

Will Your Products Be Ready For Next Wave Of European Efficiency Regulations?

by Arnold Alderman, Maintenance Leader PSMA SCDB and EEDB Data Bases

In a previous Spotlight on Safety & Compliance column,^[1] I alerted designers and product planners that products sold in Europe would be required to have continuously higher efficiency to comply with 2020, 2030, and 2050 EU reduced energy consumption requirements as compared with the 2016 estimated EU power consumption level. The EU Commission created two framework directives: Ecodesign, and the corresponding Energy Labelling, which have driven efficiency improvement in the appliance category products over the past two decades. Resulting product efficiencies have increased by 40% in some cases.

Does This Affect You?

It will if you make products for sale in Europe. You will need to know what regulations are about to be completed or revised. The full Ecodesign appliance list contains 45 product "lots" or categories. Don't be fooled by the term "appliance." The list contains many products we have never thought of as appliances like batteries, power supplies, enterprise servers, UPS, etc.

Although many appliance products will not be impacted by 2020 Ecodesign revisionary work, the ones shown in Table 1 are those now in the revision process. As an example, I chose a widely used product: ENER Lot 7 External Power Supplies (EPS).

The latest Ecodesign information is available on the Energy Efficiency Database (EEDB), a free service of the Power Sources Manufacturers Association (PSMA)^[2] under "Agency: European Commission Ecodesign Directive". The top link on the PSMA EEDB page shown in Fig. 1 below takes you to the best summary source we have found for all of the Ecodesign Lots, partially shown in Table 1.^[3]

The screenshot shows the PSMA Energy Efficiency Database (EEDB) website. At the top, there is a breadcrumb trail: Home » Technical Forums » Energy Management. The main heading is "Energy Efficiency Database" with a sub-heading "Energy Management Info & Resources for the Power Electronics Industry." Below this, there are several dropdown menus for filtering: "- Agencies -", "- Agencies by Country/State -", "- Agencies by Application -", "- Agencies by Region -", and "- Regulations by Application -". A "Back to Events List" button is also present. The "Agencies:" section highlights the "European Commission EcoDesign Directive". It includes the European Union flag, the text "Locations: Europe - EU - European Union" and "Type: Mandatory Standard". A "Notes:" section states: "The European Parliament adopted this European Commission proposal for a Directive on establishing a framework for setting Eco-design requirements (such as energy efficiency requirements) for all energy using products (EuPs) in the residential, is- tertiary and industrial sectors. There are currently 26 lots (projects) being investigated." and "The ECO-Design standards activities are being reported by both ECO-Design and ECEEE." At the bottom, there is a "Links:" section with a list of links: "1. ECEEE Website Ecodesign". Navigation links at the bottom right include "Top | Links | Events | Archived Events | Regulations".

Fig. 1. PSMA Energy Efficiency Database (EEDB): European Commission Ecodesign Directive.

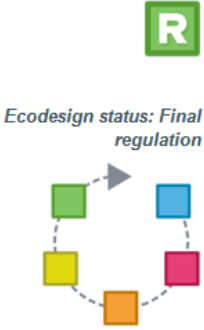
Table 1. Ecodesign Appliance Lots in the revision process.

Ecodesign	Labeling	Product lot and study	Status in the EuP process
R		Battery chargers and external power supplies: 278/2009 (ENER Lot 7)	Proposed revised ecodesign requirements were scrutinized by the WTO until 4 December 2018.
R	R	Televisions: 642/2009 and 1062/2010 (ENER Lot 5)	Adoption upcoming for ecodesign rules for electronic displays (TVs, monitors, signage).
R	R	Directional lighting: 1194/2012 and 874/2012 (ENER Lot 19)	Regulatory committee upcoming
R	R	Domestic lighting (general lighting equipment): 244/2009 and 874/2012 (ENER Lot 19)	Regulatory committee upcoming.
R	R	Domestic washing machines: 1015/2010 and 1061/2010	Public consultation ended in November 2018.
R	R	Domestic dishwashers: 1016/2010 and 1059/2010 (ENER Lot 14)	Feed back period ended in November. Public consultation upcoming.
R		Electric motors: 640/2009 and 4/2014 (ENER Lot 11)	Feed back period ended in November 2018.
R	R	Domestic refrigerators and freezers: 643/2009 and 1060/2010 (ENER Lot 13)	Revised proposals to WTO until 3 December 2018.

EPS Efficiency Regulation Activity

Looking back on the history of energy efficiency regulations, the EPS was the earliest product that engineers in many countries (including the U.S.) selected to analyze for efficiency improvement due to its single output simplicity, and the vast quantity utilized.

In my March 2019 article “Knowing the Link Between Product Regulations and Product Standards Can Put You Ahead Of The Competition”^[1] there was an explanation of Lot 5 EPS up to 2016. However, better efficiency will be needed for 2020. The ENER Lot 7 Product lot and study includes a link (see table 1 again) that brings you to the December 4, 2018 regulation revision activity illustrated in Fig. 2.



R

278/2009: Battery chargers and external power supplies

Ecodesign status: Final regulation

Last updated: 14 December 2018

Proposed revised ecodesign requirements for this product group can be found [here](#).

Existing requirements for external power supplies include most stand-alone AC/AC and AC/DC devices with a rated power up to 250 Watts and were introduced in two stages: 2010 and 2011.

Regulation in force

Ecodesign regulation 278/2009 ([pdf](#))

Ongoing

Proposed revised ecodesign requirements for this product group can be found [here](#). WTO scrutiny until 4 December 2018.

Lot number

This product group belonged to Lot number 7.

Date	Process	Key documents
2015-04	WD and updated assessment report submitted	Draft WD for external power supplies (doc) Updated assessment report (pdf) Explanatory notes (pdf)
2009-04	Regulation entered into force	Final regulation (pdf)
None	Archived documents	Archived documents (zip)

Fig. 2. Latest Ecodesign Lot 7 EPS update activity (under "Ongoing" box).

On the page shown in Fig. 2, clicking on "here" in the "Ongoing" box will bring you to the EU Commission Notification Detail Web page for the EPS, which is shown in Fig. 3.

As we see on this web page, their guiding description reads as follows:

"This draft Commission Regulation sets requirements regarding the energy performance (maximum no-load consumption and minimum average active efficiency) and information requirements for external power supplies. In accordance with Ecodesign Directive 2009/125/EC, products not meeting these requirements will not be allowed to be placed on the EU market. The draft Regulation is based on the findings of a technical, environmental, and economic study which has been carried out in consultation with stakeholders. The measures proposed were the object of an impact assessment. The draft Regulation repeals Commission Regulation (EC) No 278/2009 about Ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies."

The two documents of primary importance on this web page are

- Draft Text 1 giving the tentative applicability and timing of the new requirements, and
- Draft Text 2 providing the tentative efficiency specifications.

Click on the appropriate "en" box to access the designated document for downloading. Each Ecodesign Lot contains these two documents if revision work has progressed to the point of drafting compliance, timing, and specification documents.

Draft Commission Regulation 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 pages + Annexes 7 pages, in English)

Reference: G/TBT/N/EU/605

Date of arrival: **2018 October 05** - Final date for comments: **2018 December 04**

Description

This draft Commission Regulation sets requirements regarding the energy performance (maximum no-load consumption and minimum average active efficiency) and information requirements for external power supplies. In accordance with Ecodesign Directive 2009/125/EC, products not meeting these requirements will not be allowed to be placed on the EU market. The draft Regulation is based on the findings of a technical, environmental and economic study which has been carried out in consultation with stakeholders. The measures proposed were the object of an impact assessment. The draft Regulation repeals 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.

Objectives

Energy Efficiency
Protection of Environment

Full notification form text

en fr es

Fields of Activity

Electrical accessories

Full text of the announced text or any other relevant text

Draft Text 1 is available for download in the following languages:

en

Draft Text 2

(Annex) is available for download in the following languages:

en

Comments, answers or reactions

Comment - China - (04 December 2018) en

Comment - China - (05 December 2018) en

New Answer - European Union - (15 July 2019) en

Fig 3. EU Commission Notification Detail page for the EPS.

As an example of the type of information contained in these working documents, I have extracted the efficiency requirements for EPSs shown in Table 2. This data, which is taken from Draft Text 2, includes both no-load condition power consumption and average efficiency power consumption. Most of the maximum levels specified for power consumption (minimum efficiency levels) are lower than those of the 2009 regulation. Also note, the 10% load condition point will now be included in future average power measurements. You will need to design to this final specification for compliance on all products shipped after April 1, 2020.

Table 2. Ecodesign requirements for EPS no-load and average load power consumption.

ANNEX I
Ecodesign requirements for external power supplies

1. Energy efficiency requirements

- (a) From 1 April 2020, the no-load condition power consumption shall not exceed the following limits:

	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies	AC-DC external power supplies, except low voltage and multiple voltage output external power supplies	Low voltage external power supplies	Multiple voltage output external power supplies
$P_0 \leq 49,0 \text{ W}$	0,210 W	0,100 W	0,100 W	0,300 W
$P_0 > 49,0 \text{ W}$	0,210 W	0,210 W	0,210 W	0,300 W

- (b) From 1 April 2020, the average active efficiency shall be not less than the following limits:

	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies	AC-DC external power supplies, except low voltage and multiple voltage output external power supplies	Low voltage external power supplies	Multiple voltage output external power supplies
$P_0 \leq 1,0 \text{ W}$	$0,5 \cdot P_0 + 0,160$	$0,5 \cdot P_0 + 0,160$	$0,517 \cdot P_0 + 0,087$	$0,497 \cdot P_0 + 0,067$
$1 \text{ W} < P_0 \leq 49,0 \text{ W}$	$0,071 \cdot \ln(P_0) - 0,0014 \cdot P_0 + 0,67$	$0,071 \cdot \ln(P_0) - 0,0014 \cdot P_0 + 0,67$	$0,0834 \cdot \ln(P_0) - 0,0014 \cdot P_0 + 0,609$	$0,075 \cdot \ln(P_0) + 0,561$
$P_0 > 49,0 \text{ W}$	0,880	0,880	0,870	0,860

Comparing 2009 And 2020 Benchmarks

This benchmark information provides a quick view of the increase in 2020 efficiency targets compared to 2009.

Indicative Benchmarks Referred To In Article 6 (2009)

No-load condition

The lowest available no-load condition power consumption of external power supplies can be approximated by:

- 0.1 W or less, for $P_0 \leq 90 \text{ W}$,
- 0.2 W or less, for $90 \text{ W} < P_0 \leq 150 \text{ W}$,
- 0.4 W or less, for $150 \text{ W} < P_0 \leq 180 \text{ W}$,
- 0.5 W or less, for $P_0 > 180 \text{ W}$.

Average active efficiency

The best available active average efficiency of external power supplies according to most recent available data (status January 2008) can be approximated by:

- $0.090 \cdot \ln(PO) + 0.680$, for $1.0 \text{ W} \leq PO \leq 10.0 \text{ W}$,
- 0.890 , for $PO > 10.0 \text{ W}$.

INDICATIVE BENCHMARKS (2020)

At the time of entry into force of this regulation, the best available technology on the market for external power supplies in terms of their no-load energy consumption and average active efficiency was identified as follows.

No-load condition

The lowest available no-load condition energy consumption of external power supplies can be approximated as:

- 0.002 W , for $PO \leq 49.0 \text{ W}$;
- 0.010 W , for $PO > 49.0 \text{ W}$.

Average active efficiency

The best available active average efficiency of external power supplies according to most recent available data (status March 2015) can be approximated as:

- 0.767 , for $PO \leq 1.0 \text{ W}$;
- 0.905 , for $1.0 \text{ W} < PO \leq 49.0 \text{ W}$;
- 0.962 , for $PO > 49.0 \text{ W}$.

Summary

This article has provided an overview so you can locate the Ecodesign impact information for your product. For further perspective, Ecodesign products are estimated to contribute 50% of the European 2020 energy savings. Therefore, it is easy to understand the focus on these products.

Looking at the example of the EPS efficiency requirements gives you an idea of the amount of efficiency improvement you will need to design into your product. You will want to check the upcoming specification changes that will confront your product in Europe. Keep in mind that this present upgrade in efficiency specifications is happening worldwide.

References

1. "[Knowing The Link Between Product Regulations And Product Standards Can Put You Ahead Of The Competition](#)" by Arnold Alderman, Spotlight on Safety & Compliance, How2Power Today, March 2019.
2. [PSMA Energy Efficiency Database \(EEDB\)](#)
3. "[ECEEE Website Ecodesign](#)"

About The Authors



Arnold Alderman is founder and president of Anagenesis, a technical marketing consultancy in Los Angeles, CA. Arnold has headed up the PSMA SCDB standards data base and the PSMA EEDB efficiency regulations data base maintenance task force at Anagenesis since 2016 and 2010 respectively. He is a member of the PSMA Safety and Compliance and the Energy Management Committees.

Arnold has 17 years of experience as a technical marketing consultant assisting over 30 companies from start-ups to major international conglomerates. Anagenesis combines both engineering and marketing skills to develop both commercial and client specific market reports. He has been a keynote speaker

at international conferences and has conducted marketing and technology seminars worldwide. He has 16 years of experience in product and strategic marketing at both Fairchild Semiconductor and International Rectifier. Arnold also had 12 years prior experience in commercial power conversion equipment design, ranging from 2 W to 12 MVA, in a broad variety of power electronics applications. He holds an M.B.A. from the University of New Haven, in Connecticut and a B.S.E.E. from Northeastern University in Boston, Massachusetts. Arnold also holds four patents.

For further reading on power supply-related safety and compliance issues, see How2Power's special section on [Power Supply Safety and Compliance](#).