to EPS until the year 2020 has been developed under the condition that the market trend as developed in the preparatory study leads to an increasing penetration rate of primary load products operated by EPS.

The energy/electricity consumption of EPS could improve to some extent due to "vertical" ecodesign implementing measures on primary load product powered by EPS. However, by far the major part of the large variety of electrical and electronic equipment operating with EPS will not/cannot be covered by "vertical" ecodesign measures.

Furthermore, the regulation on EPS overlaps with the standby/off-mode regulation for the no load/off-mode operating condition for mobile products (mobile phone etc.) and notebooks. On the other hand: For mobile products (mobile phone etc.) the ecodesign requirements on standby/off mode of the "system" primary load product/EPS are in practise identical to requirements on the EPS alone, because, for measuring the off-mode of the "system" primary load product/EPS, only the EPS is connected to the power source (because maintaining the charge of the rechargeable battery is not "off" mode). However, for mobile products no further optimization is assumed for off-mode/no-load anyway. For notebooks by far the main improvement potential stems from improving the average active efficiency. Therefore, in practise, the added figures for the improvements as displayed in the impact assessments on standby/off mode and EPS do not contain double counting.

It is concluded that stock/sales of EPS in the EU-27 will increase to **3611/1088 million** units EPS in **2020**. Without taking appropriate dedicated countermeasures ("no action" specifically on EPS) it is estimated that the annual total life cycle energy consumption will rise to **423 PJ in 2020**, and the use phase electricity consumption will rise to **30.6 TWh in the EU-27**.

However, also without EU action third country initiatives as the federal US legislation setting minimum requirements on EPS as of 1 July 2008, the Energy Star programme[18] or the EU Commission Code of Conduct[19] for EPS are likely to have, to some extent, an impact on the EPS placed on the EU market, because some primary load/EPS packages are designed/shipped for the world market to identical specifications. The impact cannot be quantified.

Structure of manufacturers and users of EPS

In order to facilitate the assessment of economic and social impacts of policy options, in principle quantified shares of annual sales of high and low volume producers (e.g. SMEs), and of EU and third-country producers, would be useful. However, the vast majority of EPS are manufactured in Asia, and such a breakdown cannot be provided.

Furthermore, the impact of ecodesign requirement on the affordability of products would in principle require an assessment of the income structure of the users (households and tertiary sector) of the primary load products operated with EPS. However, since the additional costs, if any arise at all, that may arise for technologies necessary to achieve compliance for equipment not yet meeting the requirements yet are expected to be small on absolute terms, affordability is not expected to be negatively affected even for low income households, and a detailed analysis iis not provided. This is further discussed in Section 5.

Improvement potential, level of ambition and benchmarks

Improvement potential and benchmarks

The preparatory study has shown that existing cost effective technical solutions allow for improvement of the active average efficiency[20], and for a reduction of no-load losses. The energy efficiency levels corresponding to least life cycle cost (LLCC) are slightly more demanding than the levels contained in the federal US legislation which foresees mandatory requirements for no-load power consumption and active average efficiency of EPS as of 1 July 2008.

No load: The best available no load performance of EPS according to most recent available data[21] can be expressed as approximately (where P_O is the rated output power)

– 0.1W or less, for $P_O \leq 90W$;

– 0.2W or less, for $90W < P_O \leq 150W$;

– 0.4W or less, for $150W < P_O \leq 180W$;

– 0.5W or less, for $P_O > 180W$.

Active average efficiency: The best available active average efficiency of EPS identified in the preparatory study (published January 2007) can be approximated by

– $0.09 \cdot \ln(P_O) + 0.60$, for $1.0W \leq P_O \leq 25.0W$;

– 0.89, for $P_O > 25.0W$.

[18] www.eu-energystar.org

[19] http://re.jrc.ec.europa.eu/energyefficiency/index.htm

[20] The average active efficiency is the average of the active mode efficiencies at 25%, 50%, 75% and 100% of the nameplate output power.

[21] EU Code of Conduct for EPS 2006, US Environmental Protection Agency 2006/2007

The best available active average efficiency of EPS according to most recent available data can be approximated by

– $0.09 \cdot \ln(P_O) + 0.68$, for $1.0W \leq P_O \leq 10.0W$;

– 0.89, for $P_O > 10.0W$.

Level of ambition

The market penetration of products applying technologies yielding better energy efficiency levels, but not fully corresponding yet to LLCC in 2005/2006 (when the preparatory study was developed), is expected to grow[22]. As shown in Section 5, based on manufacturer feedback it is expected that the Version 2.0 energy efficiency criteria of US Energy Star programme for EPS, as released in April 2008[23] are/become cost-effective. Therefore the appropriate level of ambition is more demanding than the LLCC established in 2005/2006. In order to exploit synergies with international initiatives, thereby reducing costs for manufacturers, the level of ambition for ecodesign requirements follows the Version 2.0 energy efficiency criteria of the Energy Star programme. This approach was supported by Member States and stakeholders.

Legal basis for EU action

The Ecodesign Directive and, more specifically, its Article 16 provides the legal basis for the Commission to adopt an implementing measure on external power supplies.

SECTION 3: OBJECTIVES

The preparatory study has confirmed that a cost-effective potential for reducing use phase electricity consumption of EPS exist. Further improvements of the environmental impact are related to the total energy consumption and waste. This potential is not tapped, as outlined above. The general objective is to develop a policy which

– overcomes the barriers for deployment of EPS with advanced energy performance and corrects market failure,

while

I) leading to significant reductions of the environmental impact related to the energy use of EPS throughout the life cycle;

II) ensuring the free movement of affected products within the internal market.

The Ecodesign Directive, Article 15 (5), requires that ecodesign implementing measures meet all the following criteria:

a) there shall be no significant negative impacts on the functionality of the product, from the perspective of the user;

b) health, safety and the environment shall not be adversely affected;

c) there shall be no significant negative impact on consumers in particular as regards affordability and life cycle cost of the product;

d) there shall be no significant negative impacts on industry's competitiveness;

[22] triggered for example by the EU Code of Conduct and the EPS Energy Star programme

[23] Available on www.energystar.gov

e) in principle, the setting of an ecodesign requirement shall not have the consequence of imposing proprietary technology on manufacturers;

f) no excessive administrative burden shall be imposed on manufacturers.

SECTION 4: POLICY OPTIONS

Option 1: No EU action

This option would have the following implications:

– Programmes addressing EPS and/or primary load products shipped with EPS (in particular the voluntary Energy Star and EU Code of Conduct programmes) and legislation in other parts of the world to some extent could contribute to a reduction of the use phase electricity consumption of EPS placed on the market in the EU. However, a major part of the improvement potential would not be realized because the major part of the EPS placed on the EU market would not meet the criteria/requirements set in those programmes.

Therefore the barriers for realizing the potentials to improve the environmental performance of EPS would persist.

– It is to be expected that Member States would want to take individual, non-harmonized action. This would hamper the functioning of the internal market and lead to high administrative burdens and costs for manufacturers, in contradiction to the goals of the Ecodesign Directive.

– There is a risk of competitive disadvantages, in particular for very price sensitive products, for those primary load manufacturers shipping their products with advanced EPS vis-à-vis competitors not using advanced EPS.

– The specific mandate of the Legislator would not be respected.

Therefore this option is discarded from further analysis.

Option 2: Self regulation

This option is discarded for the following reasons:

– No initiative for self-regulation on EPS pursuant to Annex VIII of the Ecodesign Directive on has been brought forward[24].

Option 3: Ecodesign requirements on EPS mode set only in the context of ecodesign implementing measures for primary load products

This option means that ecodesign requirements on EPS mode would be set only in the context of ecodesign implementing measures for primary load products when the latter are placed on the market together with an EPS, without setting ecodesign requirements targeting the entire range of EPS. This option would imply the following:

– For many primary load products powered by an EPS the overall environmental impact is small and a dedicated ("vertical") ecodesign implementing measure may not be justified. But the large amount of such product categories powered by EPS result in a significant environmental impact and a significant improvement potential, which to a large extent can be realized through advanced EPS.

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[24] However, several mobile phone manufacturers have suggested "IPP Voluntary Agreements" addressing, amongst other aspects, the no load energy consumption of mobile phone EPS.

– Addressing EPS in implementing measures for a number of primary load products powered by EPS would realize only a part of the improvement potential related to advanced EPS.

– The "no-load" energy consumption would be reduced by Commission Regulation (EC) No 1275/2008 on standby/off-mode, but the improvement potential related to advanced performance in active-mode would not be realized. Furthermore, for mobile primary load products, lower no-load/off-mode energy consumption levels (see below) should be established than foreseen in the standby/off-mode regulation.

– One targeted measure for EPS is, from an administrative point of view, more effective than a (large) number of measures targeted at primary load products powered by EPS, largely aiming at the similar/same objective.

– The specific mandate of the Legislator would not be respected.

Therefore, this option as being the **only** policy to reduce the environmental impact of EPS is discarded.

Option 4: Energy labelling targeting specifically EPS

This option means that labelling targeting specifically EPS would be put in place without setting ecodesign requirements on EPS. This option would imply the following:

– In general two main objectives of labelling schemes (e.g. pursuant to 92/75/EEC[25], or the Energy Star labelling programme) are to increase the market penetration of, in this case, energy efficient products by providing incentives for innovation and technology development, and to help consumers to make cost effective purchasing decision by addressing running costs. The first aspect is not relevant, because the technologies for reducing the energy consumption in standby/off-mode to very low levels readily exist.

– In principle labelling could be suitable to increase the market penetration of advanced EPS, but, at least to date, EPS are sold mainly together with the primary load product, and the EPS is not on sale separately.

Assuming that the business model for EPS changes and EPS will be on sale separately in the future labelling would imply the following:

– The absolute energy consumption of an EPS is small and the difference in electricity cost between two labelling grades is usually low, if the band between two grades is sufficiently narrow to allow for differentiation between EPS.

– Therefore little incentives for purchasing EPS wit a "good" grading exist, and in addition to the policy framework marketing and awareness raising efforts would be needed.

– Consequently there is a high risk that any market transformation towards EPS with desirable performance would take place slowly.

– The administrative burdens for manufacturers would be higher when compared with the burdens associated to minimum requirements.

– Depending on the actual design of the labelling scheme, additional burdens could arise for retailers.

– The specific mandate of the Legislator would not be respected.

[25] OJ L 297 of 13.10.1992, p. 16.

Provided that ecodesign requirements are ambitious there is little to no room for further improving the energy performance of EPS. Therefore it is also not appropriate to *complement* ecodesign requirements for EPS by a labelling scheme.

Therefore this option is discarded for further analysis.

Option 5: Ecodesign implementing regulation on EPS

This option aims at improving the environmental impact of EPS by setting maximum levels for their no-load power consumption and average active efficiency.

The following sub-section contains details of the rationale for the elements of the corresponding regulation, as listed in Annex VII of the Ecodesign Directive.

Scope and definition of the EPS covered

The scope of the product categories addressed by the proposed ecodesign regulation on EPS covers EPS with a rated output up to 250W. This is in line with the preparatory study and international EPS initiatives/legislation. Products which are in the scope are e.g. EPS for mobile phones, MP3 players, notebooks, cordless phones etc.

The preparatory study has analysed also "halogen lighting convertors" for low voltage halogen lamps, and "battery chargers", the main difference between battery chargers and EPS being that the output of the batter charger connects physically directly to a removable battery (e.g. standard battery charger for AA/AAA accumulators), which is not the case for EPS. Halogen lighting convertors will be covered in the framework of a lighting specific ecodesign implementing measure, because this leads to a more consistent legislative framework (differing measurement methods, importance of convertors built into luminaires, output power of convertors often larger than 250W). Battery chargers are not in the scope because the preparatory study has come to the conclusion that the potential for improving the environmental impact is minor. In particular, the potential for improving the use phase energy is not cost effective, and the contribution to the life cycle energy consumption of the products analysed in the preparatory study is less than 5%. Furthermore, appropriate measurement methods necessary for setting specific ecodesign requirements are not available.

Staged implementation of ecodesign requirements

Ecodesign requirements for active average efficiency and no-load are set, which come into force in two stages one year/two years after entry into force of the regulation. The rationale for this timing is discussed in Section 6.

Stage 1:

a) No load power consumption

The no load power consumption shall not exceed 0.50 Watt.

b) Average active efficiency

$0.50 \cdot P_O$, for $P_O < 1.0$ Watt;

$0.09 \cdot \ln(P_O) + 0.50$, for $1.0 \text{ Watt} \leq P_O \leq 51.0$ Watts;

0.85, for $P_O > 51.0$ Watts.

(here and in the following "ln" refers to the natural logarithm)

Stage 2:

a) No load power consumption:

	AC-AC external power supplies, except low voltage external power supplies	AC-DC external power supplies except low voltage external power supplies	**Low voltage external power supplies**
$P_O < 51.0$ W	0.50 W	0.30 W	**0.30W**
$P_O \geq 51.0$W	0.50 W	0.50 W	**n/a**

b) Average active efficiency:

	AC-AC and AC-DC external power supplies, except low voltage external power supplies	**Low voltage external power supplies**
$P_O \leq 1.0$ W	$0.480 \cdot P_O + 0.140$	$\mathbf{0.497 \cdot P_O + 0.067}$
1.0 W $< P_O \leq 51.0$ W	$0.063 \cdot \mathrm{Ln}(P_O) + 0.622$	$\mathbf{0.075 \cdot \mathrm{Ln}(P_O) + 0.561}$
$P_O > 51.0$ W	0.870	**0.860**

These requirements aim at realizing the use phase energy consumption improvement potential, while fulfilling the criteria for ecodesign implementing measures set out in Section 3.

The Stage 1 requirements correspond to the mandatory requirements set in federal US legislation, applicable as of 1 July 2008, and the Stage 2 requirements correspond to the new specifications (Version 2.0) of the US Energy Star programme for EPS[23]. The efficiency levels for no load/active mode are shown in Annexes 1 and 2, together with the most recent available data. The preparatory study and the analysis of most recent data have shown that these levels can be achieved with current state-of-the-art technology.

Compared to the suggestions contained in the working document, for EPS for mobile primary load products (e.g. mobile phones or MP3 players) the average active efficiency requirement is less demanding, because the environmental impact usage in "active" is less important, and there may be a trade off with material related impacts for achieving compliance. On the other hand, for mobile primary load products the no-load power consumption is more important, because often the EPS remains connected to the mains power source after the mobile primary load product is disconnected from the EPS, and consequently a more demanding no load requirement is proposed (0.3 W for EPS for mobile primary load products power, in contrast to 0.5 W).

The first stage is scheduled to apply one year after the regulation has come into force. The requirements of the first stage ensure that EPS placed on the market during the time span between the first stage and the second stage realise a certain environmental performance. In the opposite case EPS placed on the market, having life times of several years, would be placed on the market longer than needed, leading to unnecessary energy consumption (see the more detailed discussion below).

In order to allow for sufficient time for re-design for compliance, and in order to allow for economy of scale effects for technologies being not yet cost effective, the second stage is proposed to become effective two years after entry into force of the regulation (in 2011 if the regulation comes into force as foreseen in 2009).

The requirements for no-load (0.5 W/0.3 W) are more demanding than the stage 1 off-mode level for primary load products (including the EPS) of the ecodesign regulation on standby/off-mode, which is consistent.

Measurements

Measurement method

The appropriate measurement method has been developed in the context of the US Energy Star programme. The method is widely accepted and used in legislation in the USA and in China, and in further initiatives such as the EU Code of Conduct for EPS. A mandate to the European Standardisation Organisations for a harmonised standard is under preparation.

Verification procedure for market surveillance purposes

A verification procedure for market surveillance purposes has to be specified. It is proposed to foresee a tolerance of 10% for no load and 5% for the average active efficiency, because it has been argued by several Member States that the tolerance of 15% foreseen for the first test in the European Standards related to e.g. labelling under Directive 92/75/EEC leaves room for product design which could be systematically overstepping ecodesign requirements. The test procedure should eventually be part of the European standard for measurement.

Information to be provided by the manufacturers

In order to facilitate compliance checks manufacturers are requested to provide information in the technical documentation referred to in Annexes IV and V of Directive 2005/32/EC on the average active efficiency, and the no-load power consumption.

Date for evaluation and possible revision

The main issues for a possible revision of the regulation are

– the appropriateness of the levels for the ecodesign requirements;

– the appropriateness of the product scope, in particular battery chargers.

Considering that the second stage of the ecodesign requirements becomes effective two years after entry into force of the regulation, and taking into account the time necessary for collecting, analysing and complementing the data and experiences related to the second stage in order to properly assess the technological progress, a review can be presented to the Consultation Forum four years after entry into force of the regulation.

Interrelation with ecodesign implementing measures on primary load products ("vertical"), and relation to Commission Regulation (EC) No 1275/2008 on standby/off-mode

Vertical implementing measures are complementary in the sense that environmental aspects other than the energy/electricity consumption of the EPS are addressed, e.g. the overall power consumption in active-mode.

The scope of this regulation is aligned with Commission Regulation (EC) No 1275/2008 on standby/off mode, because it should cover EPS intended for use with electrical and electronic household and office equipment as defined in the standby/off mode regulation. The regulation for EPS complements the regulation on standby/off-mode, because

– it sets requirements for the average active efficiency of EPS for a broad range ("horizontal") of primary load products, and

– it sets requirements for low voltage EPS for use with "mobile" primary load products (e.g. mobile phones) which are more demanding than the off-mode requirements set out in the standby/off mode regulation.

Electrical and electronic household and office equipment placed on the market with a low voltage EPS for use with "mobile" products are exempted from the standby/off mode regulation, because the ecodesign requirements for standby/off-mode of the "system" primary load product/EPS are in practise identical to requirements for the no-load power consumption of EPS alone, because, for measuring the off-mode power consumption of the "system", only the EPS is connected to the power source (because maintaining the charge of the rechargeable battery is not "off" mode).

SECTION 5: ANALYSIS OF IMPACTS OF THE PROPOSAL FOR A "HORIZONTAL" ECODESIGN IMPLEMENTING REGULATION ON EPS

Given that options 1-4 have been discarded in Section 4, this Section analyses the impacts of option 5. To this end an assessment of possible sub-options as regards the "intensity" of the measure – i.e. the combination of the levels of requirements and the timing for the levels pursuant to Article 15(4f) of the Ecodesign Directive – is carried out.

The assessment is done with a view to the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on manufacturers including SMEs. The aim is to find a balance between the quick realization for achieving the appropriate level of ambition and the associated benefits for the environment and the user (due to reduction of life cycle costs) on the one hand, and potential burdens related e.g. to unplanned redesign of equipment for achieving compliance with ecodesign requirements on the other hand, while avoiding negative impacts for the user, in particular as related to affordability and functionality.

The following sub-options for the intensity of the measure are considered

– Sub-option 1: Stage 1 – 6 months; Stage 2 – two years

– Sub-option 2: Stage 1 – one year; Stage 2 – two years

– Sub-option 3: Stage 2 requirements applicable after two years, without a first stage setting less demanding requirements

In order to assess the impact of these sub-options, the following factors are taken into account:

Economic impacts

Costs:

– costs related to the improved technology, production and re-design of products not complying with the requirements, and supply chain

– assessment of conformity with ecodesign requirements and reassessment of conformity with further requirements (safety etc.)

Savings:

– electricity cost savings

Social impacts

– jobs related to the production of affected equipment and impacts on SMEs

– affordability of equipment

Environmental impacts

– reduction of CO2 emissions from avoided electricity use, waste and primary energy

Economic impacts

Costs related to the improved technology, production and redesign, and supply chain

Improved technology

Cost-effective technology for ensuring compliance with the requirements is readily available. In fact, the requirements of stage 1 are slightly less demanding than the LLCC as established by the preparatory study, but have set such as to be aligned with the levels of federal US legislation in force since mid 2008. This approach minimises costs for manufacturers, because many primary load products and their EPS are produced for the world market.

The energy efficiency levels for EPS of stage 2 are also cost-effective, and table 1 estimates the combined expenses for EPS in 2011 (based on feedback from manufacturers) and EPS electricity consumption during the use phase for the case that no measure is taken, and for the case that EPS comply with stage 2 requirements, respectively.

Table 1: Comparison EPS price and electricity cost savings for 2011

Combined EPS price and electricity cost no-action			
	DETC phone (6 yrs life time)	Notebook 90W (5 yrs life time)	Printer (4 yrs life time)
EPS prices (EURO)	3.50	30.00	12.50
Electricity cost (EURO)	7.10	34.40	6.20
EPS price and electricity cost with stage 2 requirements			
	DECT phone (6 yrs life time)	Notebook 90W (5 yrs life time)	Printer (4 yrs life time)
EPS prices (EURO)	4.20	36.00	15.00
Electricity cost (EURO)	4.50	22.40	4.40

However, it is expected that the price increments for EPS meeting the stage 2 requirements will vanish by economy of scale, and it is observed already now that more efficient EPS complying with the requirements of stage 2 can be even cheaper than less efficient EPS, also due to reduced material content.

Re-design

Re-design cycles for EPS and/or the associated primary load products can be very short (few months) if minor modifications only are required, but a more thorough re-design or adaptation of production to different EPS technology (linear to electronic) requires more time. The primary load products powered by EPS usually have short re-design cycles, and the changes possibly required, e.g. as a consequence of changing the supplier of EPS, affect limited aspects of the product only and can be integrated into planned re-design/upgrade of products. On the other hand the stage 2 requirements are consistent with the criteria of the US/China Energy Star programme for EPS which are effective since late 2008 and, as of beginning 2009, many EPS meeting the stage 2 ecodesign requirements/Energy Star criteria are listed in the Energy Star database.

Supply chain

Compliance with the proposed ecodesign requirements can be achieved by applying readily available non-proprietary technologies. No risks for shortages in the EPS supply chain have been flagged by stakeholders, neither for stage 1 nor for stage 2, and no significant price increase due to short supply are expected.

Impact of timing as considered in sub-options 1-3

Sub-option 1

The working document discussed in the Consultation Forum suggested that the requirements of stage 1 would become effective 6 months after the regulation has come into force. Contributions provided by manufacturers during the Consultation Forum process indicate that manufacturers both of EPS, and of primary load products acting on world wide markets, have been preparing/investing for the requirements foreseen for stage 1 in preparation of the federal US legislation, and therefore levels and timing are realistic for those companies, and no significant additional costs are expected.

However, it was pointed out that for those manufacturers not having prepared for US legislation, including SMEs operating at European level only, a transition period of 6 months could lead to competitive disadvantages because those manufacturers still have to adapt products to achieve compliance.

Requirements and timing for stage 2 have been largely supported. It is expected that the product design for achieving compliance and reorganisation of supply with EPS can be largely integrated into planned re-design, and no significant costs arise.

Sub-option 2

Compared to sub-option 1, sub-option 2 foresees a longer transition period for stage 1 requirements. This reduces/avoids the risk of competitive disadvantages for SMEs operating at European level.

Sub-option 3

It has been argued that the time difference between stage 1 and stage 2 is small, and it has been suggested to renounce stage 1, and foresee stage 2. However, this suggestion implies the following risks:

– If no requirements are established in the EU, EPS that cannot be placed on the US market since 1 July 2008 could be preferably offered/sold be placed on the market in the EU until 2011, in order to sell off EPS not complying with US legislation any more.

– These products will be operated for several years, leading to unnecessary energy consumption; this is particularly relevant for primary load products with important energy consumption in active mode.

Assessment of conformity with ecodesign requirements and re-assessment of conformity with further requirements (safety etc.)

In general assessing the conformity to the ecodesign requirements implies costs. Furthermore, products not complying with ecodesign requirements need to be re-designed, which, in general, implies the need for reassessing conformity with further requirements. This is relevant in particular for stage 1. Costs for assessing conformity are approx. 500 EURO - 1000 EURO per model/system EPS and primary load product, which is not significant because

– possible costs for re-assessment due to re-design are occurring only once per model upon introduction of the regulation, and the associated cost *per product* is negligible because for the EPS and household and office primary load products are mass market products,

– costs for assessing conformity are much smaller than further cost factors.

Electricity cost savings

It is estimated that in 2020 the regulation will lead to a reduction of the use phase electricity consumption of 9 TWh (approx. the electricity consumption of Lithuania in 2004) compared to the "no action" scenario, see table 2 below. This implies use phase electricity consumption cost savings of **one billion EUR**[26] in (electricity prices of the year 2005).

Administrative costs for Member States

The form of the proposed legislation is a Regulation which is directly applicable in all Member States. Therefore no costs are imposed on national administrations for transposition of the implementing legislation into national legislation.

Social impacts

Jobs

Sub-option 1

It cannot be excluded that some companies, including small companies/SMEs, may have difficulties for achieving compliance in time. This may lead, in the extreme, to job losses because (some of) their products can no longer be placed on the market when the regulation becomes effective and a company has failed to ensure compliance in time. In particular, feedback from SMEs implies that a timing of 6 months for the first stage may bear the risk of job losses.

[26] average electricity price in the EU 2005: 0.136 EURO/kWh

Sub-option 2

Compared to sub-option 1, in sub-option 2 the risk of job losses reduced, and the one year transition period for stage 1 is expected to avoid significant costs and competitive disadvantages for SMEs, while leaving flexibility to design for compliance with stage 2 requirements right away, or to achieve compliance with stage 2 requirements in two steps.

Sub-option 3

No job losses in particular for SMEs are expected, because the transition period of two years is considered to be sufficiently long to integrate design for compliance into planned design/redesign cycles.

Affordability of equipment

It is not expected that the cost of EPS increases to an extent which would negatively affect affordability in any of the sub-options.

Environmental impacts

Comparison of sub-options

The proposed requirements are expected to lead to a reduction of the environmental impact of EPS throughout the life cycle. The difference of the environmental impacts between sub-options 1-3 is estimated to approx. 1 TWh per year on an accumulated level, i.e. considering the impact of EPS over the whole life cycle. Taking sub-option 2 as reference (see Section 6),

– sub-option 1 would lead to approx. ½ TWh additional aggregated electricity savings, and

– sub-option 3 would lead to approx. 1 TWh additional aggregated electricity consumption.

This estimate does not take into account the risk that inefficient EPS not being placed on the market in the US may be diverted to the EU.

The requirements on the use phase electricity consumption lead to a reduction not only for the use phase electricity consumption, but also on life cycle energy consumption and on waste because the requirements lead to a market shift to electronic switch mode EPS designs, with reduced materials and amount of waste. The technical details of this aspect have been analysed in the preparatory study.

Since to a large extent the primary load products powered by EPS are produced for the world market, it is expected that the requirements of stage 2 set in this regulation will impact on the design of primary load product/EPS packages shipped to markets other than the EU, and the resulting reductions of environmental impact will be higher than those estimated for the EU alone. However, it is not possible quantify this effect.

Use phase electricity consumption, waste and total energy consumption by 2020

Due to the relatively short life time of EPS the environmental impacts by 2020 do not depend on the particular choice of sub-option.

In the no-action scenario the **use phase electricity consumption by 2020** (see table xxx) is expected to be 31 TWh. It is expected that the regulation will lead to an annual reduction by 9 TWh by 2020, corresponding to an annual reduction of **3.6 Mt of CO_2 emissions**[27] in the EU-27, and reductions of further electricity production-related environmental impacts (e.g. SO_2, NOx, heavy metals).

Waste

It is expected that the regulation will reduce waste EPS by approx. 180 kt per year by 2020 (table 2).

Total energy consumption

For the total energy consumption related to EPS placed on the EU-27 market it is expected that the regulation leads to a reduction of 118 PJ per year by 2020 (table 2). However, the impact in terms of CO2 savings cannot be quantified, because these savings occur mainly in those countries manufacturing EPS.

Table 2: environmental impacts for EU 27 by 2020 for sales and stock (i.e. installed base) of EPS

		No action	regulation	Reduction
Environmental indicators	Unit			
Total Energy (GER)	PJ	422	304	118
of which, electricity	TWh	31	22	9
Waste, non-hazardous	kton	780	623	155
Waste, hazardous	kton	98	75	22

Impacts on trade

The process for establishing ecodesign requirements for EPS has been transparent, and a notification under WTO-TBT was issued in 2008.

[27] average specific EU emissions in 2003 for EU-25: 400g CO2 per kWh (EURELECTRIC, Environmental Statistics of the European Electricity Industry, Trends in Environmental Performance 2003-2004); this figure is higher if e.g. mining related effects are taken into account (MEEuP: plus 10%)

SECTION 6: CONCLUSION - COMPARING THE OPTIONS

Comparison of the sub-options and conclusion

The following table summarizes the considerations on the impacts of the sub-options and assesses them on a relative scale from 1 (bad) to 4 (good):

	Additional Costs for manufacturers	Energy/Electricity/cost savings	**Risk for Job losses in SMEs**
Sub 1	2	4	**2**
Sub 2	3	3	**3**
Sub 3	4	2	**4**

Table 2: summary and assessment of sub-options 1-3

It is concluded that sub-option 2 is the preferred option, achieving the appropriate balance between positive environmental impacts and electricity cost savings, and possible risks related to jobs in SMEs and additional costs. Sub-option 1 would lead to a further increase of energy/electricity savings, but would impose higher burdens on manufacturers, in particular SMEs, with the risk of competitive disadvantages and job losses. On the other hand, sub-option 3 would impose lower burdens on manufacturers, while leading to lower accumulated electricity/electricity cost/CO2 emission savings, and the risk that products which cannot be marketed in the USA due to inferior energy performance are diverted to Europe, leading to higher electricity consumption.

The regulation implies in particular

- a clear legal framework which leaves flexibility to achieve the energy efficiency levels of stage 2 for EPS either in two steps, or earlier (before stage 2 comes into effect);
- fair competition by creation of a level playing field;
- no significant impacts on the competitiveness of industry, and in particular SMEs due to the small costs related to product re-design and re-assessment of conformity;
- no impact on employment in the EU, and minor impacts, if any, on employment in countries producing EPS;
- ensuring a reduction of the life cycle environmental impact of EPS;
- removing of barriers for market take up of advanced EPS, and ensure proper functioning of the internal market;
- no significant administrative burdens for manufacturers or retailers;
- no significant increase of the purchasing cost, if any, which would be largely overcompensated by savings during the use-phase of the product;

SECTION 7: MONITORING AND EVALUATION

The appropriateness of scope, definitions and limits will be reviewed after maximum 4 years from the adoption of the measure (as required by Annex VII.9 of the Ecodesign Directive and laid down in the implementing measure). Account will be taken also of speed of technological development and input from stakeholders and Member States. Compliance with the legal provisions will follow the usual process of "New Approach" regulations as expressed by the CE marking.

Compliance checks are mainly done by market surveillance carried out by Member State authorities ensuring that the requirements are met. Further information from the field as e.g. complaints by consumer organisation or competitors could alert on possible deviations from the provisions and/or of the need to take action.

Input is also expected from work carried out in the context of upcoming ecodesign activities on further product categories, and related activities as e.g. the Energy Star programme. Contributions are also expected from international cooperation as e.g. in the framework of the IEA Implementing Agreement for Energy Efficiency End-Use Equipment.

ANNEX I: MINUTES OF THE MEETING OF THE ECODESIGN CONSULTATION FORUM OF 22 FEBRUARY 2008 AS RELATED TO ECODESIGN REQUIREMENTS FOR EXTERNAL POWER SUPPLIES[28]

The **Commission services** presented the main aspects of the working document and the rationale of the approach for discussion.

Scope

Products which are not in the scope and which have not been considered in the preparatory study, e.g. chargers for industrial applications and uninterruptable power supplies, could be explicitly excluded, or clarifying elements could be added to the scope definition itself (**ORGALIME**). "Chargers" for mobile applications as e.g. digital cameras and MP3 players should be covered, and a clarifying paragraph that e.g. chargers for mobile devices are covered would be welcome (**BEUC**). In order to ensure consistent regulation, all halogen lighting convertors (i.e. internal and external) should be regulated in the same implementing measure, preferentially in the implementing measure referring to general lighting (Lot 19) (**DE, AT**), and the scope for convertors should be extended to 500W (**DE**). It should be considered to extend the scope of lighting convertors to convertors for low voltage lighting other than halogen (**SE**).

The **Commission services** underlined that the scope comprises products accounting for 95% of the combined environmental impact of external power supplies and battery chargers as analysed in the preparatory study. Battery chargers are currently difficult to address because measurement methods have to be further developed which is time consuming, while providing little added impact. It will be considered to cover halogen lighting convertors in lighting specific ecodesign legislation. On request of **DK** it was clarified that cradles powered by an EPS e.g. for a DECT phone are not considered to be an external power supply.

Ecodesign requirements for EPS

Consistency with other schemes in the world is welcome because it simplifies EPS testing and qualification. The approach to make criteria of a voluntary programme as e.g. Energy Star or the Code of Conduct mandatory is acceptable for EPS being an accessory, but it should not be applied for complex products because useful products/functionalities may disappear from the market (**EICTA**). The staged approach (**BEUC, NL**) and the demanding set of thresholds, in particular the 2nd stage requirements, are welcomed (**BEUC**).

In some cases focussing on the active efficiency compared to the no-load losses may not be appropriate. For mobile phone EPS the 2nd stage requirements may imply material-related impacts which are not unjustified for active efficiency improvement of a few percent, and improvements should be focussed on no-load having a larger environmental impact (**ORGALIME**). The issue has been discussed in the framework of the EU Code of Conduct for EPS and it was decided to set different criteria for mobile phone EPS for a restricted time only. While voluntary programmes can be fine tuned to the market, mandatory ecodesign requirements have to be enforceable. This becomes difficult for complex requirements foreseeing functional exemptions, which are not loophole proof, and one simple requirement as suggested in the working document is preferred (**NL**).

[28] Complete minutes and presentation on working document available on TREN ecodesign website

The **Commission services** underlined that the data available shows that the requirements for the 2nd stage are realistic, and acknowledged that the 2nd stage active requirements for EPS should be re-considered for those cases when EPS are typically used very little time in active mode. The consequences of the slightly modified draft for the new Energy Star specification shortly before the meeting of the Consultation Forum will be considered.

Ecodesign requirements of halogen lighting convertors

Distinct requirements for magnetic and electronic convertors should be established, because the suggested requirements imply that magnetic halogen lighting convertors cannot comply. If magnetic convertors are to be phased out a longer transition period than the suggested two year period is necessary for industry to adapt. For certain applications, e.g. convertors operated in humid ambient conditions, magnetic convertors should be allowed because electronic convertors are not suitable (**CELMA**). If an off-switch, being the preferable solution for the consumer and the environment, is on the primary side, no no-load requirement is needed (**BEUC**).

Convertors should be transferred to lighting specific implementing measure(s), e.g. under Lot 19, and built-in types of convertors, possibly being more common than convertors separate from the luminaire, should be covered. Future technologies imply that there will be convertors being connected to the lighting control network, requiring a standby energy consumption which should be considered consistent with the horizontal "standby" implementing measure, and should not be considered "no load". The power consumption levels should be 1W/0.5W for the first and second stage respectively (**CELMA**).

The **Commission services** underlined that it is not appropriate to differentiate between technologies providing the same function. **CELMA** is welcome to provide further input on applications where magnetic convertors could be indispensable. The no-load requirement is readily met by devices having an off-switch, but it is important e.g. for "wall pack" type convertors.

Measurement methods

If third-country measurement methods are incorporated explicitly into the ecodesign measure it should be clear who is responsible for common modifications, possibly required by European conditions. With fast track procedures it is feasible to develop a measurement standard in a timeframe of six months, and the corresponding mandates should be issued immediately, and the appropriate resources for European standardization organizations have to be made available (**IT**). Relevant information related to legislation and standards related to products should, in general, be easily accessible (**SE**).

The **Commission services** considered that the suggested measurement methods are suitable for European conditions. The **Chairman** invited the affected industry to flag potential difficulties which may arise due to EU specificities. The **Chairman** stressed that a standard to be referred to in an ecodesign implementing measure should be available at the point in time when the measure is tabled for vote in the Regulatory Committee. This approach has been requested by Member States as a reaction to the difficulties with labelling of air conditioning equipment. The **Chairman** confirmed that, in general, European standardization is the preferred option, but mandates should be issued on the basis of clear policy options. The time needed for developing European standards for EPS and convertors would not allow to refer to European standards in the proposal for an ecodesign measure on EPS, because this measure is to be tabled to the Regulatory Committee soon. The relevant draft mandates will be presented to the Regulatory Committee.

The implementing measure will make clear that when available, European standards will supersede the measurement methods explicitly contained in the ecodesign measure.

CENELEC welcomed that the preferred option is harmonized standards. **CENELEC** strives for quick standardization processes.

Standardization of interfaces

A decisive option to reduce material related/life cycle environmental impacts is to use a single EPS for several appliances, which would be facilitated by standardization of interfaces, and consumers could buy them separately from the primary load device. Universal chargers sold with different plugs already exist on the market. Technical difficulties should be no excuse to do nothing (**ECOS**). Mandatory ecodesign requirements are not meant to cover only energy efficiency. Facilitating the compatibility of interfaces is a key issue, and a mandatory ecodesign requirement would be necessary. A voluntary approach is not sufficient because the business model for EPS provides no incentives for manufacturers, and there is no confidence that the usual standardization process yields the necessary solutions. For each voltage type a unique interface specification should be contained in the ecodesign implementing measure (**EEB**). It is more convenient for the consumer to have only one instead of several EPS, which currently is not possible due to different interfaces. Production/transport related savings due to reduced number of EPS can be more important than energy efficiency improvements, e.g. for mobile phone and digital camera EPS. USB interfaces for mobile phones in China shows that solutions are available. The consumer should be able to make an own choice, and the consumer can choose the most efficient one (**BEUC**).

The idea to have a universal EPS is in principle a good one. But the issues relevant for standardization are not only related to standardization of the connector. EPS, charging circuitry and the battery are specified, designed, tested and certified/verified together. The energy efficiency of a universal charger cannot be the same as a charger specific for the primary load, and the environmental balance has to be considered. Safety considerations are important. In particular, EPS are tested for compatibility and safety with the primary load. There is no method available to test a universal charger with all the primary load products that it could potentially be used with. These are not excuses, but the reality (**EICTA**).

A mandate to the standardization organisations is supported (**DE, BEUC**). **BEUC** offered support to the Commission staff for issuing a mandate and underlined that the industry should be involved.

There are many technical difficulties related not only to the interface, but also to voltage/current. For standardization of interfaces mechanical or electronic coding are possible. This should be discussed by the standardization organizations. The standard should be made compulsory. If the standard is not delivered by the standardization organizations as foreseen by the mandate, the Commission should define the relevant specifications itself. In order to actually reduce the number of EPS it has to be made sure either by a voluntary or mandatory initiative that the consumer has the choice to buy an EPS or not, and primary load products and EPS are sold separately (**DE**).

Standardization of interfaces has potential cost benefits also for industry, and an initiative to investigate standardization is supported (**FR**).

The **Chairman** suggested that standardization of interfaces should not delay the process for developing the implementing measure on EPS. Possible solutions have to be realistic. A generic requirement could be considered for the regulation, linked to a mandate to the standardization organizations. Concrete input for the mandate is welcome.

Consumer information

There is still room for communication to consumers on off-mode losses, e.g. "please unplug this device to avoid energy waste", or on waste disposal, e.g. "do not put EPS into the waste bin, but bring to recycling" (**BEUC**, supported by **FR** and **EEB**).

On request of **FR** the **Chairman** confirmed that the Ecodesign Framework Directive, Annex I Part 2 provides the legal framework for consumer information requirements.

ANNEX II: STRUCTURE OF THE METHODOLOGY USED FOR ESTABLISHING THE TECHNICAL, ENVIRONMENTAL AND ECONOMIC ANALYSIS

Following the "Methodology Study Eco-design of Energy Using Products" ("MEEuP"), the tasks listed below are carried out for developing the technical, environmental and economic analysis referred to in Annex II of the Ecodesign Directive:

Task 1: Product definition, existing standards and legislation

Task 2: Economics and market analysis

Task3: Analysis of consumer behaviour and local infrastructure

Task 4: Technical analysis of existing products

Task 5: Definition of base case ("average" model) and related environmental impact

Task 6: Technical analysis of best available technology

Task 7: Improvement potential

Task 8: Policy, impact and sensitivity analysis