THE DESIGN AND PRODUCTION STAGE: ECODESIGN REQUIREMENTS

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1. ECODESIGN IN THE CIRCULAR ECONOMY

1.1. THE KEY ROLE OF ECODESIGN IN THE CIRCULAR ECONOMY

It is well known that every product bears an impact on the environment during its lifecycle. This is even more true for electrical and electronic products, for which the use of rare materials and manufacturing processes of high quality are necessary. Once a product is put on the market, relatively little can be done to improve its environmental characteristics.[1] Most of the environmental impact of a product is determined during the early phases of product development, and more specifically at the design stage. When designing a product, decisions are taken on the type and amount of materials integrated into the product, its durability, its ease of repair and maintenance, as well as the recyclability of its components.[2]

Product design has considerably evolved over the last decades. Compared with the past, today's products have a more varied and complex design. This phenomenon is evident in the case of light bulbs, where the LED technology is more energy efficient, but also made of more complex materials than halogen lamps. In addition to that, many products are also increasingly designed to provide a wide variety of functions, while using less material. As a result, products contain a growing number of materials and additives, with smaller amounts of each specific material. Moreover, there is a trend for small products,

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1 Green paper of the European Commission of 7 February 2001 on Integrated Product Policy, COM(2001) 68 final, p. 3.

2 D. Jepsen et al., *Delivering resource-efficient products – How Ecodesign can drive a circular economy in Europe* (European Environmental Bureau 2015) p. 6.

leading to components glued or even integrated into the product body. Smartphones perfectly illustrate this tendency.

This evolving design increases the negative impacts of products on the environment. Admittedly, it contributes to a lower demand for materials, as a number of the functions for which various products were once needed can now be integrated into a single item. On the other hand, it increases their failure rate and reduces their potential for repair, reuse, remanufacture and recycling, going thus against the circular economy target.[3] Exacerbated with the current production and consumption patterns of industrialised countries and with the rapid population growth, the consequences on the environment become dramatic.

Integrating environmental considerations at the design and production phase is thus crucial to achieve the transition towards a circular economy and preserve the environment. Designing products in a smarter way can firstly prolong their first life use, by avoiding early failures and increasing the resistance of the product to wear and degradation. Extending product lifetime is the best approach to close resource loops (except for some rapidly outdated products)[4], as it allows avoiding (or at least postponing) the purchase of substitute products and all the environmental repercussions it entails.[5] Secondly, ecodesign makes products more easily reparable and upgradeable, thanks to the accessibility of components and the availability of spare parts, tools, manuals and upgrades. Finally, at the end of their lifetime, ecodesigned products can be easily reused, remanufactured and recycled, allowing the added value in products to be kept for as long as possible and minimizing waste.

1.2. THE NEED OF A MULTI-TIERED ECODESIGN APPROACH

Ecodesign rules do not automatically coincide with the idea of circular economy. For example, the remanufacturing of products is part of the circular economy

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3 European Environmental Agency (EEA), *Circular by design: Products in the circular economy* (European Union 2017), p. 16.

4 See for ex., W. Dewulf, J.R. Duflou, 'The environmentally optimized lifetime: a crucial concept in life cycle engineering', in G. Seliger et al. (eds.), *Proceedings of the global conference on sustainable product development and life cycle engineering* (Berlin Uni-edition 2004) p. 59 at p. 62; I. Rüdenauer, C.O. Gensch, *Eco-efficiency analysis of washing machines. Refinement of task 4: further use versus substitution of washing machines in stock* (Oko-Institut e.V. 2005); C. Dalhammar, 'Industry attitudes towards ecodesign standards for improved resource efficiency', 123 *Journal of Cleaner Production* (2016) p. 158.

5 Ricardo-AEA, *The durability of products – Standards assessment for the circular economy under the Eco-Innovation Action Plan* (European Commission 2015) p. 3. For example, an empirical analysis showed that it was beneficial for the environment to extend car lifetime in Japan during the period 1990–2000: S. Kagawa et al., 'The economic and environmental consequences of automobile lifetime extension and fuel economy improvement: Japan's case', 20 *Economic System Research* (2008) p. 3 at p. 28.

as it reintegrates products at the end of their lifecycle into the loops. However, imposing energy requirements on products may operate as an obstacle to the development of the market for remanufactured products. Such strategy could paradoxically result in negative repercussions for the environment. Indeed, although some remanufactured products consume a higher amount of energy during the use phase than new products, they can achieve significant energy savings and carbon emissions reduction thanks to their reduced consumption of energy in the production phase.[6] Since environmental impacts caused by products appear at each stage of their lifecycle and under different aspects, ecodesign rules must be thoughtfully conceived to effectively tackle environmental issues and to avoid contradictions with the objective of circular economy.

Irrespective of the nature of actions (regulatory or not), it is important to follow a multi-tiered approach when adopting ecodesign requirements. On the one hand, the action must apply the principle of 'product lifecycle thinking' and thus take into account the environmental damages caused during the raw material selection, the product manufacturing, packaging, transport and distribution, installation and maintenance, use and end-of-life.[7] This principle allows preventing environmental impacts to be merely transferred from one phase of the life cycle to another. For example, new cars might have reduced energy consumption at the end-use stage, but they might also be associated with increased energy consumption at the production stage.[8] On the other hand, the various environmental parameters must be taken into account, such as the consumption of materials, energy and water, emissions to air, water or soil, waste materials generated, possibilities for reuse, recycling and recovery of materials and of energy. The aforementioned example on light bulbs is relevant in this case as LED technology might lead to a reduction of energy consumption, but to an increase of waste materials. An assessment must thus be carried out to strike a balance between these (sometimes conflicting) factors. It is only with such a multi-tiered and comprehensive approach that the best ecodesign choices could be made.

1.3. TO REGULATE OR NOT TO REGULATE?

Ecodesign can be stimulated by different drivers, such as a technology push, market pull and regulatory push and pull.[9] Legislative measures are not

6 Centre for Strategy & Evaluation Services (CSES), *Evaluation of the Ecodesign Directive (2009/125/EC) – Final Report* (European Commission 2012) p. 23.

7 It has been considered as the "*prerequisite of any sound sustainability assessment*": see W. Klöpffer, 'Life-Cycle Based Methods for Sustainable Product Development', 8 *The International Journal of Life Cycle Assessment* (2003) p. 158.

8 See S. Kagawa et al., 'The economic and environmental consequences of automobile lifetime extension and fuel economy improvement: Japan's case', 20 *Economic System Research* (2008) p. 3 at p. 28.

9 K. Rennings, 'Redefining innovation – eco-innovation research and the contribution from ecological economics', 32 *Ecological Economics* (2000) p. 319 at p. 332.

necessarily needed to obtain ecodesigned products. In some cases, the market forces in place and external factors are able to foster the shift towards ecodesign, whereas in others public intervention is required. An example of external factors is the scarcity of resources which, associated with a constant increase of material costs, could constitute an important driver for change. In absence of such factors, changes might not occur. While some producers will never be influenced by arguments of moral when dealing with business, the pro-environmental ones may also be forced to take environmentally harming decisions after having struck the balance between environmental protection and other values such as health or safety.[10] Even when producers decide to produce ecodesigned products, some obstacles remain. First of all, the efforts devoted to ecodesign are only visible years after when it comes to recycling materials. Secondly, implementing ecodesign strategies might require some costs and investments in the research and developments sector.[11] The resulting product often costs a few cents more, but this price difference may represent a great deal from the company perspective because of low margins and fierce competition in some product sectors.[12] Hence, the absence of legislation might encourage the pursuit of business-as-usual and resistance to change, except in case of ongoing or looming crises.

When market forces fail to evolve in the right direction at an acceptable speed and when little or no voluntary initiative is undertaken, legislation might be needed. Legislative measures are adopted to support or supplement voluntary initiatives aiming at ecodesigned product and a circular economy. As rightly pointed out by T. Cooper, "*the ability and willingness of industry and consumers to take actions considered necessary by public authorities will influence decisions concerning which instruments to use*".[13] Different legislative approaches are possible: either instruments that provide incentives for ecodesign, including eco-labels, taxes and charges, or a 'command-and-control approach'[14], whereby public authorities impose direct obligations on producers and use enforcement mechanisms. The latter generally takes the form of minimum mandatory requirements.

The EU has decided to follow this 'command-and-control approach' when it adopted the Ecodesign Directive.[15] This contribution will focus on this

10 E. Maitre-Ekern, 'The Choice of Regulatory Instruments for a Circular Economy', in Klaus Mathis and Bruce R. Huber (eds.), *Environmental Law and Economics* (Springer 2017) p. 313.

11 Rapport d'information de l'Assemblée Nationale du 26 octobre 2011 sur la gestion durable des matières premières minérales, n°3880, p. 108.

12 D. Jepsen et al., *Delivering resource-efficient products – How Ecodesign can drive a circular economy in Europe* (European Environmental Bureau 2015) p. 54.

13 T. Cooper, 'Policies for longevity', in T. Cooper (ed.), *Longer lasting products: Alternatives to the throwaway society* (Gower 2010) p. 225.

14 E. Maitre-Ekern, 'The Choice of Regulatory Instruments for a Circular Economy', in Klaus Mathis and Bruce R. Huber (eds.), *Environmental Law and Economics* (Springer 2017) p. 317.

15 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. 10–35 (hereafter 'Ecodesign Directive').

Ecodesign Directive and on the implementing measures taken on its basis. The legal framework established by these legal instruments play a key role in shaping the design and the production stage of products circulating within the EU territory. The first part of the chapter will be dedicated to describing the main provisions of the Ecodesign Directive, as well as to identifying the existing and potential future implementing measures, taking the most recent texts adopted by EU institutions and organisations into account. In the second part, this package of rules will be evaluated against the long-term target of circular economy, with the help of criteria of necessity and effectiveness.

2. THE ECODESIGN DIRECTIVE 2009/125/EC

2.1. OBJECTIVES AND LEGAL BASIS OF THE ECODESIGN DIRECTIVE

Noticing that market failures and imperfections hindered economic actors to produce and consume ecodesigned products, the European legislator decided to take the lead. The concept of 'Integrated Product Policy' emerged as a new EU environmental strategy, with the aim of focusing on the environmental performance of products to promote a sustainable and greener development of the market.[16] Among the rules adopted to address the issue, a package of two legislative acts, namely the current Ecodesign Directive and Energy Labelling Regulation[17], was introduced. Together, they provide the legal support to alleviate the negative impacts of products on the environment, influencing the way they are made, used and disposed. The Ecodesign Directive 'pushes' the market towards greener products by banning the worst performing ones, while the Energy Labelling Regulation 'pulls' the market towards more energy efficient products by encouraging and empowering consumers to buy such efficient products based on useful information.[18] The specific requirements for each product group are, after a preparatory study and extensive stakeholder consultation, set out in *implementing measures* for ecodesign and *delegated acts* for energy labelling.

Surprisingly, in spite of its main environmental goal, the Ecodesign Directive was adopted on the basis of Article 95 TEC (corresponding to Article 114 TFEU), which provides for the establishment and the functioning of the

16 See the Green paper of the European Commission of 7 February 2001 on Integrated Product Policy, COM(2001) 68 final.

17 Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU, OJ L 198, 28.7.2017, p. 1–23.

18 Staff Working Document of the European Commission of 15 July 2015 on the Evaluation of the Energy Labelling and Ecodesign Directives, SWD(2015) 143 final, p. 3.

internal market. The reasoning was that the Directive ensures that products that freely move within the EU boundaries satisfy environmental and energy related requirements.[19] Adopting such ecodesign requirements at the national level would create barriers to trade and distortion of competition and could consequently hinder the shift towards circular economy.[20] Article 95(3) TEC nevertheless allows to integrate environmental protection within the objective of internal market, taking as a base a high level of protection and considering any new development based on scientific facts. This possibility of integration goes hand in hand with Article 11 TFEU, which sets out an obligation to integrate environmental protection requirements into the definition and implementation of the Union's policies and activities. The legal basis of the Ecodesign Directive reflects thus its importance for both the internal market and the environment.

2.2. SCOPE OF THE DIRECTIVE

The Ecodesign Directive is a framework legislation that does not create direct obligations. Instead it enshrines general principles and criteria for the establishment of binding ecodesign requirements for specific product groups. In other words, it sets the basis while leaving room to the European Commission (EC) for the development and adoption of implementing measures. The scope of the Directive has therefore been deliberately left large. Following Article 2, the Ecodesign Directive applies to all 'energy-related products', meaning any good placed on the market and/or put into service that has an impact on energy consumption during its use. The notion covers (1) energy-using products which use, generate, transfer or measure energy (electricity, gas, fossil fuel), such as boilers, computers and industrial fans, and (2) other energy-related products, which do not use energy but have an impact on energy consumption, such as windows, insulation material and shower heads. The scope also includes parts intended to be incorporated into energy-related products which are placed on the market and/or put into service as individual parts for end-users and of which the environmental performance can be assessed independently. Implementing measures can thus be taken on any of these products.

The former Ecodesign Directive 2005/32/EC[21], which was repealed by the Directive 2009/125/EC, only applied to energy-using products. The justification

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19 Proposal for a Directive of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy related products, COM(2008) 399 final, pp. 5–6.

20 See Recital 2 of the Ecodesign Directive.

21 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 and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, OJ L 191, 22.7.2005, p. 29–58.

was that energy-using products have a particularly important impact on the environment compared to other products.[22] This narrower scope was then considered as an important restriction on the contribution of the Ecodesign rules to the EU Integrated Product Policy.[23] The recast of the directive in 2009 finally extended the scope to energy-related products, as they also have an important environmental impact and high potential for improvement. As outlined in Recital 3 of the Directive 2009/125/EC, energy-related products "*account for a large proportion of the consumption of natural resources and energy*" in the EU and require the use of rare materials and manufacturing processes of high quality. Through this extended scope, the number of energy-efficient and eco-friendly products available on the market could be expanded. Some energy-related products remained nonetheless out of the scope of the Ecodesign Directive, the main category being the means of transport for person or goods (Article 1(3)). The reason of this exclusion is that these products are already subject to a wide range of regulatory and voluntary measures that, in addition to safety and other aspects, also address environmental performance.[24]

Article 21 of the Ecodesign Directive even refers to the possibility of broadening the scope to non-energy-related products. Although this extension remains possible, a study from 2012[25] has already been carried out on the basis of this Article and concluded that although the use of Ecodesign requirements could bring substantial improvements to an important number of non-energy-related products, no extension was needed. It was considered that (1) there was still insufficient experience with the extended scope, (2) significant progress needed to be made in the implementation of the existing Ecodesign Directive prior to any possible extension, (3) a different approach was required for non-energy-related products, (4) it would be difficult to establish ecodesign requirements for such products and (5) the possibility of applying self-regulatory initiatives and local advisory services should first be examined.

2.3. KEY PROVISION: ARTICLE 15

The main provision of the Ecodesign Directive is undoubtedly Article 15, which clearly delineates the limits within which the implementing measures can be

22 Proposal for a Directive of the European Parliament and of the Council on establishing a framework for the setting of Eco-design requirements for Energy-Using Products and amending Council Directive 92/42/EEC, COM(2003) 453 final, p. 2–3.

23 Proposal for a Directive of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy related products, COM(2008) 399 final, p. 5.

24 For example, the environmental performance of cars is already regulated by many EU legislations. *Cfr infra*, 4.2..

25 Centre for Strategy & Evaluation Services (CSES), *Evaluation of the Ecodesign Directive (2009/125/EC) – Final Report* (European Commission 2012), especially p. 159 at p. 220.

adopted. The second paragraph of Article 15 lay down criteria governing the choice of products for the adoption of implementing measures. Pursuant to it, products shall be covered by an implementing measure (or by a self-regulation)[26] if they (1) have a volume of sales that exceeds 200 000 units per year throughout the internal European market, (2) have a significant environmental impact and (3) present significant potential for improvement in environmental impact without incurring excessive costs. Concerning the third criteria to be fulfilled, consideration has to be given to the absence of other relevant EU legislation, the existence of a market failure and the disparity amongst similar products in terms of environmental performance. These criteria leave great latitude in the implementation of the Directive.[27] However, the vagueness of the terms used in this provision, especially the word "significant", has already been pointed out as problematic.[28]

When products meet the criteria enumerated in Article 15, they can be subject to ecodesign requirements through implementing measures. These can be elaborated for specific product groups or applying more horizontally across different product categories. The Ecodesign Directive is based on lifecycle thinking (Article 15(4)(a), as well as Recitals 7 and 13), meaning that the full life cycle of products – from their production to their end-of-life – has to be taken into account when adopting ecodesign requirements. The requirements are from two types, either generic or specific. As defined in Article 2(25) of the Directive, generic requirements address important issues without quantitative targets being set. They can for example oblige producers to make batteries easily removable from their products or to inform consumers and recyclers about the waste disposal, disassembly and recycling. These generic requirements contribute to the achievement of the information requirements enshrined in Article 14. By contrast, specific requirements set numerical targets, for instance on maximum energy use during operation (Article 2(26)). Annexes I and II provide the methodology for setting these generic and specific ecodesign requirements. It is interesting to note that products that do not fulfil the criteria set out in Article 15 could still fall under Article 11, which requires information on components and sub-assemblies.

Mandatory ecodesign requirements set the minimal thresholds that products have to reach in order to be put on the EU market. The requirements are intended to remain flexible so that they allow for swift improvement of environmental product performance.[29] Through this approach, Ecodesign rules aim at progressively removing the worst performing products in terms of eco-efficiency from the market, without entering the difficult area of identification

26 *Cfr infra*, 2.6..

27 R. Malcolm, 'Ecodesign Laws and the Environmental Impact of our Consumption of Products', 23 *Journal of Environmental Law* (2011) p. 497.

28 *Cfr infra*, 3.1..

29 Recital 17 of Ecodesign Directive.

and selection of the very best performing products.[30] The prime rationale of the Directive is not to promote the development of new technologies, although it incidentally does so by providing the necessary framework conditions, a clear timetable and legal certainty to producers.

In addition to these minimum requirements, implementing measures identify advanced benchmarks of environmental performance of the concerned products. They correspond to the level achieved by the top performing products available on the market. Attaining such benchmarks is voluntary for industry.[31] More than giving inspiration to producers, these benchmarks can possibly become future mandatory ecodesign requirements. This clear mid-term orientation on future requirements is of particular importance for producers (and especially SMEs) as it ensures the necessary stability and reliability for product innovation. It enables producers to take long-term strategic aspects better into consideration when investigating the sustainability of their business models and product portfolio.[32] Discussions on using these best practices in legislation have already taken place. More than questioning the incentives of these advanced benchmarks for progressive firms, it was argued that weak ecodesign rules provide legitimacy to laggards. In other words, some companies would claim that their products are sustainable for the sole reason that they comply with the requirements adopted within the framework of the Ecodesign Directive.[33] Advancing this argument, an increasing number of stakeholders seem to view stringent standards as a potential source of competitive advantage for EU industries and advocate higher mandatory thresholds based on advanced benchmarks.[34]

While the Ecodesign Directive aims at increasing the level of protection of the environment through a product-oriented approach (Article 1(2)), the environmental interest is far from being the only one taken into account. During the preparation of implementing measures, Article 15(4)(b) requires the EC to consider the impact on the environment, but also on consumers and manufacturers, including SMEs, in terms of competitiveness, innovation, market access and costs and benefits. In that regard, Article 15(5) mentions additional criteria for ecodesign requirements, namely that:

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30 D. Jepsen et al., *Delivering resource-efficient products – How Ecodesign can drive a circular economy in Europe* (European Environmental Bureau 2015) p. 55.

31 Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, COM(2008) 397 final, pp. 4–5.

32 D. Jepsen et al., *Delivering resource-efficient products – How Ecodesign can drive a circular economy in Europe* (European Environmental Bureau 2015) p. 54.

33 A.-K. Jönbrink and H.E. Melin, *How central authorities can support ecodesign. Company perspectives*. (TemaNord 2008) p. 54.

34 C. Dalhammar et al., *Addressing resource efficiency through the Ecodesign Directive* (TemaNord 2014) p. 101.

a) *there shall be no significant negative impact on the functionality of the product, from the perspective of the user;*
b) *health, safety and the environment shall not be adversely affected;*
c) *there shall be no significant negative impact on consumers in particular as regards the affordability and the life cycle cost of the product;*
d) *there shall be no significant negative impact on industry's competitiveness;*
e) *in principle, the setting of an ecodesign requirement shall not have the consequence of imposing proprietary technology on manufacturers; and*
f) *no excessive administrative burden shall be imposed on manufacturers.*

2.4. ADOPTION PROCEDURE OF IMPLEMENTING MEASURES

The adoption of implementing measures follows a specific procedure consisting of five distinct steps. First of all, the EC establishes a working plan for the following three years with an indicative list of priority products (Article 16). In this working plan, the scope of the product categories that will be investigated through Preparatory Studies is defined, indicating whether existing product-specific measures will be reviewed or whether additional product groups will be further examined. Following the working plan, preparatory studies are then carried out with the contribution of scientists. A methodology has been developed to provide guidance to the EC on how to assess whether and which ecodesign requirements are appropriate for a given product.[35] The assessment is holistic and based on a lifecycle thinking in order to cope with the multiple dimensions of environmental protection and to achieve absolute reductions of environmental damages. On the basis of the preparatory studies, draft regulations are submitted to consultation of stakeholders, gathering Member States' representatives and all interested parties concerned with the product group in question, such as industry, trade unions, traders, retailers, importers, environmental protection groups and consumer organisations (Article 18). The next step consists of the vote of regulatory committee with Member States' representatives on the regulations (Article 19). Finally, the implementing measure is scrutinized by the European Parliament (EP) and the Council before being adopted.

Through this procedure, the adoption of implementing measures takes on averages 4 years. The outcome of this long process consists of a regulation, directly applicable in all Member States. This implementing measure defines the type of products covered, the ecodesign requirements that apply to them, the transitional period for its implementation and the date for its evaluation

35 European Commission, *Ecodesign: your future – How ecodesign can help the environment by making products smarter* (European Union 2012) p. 3.

and possible revision.[36] Ecodesign requirements are gradual and not retroactive (Article 15(4)(f)), which is essential from a technological and a financial point of view. They are also regularly reviewed (Article 21), so as to ensure that minimum requirements and benchmarks remain relevant with time and provide businesses with a long-term perspective of the future regulatory mandatory requirements.

2.5. COMPLIANCE AND THE ROLE OF STANDARDISATION

Once the implementing measure is adopted, every manufacturer who produces or imports and sells products within the EU boundaries has to comply with all mandatory requirements it contains. Manufacturers bear the burden of proof, meaning that they have to prove the compliance of their products with the applicable ecodesign requirements. The conformity assessment is based on self-assessment. As explained in Article 8(2) of Ecodesign Directive, implementing measures leave the choice between two procedures to assess product conformity, namely an internal design control or an appropriate management system. In this procedure, the methods used must be reliable, accurate and reproducible, take the generally recognised state of the art into account and produce results deemed to be of low uncertainty.

Article 9 nonetheless enumerates cases where the product is presumed conform to the applicable ecodesign requirements. One of them concerns products for which harmonised standards developed by the European standardization bodies have been applied. These standards provide requirements and guidelines for testing and for result assessment, measurements and verification, which help producers make products conform to ecodesign requirements laid down in implementing measures.[37] The use of these standards remains voluntary. More than for the conformity assessment, standards are of utmost importance for the transition towards circular economy, as they can "*create intra-firm and inter-firm efficiencies, facilitate economies of scale in manufacturing and promote interoperability between complementary products*".[38] Another presumption provided in Article 9(3) covers products which have been awarded a European eco-label in so far as the applicable ecodesign requirements are met by the ecolabel. The presumption may be extended on a case by case basis to other ecolabels if they fulfil equivalent conditions (Article 9(4)).[39]

The compliance with ecodesign requirements can then be verified by the national market surveillance authorities (Article 3). The verification can be

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36 Annex VII to Ecodesign Directive.

37 P. Tecchio et al., 'In search of standards to support circularity in product policies', 168 *Journal of Cleaner Production* (2017) p. 1534.

38 A. Russell, 'Standardization in History: A Review Essay with an Eye to the Future', in S. Bolin (ed.), *The Standards Edge: Future Generations* (Sheridan Press 2005) p. 249.

39 For further details, see the chapter on Ecolabel written by B. Keirsbilck in this book.

achieved directly on the product or on the basis of the technical documentation, depending on the implementing measure (Article 15(7)). It is for the Member States to organise such control and surveillance and find the balance while controlling the design of products. Information about the results of the market surveillance is then passed on to the EC. If the product complies with the requirements, it can bear the CE marking[40] and freely move within the EU boundaries (Article 6). No restrictions are possible, except on grounds of major needs or in case of new scientific evidence as stated in Article 114(4), (5) and (6) TFEU.[41] If the product does not conform to the ecodesign requirements, it cannot be placed on the EU market (Article 7). When Member States notice that non-complying products circulate within the EU, penalties can be imposed, depending on the extent of non-compliance and on the number of units of non-complying products (Article 20).

Control and market surveillance are of utmost importance for an effective enforcement of the Ecodesign rules. As R. Malcolm stated, "*the enforcement of the Directive and its implementing regulations and their control of products, their energy use and environmental impact, is only as good as the enforcement mechanisms accompanying it*".[42] The fact that control and market surveillance of compliance with ecodesign requirements is organised at the national law means great variations in compliance records throughout the EU. Article 12 of the Ecodesign Directive already requires administrative cooperation and exchange of information between national market surveillance authorities. However, the EC estimates that between 10 and 25% of products covered by the directive do not satisfy the ecodesign and energy labelling requirements.[43] Some projects have been put in place to alleviate this problem, such as the Administrative Cooperation groups on ecodesign and on energy labelling, as well as the Proposal for a Regulation of the EP and of the Council on market surveillance of products.[44]

2.6. THE PLACE OF SELF-REGULATION

In addition to implementing measures, the Ecodesign Directive raises voluntary agreements and other self-regulations as another possibility to set ecodesign requirements (Article 15(1) and (3)(b), 17 and Annex VIII). This idea has also been transposed to Energy labelling rules, acknowledging voluntary energy labels such

40 See Article 5 of Ecodesign Directive.

41 Recital 11 of Ecodesign Directive.

42 R. Malcolm, 'Ecodesign Laws and the Environmental Impact of our Consumption of Products', 23 *Journal of Environmental Law* (2011) p. 503.

43 Communication from the Commission on Ecodesign Working Plan 2016–2019, COM(2016) 773 final, p. 9.

44 Proposal for a Regulation of the European Parliament and of the Council on market surveillance of products, COM(2013) 075 final.

as the Green Star. Self-regulation implies an agreement between different actors of the industry. As stated in Recital 19 of the Ecodesign Directive, self-regulation offers advantages compared to mandatory regulations. They can enable quick progress due to rapid and cost-effective implementation and allow for flexible and appropriate adaptations to technological options and market sensitivities. More than being stakeholders like for implementing measures, producers have the power to control the process of self-regulation and decide on its content. Moreover, they avoid being subject to regulatory obligations, which lighten the legislative burden on the state at the same time. When the legislator is willing to introduce ecodesign requirements that are not in the direct interest of producers, implementing measures will be preferable. However, it should be noted that the difference between legislation and self-regulation is more than procedural. As A.M. Bundgaard pointed out, while implementing measures intend to remove the worst performing products from the market, self-regulations strive to pull part of the market in a more environmentally sound direction.[45]

The best example to illustrate the distinction between self-regulations and implementing measures is the household washing machines. These products were firstly covered by voluntary commitments[46] and energy labelling from 1997 to 2008. It led to phase out the least efficient household washing machines and to improve their energy efficiency by 24% in the last 10 years. However, mandatory ecodesign requirements were finally adopted instead for two reasons.[47] On the one hand, there was a market failure. As over 90% of household washing machines were in the energy label's highest efficiency class, it was giving no incentive to further improve their energy efficiency. On the other hand, given the growing share of imports from non-EU based manufacturers, the EU industry association feared that important actors would not join voluntary agreements and foresees difficulties in avoiding free riders. The case of washing machines demonstrates the added value lying in mandatory ecodesign requirements.

When existing or proposed self-regulations concern product groups that are under analysis for further ecodesign requirements, the EC can recognise these self-regulations and refrain from adopting an implementing measure. Self-regulation can thus be prioritised to promote ecodesigned products in some cases, if they are in line with the policy objectives of the Ecodesign Directive. The Directive nonetheless requires them to respect strict criteria established in an indicative list in Annex VIII, in addition to the basic legal

45 A.M. Bundgaard et al., 'From energy efficiency towards resource efficiency within the Ecodesign Directive', 144 *Journal of Cleaner Production* (2017) p. 371.

46 Voluntary Commitment of the CECED of 24 September 1997 on reducing energy consumption of domestic washing machines; Voluntary Commitment II of the CECED of 31 Augustus 2002 on reducing energy consumption of domestic washing machines (2002–2008).

47 Impact assessment accompanying document to the Draft Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household washing machines, SEC(2010) 1354, pp. 6–7 and pp. 15–16.

requirements.[48] These criteria include the openness of the participation of third country operators; added value in terms of the improved overall environmental performance of the product; the representativeness of a large majority of the relevant economic sector; quantified and staged objectives; the involvement of civil society; a well-designed monitoring and reporting system; the cost-effectiveness of administering a self-regulatory initiative; sustainability and incentive compatibility. A recommendation for self-regulation issued by the EC provides guidelines on these criteria.[49] Through all these requirements, self-regulations are controlled and monitored by the EC.

The majority of European organisations, Member States and NGOs do not find self-regulatory measures appropriate to deal with product ecodesign. According to these opponents, voluntary agreements tend not to set sufficiently stringent requirements from the environmental perspective in relation to the business as usual scenario and do not bring better or quicker results than implementing measures. There is, moreover, criticism about the transparency of the procedures for initiating and establishing voluntary agreements, as well as important questions on the monitoring of compliance from the side of industry. Therefore, these stakeholders consider voluntary agreements as nothing more than a complement to legislation, especially when they are aiming to address issues and aspects that implementing measures cannot effectively address. In the words of the consumer organisation BEUC, "*self-regulatory measures should not take precedence over regulatory measures*".[50] Industry representatives seem more positive about self-regulation, appreciating its flexibility, although concerns were expressed about the capacity to reach agreement and enforce them.[51]

3. IMPLEMENTING MEASURES SUPPLEMENTING THE ECODESIGN DIRECTIVE

3.1. VARIOUS PRODUCTS WITH A FOCUS ON ENERGY EFFICIENCY REQUIREMENTS

There is currently a wide range of implementing measures that supplement the Ecodesign Directive. In total, the ecodesign framework gathers 29

48 As recalled in Annex VIII, self-regulatory initiatives must comply with all provisions of the Treaty (in particular internal market and competition rules), as well as with the international engagements of the Community.

49 Commission Recommendation (EU) 2016/2125 of 30 November 2016 on guidelines for self-regulation measures concluded by industry under Directive 2009/125/EC of the European Parliament and of the Council, C/2016/7770, OJ L 329, 3.12.2016, p. 109–117.

50 BEUC, *Greener, better, faster, stronger Ecodesign – Consumer organisations' views on the implementation and enforcement of the Ecodesign Directive* (European Union 2017) p. 8.

51 Centre for Strategy & Evaluation Services (CSES), *Evaluation of the Ecodesign Directive (2009/125/EC) – Final Report* (European Commission 2012) p. 148.

ecodesign implementing measures shaping the design of various products such as computers and dishwashers, 16 delegated acts for energy labelling and 3 recognised voluntary agreements on complex set-top boxes, imaging equipment and games consoles. Around 40 standardisation mandates were launched for these product groups. The list of products covered by implementing measures, as well as the list of existing harmonised standards supporting these latter, is available at the Europa website.[52] It is intriguing to note that no implementing measure was adopted on energy-related products since the scope of the Ecodesign Directive was extended in 2009, although impact assessments concerning such products are ongoing.[53]

Although the Ecodesign Directive and its implementing measures follow a lifecycle approach, the main focus has so far been on setting energy efficiency improvements. Through the EEB study from 2009[54], it was noted that implementing measures included a wide scope of environmental issues at an early stage of the adoption procedure, before applying only to a few selected issues, mainly energy efficiency in the use phase. Read in conjunction with the study issued by Defra in 2011[55], this study identified several reasons explaining the focus on energy efficiency. The first reason lies in the interpretation of Article 15 of the Directive, and more particularly its second paragraph requiring "a significant environmental impact" and "significant potential for improvement". It is indeed difficult to assess whether these two criteria are met when dealing with other parameters than energy, especially due to a lack of information. On the other hand, the 'significance' of energy in the use phase was overestimated.[56] Secondly, the focus on energy efficiency finds its roots in the chosen methodology and adoption procedure. Due to the absence of the necessary data, no suitable measurement methods or testing standards were available for the development of requirement relating to other environmental aspects. The fact that Ecodesign has been under the jurisdiction of DG Enterprise and DG Energy contributes to this narrow focus too.[57] A third barrier to achieve more resourceful efficiency through the Ecodesign Directive concerns the compliance with other existing instruments, such as REACH, WEEE and RoHS. The study detected a 'passing

52 See http://ec.europa.eu/growth/industry/sustainability/ecodesign_en.

53 This is the case of windows. See Communication from the Commission on Ecodesign Working Plan 2016–2019, COM(2016) 773 final, p. 4.

54 C. Van Rossem et al., *Designing Greener Electronic Products: Building Synergies between EU Product Policy Instruments or Simply Passing the Buck?* (European Environmental Bureau 2009).

55 D. Maxwell et al., *Review of EuP Preparatory Study Evidence: Does it support development of non-energy related implementing measures?* (DEFRA 2011).

56 C. Van Rossem et al., *Designing Greener Electronic Products: Building Synergies between EU Product Policy Instruments or Simply Passing the Buck?* (European Environmental Bureau 2009), p. 24.

57 While DG Energy mainly focuses on energy consumption in the use phase, DG Enterprise primarily focuses on the production phase and the extraction of raw materials.

the buck strategy' through reference to other environmental legislative measures, impeding the adoption of some ecodesign requirements.

Thanks to the existing implementing measures, there have been great reductions in energy use. The first to benefit from these is the environment. It was estimated that by 2020 the ecodesign framework would result in energy savings of more than the annual primary energy consumption of Italy.[58] Energy efficiency improvement contributes to the achievement of the greenhouse gas emission targets, considered as a priority environmental goal by the Directive.[59] Energy efficiency improvement is also beneficial for consumers who save on their energy bills, and producers who get extra revenue.[60] Furthermore, ecodesign rules allow increasing security of supply and reducing import dependency, as highlighted in Recital 6 of the Ecodesign Directive.

Ecodesign requirements have had influence on the array of products available on the market. While products become more energy efficient, others are simply banned from the EU market. An illustrative example concerns the inefficient halogen light bulbs which were phased out in September 2018. Exceptions exist for bulbs that are difficult to replace by others or integrated into the products (like ovens).[61] These exceptions were made to empty the existing luminaire stock, to prevent undue costs on consumers and to give time to manufacturers to develop luminaires dedicated to more efficient lighting technologies (Recital 21 of the Regulation). It should also be noted that the Regulation does not apply to products that are already on the shelves in stores, nor in consumers' houses, but only to new products being offered for sale (Recital 4).

3.2. OTHER EXISTING ECODESIGN REQUIREMENTS

In addition to these energy efficiency requirements, requirements on other environmental aspects have been adopted. This type of requirements is varied, depending on the characteristics of the product concerned. There are ecodesign requirements which limit the consumption of other resources. For example, the ecodesign requirements contained in the implementing measure on domestic washing machines limits their water consumption. The implementing measure also imposes on producers to design their washing machines with the possibility for the end-users of a cycle at 20 °C.

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58 Communication from the Commission on Ecodesign Working Plan 2016–2019, COM(2016) 773 final, p. 2.

59 See Recital 14 of Ecodesign Directive.

60 Communication from the Commission on Ecodesign Working Plan 2016–2019, COM(2016) 773 final, p. 2.

61 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, OJ L 76, 24.3.2009, p. 3–16.

Some ecodesign requirements support directly or indirectly product durability. The first products to be concerned are vacuum cleaners. Their hose must be considered useable after 40 000 oscillations under strain[62] and operational motor lifetime of the vacuum cleaners should last a minimum of 500 hours.[63] The second category of products is lamps. Various lamp types have to meet minimum requirements for lumen maintenance, the number of switching cycles before failure, the rated lifetime as well as a maximum premature failure rate.[64] Similar ecodesign requirements have been introduced for printers, for which spare parts should be made available for a minimum time period after the end of product manufacturing (from 3 to 5 years depending on the model).[65]

Closely linked to requirements on durable design, implementing measures can also require producers to give information on lifetime. The implementing measure on lighting establishes for example an obligation to inform end-users on the nominal lifetime of lamps in hours prior to their purchase.[66] This information must be visibly displayed on the packaging and on free access websites. Such information requirements also exist for notebooks. If a notebook computer is equipped with a battery that cannot be accessed and replaced by a non-professional user, manufacturers have to provide in the technical documentation, and make available on free-access websites and on the external packaging of the notebook computer, the following information: "*The batteries in this product cannot be easily replaced by users themselves*".[67]

Finally, some ecodesign requirements focus on the recyclability of products. More than information obligation on recyclability[68], there are requirements

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62 See Annex II, pt 7 to Commission Regulation (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners, OJ L 192, 13.7.2013, p. 24–34.

63 See Annex II, pt 8 to Commission Regulation (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners, OJ L 192, 13.7.2013, p. 24–34.

64 See Annex II (2) to 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, OJ L 76, 24.3.2009, p. 3–16.

65 Industry voluntary agreement of April 2015 to improve the environmental performance of imaging equipment placed on the European market, VA v.5.2, p. 13.

66 See Annex II (3) to 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, OJ L 76, 24.3.2009, p. 3–16.

67 See Annex II pt 7.2. to Commission Regulation (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers, OJ L 175, 27.6.2013, p. 13–33.

68 See for ex. Annex II (2) to Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers, OJ L 177, 8.7.2015, p. 19–51.

which improve the recycling of products. One example can be drawn from the voluntary agreement on imaging equipment.[69] This self-regulation prohibits the use of non-separable connections between different materials, for example through weld or glue, unless they are technically or legally required. Along the same line, any cartridge produced or recommended by the original equipment manufacturer for use in the product should not be designed to prevent its reuse and recycling. Another requirement on product recyclability contained in the voluntary agreement on imaging equipment consists of making information available to customers on the minimum percentage of postconsumer recycled plastic content.

3.3. RECENT INITIATIVES FROM THE EUROPEAN COMMISSION

In its Circular Economy Package from 2015[70], the EC underlined the substantial contribution of the Ecodesign Directive in the transition towards circular economy. Recognising the strong focus on energy efficiency and the missed opportunity to cover other environmental aspects, it proposed to undertake three actions concerning the production and design stage.[71] First, the EC committed to strive for more circular economy aspects in future product requirements under the Ecodesign Directive. In the Ecodesign working plan 2016–2019[72], the EC indicated that it would explore the possibility of establishing more product-specific and/or horizontal requirements in areas such as durability (e.g. minimum lifetime of products or critical components), reparability (e.g. availability of spare parts, tools and repair manuals, design for repair), upgradeability, design for disassembly (e.g. easy removal of certain components), information (e.g. marking of plastic parts) and ease of reuse and recycling (e.g. avoiding incompatible plastics) for existing and new products regulated under the Ecodesign Directive. Research activities conducted by the Joint Research Centre of the EC are already under way, assessing the reparability

69 Industry voluntary agreement of April 2015 to improve the environmental performance of imaging equipment placed on the European market, VA v.5.2, pp. 10–11.

70 Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Closing the loop – An EU action plan for the circular economy, COM(2015) 614 final (hereafter 'Circular economy Package').

71 See Annex to the Circular Economy Package, as well as the Commission Report to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Circular Economy Action Plan, COM(2017) 33.

72 Communication from the Commission on Ecodesign Working Plan 2016–2019, COM(2016) 773 final.

and upgradability of TVs[73] and the durability of washing machines.[74] A separate track was suggested for ICT products (such as smartphones), as this product group is under rapid technological progress, leading to uncertainty about future market developments. A more in-depth assessment was proposed to evaluate the possibility of including them in future ecodesign working plans. A first guide on the assessment of material efficiency of smartphones has been issued in April 2018.[75]

Second, the EC planned to request to European standardization organizations the development of standards on material efficiency for setting those future Ecodesign requirements. The standardisation request M/543 on material efficiency requirements was submitted in 2015, with a deadline set on 31st March 2019.[76] After three years of debate and two standardisation request attempts, CEN and CENELEC created the Joint Technical Committee 10 to develop European horizontal standards related to material efficiency aspects for Ecodesign products. If adopted, these standards would provide definitions of parameters and methods for assessing product durability, upgradability, ability to repair, reuse and recycle, as well as documentation and/or marking on information relating to material efficiency of the product. The standards would cover all products under the scope of the Ecodesign Directive or apply to specific products if the horizontal approach is not possible.

Third, the EC pledged the establishment of ecodesign requirements for electronic displays, as required by Article 16(2)(a) of Ecodesign Directive. A Draft Regulation on electronic displays[77] was introduced in December 2016. The proposal contains several requirements related to resource efficiency, such as the prohibition to weld or glue batteries or internal power supplies.[78] Display producers are also under the obligation to provide information on their products to third parties dealing with maintenance, repair, reuse, recycling and recovery.[79] Such information must be kept available for at least 15 years and takes

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73 The first draft of the report is available at: http://susproc.jrc.ec.europa.eu/E4C/documents.html.

74 The document is available at: https://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2017/7-appliances-products-lighting-and-ict/durability-testing-procedure-for-washing-machines-8211-approach-and-first-learnings/.

75 The first draft of the report is available at: http://susproc.jrc.ec.europa.eu/E4C/documents.html.

76 Commission Implementing Decision of 17 December 2015 on a standardisation request to the European standardisation organisations as regards ecodesign requirements on material efficiency aspects for energy-related products in support of the implementation of Directive 2009/125/EC of the European Parliament and of the Council (M/543), C(2015)9096.

77 Draft Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for electronic displays. Available at: https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2016–7108187_en.

78 See Annex III to the Draft Regulation on electronic displays.

79 See Annex IV to the Draft Regulation on electronic displays.

the form of a diagram showing the location of some components for the product disassembly or instructions on the sequence of operations needed to remove the components, with fastening techniques and the tools needed.[80]

3.4. REACTIONS TO THESE INITIATIVES

Ecodesign rules and the related actions undertaken by the EC have triggered heated comments from EU circles. The different opinions expressed by EU institutions and organisations can be grouped into five main ideas. A first topic of discussion concerns the scope of the Ecodesign Directive. Despite the impact assessment study carried out in 2012[81] which concluded that there was no need for an extension of the scope, the issue is still under debate. In its Resolution of July 2015 on resource efficiency[82], as well as in its Resolution of May 2018[83], the EP asked the EC to evaluate the possibility of using the current ecodesign methodology for other product categories in addition to energy-related products and thus broadening its scope to cover all main product groups. The same idea was expressed by the EESC in its Opinion on the Circular Economy Package, where it stated that Ecodesign principles should be applied across all sectors, mainly because mobility, housing and food have been identified as being responsible for 70–80% of the adverse environmental impact.[84]

Secondly, the current focus on energy efficiency has been highly criticized. As reflected in the EESC Opinion on the Ecodesign Working Plan from 2016–2019, the need to go beyond energy considerations is frequently emphasized, so as to drive change in behaviour through the supply chains of goods and services at a pace that would permit the achievement of the Circular Economy Action Plan.[85] In that regard, the EP called on the EC to gradually include all relevant resource-efficiency features in the mandatory requirements for product design and introduce a mandatory product passport based on these requirements.[86] One of its suggestions is to assess, on the basis of a cost-benefit analysis, the possibility

80 *Ibid*.

81 *Cfr supra,* 2.2..

82 European Parliament Resolution of 9 July 2015 on resource efficiency: moving towards a circular economy, (2014/2208(INI)), pt. 24.

83 European Parliament Resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)), pt. 30.

84 EESC Opinion of 27 April 2016 on the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop – An EU action plan for the circular economy – COM(2015) 614 final, NAT/676, pt 4.1.2..

85 EESC Opinion on the Communication from the Commission Ecodesign Working Plan 2016–2019, COM(2016) 773 final, NAT/702, pt. 1.2.

86 European Parliament Resolution of 9 July 2015 on resource efficiency: moving towards a circular economy, (2014/2208(INI)), pt. 24.

of establishing minimum recycled material content in new products.[87] In July 2017, the EP also proposed the establishment of 'minimum resistance criteria', which could be based on standards, and highlighted the need to promote product reparability and durability through a number of measures.[88] Along the same line, the consumer associations BEUC and ANEC stressed the importance of ambitious requirements for material efficiency, including a minimum product lifetime, the availability of spare parts at reasonable cost, the availability of software updates, the limited use of hazardous chemicals and a better waste management.[89] For these new requirements, the EP emphasized the importance of having criteria well specified and defined in a clear and objective manner, while being easily measurable and achievable at a proportionate cost.[90] Closely linked to this lifecycle approach, the idea of horizontal requirements on, *inter alia*, durability, reparability, reusability and recyclability was also put forward.[91]

A third criticism centers on the absence of mobiles and smartphones in the indicative list of new product groups in the Ecodesign Working Plan 2016–2019. The issue was raised by BEUC, which disapproves the specific assessment planned by the EC for ICT products as it will delay the adoption of implementing measures on this product group.[92] Sharing the same opinion, the EP repeatedly highlighted that these products, which are sold in large numbers and replaced frequently, have a clear potential for improvement, not only in terms of energy efficiency, but also concerning the recycling of rare metals, product design and removable batteries.[93] In March 2018, an open letter on that issue was submitted to the EC President Juncker by Coolproducts, a coalition of environmental NGOs, with the support of over 30 stakeholders (including Ifixit, RREUSE).[94] Deploring the exploratory study on ICT products, they called for fast and

87 European Parliament Resolution of 9 July 2015 on resource efficiency: moving towards a circular economy, (2014/2208(INI)), pt. 25.

88 European Parliament Resolution of 4 July 2017 on a longer lifetime for products: benefits for consumers and companies (2016/2272(INI)).

89 BEUC, *Greener, better, faster, stronger Ecodesign – Consumer organisations' views on the implementation and enforcement of the Ecodesign Directive* (European Union 2017).

90 European Parliament Resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)), pt. 18.

91 European Parliament Resolution of 9 July 2015 on resource efficiency: moving towards a circular economy, (2014/2208(INI)), pt. 24.

92 BEUC, *Greener, better, faster, stronger Ecodesign – Consumer organisations' views on the implementation and enforcement of the Ecodesign Directive* (European Union 2017) p. 6.

93 European Parliament Report of 7 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)); European Parliament Resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)), pt. 28.

94 Open letter from Coolproducts of 26 March 2018 to President Juncker: Regulate smartphones through Ecodesign available at: https://static1.squarespace.com/static/57d64e6629687f1a258ec04e/t/5ab900ea758d46cbe65597d9/1522073834956/Open+Letter+to+President+Juncker+-+Regulate+smartphones+through+Ecodesign.pdf.

efficient actions, claiming that the necessary legislative tools were already available through Ecodesign and Energy Labelling rules.

Fourthly, the effectiveness and enforcement of the implementing measures also cause concerns. This issue has constantly been raised by the EP. In its 2015 Resolution on 'resource efficiency', it claimed that an emphasis should be given on the implementation of self-monitoring and third-party auditing to ensure that products comply with these standards.[95] The EP Report from 2018 expressed the need to tighten up coordination between the national authorities, suggesting that (1) best practices established by Member States should be shared, (2) rapid screening methods should be implemented in cooperation with industry experts to detect the products that are most likely to be non-compliant and (3) dissuasive measures should be taken to improve compliance with ecodesign requirements.[96] Lastly, the EP stated, based on a study gathering interviews of stakeholders in 2017[97], that the majority of stakeholders encounter three main obstacles to full implementation of ecodesign legislation: (1) a lack of clear political support and direction; (2) a slow pace of the regulatory process and (3) an inadequate market surveillance.[98] These concerns could grow if material efficiency requirements are adopted, due to the lack of suitable methods to support enforcement of a lifecycle ecodesign approach in and beyond the EU boundaries.

Finally, there are many comments on the Draft Regulation on electronic displays, which reflect how challenging it is to adopt ecodesign requirements.[99] From the producer side, the Joint Industry Paper on Draft Ecodesign Regulation on Electronic Displays[100] and the Comments from Digitaleurope[101] neatly summarize the major controversial points. The lack of prior assessment was put forward for some products falling within the wide scope of the draft implementing measure. The broad scope was also seen as problematic since it would result in double regulation for electronic displays already covered by other implementing measures. Furthermore, the request was made to remove the resource efficiency requirement prohibiting welding and gluing as it would impede manufacturers in their ability to design products and hamper innovation. Besides, the evidence that these fastening techniques inhibit

95 European Parliament Resolution of 9 July 2015 on resource efficiency: moving towards a circular economy, (2014/2208(INI)), pt. 24.

96 Report of the European Parliament of 7 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)), pp. 5–6.

97 C. Egenhofer et al., *1. Stakeholders views on the Ecodesign Directive: An assessment of the successes and shortcomings – Briefing paper* (European Union 2017).

98 Recital K of the European Parliament Resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)).

99 See all the feedbacks available at: https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2016–7108187/feedback_en?p_id=8483.

100 Joint Industry Paper from Digitaleurope et al. of 3 July 2017 on Draft Ecodesign Regulation on Electronic Displays.

101 Comments from Digitaleurope of 3 February 2017 on the Draft Ecodesign Regulation on Electronic Displays.

removability of components was deemed not concrete enough. These suggestions sharply contrast with the view expressed by the consumer side, as demonstrated in the document issued by BEUC.[102] Rather, the latter calls for a wider scope including integrated displays and digital photo frames, as well as for more resource efficiency requirements.

4. EVALUATION OF THE ECODESIGN DIRECTIVE AND ITS IMPLEMENTING MEASURES

4.1. NECESSITY OF THE ECODESIGN RULES

A legal norm is necessary if there is a certain issue to address and no existing norm with the same purpose, scope and outcome. It ties in closely with the principle of subsidiarity which question whether the EU act would provide clear added value or whether similar changes could be achieved at national level. Concerning the existence of an issue to be settled, the first part of this chapter as well as the previous chapters of this book clearly described the negative consequences of massive production and consumption of products caused by the linear economy currently dominant in European countries. Without promoting ecodesigned products, the transition towards circular economy could not be achieved.[103]

In absence of the Ecodesign Directive and its implementing measures, it has been noted that market forces and external factors were not able to trigger but hindered the development of ecodesigned products. A legislative response was thus necessary to drive specific aspects of sustainability within supply chains. While other legal instruments such as information disclosure and financial incentives, or self-regulatory measures can encourage eco-efficient design solutions among producers, the Ecodesign legal framework has distinct and irreplaceable advantages.[104] First, producers have no choice but to observe the mandatory ecodesign requirements, as non-complying products could be banned from the market. Second, the Ecodesign Directive creates a level playing field where all producers (even those who export) are subject to the same rules and not necessarily put at competitive disadvantage like with taxes and charges. Consequently, unlike other EU policies in general, mandatory ecodesign requirements tend to be taken up in other jurisdictions, who want to ensure

102 BEUC, *Consumer organization views on Ecodesign and Energy Labelling for Electronic Displays* (European Union 2017).

103 *Cfr supra*, 1.1..

104 See from the same opinion, N. Sachs, 'Can we regulate our way to Energy Efficiency? Products standards as climate policy', 25 *Vanderbilt Law Review* (2012) p. 1631.

the competitiveness of their industries on the global market.[105] These extra-territorial effects constitute the third advantage of the Ecodesign Directive. Regarding the implementing measures, their necessity is assessed during the adoption process. The working plan helps deciding whether ecodesign requirements are needed for specific or all products, while the impact assessment analyses existing initiatives on the concerned products, as well as the capacity of the market forces to address the issue.

The necessity of adopting Ecodesign rules at the EU level is also undeniable. Establishing mandatory ecodesign requirements at the national level would have been inappropriate. Having to comply with rules differing from one Member State to another would have created financial and administrative burden for producers who would then have passed on the costs to final consumers. Moreover, it would have exacerbated the fragmentation of the legal framework promoting circular economy, obliging consumers and producers to deal with a tortuous legal maze. The Ecodesign rules thus benefit all stakeholders by preventing disparate national legislation from becoming obstacles to intra-EU trade and by enhancing product quality and environmental protection. Moreover, the wider the level playing field is, the more it influences manufacturers from outside the EU.

4.2. EFFECTIVENESS OF THE ECODESIGN RULES

A legal norm is effective if it achieves, to the best degree, the objectives or other intended effects, having regard to their substance and to their enforcement. As aforementioned in the second part of this chapter, the Ecodesign Directive was adopted on the basis of Article 95 TEC. Although this provision has as its object the establishment and functioning of the internal market, it allows taking the protection of the environment into consideration. Through this combination of objectives, the Directive aims at ensuring the eco-efficiency of products which freely move across the EU. This contributes to closing the loops of resources in our economy. Since these objectives closely relate to the interests at stake, the effectiveness will be measured against the interest of the environment, consumers and producers.

The Ecodesign rules developed at the EU level are quite effective to achieve objectives. Through this command-and-control approach, every company willing to sell products on the EU market has to adhere to ecodesign mandatory requirements. These requirements are tested and approved by official scientific methods, which ensure that they enhance the protection of the environment with no or limited rebound effects. Many specific groups of energy-related

[105] C. Dalhammar et al., *Addressing resource efficiency through the Ecodesign Directive* (TemaNord 2014) p. 94.

products are already subject to implementing measures. Further work and debate are ongoing to include other products within this legal framework, with the question of whether ecodesign rules should be extended to all products. In that regard, voluntary agreements could be used to cover certain categories of non-energy-related products. Once the product complies with these requirements, Member States cannot restrict their movement on the market, except on the basis of grounds listed in Article 36 TFEU or from mandatory requirements (*e.g.* protection of the environment).[106] The ecodesign legislation thus allow to fight against climate change from a product-oriented perspective and to shift towards a circular economy, while ensuring the smooth functioning of the EU internal market.

The contribution of the Ecodesign rules to the project of circular economy could be even stronger. Many ideas on future ecodesign requirements are envisaged in that sense. Admittedly, the focus on energy efficiency allowed a great reduction of the energy consumption of the covered products and ecodesign requirements on energy efficiency should still be developed. However, the greater environmental impact of products is now shifting to materials. Constant calls are being made by EU institutions and organisations and supported by studies[107] to adopt a range of non-energy in use improvements. Although it could require the development of another methodology and the adaptation of the adoption procedure, such requirements seem essential in the current environmental context. Some inspiration could be drawn from existing legislation or self-regulation in that regard. An example of inspiring legislation is the one regulating cars, which provides *inter alia* for access to repair and maintenance information, tools and relevant software to independent operators, as well as for the almost total reuse and recovery of end-of-life vehicles.[108]

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106 These derogations are narrowly interpreted by the European Court of Justice. Moreover, the Member State must demonstrate that the measure is proportionate and suitable to reach the goal. See for ex. ECJ 20 September 1988, Case 302/86, *Commission v Denmark*.

107 See for ex. D. Maxwell et al., *Review of EuP Preparatory Study Evidence: Does it support development of non-energy related implementing measures?* (DEFRA 2011); F. Ardente et al., *Review of resource efficiency and end-of-life requirements – Deliverable 1 of the project "Integration of resource efficiency and waste management criteria in the implementing measures under the Ecodesign Directive"* (European Commission 2011); BIO Intelligence Service, *Material efficiency ecodesign report and module to the methodology for the Ecodesign of energy-related products (MEErP) – Part 1: Material efficiency for Ecodesign* (European Commission 2013).

108 See Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles – Commission Statements, OJ L 269, 21.10.2000, p. 34–43; Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/EC,OJ L 188, 18.7.2009, p. 1–13; Directive 2005/64/EC of the European Parliament and of the Council of 26 October 2005 on the type-approval of

Although the context in the car sector was particular[109], some ideas could be transposed to household products. Some national self-regulatory measures could also serve as an inspiration, like the Austrian Durability Mark for Electrical and Electronic appliances (ONR 192102) or the German voluntary certification (The Blue Angel). To get the label, producers have to make products with a minimum average lifetime and to guarantee the availability of spare parts for a certain period of time, the open availability of a repair manual to end-consumers and accredited centers, as well as the easy removal of the battery and other consumables by the end-user. Finally, private initiatives like Ifixit, which provides a reparability rate of some devices, could give additional insight.

The adoption and enforcement procedures could also be improved and optimized, especially if new requirements on other environmental issues are introduced. So far, the four-year period could seem problematic, especially for products with rapid technological progress. However, the importance of designing appropriate standards and proceeding carefully and stepwise in the process should not be neglected. It is indeed sound to avoid ecodesign measures that may have large unforeseen effects, leading to setbacks.[110] C. Dalhammar even stated that the procedure, which enables good coordination between all the relevant EC services and early interaction with other stakeholders, could pave the way for other legal instruments.[111] Yet, the adoption of ecodesign requirements on the significant environmental aspects of a product should not be unduly delayed by uncertainties regarding some potential environmental damages. Concerning the enforcement of ecodesign requirements, it seems that the coordination between the national authorities could be enhanced for more effectiveness, as highlighted by the EP.[112]

While the environment is protected through the objective of the Ecodesign Directive, it is noteworthy that the other interests at stake are duly taken into consideration. In general, ecodesign legislation is beneficial for producers and consumers. On the producer side, the level playing field established by the Directive protects them from competition from low-quality and inefficient imported products. Stringent ecodesign requirements are also a potential source of competitive advantage, triggering quality products, innovation, energy and resource savings and new business models. By removing the most inefficient products from the market, it is quite unlikely that innovative products are affected

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motor vehicles with regard to their reusability, recyclability and recoverability and amending Council Directive 70/156/EEC, OJ L 310, 25.11.2005, p. 10–27.

109 Car legislation was originally implemented because of a lack of competitiveness on the repair market and not because of the difficulty to repair. See Deloitte, "Study on socioeconomic impacts of increased reparability – Final Report" (European Union 2016), p.15.

110 C. Dalhammar et al., *Addressing resource efficiency through the Ecodesign Directive* (TemaNord 2014) p. 25.

111 C. Dalhammar et al., *Addressing resource efficiency through the Ecodesign Directive* (TemaNord 2014) p. 16.

112 *Cfr supra*, 3.4..

directly. Although some requirements might increase the costs for manufacturers in the short term, it makes a good return on investment in the longer term. Yet, as the EC stated, these requirements must remain flexible – setting efficiency targets but not prescribing technical solutions – in order to stimulate new options and adapt to technical progress.[113] Less virgin material extracted, lower price volatilities and supply risks[114], less energy embedded, less waste generated.

From the consumer point of view, Ecodesign rules guarantee quality products with reliable and accessible information. Admittedly, their freedom of choice is reduced by the fact that some products are phased out of the EU market.[115] However, it is still possible for consumers to choose between a variety of best performing products for their needs, including new technologies and models that were brought to the market following the adoption of ecodesign rules.[116] Furthermore, rules banning non-eco-friendly products generally generate consumer savings, at least in the long term. While consumers might feel the price difference in their wallet when purchasing ecodesigned products[117], the latter are also of better quality, more energy- and resource-efficient and with a longer lifespan. The transition from halogen lamps to LEDs aptly illustrates this point.[118]

Considering producer and consumer interests when adopting ecodesign rules is of particular importance for a smooth transition towards circular economy, which requires a close cooperation between all actors of the chain. This is done through the active participation of stakeholders during the adoption procedure of implementing measures. This involvement not only ensures the transparency and legitimacy of the rules, but also anticipates and prevents potential adverse impacts and trade-offs. Conflicts of interests are mostly avoided by the fact that implementing measures are defined in a technology independent way. If nevertheless a conflict occurs, one could say that environmental considerations should prevail as protecting the environment inherently benefits to everyone in the end.

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113 Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Closing the loop – An EU action plan for the circular economy, COM(2015) 614 final, p. 3; CECED, *Let's close the loop through innovation & competition* (European Union 2015) pp. 1–2.

114 An illustrative example is the plastic bottle where virgin plastic depends on oil price.

115 See in that regard examples of reactions to the ban on halogen lightbulbs: https://www.theguardian.com/environment/2018/aug/23/europe-to-ban-halogen-lightbulbs (visited on 31 August 2018).

116 D. Jepsen et al., *Delivering resource-efficient products – How Ecodesign can drive a circular economy in Europe* (European Environmental Bureau 2015) p. 57.

117 There is no clear evidence that resource-related requirements lead to more costly products. Most requirements can be met with existing technical solutions, at relatively little additional cost if at all. And if requirements are implemented in a staged approach aligning re-design activities with the normal product cycle, necessary changes can be easily included in product concepts.

118 Although halogen lamps are individually cheaper than LEDs, it is "false economy" as they use far more power (five times higher) and last less long (up to ten times shorter).

5. CONCLUSION

The Ecodesign Directive and the framework it establishes is essential for the success of the circular economy project. It helps weaken the impacts of energy-related products on the environment, from the beginning to the end of their lifecycle. As emphasized in this contribution, such legal tool is necessary to trigger ecodesigned products throughout the whole EU territory at a desirable speed. There are still a few issues relating to its effectiveness, as shown by the various actions and reactions from the EU institutions and organisations. Most of the comments are fully justified to improve the effectiveness of the Ecodesign rules and thus to better achieve the ambitious transition towards circular economy. Some points should warrant the most assiduous attention from the EC, including a wider range of products covered by implementing measures, more ecodesign requirements on aspects other than energy efficiency in the use phase and more effective adoption and enforcement procedures. Inspiration for the future developments of this legal framework could be derived from national schemes (see the reports from the break-out session on national initiatives in this book) or from other EU legislations (like the one on cars).

One major idea should be kept in mind when adopting and implementing ecodesign requirements: the need for a multi-tiered approach. Without considering the various environmental aspects and the different stages of the product lifecycle, ecodesign requirements could not effectively contribute to the achievement of a circular economy. In that regard, cooperation is needed between the different actors of the chain. Consumers will not be able to repair the product if it has not been designed in a reparable way. On the other hand, it would be pointless for producers to design a reparable and a durable product, which could take more efforts, energy and resource, if consumers do not buy it or take care of it but throw it away too early, without any treatment at the end of its life. While actors are required to be actively involved in this process, they gain many advantages to do so. In the long term, designing consumer goods in an eco-friendly way can lead to economic growth and to a preserved and sound environment.

Another evaluative criterion that would have shed brighter light on the effectiveness of the Ecodesign legislation is the assessment of its coherence and consistency with other legal and self-regulatory instruments. A norm is deemed consistent if it does not contradict other norms, and coherent if it establishes positive connections with them. Although the Ecodesign Directive and its implementing measures have proven to be quite effective in the production and consumption of ecodesigned products since its adoption, this effectiveness highly depends on synergies with other legal instruments and self-regulations. As highlighted by the EP, the Ecodesign Directive is '*part of a larger toolbox*'.[119] It

[119] European Parliament Resolution of 31 May 2018 on the implementation of the Ecodesign Directive (2009/125/EC), (2017/2087(INI)), pt. 6.

is no alternative, but rather a complement to other rules. Even though no such analysis has been carried out in the present contribution, the following chapters of this book will bring an overview of the possible legal combinations to reach a circular economy.

Along the same line, ecodesign mandatory requirements should also be combined with business models other than the usual consumption model of buying, possessing and disposing things. Beyond the idea of functional economy (more deeply described in one chapter of this book), there are other business models like leasing, sharing, exchanging or collective purchasing for which ecodesigned products are more suitable. Products with ecodesign are long-lasting and more easily reparable, upgradable and recyclable, allowing producers to further economy benefits and consumers to use them longer. With such business models, economic actors are thus encouraged to turn to ecodesigned products, either because they remain involved in the exploitation and final disposal of the product (producers) or because they feel responsible towards other users (consumers).