Integrated Product Policy Instruments

Remmen, Arne; Andersen, Rikke Dorothea; Dalhammar, Carl

Publication date:
2010

Document Version
Early version, also known as pre-print

INTEGRATED PRODUCT POLICY INSTRUMENTS

Brief prepared for the Workshop "Ecodesign and Resource Efficiency" in Copenhagen 26 November 2010

Arne Remmen[i], Rikke Dorothea Andersen[ii], Carl Dalhammar[iii]

1. INTRODUCTION

Today, electronic products are everywhere in the households. The quantity is increasing; it is common to have a TV not only in the living room, but also in the bedroom, the kitchen and even in the children's rooms. According to the Danish Energy Agency the number of TVs in Danish households has grown from around 2.2 million in 1980 to 5.5 million in 2008 [1]. That equals a growth from approximately 1 TV per household in 1980 to around one per person in 2008. Also the variety of products is increasing; on the ICT side families have TV, DVD player, Xbox, Play Station or Wii, PC, laptop, fixed line phone, several mobile phones and the list could go on. With this amount of products the environmental impacts of a household cannot be traced back to one or two major contributors, but it is spread on many different products. Even though several of these products are getting more energy efficient, then the amount and the use of ICT is expanded, so the overall trend is increasing or in the best cases stable electricity consumption.

The products are also getting more complex both in terms of their function and the technique inside the product, but also in terms of their product chain and the stakeholders involved in the products' life time. A product might be sold in Denmark, but is produced in South Korea with suppliers and sub-suppliers from China, Malaysia and Singapore delivering parts to the final product. Once the product is broken or out of fashion, it is thrown out – hopefully in a way so it can be disassembled, materials reused and toxic substances handled properly. Unfortunately, loads of old ICT equipment end up in scrap yards in India or Africa, where they are disassembled in ways that endangers both the environment and human health.

1.1. Integrated Product Policy

This development has challenged the approach to regulation and stimulation of innovation of cleaner products. EU did respond to the above trends by introducing the Integrated Product Policy (IPP) in the late 90'ties. IPP was developed in cooperation between the Commission and stakeholders [2]. IPP is based on several key principles, first of all *the life cycle perspective* that means considering the entire product life cycle from the extraction of raw materials, production, transport, use, recycling and disposal. This aims at considering both the cumulative environmental impacts and avoiding burden shifting, where environmental impacts in a single life cycle phases are addressed with the result of increasing the environmental impact in another life cycle phase. Furthermore, IPP is an integrated approach aiming at promoting measures to reduce the environmental impact of products at a point, where this is most effective [2]. This covers the product life cycle approach to ecodesign.

Further key principles of IPP were introduced as "working with the market", "stakeholder involvement", "continuous improvement" and "a variety of policy instruments". [2]

1.2 Product-oriented Policy Instruments

Since the introduction of IPP the overall frame for this type of initiatives has been labelled: Sustainable Consumption and Production.

Furthermore, several legislations implementing a product oriented policy have been enacted. The following five are especially relevant in this context:

- Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
- Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE)
- Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products (EuP)
- 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 (ErP)
- Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel
- Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products

Each of the regulations has their own rationale and approach to a product oriented policy. The hypothesis in this paper is that the potential synergy between the different ecodesign directives on the one hand and the energy- and eco-labels one the other hand is not fully utilized. The implementation of ecodesign principles and practices in European enterprises could be expanded with a more coordinated effort.

The synergy between different EU regulations is analysed in this paper with the aim of investigating to what extent ecodesign is implemented in the different directives. First, an analysis of the EuP Directive and its potential to implement ecodesign is presented. Thereafter, analyses on how ecodesign is implemented in the RoHS and WEEE Directives are presented. Analyses of EU's ecolabel and the energy label are presented and finally the synergy between the two different types of policy instruments is analysed. Throughout the paper the requirements for televisions will be used to exemplify.

2. RESULTS

The concept of eco-design has been applied at enterprises and universities since the late 90'ties, and became well-known through publications e.g. the UNEP manual: "EcoDesign: A promising approach to sustainable production and consumption" in 1997 by Brezet and van Hemel; and "How to do eco-design" in 2002 by Ursula Tischner, et.al. Compared to many other tools, then the core focus is on all life cycle phases and the potential for environmental *improvements* of the product in each of these phases based on former knowledge and basic environmental design principles. More recently, eco-design has also been connected to more functional and system oriented approaches such Design for Sustainability, Product Service System and System Innovations.

This comprehensive approach to eco-design is somehow different from the approach chosen by EU in the different so-called eco-design directives.

2.1 The EuP and ErP Directive

The EuP and ErP Directive establish a framework for setting ecodesign requirements for energy using and energy related products. The ecodesign requirements are set up in implementing measures (IM). The objective of the Directives is to ensure free movement on the market of products in compliance with the ecodesign requirements and "*it contributes to sustainable development by increasing energy efficiency and the level of protection of the environment, while at the same time increasing the security of the energy supply*" [3].

The requirements of the IM will be gradually tightened in order to ensure continuous improvement. The implementation of the EuP Directive indicates that focus in the IM is towards only setting requirements for the energy consumption and energy efficiency. The argument for focusing solely on power consumption is presented in the comments to the Regulation. It is argued that environmental impacts related to hazardous substances in the TVs and waste from disposed TVs are addressed in the RoHS and WEEE Directive, respectively. In Table 1 the focus areas of the nine IM that have been adopted so far are listed. This shows clearly that focus is not on an integrated thinking as originally in the concept of ecodesign and IPP as well. The EuP Directive does however have the potential to implement ecodesign, if not only the area with THE most important environmental impact is addressed and if more generic requirements are set up.

2.2 The RoHS Directive

The RoHS Directive restricts the use of certain chemical substances in electronic and electrical equipment. The restriction concerns cadmium, lead, mercury, hexavalent chromium, poly-brominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE), in quantities exceeding maximum concentration values. While there is no direct formulation on ecodesign, the aim of the Directive is "*to contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment*" [4]. If electrical and electronic products do not comply with the regulation the products are prohibited from being sold on the EU market [5].

According to the Commission the RoHS Directive has prevented several thousand tonnes of the prohibited substances from being placed in the products. Furthermore, design practices in this regard have changed also in countries outside the EU. However, compliance checks in EU member states

have revealed that up to 44% of the EEE that was checked for compliance does still not comply with the Directive. [6]

2.3 The WEEE Directive

The WEEE Directive aims to establish an individual producer responsibility for the take back and treatment of WEEE by making the producer economically responsible for the take back and an environmental friendly treatment of WEEE. The producer can comply with this regulation individually or by joining collective schemes. The WEEE directive also sets requirements as to the recovery rates of the products in scope. The purpose of the WEEE Directive is, "*as a first priority, the prevention of waste electrical and electronic equipment (WEEE), and in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. It also seeks to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, e.g. producers, distributors and consumers and in particular those operators directly involved in the treatment of waste electrical and electronic equipment*" [7].

The idea behind the regulation is that by making the producer responsible for the end of life phase of their products, this will give economic incentives for the producer to integrate considerations about the product's end of life phase and recycling options in the design phase. Article 4 of the Directive says: "*Member States shall encourage the design and production of electrical and electronic equipment which take into account and facilitate dismantling and recovery, in particular the reuse and recycling of WEEE, their components and materials.*" [7]

A recent study has revealed that only seven member states have fully implemented the individual producer responsibility and seven member states have completely ignored the implementation of individual producer responsibility [8]. In the latter countries the producers can join collective schemes, where they are not financially responsible for the take back of exactly their products, but the payments are based on averages. In these member states the incentives for ecodesign have diminished significantly, and it is questionable whether the WEEE Directive serves its purpose related to ecodesign at all.

2.4 The Flower

The Flower is the European ecolabel established in 1992. A large range of products can be awarded the ecolabel from campsite services to paint and refrigerators. In this paper the requirements for TVs are investigated further.

The latest Commission Decision on establishing the revised ecological criteria for the award of the Community Ecolabel to TVs was published in March 2009 and focuses on the following areas [9]:

- Power consumption in on-mode
- Power consumption in standby
- Maximum energy consumption
- Dismantling
- Life-time extension
- Chemicals in products
- Information requirements

From the above list it is clear that the Flower expands the focus of criteria compared to the EuP Directive. Besides setting criteria to the energy consumption in the use phase, criteria are set to other life cycle stages and other types of environmental impacts.

Since the introduction of the label the number of labelled products and services has grown steadily. In the beginning of 2010 1064 licences were awarded, 6 of these to TVs. [10]

2.5 The Energy Labelling Directive

The first energy labelling Directive was adopted in 1992. The Directive sets a framework for mandatory energy labelling requirements for household appliances, such as refrigerators and washing machines. In 2010 a revision of the Directive was adopted, which includes energy related products in the scope [11].

As in the EuP Directive, requirements of the Energy Labelling Directive are set up in IM. To exemplify the IM for TVs is used. The following analysis is of the proposal put forward in September 2010 [12].

The labelling requirements proposed are that televisions placed on the European market must be supplied with a label with the following information:

1. the energy efficiency class
2. the on-mode power consumption and the annual on-mode energy consumption
3. the screen size in diagonal

Obviously, the label focuses only on energy efficiency. The intention is that the criteria for labelling shall be gradually tightened, meaning that for the label applicable 12 months after the publication of the IM the most energy efficient label possible to obtain is A. From 2014 it will be possible to obtain the label A+ and the F will be the least efficient label. In 2016 A++ will be the most efficient

label and E will be the least efficient label. Finally in 2020 the most efficient label is A+++ and D will be the least efficient label. [12]

In Figure 1 the requirements to on-mode power consumption of the EuP Directive, the Flower and the Energy labelling Directive is illustrated. As the Energy labelling Directive works with an energy efficiency index, which is divided in intervals, the lines in Figure 1 represent the maximum power consumption the products must have in order to obtain the given label. As an example, in order for the product to obtain the energy efficiency label A+ the product must have a power consumption that is between the A+ line and the A++ line.

2.6 The Synergy between Policy Instruments

Two results can be concluded from the above;

- The synergy between the different product policy instruments can be improved
- The synergy between the EuP, WEEE and RoHS Directives can be improved.

Five product-oriented policy instruments are presented above. Four of the instruments are mandatory, that is the EuP, RoHS, WEEE and Energy labelling Directives, while the Flower ecolabel is voluntary. The three directives set minimum requirements that expels the worst performing products from the market, then the Energy labelling Directive aims at giving the producers incentives to produce continuously improved products. The Ecolabelling Directive also aims at creating incentives for producers to produce environmentally improved products, but on a voluntary basis, and for the best 10-20% of the product group.

In Figure 2 the aim of the different policy instruments is illustrated. RoHS and EuP directives set minimum standards for products' environmental performance, thereby removing the worst performing products from the market. In the other end of the scale, ecolabels set voluntary criteria that only the best performing products on the market can fulfil. The ecolabels are continuously updated and tightened to ensure that only the 10-20% best products can fulfil the criteria. In this way the ecolabels can generate changes in the market that can create a pull towards more environmental friendly products.

It is recognized that the directives and the ecolabels are creating different incentives to the manufacturers, cf. Figure 2. However, as the IM of the EuP Directive is not setting comprehensive requirements in terms of fulfilling the aim of ecodesign, then the rather obvious linkage between the ecolabel and the IM have not been utilized.

Many years of work and experience is behind the ecolabels with setting environmental criteria for products based on the hot spots of a products environmental performance. By creating a common information platform / evidence base between the different policy instruments this knowledge could have been utilized and have led to a faster and more comprehensive implementation of the EuP Directive by including more environmental impacts categories in the scope of the IM. This type of synergy is visible when considering the proposal for IM of the Energy labelling Directive. The energy efficient index determining the label applied to TV fits for some of the categories to both the Flower and the IM of the EuP Directive.

2.7 The Synergy between EuP, WEEE and RoHS Directives

It is a balance on the one hand to develop regulations of the environmental impacts of products in a life cycle perspective and on the other hand not create inexpedient double regulation that confuses producers, consumers and regulators. However, the objective of the EuP Directive can only be fulfilled by looking at the entire product life cycle and setting requirements to all important environmental impact categories.

Especially, the WEEE Directive does not fulfil its objective of ecodesign, and a challenge for revision of the IM in the future is to set specific requirements on design for recycling, material use, etc. as part of the EuP IM without conflicting with the WEEE Directive (since WEEE does not set such requirements). The RoHS Directive has to some degree fulfilled its objectives, but improvements can be made. Chemical requirements in the EuP IM could be an information obligation on the product's content of Substances of Very High Concern (SVHC) of the candidate list in the REACH Regulation.

As the existing regulation only to a limited degree fulfil their objectives on ecodesign, the EuP directive could without compromising other regulations encompass requirements on the environmental impact of the entire life cycle of the products. It is likely that requirements in three different directives creates confusion and lack of coherency – and one way to avoid "double regulation" is obviously to gather directives with the same overall objective – ecodesign – in a common Directive.

In spite the critical comments to the current processes and content of the IM, then the EuP directive is a strong policy instrument on the right track and more dynamic – compared to ROHS (that just has been recast without significant changes) and WEEE that fails on the ecodesign dimension. Besides, a further benefit is that it will create clarity among regulators, producers and consumers, and the manufacturers will only have one "door" to consider – in the long run generic requirements of the EuP Directive could be a guidebook on ecodesign and on how enterprises can develop cleaner products.

3. DISCUSSION

The EuP/ErP Directive has achieved its objective, when it comes to removing products with poor energy performance from the internal market in EU. The directive is a strong policy instrument and very likely the most important means to reduce energy consumption in the EU. Furthermore, the directive has the potential to be a driver for innovation, if the requirements in the IM are gradually tightened – reflecting new technologies and market changes.

However, as an ecodesign directive the aim of EuP/ErP can also be seen as to make manufacturers "embed" ecodesign practices in their design and operation practices. In this view, the EuP/ErP directive has been less successful as the IMs focus almost exclusively on energy consumption in the use phase. Taking the two other IPP directives into consideration, the RoHS and WEEE Directive, the picture does not change much. Looking at the criteria for TVs of the European ecolabel more environmental aspects are included and the criteria decided for on-mode power consumption are stricter.

Therefore two conclusions can be drawn:

1. It is time to create a synergy between the IPP directives and the European ecolabels and thereby utilize the knowledge that already exist on environmental hotspots for the different products groups. For instance by introducing a common information platform/evidence base. A further benefit besides sharing of knowledge and experience is that a common evidence platform will reduce the time for preparatory studies when developing new requirements.
2. If we want to stimulate ecodesign practices among manufacturers, one possible solution is to convert the EuP Directive into the ONE ecodesign directive, as was the intention from the beginning. This means including more environmental aspects and life cycle phases into the requirements instead of in the directive to refer to other directives that do not include the preventive eco-design issue after all.

Table 1: Focus area of the nine adopted IM of the EuP Directive [13, 14, 15, 16, 17, 18, 19, 20, 21]

	Entry into force	Adopted	Power consumption	Energy efficiency	Lamp efficacy	Performance	Motor efficiency	Information requirements
Television	12.08.09	22.07.09	■					■
Standby and off-mode losses	07.01.09	17.12.08	■					■
Battery chargers and external power supplies	27.04.09	07.04.09	■	■				■
Tertiary lighting	13.04.09	18.03.09	■	■	■	■		■
Simple set-top boxes	25.02.09	04.02.09	■					■
Domestic lighting	18.03.09	14.04.09	■		■	■		■
Electric motors	12.08.09	22.07.09					■	■
Circulators	12.08.09	22.07.09		■				■
Domestic refrigeration	12.08.09	22.07.09		■		■		■

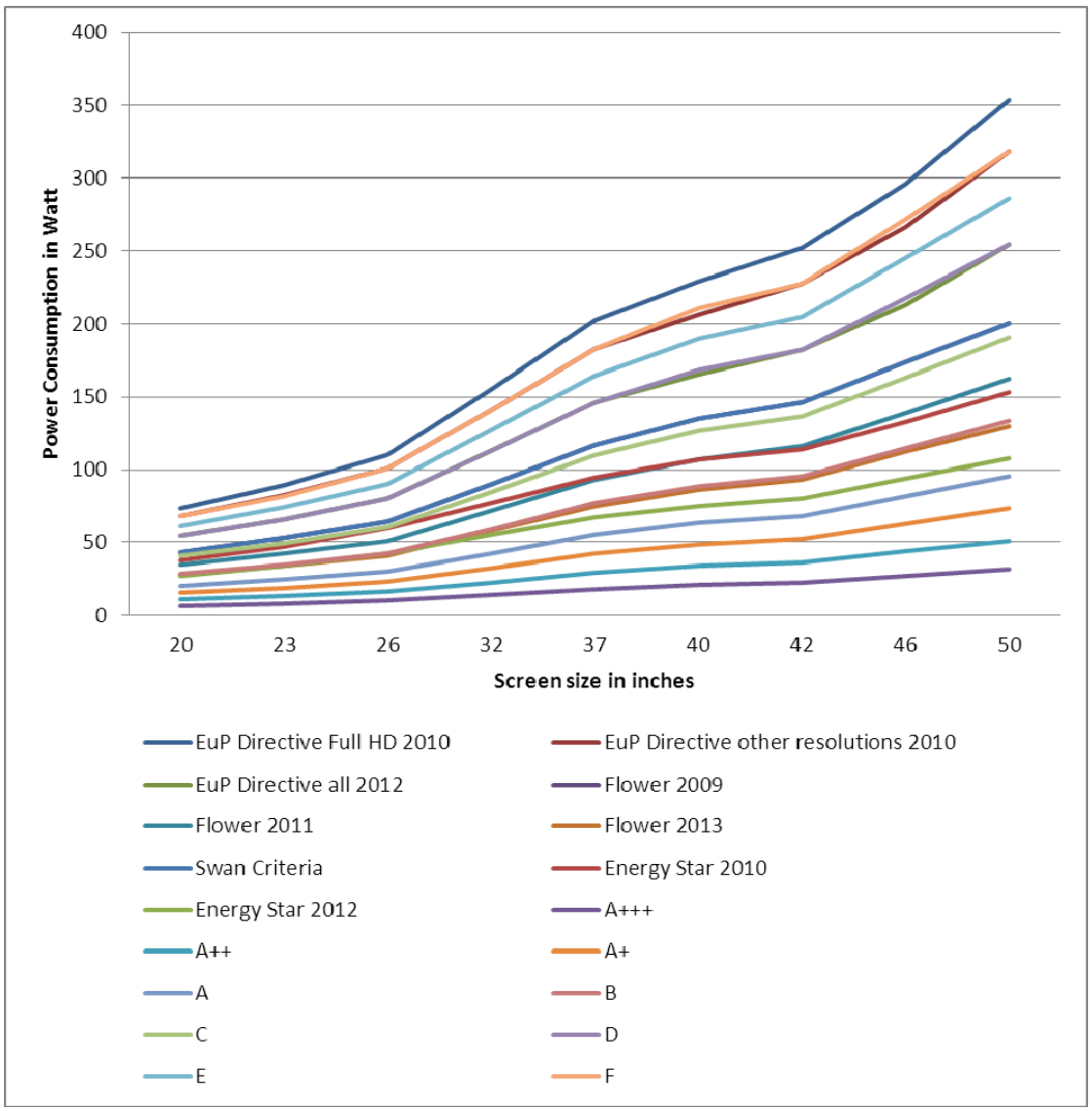

Figure 1: On-mode power consumption requirements of the IM of the EuP Directive, the Flower ecolabel and the forthcoming energy label for TVs.

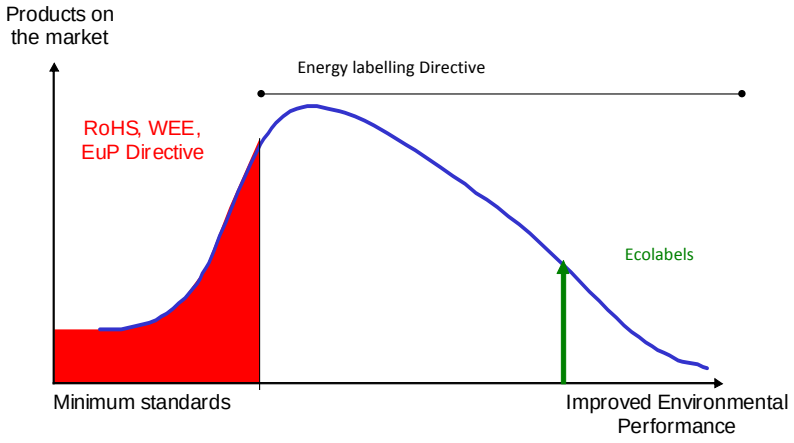

Figure 2: The scope of the EuP and RoHS Directives compared to the scope of the Ecolabel

4. REFERENCES

[1] Danish Energy Agency. "*Energistatistik 2008"*. http://www.ens.dk/da-DK/Info/TalOgKort/Statistik_og_noegletal/Aarsstatistik/Sider/Forside.aspx. 2010. (accessed July 29, 2010).

[2] European Commission. "Communication from the Commission to the Council and the European Parliament – Integrated Product Policy, Building on Environmental Life-Cycle Thinking". *EUR-lex*, June 18, 2003.

[3] European Commission. "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", *Official Journal of the European Union*, October 31, 2009.

[4] European Commission. "Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment". *Official Journal of the European Union*, February 13, 2003.

[5] Europa. "Questions and answers on the revised directive on restrictions of certain dangerous substances in electrical and electronic equipment (RoHS)". *Press releases RAPID*, December 3, 2008.

[6] European Commission. "Commission Staff Working Paper accompanying the Proposal for a Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment", *EUR-lex*, December 3, 2008.

[7] European Commission. "Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE)", *Official Journal of the European Union*, February 13, 2003.

[8] C. van Rossem, and C. Dalhammar. *Designing Greener Electronic Products: Building Synergies between EU Product Policy Instruments or Simply Passing the Buck?* Resp. Ed. John Hontelez, European Environmental Bureau, 2010.

[9] European Commission. "Commission Decision of 12 March 2009 establishing the revised criteria for the award of the Community Eco-label to televisions", *Official Journal of the European Union*, March 28, 2009.

[10] European Commission. "*Facts and Figures*". http://ec.europa.eu/environment/ecolabel/about_ecolabel/facts_and_figures_en.htm. 2010 (accessed July 17, 2010).

[11] European Commission. "Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources be energy-related products", *Official Journal of the European Union*, June 18, 2010.

[12] European Commission. "Commission Delegated Regulation (EU) No …/..
of 28.9.2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council
with regard to energy labelling of televisions". *Proposal*, September 28, 2010.

[13] European Commission. "Commission Regulation (EC No 642/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and the Council with regard to ecodesign requirements for televisions". *Official Journal of the European Union*, July 23, 2009.

[14] European Commission. "Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment". *Official Journal of the European Union*, December 18, 2008.

[15] European Commission. "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". *Official Journal of the European Union*, April 7, 2009.

[16] European Commission. "Commission Regulation (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaries able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council". *Official Journal of the European Union*, March 24, 2009.

[17] European Commission. "Commission Regulation (EC) No 107/2009 of 4 February 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for simple set-top boxes". *Official Journal of the European Union*, February 5, 2009.

[18] European Commission. "Commission Regulation (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps". *Official Journal of the European Union*, March 24, 2009.

[19] European Commission. "Commission Regulation (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors". *Official Journal of the European Union*, July 23, 2009.

[20] European Commission. "Commission Regulation (EC) No 641/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products". *Official Journal of the European Union*, July 23, 2009.

[21] European Commission. "Commission Regulation (EC) No 643/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household refrigerating appliances". *Official Journal of the European Union*, July 23, 2009.

Authors of this brief in Integrated product policy instruments:

[i] Arne Remmen ar@plan.aau.dk
[ii] Rikke Andersen rda@plan.aau.dk
[iii] Carl Dalhammer carl.dalhammar@iiiee.lu.se