Explanatory Memorandum for the Ecodesign Consultation Forum

Ecodesign – External power supplies and wireless chargers

Meeting of 8 December 2022

Disclaimer:
This text is part of the working documents supporting the revision of COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies. It summarises the main elements of an initial draft of the revised legal text to support the stakeholders' consultation process, in particular the Consultation Forum meeting of 8 December 2022.
Please note that while it has been prepared by DG ENER staff and its consultants, it is by no means an official document endorsed by the European Commission.

1. CONTEXT OF THE ACT

1.1 Grounds for and objectives of the proposal

The Ecodesign Directive 2009/125/EC[1] establishes a framework for the setting of ecodesign requirements for energy-related products at EU level. It is a key instrument of the union policy for improving the energy efficiency and other environmental aspects of products placed on the market or put into service in the European Economic Area (EEA). It is an important instrument for achieving the EU energy savings objectives for 2030, and it is also expected to contribute significantly to the transition towards a more circular economy, as expressed in the Circular Economy action plan 2015[2] and the Circular Economy action plan 2020. Furthermore, the implementation of Directive 2009/125/EC will contribute to the EU's target of reducing net greenhouse gas emissions by at least 55% by 2030[3].

Ecodesign requirements for external power supplies (EPS) have been introduced in 2009[4] and revised in 2019[5]. Article 7 of the revised regulation requires the Commission to "review this Regulation in the light of technological progress and shall present the results of this review, including, if appropriate, a draft revision proposal, to the Consultation Forum by 14 November 2022. The review shall assess in particular: the feasibility of setting a requirement regarding minimum energy efficiency at 10 % load; options for including within the scope of the Regulation wireless chargers, active power over Ethernet injectors, and external power supplies used with electrical and electronic household and office equipment that is not included in Annex I; and options for including requirements in support of circular economy objectives, including interoperability."

In addition, as part of the Ecodesign and Energy Labelling Working Plan 2020-2024 (EELWP)[6], EPS are among the product groups to be possibly subject to revised requirements, and an analysis of the concept denoted as "Universal External Power Supply" has been carried out as part of the preparatory work. The outcome of the study[7], illustrates how harmonised EPS are designed to be able to power an increasingly wide number of electronic, electric and battery powered products. In this context it is important to note

[1] Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (OJ L 285, 31.10.2009, p. 10).

[2] Closing the loop - An EU action plan for the Circular Economy". COM(2015) 614 final, Brussels, 2.12.2015

[3] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality. COM(2021) 550 final, Brussels, 14.7.2021

[4] Commission Regulation (EC) No 278/2009 with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies

[5] Commission Regulation (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulation (EC) No 278/2009.

[6] Communication from the Commission Ecodesign and Energy Labelling Working Plan 2022-2024 2022/C 182/01, C/2022/2026, (OJ C 182, 4.5.2022, p. 1–12)

[7] https://www.ecodesignworkingplan20-24.eu/documents

that the USB-PD standard has been recently updated to support a power output of up to 240W over the USB Type-C cable and connector[8].

The Circular Economy Action Plan 2020[9] provides for policy measures to reduce the generation of electronics waste and to extend product lifetime. To address these challenges, the Commission initiated a 'Circular Electronics Initiative' addressing, among other policy actions, regulatory measures on chargers for mobile phones and similar devices, including the introduction of a common charger, improving the durability of charging cables, and incentives to decouple the purchase of chargers from the purchase of new devices.

In 2020 an impact assessment study on 'common chargers' with a specific focus on mobile phones[10] explored policy options to enhance interoperability of EPS, followed by a study to assess the impacts of the unbundling of chargers[11].

Now, with the proposed revision of the Radio Equipment Directive[12] a range of battery powered radio devices[13] will be required to implement a USB Type-C receptacle and being capable of being charged with a USB Type-C cable, and, in so far as they are capable of wired charging at voltages higher than 5 Volts, currents higher than 3 Amperes or powers higher than 15 Watts being compatible with the power delivery protocol defined in the USB-PD specification. Further, consumers and other end-users shall have the possibility to acquire this radio equipment without a charging device ('unbundling'). Given these requirements are set under the Radio Equipment Directive per se the scope is limited to devices in scope of this Directive and actually the proposed scope for USB Type-C and USB-PD compatibility and unbundling is further limited to a subset of battery powered radio equipment.

In order to explore options for a revision of Regulation (EU) 2019/1782 an evaluation study[14] was launched in March 2022, followed by a public call for evidence for an impact assessment[15], with a feedback period from 06 April 6, 2022 to May 4, 2022. 16 stakeholders provided input to this consultation.

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[8] IEC 62680-1-2:2022 Universal serial bus interfaces for data and power - Part 1-2: Common components - USB Power Delivery specification; USB Power Delivery (Rev. 3.1, version 1.4) and USB Type-C Rev. 2.1. NB: the EN version is due in July 2023.

[9] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A new Circular Economy Action Plan For a cleaner and more competitive Europe COM/2020/98 final

[10] European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Impact assessment study on common chargers of portable devices, Publications Office, 2020, https://data.europa.eu/doi/10.2873/528465

[11] European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Vazquez, Y., Impact assessment study to assess unbundling of chargers : final report, Publications Office, 2021, https://data.europa.eu/doi/10.2873/788086

[12] European Parliament legislative resolution of 4 October 2022 on the proposal for a directive of the European Parliament and of the Council amending Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment (COM(2021)0547 – C9-0366/2021 – 2021/0291(COD))

[13] handheld mobile phones, tablets, digital cameras, headphones, headsets, handheld videogame consoles, portable speakers, e-readers, keyboards, mice, portable navigation systems, earbuds, laptops.

[14] Evaluation of Regulation (EU) 2019/1782

[15] Call for evidence for an impact assessment - Ares(2022)2607558

Main problems preliminarily identified to be addressed by a revised regulation are:

- The need for more rapid reduction in energy use and greenhouse gas emissions
- The other environmental impacts of EPS
- Legal uncertainties

Problem drivers according to the impact assessment study are for example:

- Lack of clarity on scope
- Lack of mandatory technical standards to allow interchangeability
- Lack of information about the compatibility (adaptiveness) of EPS with the intended load
- Lack of information to consumers about the efficiency of the EPS
- Emergence of wireless charging
- Lack of efficiency requirements at low power

1.2 General context

Compatibility of external power supplies

A large number of electronic or battery-powered appliances make use of a proprietary EPS. Many of the EPS are however almost identical in characteristics and performance but are not interchangeable due to certain relatively minor features, such as the connector shape.

Most common domestic electric and electronic products, stationary or battery powered, are supplied by a DC power supply or charger. It is moreover common practice to bundle each device with its own EPS (i.e. sell it together in the same package) to ensure that it is powered or charged at the required parameters.

Many EPS, namely those used to recharge batteries, are only used for a limited period of time per day, and in many cases not even on a daily basis (digital cameras, e-books, wireless speakers, gardening tools, power tools etc.), thus could potentially be shared by several devices.

Significant gains in term of material efficiency are anticipated if EPS and products are generally unbundled, so that an EPS is only purchased if the consumer does not already possess a compatible one, or any other suitable way to power the product[16]. In addition, EPS typically have a longer lifetime than the powered product, which is usually more prone to malfunction or obsolescence. Unbundling the EPS from the powered appliances should therefore result in fewer EPS produced, re-usage of standardised cables, and in turn material and waste savings, and cost savings for consumers. A universal EPS would also eliminate the risk for consumers relying on a proprietary EPS which may become discontinued or replaceable only with a lower quality product. Indirect material savings are expected from an improved reparability and robustness of products currently using an internal power supply (IPS) should the latter be externalised. A faulty IPS may easily result in the disposal of the entire product due to high labour costs for its replacement. An external universal EPS could, on the contrary, be easily replaced by an inexperienced user.

[16] For example by using the power supply/charger of other appliances, a power-bank or a USB wall socket.

The scope of Commission Regulation (EU) 2019/1782 however only covers the EPS as such, not the device which is charged or powered with an EPS. To ensure consistency, a revision of this regulation has therefore likely to be complemented by product group specific regulations under Directive 2009/125/EC and later on, under the Ecodesign of Sustainable Products Regulation[17]. Vice versa, the revision of the Radio Equipment Directive with regards to EPS compatibility needs to be complemented by ecodesign requirements on EPS to unfold the full savings potential of up to 250 million euro a year for consumers mainly due to re-use of chargers in scope of the RED revision[18], and to reduce related electronics waste by almost 1 000 tonnes annually.

One of the challenges around the elaboration of regulatory requirements in light of the above is related to standardisation and harmonisation. Over the past decade there have been several attempts to harmonise EPS at EU level, with a focus on mobile phone 'chargers'. Between 2009 and 2014 a Memorandum of Understanding (MoU) was in place to harmonise chargers for data-enabled mobile phones sold in the EU[19]. Due to the proposition for a new MoU falling short to get rid of the market fragmentation in terms of interoperability of chargers the above mentioned revision of the Radio Equipment Directive has been initiated.

Wireless charging

Recently, a technical study to assess the current state of wireless charging[20] has been carried out to analyse the potential need to regulate interoperability of wireless chargers. The study came to the conclusion, that voluntarily the market already moves towards the Qi standard[21], which facilitates interoperability across brands and product categories. The Qi standard currently covers power transmission up to 15 W, but work is in progress to extend the standard to the 30 – 60 W range, with tablets and laptops as explicit target application. No further need for regulatory intervention has been identified to enhance interoperability of the charging pad or cradle with devices. However, there is a potential to enhance interoperability of the charging pad or cradle with external power supplies.

The energy efficiency of wireless charging is typically lower than that of wired charging[22]. The efficiency of wireless charging however is determined by the interplay of EPS, charging pad and device. Best efficiencies are typically achieved when alignment of transmitter and receiver coils is done in a co-design process, which contradicts the intention to use the same wireless charger efficiently over a broad range of products.

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[17] Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC, 2022/0095 (COD)

[18] European Commission: A common charger for electronic devices, June 2022, https://ec.europa.eu/docsroom/documents/50321

[19] MoU regarding Harmonisation of a Charging Capability for Mobile Phones, June 5, 2009, https://ec.europa.eu/docsroom/documents/2417/attachments/1/translations

[20] European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Sánchez, D., Schischke, K., Kuehnemund, M., Technical supporting study to assess the status of wireless charging technologies used for mobile phones and similar portable equipment and next expected main technological developments : deliverable 5 (D5) : final report, Publications Office, 2021, https://data.europa.eu/doi/10.2873/537546

[21] Qi specification, Version 1.3 (January 2021)

[22] Sanchez, D.; Schischke, K.; Nissen, N. F.; Lang, K.-D.: Technology Assessment of wireless charging using life cycle tools, Going Green CARE INNOVATION 2018, Vienna, Austria, 26.11.2018 - 29.11.2018

Lifetime and market development of EPS

The study in preparation of the EELWP and the Ecodesign Impact Accounting Annual Report 2020[23] have estimated the stock in the EU to about four EPS per inhabitant, or 1,71 billion units in scope of the current Regulation (EU) 2019/1782. Market dynamics largely depend on the market dynamics of the products sold with an EPS. Many of these markets are mature, in particular the larger markets in terms of units, such as mobile phones, tablet computers[24] or laptops, but there is a trend towards small battery powered appliances and gadgets, which depend on EPS for battery charging.

The main lifetime limiting factor is the end of use of the device the EPS initially has been sold with, which is in average as low as 2,5 years for e.g. entry-level smartphones[25] and in the range of 5 to 10 years for products with longer replacement cycles, such as cordless phones, laptops, monitors, cordless power tools, garden care products or home security systems. For products with rechargeable batteries, defects of the cable connecting the EPS with the battery powered device are a lifetime limiting factor for the EPS assembly due to mechanical stress, but also potentially for the battery powered device, if a replacement cable is not easily available.

In 2020 consumers in the EU paid 4,3 billion Euros for new EPS in scope of Regulation (EU) 2019/1782 (acquisition costs). This is expected to grow slightly to 4,4 billion Euros in 2040 without policy intervention[26].

Energy use external power supplies

Since the adoption of the first ecodesign requirements for external power supplies in 2009[27] energy efficiency of EPS has significantly improved. With the Commission Regulation (EU) 2019/1782 the minimum average efficiency has been increased further to correspond now with the international level VI, initially developed by the US Department of Energy[28]. These measures result in significant electricity savings in 2023 (see Figure 1).
Total electricity consumption of EPS in scope of Regulation (EU) 2019/1782 was 11,6 TWh/a in 2020, thereof 11,0 TWh/a due to active mode losses[29]. This corresponds to greenhouse gas emissions of 4,4 $MtCO_2$ eq.[30]. Total electricity consumption dropped to **9,9 TWh/a in 2022** (Primary Energy: 21 TWh/a; greenhouse gas emissions: 3,7 $MtCO_2$ eq./a) due to stock replacements being compliant with the latest energy efficiency requirements.

[23] European Commission, Directorate-General for Energy, Ecodesign impact accounting annual report 2020 : overview and status report, Publications Office, 2021, https://data.europa.eu/doi/10.2833/72143

[24] 'Ecodesign preparatory study on mobile phones, smartphones and tablets', DOI 10.2873/175802, Task 2

[25] 'Ecodesign preparatory study on mobile phones, smartphones and tablets', DOI 10.2873/175802, Task 2

[26] European Commission: Ecodesign Impact Accounting, Annual Report 2020, Overview and Status Report, Annex, p. 297

[27] Commission Regulation (EC) No 278/2009 of 6 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies (OJ L 93, 7.4.2009, p. 3)

[28] Department of Energy: 10 CFR Part 430 [Docket No. EERE–2008–BT–STD–0005], RIN: 1904–AB57, Energy Conservation Program: Energy Conservation Standards for External Power Supplies, 2014

[29] European Commission: Ecodesign Impact Accounting, Annual Report 2020, Overview and Status Report, Annex, p. 117, 207

[30] European Commission: Ecodesign Impact Accounting, Annual Report 2020, Overview and Status Report, Annex, p. 244

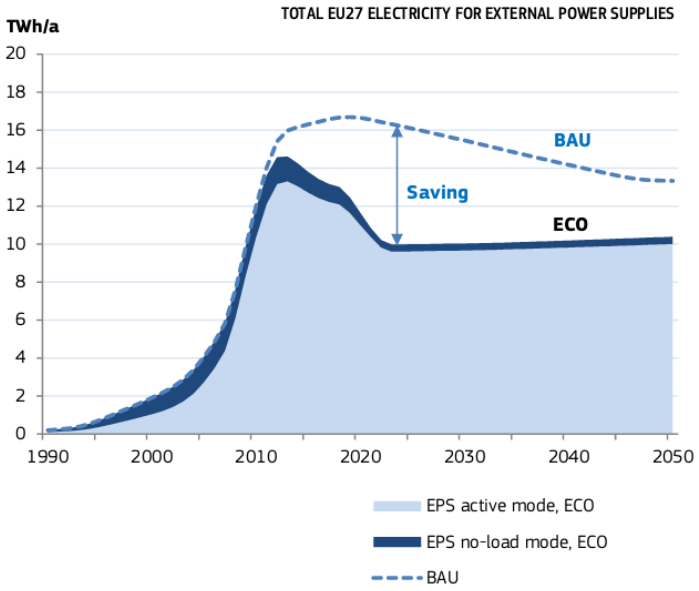

Figure 1: EU27 electricity consumption of the product group external power supplies[31]

Thanks to the information requirement regarding energy efficiency at 10% load implemented by Regulation (EU) 2019/1782 comprehensive data on energy efficiency regarding this particular aspect is available. These data have been analysed in detail as part of the Evaluation Report and indicates, as technically expected, a lower efficiency at 10% compared to the average at load points 25%, 50%, 75%, and 100%. As a tendency, the efficiency at 10% load is in average 10%-points lower than the active average efficiency. Setting a specific requirement on energy efficiency at 10% is in so far a policy option as it helps to reduce losses, when compatible EPS are increasingly used for loads which are significantly below the rated output of the EPS. In a scenario with better compatibility of EPS across a broad range of products this 10% load efficiency will become much more important than today.

Without a revision of the current regulation, total electricity consumption is forecasted to increase slowly again due to a growing market of EPS to a level of 10,0 TWh/a in 2030 (Primary Energy: 21 TWh/a; greenhouse gas emissions: 3,4 $MtCO_2$ eq./a) and 10,1 TWh/a in 2040 (Primary Energy: 22 TWh/a, greenhouse gas emissions: 3,1 $MtCO_2$ eq./a)[32].

<u>Environmental impacts due to obsolete EPS</u>

Due to the limited compatibility of EPS across models of the same product category and even less across product categories and as it is common practice to sell equipment bundled with an EPS the use lifetime of EPS is typically closely correlated with the use lifetime of the equipment the EPS is intended to power and can be as short as 1 to 2 years for some product categories. The vast majority of EPS is taken out of operation although they are fully functional. Greenhouse gas emissions of manufacturing external power supplies in the

[31] European Commission: Ecodesign Impact Accounting, Annual Report 2020, Overview and Status Report

[32] European Commission: Ecodesign Impact Accounting, Annual Report 2020, Overview and Status Report, Annex, p. 117, 207, 244

case of mobile phones and tablets is in the range of 400 to 800 g CO_2e per EPS[33]. Both the type and the processing of materials used in external power supplies are key factors when it comes to determining the environmental impacts of the devices. The production of electronics hardware requires refined materials and processing in energy-intensive cleanrooms. In manufacturing, the highest impacts on the global warming potential stem from integrated circuits (ICs) and the printed circuit boards (PCB). Additional environmental impacts stem from the use of (critical) raw materials in main electronic components. Accordingly, each discarded EPS contributes to electronics waste generation. In case of small ICT equipment the fact that without the EPS the whole product package is smaller in terms of volume and weight also significantly reduces the environmental impacts of the distribution phase, as many of these products are shipped by air cargo from assembly facilities in eastern Asia[34].
Prolonging the replacement cycles of EPS and overall reducing the number of EPS in use through better compatibility across product categories thus helps to reduce environmental impacts of EPS production, distribution and waste generation.
As the 2019 revision of the ecodesign regulation on external power supplies significantly increased the minimum requirements on efficiency, a new requirement to increase EPS use lifetime now does not create a lock-in effect of keeping inefficient EPS in use for extended periods of time.

Problematic end-of-life management

Many households do not discard their old mobile devices, but rather keep them at home in hibernation[35, 36, 37]. On the European Union level the stock of hibernating mobile phones alone is almost 700 million units[38], and it can be assumed, that the number of hibernating EPS for these devices is in the same range. Hence, there is a significant untapped potential for collecting these devices, reuse a significant share, recovering valuable materials and disposing of non-recyclable substances properly. Triggering an unbundling of EPS and device will also reduce such a hibernation effect in future. Instead of being kept in hibernation a large share of EPS is expected to be reused.

In this overall context, the evaluation study[39] identified a number of areas for potential regulatory intervention, related to a) interoperability of EPS, and b) energy efficiency, complemented by information requirements.

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[33] 'Ecodesign preparatory study on mobile phones, smartphones and tablets', DOI 10.2873/175802, see Base Cases 3 and 6

[34] 'Ecodesign preparatory study on mobile phones, smartphones and tablets', DOI 10.2873/175802, Task 5

[35] Sofies (2019): Étude du marché et parc de téléphones portables français en vue d'augmenter durablement leur taux de collecte.

[36] Bitkom e.V. (2020): Deutsche horten fast 200 Millionen Alt-Handys. In Bitkom e.V., 4/16/2020. Available online at https://www.bitkom.org/Presse/Presseinformation/Deutsche-horten-fast-200-Millionen-Alt-Handys

[37] Impact assessment study to assess unbundling of chargers, 2021, https://op.europa.eu/en/publication-detail/-/publication/90e9a07d-1054-11ec-9151-01aa75ed71a1

[38] European Economic and Social Committee (2019): Identifying the impact of the circular economy on the Fast-Moving Consumer Goods Industry: opportunities and challenges for businesses, workers and consumers – mobile phones as an example. Available online at https://www.eesc.europa.eu/sites/default/files/files/qe-03-19-510-en-n.pdf

[39] Evaluation of Regulation (EU) 2019/1782

1.3 Impact of the policy options

The proposed regulatory interventions, if complemented by product specific requirements on unbundling as foreseen with the revision of the Radio Equipment Directive, but on a broader product scale, will lead to significant environmental savings. This actual savings also depend on the users and to which extend they reuse already existing EPS for future products. The effect of broad interoperability materialises only with some delay as a reuse of EPS covered by the revised regulation will happen once the use of the product, with which it was sold initially is taken out of use. Only then the production of new EPS will be avoided.

The expected savings are in the range of 300 million units of EPS sold less per year from 2030 onwards, which means **14.000 tonnes** of electronics products are put less on the market, which consequently means avoided electronics waste later on. Avoided production and requirements on energy efficiency will lead to **savings of 1,5 TWh/a** in terms of Primary Energy across the whole life cycle of EPS on the EU27 market. The savings in terms of greenhouse gas emissions are in the range of **300.000 tonnes CO_2eq. per year**, in the years 2030 to 2040, for all measures combined. Most of this is related to avoided production but to a smaller extend also due to less emissions for distribution of products without an EPS. Similarly, savings in other environmental impact categories are achieved by these measures, including reduced acidification by 1.800 tonnes SO_2eq. per year and saved process water use of just below 2 million m^3 per year.

For consumers in the EU member states the proposed measures mean savings of close to **3 billion Euro per year** in terms of saved purchase costs for EPS in case manufacturers reduce prices of products sold without EPS accordingly. Saved electricity costs due to the measures on energy efficiency will add up to **30 million Euro per year**. Saved greenhouse gas emissions due to these efficiency related measures are **60.000 tonnes CO2eq**. per year from 2028 onwards.

Further, **avoided external damages** of the proposed measures combined are anticipated in the range of **100 million Euro in 2030** and each year thereafter.

1.4 Consistency with existing regulation and standards in EU and third countries

The Ecodesign Framework Directive 2009/125/EC is an important instrument for achieving the European targets on energy efficiency and a circular economy and the revision of regulation (EU) 2019/1782 on external power supplies is a concrete contribution to this process.

This revision has to be aligned thoroughly with the revision of the Radio Equipment Directive with regards to compatibility of a defined scope of radio equipment with USB Type-C cables and with the USB-PD specification. Products not in scope of the Radio Equipment Directive can be addressed through product group specific ecodesign regulations under the Ecodesign Framework Directive 2009/125/EC.

There is no similar regulation outside the EU and EEA requiring a common charger solution across product models or even across product groups.

Regarding energy efficiency of external power supplies legislation is in place in the United States (effective since 2016) and Canada (since 2017), requiring an EPS efficiency corresponding to level VI. With regulation (EU) 2019/1782 the same efficiency level VI became mandatory on the EU market on April 1, 2020. Since then for external power supplies also the energy efficiency at 10% load are an information requirement. The European Code of Conduct on Energy Efficiency of External Power Supplies[40] also set voluntary minimum requirements at 10% load.

Most relevant EN standards in the context of enhancing compatibility of EPS and powered application are those specifying USB components, namely USB Type-A and Type-C connectors and receptacles, and Type-C cables, and the power delivery protocol, i.e.

- EN IEC 62680-1-2:2022 "Universal serial bus interfaces for data and power - Part 1-2: Common components - USB Power Delivery specification"
- EN IEC 62680-1-3:2022 "Universal serial bus interfaces for data and power - Part 1-3: Common components - USB Type-C® Cable and Connector Specification"

These standards are complemented by EN IEC 63002:2021 "Interoperability specifications and communication method for external power supplies used with computing and consumer electronics devices".

For internal power supplies of computers a voluntary certification program '80 plus' is in place to label the energy efficiency. Six levels of energy efficiency are defined by now. No similar marking is in place for external power supplies as the existent marking with roman numbers does not provide any guidance as the highest defined level VI is already the minimum requirement in the EU.

As the proposal is closely aligned with the aforementioned regulatory initiatives, full consistency is given with existing provisions in the policy area, but further product-specific regulations, i.e., covering products beyond the scope of the Radio Equipment Directive, are required, to achieve the full savings potential of EPS interoperability.

2. LEGAL BASIS, SUBSIDIARITY AND PROPORTIONALITY

2.1 Legal basis

The proposed Ecodesign regulation is a Commission Regulation pursuant to Directive 2009/125/EC, in particular Articles 15, 18 and 19 thereof.

The legal basis for acting at EU level through the Ecodesign Framework Directive is Article 95 of the Treaty establishing the European Community[41]. Article 95 relates to the 'the establishment and functioning of the internal market' and sets as an objective a high level of protection with regards to health, safety, environmental protection and consumer protection.

[40] Version 5, 29 October 2013, tier 2 took effect in 2016

[41] Consolidated version: OJ C 325, 24.12.2002, p. 33–184

2.2 Subsidiarity (for non-exclusive competence)

The adoption of ecodesign requirements for external power supplies by individual Member States' legislation would lead to obstacles to the free movement of goods within the Union. Such measures must therefore have the same content throughout the Union. In line with the principle of subsidiarity[42], it is thus appropriate for the measure in question to be adopted at Union level. The EU will limit itself only to setting the legislative framework. As far as certain aspects of the implementation are concerned, i.e. market surveillance and monitoring, EU action is not necessary to achieve the objectives, as Member States assume these responsibilities under the Ecodesign Framework Directive.

2.3 Proportionality

The Ecodesign Framework Regulation includes a built-in proportionality and significance test in Article 15(2), which states that the implementing measures shall specify products that meet the following criteria:

a) the product shall represent a significant volume of sales and trade, indicatively more than 200 000 units a year within the Community according to the most recently available figures;
b) the product shall, considering the quantities placed on the market and/or put into service, have a significant environmental impact within the Community, as specified in the Community strategic priorities as set out in Decision No 1600/2002/EC; and
c) the product shall present significant potential for improvement in terms of its environmental impact without entailing excessive costs, taking into account in particular:
    i. the absence of other relevant Community legislation or failure of market forces to address the issue properly; and
    ii. a wide disparity in the environmental performance of products available on the market with equivalent functionality.

An assessment of the proposal in view of such requirements was carried out in the impact assessment. This concluded that the proposal fulfils the criteria, while achieving the objectives described in Section 1 of this Explanatory Memorandum. In accordance with the principle of proportionality, this measure does not go beyond what is necessary in order to achieve the objective, which is to set harmonised ecodesign requirements for external power supplies.

3. LEGAL ELEMENTS OF THE PROPOSAL

3.1 Summary of proposed options for a revised Ecodesign Regulation

The working documents on ecodesign requirements for external power supplies propose the following measures:

[42] The principle of subsidiarity as is defined in Article 5 of the Treaty establishing the European Union intends to ensure that decisions are taken as closely as possible to the citizen; the Union should take action only in areas which fall within its exclusive competence and which do not lead to a more effective action if taken at national, regional or local level.

1. As regards the scope of the proposed Regulation

The scope of the Regulation is extended to wireless chargers[43] up to 60 W.

The scope of the Regulation as regards external power supplies covers the scope of the current Regulation (EU) 2019/1782 and, additionally, external power supplies used for:

- Vacuum cleaners
- Power-over-Ethernet injectors
- Drones
- Power tools and gardening tools
- Electric bicycles with a maximum continuous rated power of 250 Watts
- Table-top LED lighting equipment and lighting equipment with rechargeable batteries for use in household environments
- Battery charging equipment:
  - Battery Chargers
  - Charging Stations
  - Docking Stations for autonomous appliances
  - Wireless charging pads
  - Battery powered charging devices ('powerbanks');

Explicitly, external power supplies placed on the market as stand-alone devices intended for one of the EPS applications listed in Annex I of the Regulation or marketed as 'universal', 'multi-purpose' or similar, which gives the consumer the impression, that the EPS is intended for at least a sub-set of applications listed in Annex I are included in the scope. To avoid any ambiguity, the EPS definition therefore is rephrased to "it is used or intended to be used with electrical and electronic household and office equipment included in Annex I".

Further, the scope is clarified by comprehensively listing information and technology equipment for which the external power supplies used in scope are used:

- Products referred to in Annex Ia of Directive (EU) 2022/… of the European Parliament and of the Council amending Directive 2014/53/EU on the harmonisation of the laws of the Member states relating to the making available on the market of radio equipment;
- Basestations for cordless phones;
- Routers and other home network equipment;
- Smartwatches, fitness trackers and other wearable devices with rechargeable batteries;
- Smart home assistants with voice recognition;
- Webcams and security cameras;
- Weather stations;

[43] Given the aforementioned fact, that the energy efficiency of the entire wireless charging process is a system aspect beyond the scope of the regulation, being determined by the interplay of the charging pad, its power supply, and the device to be charged, the only requirement, which applies to wireless chargers is the design requirement to have the wireless charging pad powered by an external power supply and not to contain the 230 V AC circuitry.

- Air quality monitors and sensors;
- Mass storage devices, multiple card readers, active USB hubs;
- Copying and printing equipment;
- Monitors;
- Set-top boxes;
- Power over Ethernet injectors;
- Computers;
- Docking stations;
- Other information technology equipment.

Lighting converters are introduced in the scope.

2. As regards definitions:

The following definitions are introduced for the sake of clarity and aiming at consistency with other Ecodesign Regulations and the terminology used by the Radio Equipment Directive:

'charger' means an external power supply to charge the battery of and provide electrical power to a battery-powered device([44]);

'wireless charger' means a system used to charge without contact of metallic conductors removable or integrated rechargeable batteries typically used in the equipment included in Annex I, which is not wired to this equipment and has a nameplate output power not exceeding 250 watts.

'wireless charging pad' means a device that meets all of the following criteria:

(a) it is designed to transmit power by inductive coupling;

(b) it is used with one or more separate devices that constitute the primary load;

(c) it is contained in a physical enclosure separate from the device or devices that constitute the primary load;

(d) it has nameplate output power not exceeding 60 watts;

(e) it is used or intended to be used with electrical and electronic household and office equipment included in Annex I;

'battery charger' means a device that connects directly at its output interface by means of contact of metallic conductors to one or more removable batteries or battery-packs for the purpose of charging;

'charging station' means a device which connects directly at its output interface by means of contact of metallic conductors with a battery-operated appliance which is placed in it for the purpose of charging.

([44]) NB: in the Radio Equipment Directive the charger / EPS is denoted as "charging device"

'adaptive external power supply' means an external power supply that can alter its output voltage during active-mode based on an established digital communication protocol with the end-use application without any user-triggered action.

'USB-PD adaptive external power supply' means an adaptive external power supply, compliant with the USB Power Deliv-ery specification;

'Power Delivery' means the capability, defined according to the USB Power Delivery Specification to supply variable power as well as exchange data with devices connected via a USB connection.

'containing product' means a product containing one or more external power supplies, and which has additional functions than the supply of DC electrical power which can be turned off without significant effort for the purpose of verification of the external power supplies. Examples of containing products are table-top LED lighting equipment with USB receptacles or wall-sockets with USB with USB receptacles.

3. <u>As regards ecodesign requirements for energy efficiency</u>

   - For the 10% load point a specific requirement is set, which is set at 10%-points below the average active efficiency requirement (which is level VI, no changes implemented as regards the active average efficiency);

4. <u>As regards ecodesign requirements for material efficiency</u>

   - To enhance interoperability of EPS and device, and thus enabling unbundling at larger scale, requirements are set for:

     - the EPS unit requiring a detachable output cable and as standard interfaces either a USB Type-A receptacle or Type-C receptacle or both; up to 15 W load both Type-A or Type-C are permissible, above 15 W Type-C is mandatory[45]
     - compatibility of the EPS (when equipped with a Type-C receptacle) with a USB Type-C cable[46];
     - the EPS shall support USB-PD, if the load (i.e. the powered device) requires voltages higher than 5 Volts, currents higher than 3 Amperes or powers higher than 15 Watts.

   This applies to all EPS in scope of the regulation up to 240 W output power and maximum 48 Volts.

[45] Type-A is specified only for USB 2.0 (2,5 W) and 3.1 (4,5 W) and is also compatible with USB-BC 1.2 with maximum 10 W; above 10 W Type-A connectors are not an option

[46] This explicitly does not mean, the powered device has to be equipped with a USB Type-C receptacle as EN IEC 62680-1-3:2021 "Universal serial bus interfaces for data and power - Part 1-3: Common components - USB Type-C® Cable and Connector Specification" explicitly covers the use of a captive cable, which "is defined as a cable that has one USB connector and is either permanently attached or has a non-USB connector".

5. As regards information requirements

   - External power supplies must bear on the nameplate a marking of the active average efficiency. For adaptive power supplies it means the lowest average active efficiency at any of the fixed output voltages supported.
   - Adaptive external power supplies must be marked with a USB-PD pictogram and must bear on the nameplate the output power and the maximum output voltage.

6. As regards transitional test methods and standardisation request for adaptive external power supplies

   - Transitional test methods introduced to determine the efficiency of adaptive external power supplies are based on the on-going related work at the DoE.
   - A standardisation request will likely be required to streamline and possibly simplify this testing

3.2 Requirements not proposed in the working document

Following requirements have been analysed in the impact assessment, based on findings in the evaluation of Regulation (EU) 2019/1782, but were discarded:

- A requirement on reparability and reliability criteria was discarded as the typical technical lifetime of an EPS exceeds the lifetime of the product it is sold with, with the exception of cables, which is taken into account by requiring detachable cables for USB EPS; further, ease of reparability of the EPS is not addressed due to safety concerns;

- The standardisation of the wireless charging protocol was considered not relevant as the industry already to a large extend adopted the Qi standard for interoperability of charging pad and battery powered devices; In addition, a universal wireless charging pad for a broad range of end-device form factors (from, e.g., fitness trackers to slate tablets) would inevitably result in pad-device-combinations with a low energy transmission efficiency and thus results in unwanted side effects;

- A requirement on energy efficiency of the wireless charging pad was discarded as efficiency of the entire charging process is a system aspect beyond the scope of the proposed revised regulation, being determined by the interplay of the charging pad, its power supply, and the device to be charged.