Knowing The Link Between Product Regulations And Product Standards Can Put You Ahead Of The Competition

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

Maintaining the Power Sources Manufacturers Association (PSMA) Energy Efficiency Data Base (EEDB) and the Safety and Compliance Data Base (SCDB) has given me the unique opportunity to track and understand the relationship between the product regulations in the EEDB and product standards in the SCDB.

A *regulation* is a rule or directive created and maintained by an authority such as a country, federation of countries, states, or provinces. Enforcement is by law. Content is available to the public for free.

A *standard* is a document created by consensus and approved by a recognized body or organization for common or repeated use. Standards may be international or regional. Most standards are available to the public for a fee levied by the organization. Enforcement occurs when a label is attached to the product indicating compliance.

Regulations precede and influence certain performance and test standards. This article explains how company standards staff and design engineers can monitor and influence a regulation far in advance of any standard(s) creation thus better positioning their company products for success under the new regulation.

Beginning with a historical example, I chose the European Union (EU) and the relationship between the Ecodesign efficiency regulation and the relevant IEC standard(s). I find that they have the clearest and most easily understood creation process. Once the regulation/standard association is covered, then we will see how it applies to the next regulation upgrade now commencing. Everything explained here applies to creative processes in the U.S. and other countries using the organizations and processes of those countries. The U.S. processes will be covered in a future article.

Why Regulation Tracking Is Important

The EU target power consumption reduction translates into the required performance of a multitude of energy-related products (ErPs). EU Parliament in their DIRECTIVE 2009/125/EC established the framework for Ecodesign creating a framework for more than 35 lots with each lot having one or two appliances. Ecodesign legislation listing all of the energy-related products is shown in reference 1. In 2009, Ecodesign Lot 7 (CELEX:32009L0125)[2] contained both EPS and small battery chargers. We will focus on the EPS.

EU Regulation Development

The regulation creation process is very slow. Comprised of five steps and conducted over several years, it allows a supplier adequate time to prepare products for compliance with the new regulation.

Action 1: The EU Commission assigns a team of analysts, both commission staff and consultants, to determine the energy consumption level reduction needed.

Action 2: The EU targets are then translated into product performance (in this case, efficiency) by Ecodesign teams. European Parliament Directive 2005/32/EC established the five process Ecodesign steps shown in Fig. 1. Using these steps, the Ecodesign team develops the efficiency performance requirements for an ErP adequately contributing to the overall EU power consumption level target.

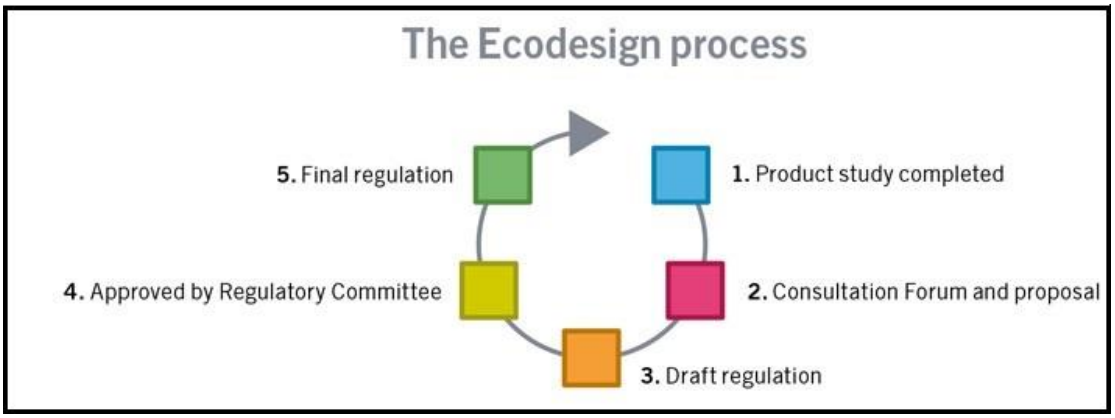

Fig. 1. Ecodesign process steps.

The Ecodesign Lot 7 team determined EPS power consumption could best be reduced by focusing on a) the no-load electric energy consumption and b) the average active-mode efficiency. Executing the five steps in Fig. 1, they arrived at the approved minimum efficiency levels that were passed into law as a part of EU COMMISSION REGULATION (EC) No 278/2009 on April 6, 2009.[3]

Table 1 from that regulation established the acceptable performance limits in terms of no-load power consumption and average active efficiency. (Note: Table 1 refers to low-voltage external power supplies. Low voltage is defined in Article 8, para. 2 as less than 6-V output voltage, and more than 550-mA output current.)

Table 1. 2011 external power supply minimum performance limits.

(b) **Two years** after this Regulation has come into force:

The no-load condition power consumption shall not exceed the following limits:

	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
$P_O \leq 51{,}0$ W	0,50 W	0,30 W	0,30 W
$P_O > 51{,}0$ W	0,50 W	0,50 W	n/a

The average active efficiency shall be not less than the following limits:

	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	$0{,}480 \cdot P_O + 0{,}140$	$0{,}497 \cdot P_O + 0{,}067$
$1{,}0$ W $< P_O \leq 51{,}0$ W	$0{,}063 \cdot \ln(P_O) + 0{,}622$	$0{,}075 \cdot \ln(P_O) + 0{,}561$
$P_O > 51{,}0$ W	0,870	0,860

The document that identifies the associated standard from which the test procedure is derived is EU Document 52015XC0415 (01)[4]with an extensive title referred to in the reference. (Note that publication titles and references of harmonized standards are applicable under EU harmonization legislation.) Table 2 from that document identifies the associated Standard EN50563-2011 with first publication in 2013. (Note that maximum no-load power consumption was first established by U.S. Executive Order 13221 July 31, 2001.)

Table 2. From EU Commission communication: Coupling is identified between the standard EN 50563 test procedure and the EPS efficiency regulation. (Implementation – 2015/C 120/02).[5]

(2015/C 120/02)

ESO (1)	Reference and title of the standard (and reference document)	Reference of superseded standard	Date of cessation of presumption of conformity of superseded standard Note 1	First publication OJ
Cenelec	EN 50563:2011 External a.c. - d.c. and a.c. - a.c. power supplies – Determination of no-load power and average efficiency of active modes			7.5.2013
	EN 50563:2011/A1:2013	Note 3	30.9.2016	This is the first publication

Associated IEC Standard

The standard associated with the regulation may be any type including a performance standard, or a test standard. In this example, IEC 50563 is a test standard.[6] This standard creation is not historically accurate but is estimated to have started by a European Committee for Electrotechnical Standardization (CENELEC) team in 2008.

Ecos Consulting initially developed the equations in Table 2 during California Energy Commission (CEC) and Energy Star work in 2003 and subsequently modified them in 2006 and 2007 during further CEC efficiency regulation test procedure work. The equations were later adopted by Ecodesign during their harmonization efforts in the 2008/2009 time frame.

Development Timeline

The advantage of monitoring the regulation prior to commencing the standard creation becomes clear when the timeline of these two documents is illustrated in Fig. 2. Following the timeline figure, the regulation establishing the process was started in 2005. Subsequently, the standard EN 50563 development commenced a year or so before the conclusion of the Ecodesign Lot 7 regulation work in 2009. So, the regulation development work occurred very early compared to the standard work.

By participating in or at least monitoring the regulation performance development, a one-year advantage was available to the manufacturer to prepare their product for compliance and competitive positioning. Issued in 2011 and becoming effective in 2015, the standard EN 50563 set the final EPS testing procedure for an efficiency performance product in compliance with the Ecodesign Lot 7 regulation.

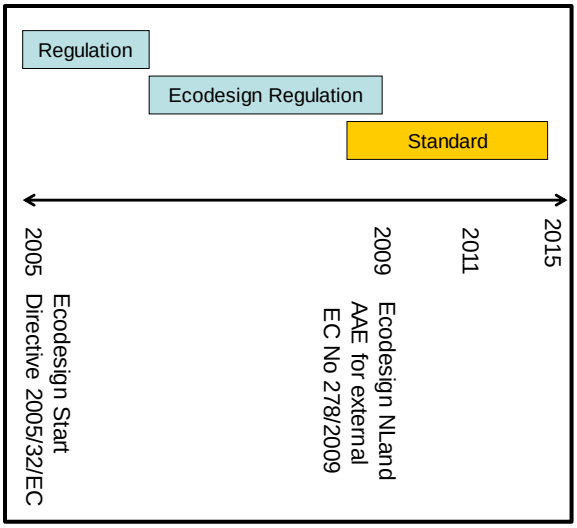

Fig. 2. Timeline for regulation example and the associated standard.

Better Prepared

A supplier company, heeding the advice of their standards engineer, would normally take advantage of the multi-year standard creation work by participating in or monitoring the action of the standards committee. However, the timeline illustrates that there is an even greater advantage to be realized by being involved in or cognizant of the regulation creation process.

Next Phases

What about present efficiency regulations and standards? Many suppliers incorrectly believe that the 2005-to-2015 sally of energy efficiency regulations and standards is over, requiring no further compliance effort. But that is not the case. Regulation creation is an ongoing process as shown for this efficiency regulation case with government and non-government agencies seeking to continue reductions in power consumption.

However, by directive, the EU continues to raise the efficiency bar. They are using projected power consumption for the year 2016 to determine future required energy consumption reductions for the next decades. The EU has negotiated the targets of 20% reduction by 2020, and 32.7% by 2030[7] with all countries and their experts. (Note that other countries are doing the same. Countries' targets may vary so check those countries for which you have concerns about product acceptance. Even states and provinces sometimes set their own aggressive goals.) [8,9]

Their seriousness is reflected by the following statement: "The revised Energy Efficiency Directive (EU) 2018/2002 (Energy Efficiency Directive (EU) 2018/2002)[8] sets a 2030 target of 32.5%, also with a possible upward revision in 2023. The new Governance Regulation (EU) 2018/1999 includes the requirement for the Member States to draw up integrated National Energy and Climate Plans for 2021 to 2030 outlining how to achieve the targets and submit the draft to the European Commission by the end of 2018".[10]

Fig. 3 illustrates Phases 2 and 3 creating the Ecodesign EPS regulation for 2020 and 2030 respectively. Since EN 50563 is a test standard not a performance standard, very little if any update will be required as this standard is used in Phases 2 and 3. In this instance, all attention should be on the developing regulation.

If the associated standard had covered EPS performance, that standard would need updating in the later phases following the requirements dictated by the subsequent regulations. Phase 1 depicts the original regulation work effective in 2015. The present 2020 update is in Phase 2. The future 2030 work is covered in Phase 3. In each case, the first step is creating the regulation target followed by the determination of the Ecodesign appliance-specific performance.

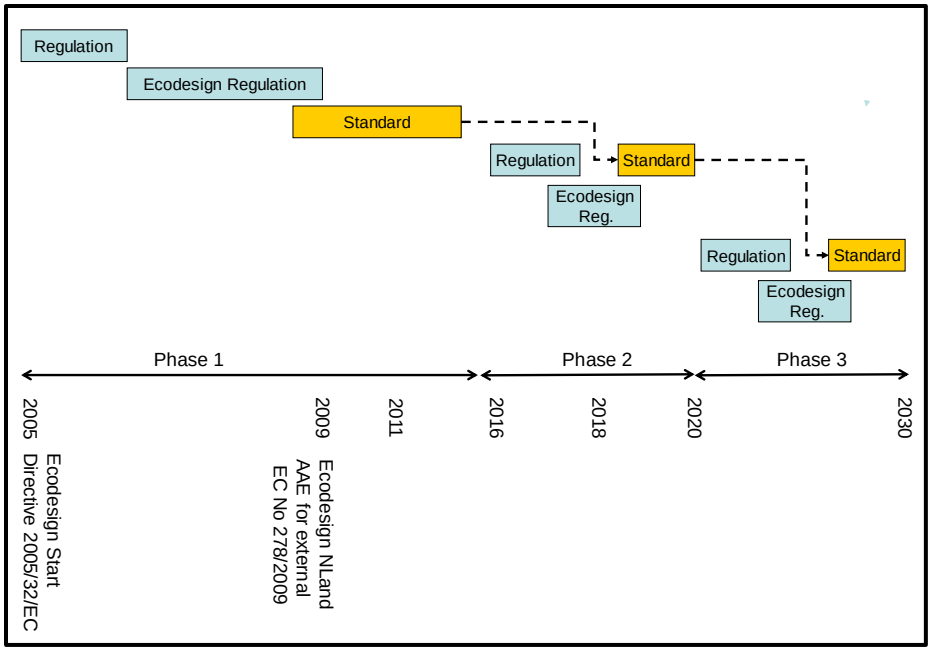

Fig. 3. Timeline for regulation example and associated standard through 2030.

Summary

In this article, we have shown that there sometimes is a link between a regulation and a standard. Our example, taken from the EU history for the EPS product regulation, clearly identifies that there is regulation development occurring several years before the associated standard development. Knowledge of this link is priceless when working to achieve product compliance and maintain a competitive advantage.

A final note: sometimes even earlier work will provide insight into regulation content. The equations in Fig. 1 were first derived in 2003 by Ecos Consulting for the California Energy Commission. These equations were subsequently improved through the efforts of CEC, Energy Star, and the EU. Those involved in this early work gained almost a decade of advantage on their competitors.

References

1. Eco-design legislation listing all of energy-related products.
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3. https://www.eceee.org/static/media/uploads/site-2/ecodesign/products/Battery%20charges%20and%20external%20power%20supplies%20Lot%207/finalreg-eps.pdf
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About The Author

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 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.