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SPECIAL SECTION

THE DIGITAL PRODUCT PASSPORT UNDER THE EU ECODESIGN REGULATION 2024: EMPOWERMENT OF THE CUSTOMER-CONSUMER ON THE ROAD TO SUSTAINABILITY IN A CIRCULAR ECONOMY OR INFORMATION OVERLOAD?

Abstract

The European Commission has established mandatory ecodesign requirements for products and services introduced into the internal market under the new Ecodesign Regulation from 2024 (ESPR) in order to support the development of a circular economy and increase the EU's competitiveness. The measures encompass product parameters and information requirements. Here, the newly established Digital Product Passport (DPP) will play a central role, complemented by labels and other information sources. This paper investigates the information requirements, the DPP, and labels in order to discover whether these measures will realise the ESPR's aim of improving product traceability and of positioning consumers to make sustainable choices and ultimately promote sustainability and a circular economy. The DPP's efficiency as an information tool and its interaction with labels, as well as the change to the consumer's position in terms of their safety and their rights will be considered. While the ESPR's implementation and product-group specific regulation is still underway, the DPP looks to become a comprehensive data provision tool that will place relevant and easily comprehensible product information at the customer's fingertips. Aspects from the product's whole lifecycle will be covered, from origin and materials used, over resource consumption during production and when in use, to contained substances of concern, as well as instructions for installing, using, maintaining, and disposing of the product. This information is also relevant for other economic operators like repairers, refurbishers, and waste disposers. For the economic actor burdened with the creation and maintenance of the DPP, often the manufacturer, the tool brings advantages like enhancing buyer trust and product differentiation. The transparency of product parameters and the ensuing market competition will foster incentives for product development and thus increase the sustainability of offered products. The DPP has limitations, like its accessibility for vulnerable consumers and its scope, and important opportunities might be missed if these are not addressed. Despite this, the information requirements and in particular the DPP appear to be measures that will support the European Green Deal,

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as well as the New Circular Economy Action Plan and the New Consumer Agenda and enhance the internal market's sustainability and circularity.

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SUMMARY

1 Introduction: EU Law, Sustainability, and Consumer Law

In its recent Communication on '[a] Competitiveness Compass for the EU'[1], the European Commission admitted that the EU's strengths must be leveraged, and that action has to be taken 'now to regain [the EU's] competitiveness and secure its prosperity.'[2] These objectives echo the EU strategic agenda for 2024-2029 as well as the Commission priorities for 2024-2029.[3] One planned measure is the creation of a single market with a circular economy, which links to the EU 'core objective'[4] of 'the sustainable development of Europe' (Art 3(3) Treaty on the Functioning of the EU (TFEU)[5]). A roadmap for sustainable development was laid down in the European Green Deal[6] and the New Circular Economy Action Plan (CEAP)[7]. The Grean Deal proposed 'a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where […] economic growth is decoupled from resource use.'[8] The EU's industry was found to be 'too "linear"' with '[o]nly 12% of the materials it uses

[1] Commission, 'A Competitiveness Compass for the EU' COM (2025) 30 final, hereinafter 'Competitiveness Compass'. The document is available at <https://circulareconomy.europa.eu/platform/sites/default/files/2025-01/Competitiveness%20Compass.pdf> accessed 3 November 2025.
[2] Competitiveness Compass 1.
[3] See <http://european-union.europa.eu/priorities-and-actions/eu-priorities/european-union-priorities-2024-2029_en> accessed 3 November 2025.
[4] See <https://eur-lex.europa.eu/summary/chapter/20.html> accessed 3 November 2025.
[5] Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C326/01.
[6] Commission, 'The European Green Deal' COM (2019) 640 final, hereinafter 'Green Deal'. See further <https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en> accessed 3 November 2025. This has been called the 'most ambitious economic sustainable growth strategy of the EU since its foundation', see Lucila De Almeida and Fabrizio Esposito, 'Consumers and the Green Transition Between Saying and Doing: Promising Consumer Empowerment While Restricting Consumers' Choices is Dangerous' (2023) 42 Yearbook of European Law 407, 412.
[7] Commission, 'A new Circular Economy Action Plan for a Cleaner and More Competitive Europe' COM (2020) 98 final, hereinafter 'CEAP'. See also <https://environment.ec.europa.eu/strategy/circular-economy_en> accessed 3 November 2025.
[8] Green Deal 2.

com[ing] from recycling'.[9] The aim to reuse before recycling materials is to materialise through the CEAP[10] and a New Industrial Strategy for Europe[11]. The mandatory ecodesign requirements of the new Ecodesign Regulation[12] are one facet that will supposedly support these plans (Art 1(1) ESPR).[13]

There have been previous endeavours in product policy, ecodesign, and energy labelling to promote sustainable products in the internal market. Pertinent measures include:[14] the Ecodesign Directive[15] (now repealed), the Energy Label Regulation[16], and the Standby Mode Ecodesign Regulation[17]. The focus of these measures was to advance resource savings (energy conservation) and environmental protection (see Rec 10 Ecodesign Directive, Rec 2 Energy Label Regulation, Rec 1-7 Standby Mode Ecodesign Regulation); consumers played a subordinated role. In contrast, the ESPR targets customers, which encompasses both consumers and business entities acting in a consumer capacity, and economic operators (see Section 2.2 below).

Within the ESPR's framework, the Digital Product Passport (DPP) is established as a means of making product information available to both economic actors and customers. In this way, customers are meant to be put into a position to make more informed choices while the traceability of products is improved at the same time (Rec 32).

It can be argued that the ESPR forms part of EU consumer law. While the Regulation does not grant consumers new rights vis-à-vis businesses, it pursues a new line of EU consumer policy that seeks to empower consumers to act. This approach follows the European Green Deal,[18] the CEAP,[19] and the New Consumer Agenda[20]. The Agenda has

[9] Green Deal 7.
[10] Cf CEAP 2-3.
[11] Commission, 'A New Industrial Strategy for Europe' COM (2020) 102 final. For further details, see <https://single-market-economy.ec.europa.eu/industry/strategy_en> accessed 3 November 2025.
[12] Council Regulation (EU) 2024/1781 of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC [2024] OJ L1781/1, hereinafter 'ESPR'.
[13] Compare Competitiveness Compass 11.
[14] See on this generally <https://single-market-economy.ec.europa.eu/industry/sustainability/sustainable-product-policy-ecodesign_en> accessed 3 November 2025. For further details on the different kind of legislative acts and measures, see Thomas Adisorn and Lena Tholen and Thomas Götz, 'Towards a Digital Product Passport Fit for Contributing to a Circular Economy' (2021) 14 Energies 2289 in Section 3.1. On the link between sustainable development and environmental law, see Elisa Morgera and Kati Kulovesi, 'Environmental Law' in Catherine Barnard and Steve Peers (eds), *European Union Law* (4th edn, OUP 2023) 692, 706.
[15] Directive 2009/125/EC of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products [2009] OJ L285/10.
[16] Regulation (EU) 2017/1369 of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU [2017] OJ L198/1.
[17] Regulation (EU) 2023/826 of 17 April 2023 laying down ecodesign requirements for off mode, standby mode, and networked standby energy consumption of electrical and electronic household and office equipment pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 1275/2008 and (EC) No 107/2009 [2023] OJ L103/29.
[18] See European Green Deal 8. See also De Almeida and Esposito (fn 6) 412.
[19] CEAP 5.
[20] Commission, 'New Consumer Agenda Strengthening Consumer Resilience for Sustainable Recovery' COM (2020) 696 final 5-7, hereinafter 'New Consumer Agenda'. See on this <https://commission.europa.eu/strategy-and-policy/policies/consumers/consumer-protection-policy/consumer-strategy_en> accessed 3 November 2025. The

five priority areas: green transition, digital transformation, redress and enforcement of consumer rights, specific needs of certain consumer groups, and international cooperation. The first of these, the green transition, relates directly to the ESPR and the new empowerment strategy: Its aim is to 'empower, support and enable every consumer, regardless of their financial situation, to play an active role in the green transition'.[21]

This paper examines the ESPR's requirements for the DPP and considers its suitability as a vehicle to enhance sustainability and promote circularity through ecodesign.[22] The salient question is whether the double aim of this instrument can be achieved or whether this product digitisation merely burdens businesses and consumers with (yet) more information to process. To discover an answer, the paper investigates three strands of questions: First, whether the DPP can be an efficient means of fulfilling information duties from the perspective of businesses and customers. Secondly, how these requirements mesh with existing information duties and requirements like energy labels under the Energy Label Regulation. Thirdly, whether the consumer's situation is improved in terms of their empowerment to make informed and sustainable choices, as well as the safeguarding of their rights and safety.

The remainder of this paper is structured as follows: An overview of the ESPR in terms of its aims and scope (Sections 2.1 and 2.2) and definitions of key concepts (2.3) is followed by an examination of the product requirements, namely, information requirements (3.1), with particular focus on the DPP (3.2) and labels (3.3).[23] These aspects provide the background for a discussion of the three strands of questions of the DPP's efficiency as a means of information (4.1), the DPP's interaction with other information and labelling requirements (4.2), and whether there is a change in the consumer's situation (4.3). As the ESPR only entered into force on 18 July 2024 and its implementation is still underway,[24] with the first delegated acts under the ESPR

Commission is currently evaluating the results of a public consultation and plans to adopt a consumer agenda for 2025-2030 at the end of this year, see <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14514-Consumer-Agenda-2025-2030-and-action-plan-on-consumers-in-the-Single-Market_en> accessed 3 November 2025.

[21] New Consumer Agenda 5. See also ibid 8-9 on the DPP and digital information.

[22] This paper considers the practical aspects of the ESPR requirements. For a discussion of the technical side, the DPP system, see Commission, 'Webinar on Digital Product Passport Standardisation' (12 June 2023, no longer available online), hereinafter 'DPP Standardisation Webinar'. See further, eg, Meliha Honic and Pedro Meda Magalhães and Pablo Van den Bosch, 'From Data Templates to Material Passports and Digital Product Passports' in Catherine De Wolf and Sultan Çetin and Nancy Bocken (eds), *A Circular Built Environment in the Digital Age* (Springer 2024) 79–94, contrasting DPP from other kinds of passports like material passports; Konstantinos Voulgaridis and others, 'Digital product passports as enablers of digital circular economy: a framework based on technological perspective' (2024) 85 Telecommunication Systems 699–715; Jens Niederhausen and others, 'Metrology and the quality infrastructure for the Digital Product Passport' (2025) 38 Measurement: Sensors 101491, <https://doi.org/10.1016/j.measen.2024.101491> accessed 3 November 2025.

[23] A discussion of the ESPR's requirements as to a product's performance requirements, contained in Art 6 and Annex I ESPR, goes beyond the scope of this paper.

[24] The implementation of the ESPR, like the drafting of working plans and determining product-group-specific requirements, will be influenced by the Group of Experts on Ecodesign for Sustainable Products and Energy Labelling ('Ecodesign Forum'). The Forum held its first meeting in February 2025 and another in April. A first working plan has been published, see Commission, 'Ecodesign for Sustainable Products and Energy Labelling Working Plan 2025-2030'

expected to come into force in early 2027,[25] an interim evaluation of the ESPR is made (5.1) and improvements suggested, where appropriate (5.2). This leads to an outlook for the EU's sustainability measures (5.3).

2 The New Ecodesign Regulation (ESPR): Sustainability and EU Consumer Law

The sustainability measures prior to the ESPR, in particular the Ecodesign Directive, established a foundation for the collection and provision of data elements relating to ecological considerations; however, the Directive lacked 'a systematic data flow'[26]: While a database exists for energy-related product data in the form of the European Product Registry for Energy Labelling (EPREL)[27], the Ecodesign Directive merely provided that ecologically-relevant product information be made available to the consumer 'in the form [manufacturers] deem appropriate' (Art 14 Ecodesign Regulation). This situation is remedied under the ESPR in that it integrates several ecodesign aspects (see Section 2.1 below), targets both economic actors and customers (see Section 2.2), and foresees information requirements (see Section 3.1.) and the DPP as a collection of data sets on the different aspects of a product's lifecycle (see Section 3.2).

2.1 Aims of the ESPR

The ESPR has the ambitious objective of acting as a general ecodesign framework that tackles

> *product durability, reliability, repairability, upgradability, reusability and recyclability, […] refurbishment and maintenance […] , …] the presence of hazardous chemicals in products, […] energy and resource efficiency […] ; that] reduce[s …] waste and increase[s] the recycled content in products[…], enable[es] remanufacturing and high-quality recycling and reduc[es] carbon and environmental footprints[; and] address[es] practices associated with premature obsolescence.*[28]

By addressing all of these parameters, product sustainability in the EU is supposed to be improved while waste is reduced. Consequently, the ESPR is meant to support the EU's

COM (2025) 187 final, hereinafter 'Ecodesign Working Plan'. It states at 4-6 that acts will be adopted for the following product groups by year (further measures are listed at 8): Iron and steel (2026); textiles, tyres, and aluminium (all 2027); furniture (2028); mattresses (2029). Furthermore, horizontal requirements for repairability (and a score) as well as recyclability of electronic products will be laid down in 2027 and 2029 (see ibid 6). On the Forum and its work in general, see Rec 52 and Arts 19–20 ESPR and <https://environment.ec.europa.eu/news/advancing-sustainability-through-espr-2025-02-19_en> accessed 3 November 2025.

[25] See DPP Standardisation Webinar (n 22) and Ecodesign Working Plan 4-6.

[26] Adisorn and Tholen and Götz (n 14) in Section 3.1.

[27] For further information on this database, see <https://energy-efficient-products.ec.europa.eu/eprel_en> accessed 3 November 2025.

[28] Recs 6 and 7 ESPR.

objectives of energy and environment conservation in general and sustainability and the circular economy in particular (Recs 9–10, 2 ESPR). The ESPR builds on and replaces the Ecodesign Directive from 2009, as it acts as a sustainability framework for 'virtually all physical products',[29] while the 2009 Directive was limited to 'energy-related products' (Arts 1(1), 2 point 1 Ecodesign Directive). New under the ESPR is the DPP (Arts 9–15 ESPR, see Sections 3.2 and 4. below), the rules prohibiting the destruction of unsold products (Arts 23–26), and the establishment of mandatory green public procurement rules (Art 65).[30]

2.2 Scope of the ESPR

Article 2 point 1 ESPR limits the ESPR's scope in terms of 'products' to 'any physical goods that are placed on the market or put into service', so that digital content is generally excluded; however, where digital content forms 'an integral part of a physical product' (Rec 13 ESPR), this is covered by the Directive. Intermediate products and components are within the ESPR's scope (Art 1(2)). An intermediate product is 'a product that requires further manufacturing or transformation such as mixing, coating or assembling to make it suitable for end-users' (Art 2 point 3), while components are 'product[s] intended to be incorporated into another product' (Art 2 point 2). These products are covered when they are first made available on the internal market, ie, supplied ('making available on the market', Art 2 point 39, and 'placing on the market', Art 2 point 40) or are first used in the internal market ('putting into service', Art 2 point 41).

There are only few product exceptions. These relate to particular product categories for which regulation either already exists or where sustainability requirements are not suitable (Rec 13, Art 1(2) ESPR): food[31], feed[32], medicinal products[33], veterinary medicinal products[34], living plants, animals and micro-organisms, products of human origin, products of plants and animals relating directly to their future reproduction, and vehicles[35].

[29] Anonymous, 'Ecodesign for Sustainable Products Regulation: Making sustainable products the norm in the EU' (European Commission 2025) <https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en> accessed 3 November 2025.
[30] On the last, see Kleoniki Pouikli, 'The role of Green Public Procurement (GPP) under the EU Green Deal as a key lever of the transition to a circular and climate neutral Europe' in Christiane Trüe and Lydia Scholz (eds), *The EU Green Deal and its Implementation* (Nomos 2023) 247–266.
[31] See Art 2 Regulation (EC) No 178/2002 of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [2002] OJ L31/1.
[32] See Art 3(4) Food Law Regulation.
[33] See Art 1(2) Directive 2001/83/EC of 6 November 2001 on the Community code relating to medicinal products for human use [2001] OJ L311/67.
[34] See Art 4(1) Regulation (EU) 2019/6 of 11 December 2018 on veterinary medicinal products and repealing Directive 2001/82/EC [2001] OJ L4/43.
[35] See Art 2(1) Regulation (EU) No 167/2013 of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles [2013] OJ L60/1, Art 2(1) Regulation (EU) No 168/2013 of 15 January 2013 on the approval and

Consequently, a broad range of physical goods are covered by the ESPR. Recital 13 clarifies that tyres count as components and that the ESPR applies to E-bikes and e-scooters.

A line is drawn between new and used products: Remanufactured products, ie, 'a new product [that] is produced from objects that are waste, products or components and through which at least one change is made that substantially affects the safety, performance, purpose or type of the product' (Art 2 point 16) count as new products and therefore fall within the ESPR's scope, while second-hand goods, including repaired or refurbished[36] items, are not (Rec 17).

2.3 Key Concepts of the ESPR

The ESPR defines a number of key concepts that are worth noting before examining the Regulation's measures.

'Ecodesign' is characterised as the process of integrating 'environmental sustainability considerations into the characteristics of a product' and its 'value chain'. Thus, not only the finished product, but its entire 'life cycle' (Art 2 point 12 ESPR), ie, its production —including the creation or acquisition of raw materials—, storage, distribution, use, maintenance, repair or reuse, and disposal (recycling or otherwise) need to be sustainable (see Arts 1(1), 2 points 11, 13, 16-20, and Rec 6).

Primary targets of the ESPR are 'economic operators', ie, manufacturers and their authorised representatives, importers, distributors, dealers, and fulfilment service providers (Art 2 points 46, 42, 44-45, 55 ESPR).[37] The secondary target is the economic actors' 'customer': 'a natural or legal person that purchases, hires or receives a product for their own use *whether or not acting for purposes which are outside their trade, business, craft or profession*' (Art 2 point 35, emphasis added). The second half of the definition means that the notion goes beyond that of a consumer, which has traditionally been limited to natural persons acting in a private capacity;[38] here, 'customer' encompasses professionals acting in such a capacity. This definition, while broader than the conventional notion, leaves open whether the customer is an 'average' or a 'vulnerable' consumer.[39]

market surveillance of two- or three-wheel vehicles and quadricycles [2013] OJ L60/52, and Art 2(1) Regulation (EU) 2018/858 of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC [2018] OJ L151/1.

[36] Products that are prepared, cleaned, tested, serviced, and repaired, see Art 2 point 18 ESPR.

[37] The Commission has noted that '[e]codesign requirements […] target manufacturers that need to design their products respecting all requirements and limitations', see <https://energy-efficient-products.ec.europa.eu/ecodesign-and-energy-label/legislative-framework_en> accessed 3 November 2025.

[38] Article 2 ESPR refers to Art 2(2) Directive (EU) 2019/771 of 20 May 2019 on certain aspects concerning contracts for the sale of goods, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC, and repealing Directive 1999/44/EC [2019] OJ L136/28: '"consumer" means any natural person who, in relation to contracts covered by this Directive, is acting for purposes which are outside that person's trade, business, craft or profession'.

[39] On this distinction, see, eg, Jule Mulder, Comparing Vulnerability? How can EU Comparative Law Methods Shed Light on the Concept of The Vulnerable Consumer (2019) 6(2) Journal of International and Comparative Law 209, 210-215.

Out of the three ESPR measures discussed in this paper, only information requirements and the DPP are defined; a label is understood in its common meaning. 'Information requirement' is 'an obligation for a product to be accompanied by information as specified in Article 7(2) [ESPR]' (Art 2 point 9).

Article 2 point 28 ESPR defines a DPP as:

a set of data specific to a product that includes the information specified in the applicable delegated act adopted pursuant to Article 4 and that is accessible via electronic means through a data carrier in accordance with Chapter III.

In this respect, a 'data carrier' is 'a linear barcode symbol, a two-dimensional symbol or other automatic identification data capture medium that can be read by a device' (Art 2 point 29). Given examples of a data carrier include watermarks and QR codes (Rec 37). Until harmonised EU standards are established,[40] data carriers must comply with ISO or other European or international standards (Art 10(1)(c)).

3 The Ecodesign Product Requirements under the ESPR

Ecodesign obligations under the ESPR can take the following forms: Product performance requirements (Art 6 ESPR), information requirements (Art 7), or a combination of both (Art 5(9)). Performance requirements relate to minimum or maximum values of, or non-quantitative requirements for, particular parameters (Art 6(2)) concerning a wide range of sustainability aspects like durability, repairability, recyclability, resource consumption, substances of concern, and microplastic release (Annex I ESPR). In what follows, the ESPR's information requirements are discussed both generally (3.1) and two forms specifically: the DPP (3.2) and labels (3.3). The next section (4) considers the impact of these measures.

3.1 The ESPR's Information Requirements

Products within the ESPR's scope can come with information obligations for the product's manufacturer (Rec 28 ESPR), which will be determined in delegated acts (Art 7(1)). These are meant to 'improve product aspects relevant for environmental sustainability' (Rec 16) and to enable consumers and public authorities to make 'more sustainable choices' (Rec 28). While the exact requirements may vary across product categories, all products must come with a DPP and information allowing substances of concern to be tracked throughout the product's life cycle (Art 7(5), Rec 31). Article 2 point 27 ESPR adopts a broad notion of these substances that encompasses a multitude of health

[40] Standards for the DPP are to be delivered by December 2025, see DPP Standardisation Webinar (n 22).

and environmental considerations, as well as any substance that 'negatively affects the reuse and recycling of materials in the product in which it is present'.[41]

In addition, the customer is to be informed on how to handle the product in terms of its installation, use, maintenance, repair, and disposal (Art 7(2)(b)(ii) ESPR), including its disassembly, recycling, reuse, or refurbishment (ibid point (iii)). Information on a product's performance parameters (on which see Annex I ESPR) may need to be included in the form of a score of its repairability and durability, and what its environmental and carbon footprint is (Art 7(2)(b)(i)). Moreover, other relevant information 'that could influence sustainable product choices for customers' and that is necessary for the product's handling may need to be included (ibid point (iv)). Examples of disposal information are available take-back schemes in Member States and databases of drop-off points (Rec 28).

The required information must be presented in a recipient-friendly manner, ie, 'be clear, easily understandable and tailored to the particular […] product groups concerned and the intended recipients' (Art 7(2)(c) ESPR) and be easily accessible (Rec 28). Each Member State can determine the language in which the information is to be provided (Art 7(8)). The main communication mechanism for the required information is the DPP (on which, see below), while other forms of communication may be set in addition in delegated acts (Arts 7, 9(1)): User manuals or product documents (Art 7(7)(d), product packaging (ibid point b), labels (ibid point c), free access websites or applications (ibid point e), and the product itself (ibid point a). Having said this, 'essential information' on the 'health, safety and rights of end users' must be provided both through some physical means and through a data carrier (Rec 28). Information that leads to an informed purchase decision needs to be provided prior to a purchase transaction (ibid).

3.2 The ESPR's Digital Product Passport (DPP)

The ESPR's new and main digital information tool, the DPP, is regulated in the seven provisions making up Chapter III: Articles 7 to 15. The DPP serves a triple purpose: to provide information to economic operators and customers, to facilitate product compliance verification by the Member States' national authorities, and to improve product traceability (Art 9(3)).[42] It is therefore not surprising that all products that are subject to information requirements must at least include a DPP as a means of

[41] The provision refers to three pieces of legislation for specifications: Regulation (EC) No 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC [2006] OJ L396/1; Regulation (EC) No 1272/2008 of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 [2008] OJ L353/1; and Regulation (EU) 2019/1021 of 20 June 2019 on persistent organic pollutants (recast) [2019] OJ L169/45.

[42] On another occasion, the Commission has stated that the DPP has the triple purpose of increasing environmental sustainability, promoting circularity, and supporting legal compliance. See DPP Standardisation Webinar (n 22).

communicating information (Art 9(1) ESPR). The DPP is to be created by the economic operator that places the related product on or puts it into service in the market (Art 10(3)). This will often be the manufacturer but can also be an importer or a distributor (compare Art 2 points 46, 42-45, 39-41).

The DPP's data is to be presented in the form of one or several types of data carriers, like a QR code (Arts 2 point 38, 9(2)(b), Rec 37) and be linked through a 'unique product identifier' (Art 10(1)(a)). This identifier is to facilitate the product's traceability and must be stored together with other specific data in a digital product passport registry that is to be established by the Commission (Recs 36 and 41, Art 11(1)-(2)). The DPP's data must be complete, up to date, and accurate (Arts 9(1), 11 point g), and be in an interoperable format that allows data transfers without lock-ins, and be searchable and machine-readable, where appropriate (Arts 10(1)(d), 11 point a). It must be accessible easily and free of charge (Art 11 point b). For this purpose, the Commission will establish and maintain a web portal for DPPs (Art 14, Rec 42). The DPP's technical details, including the number of data carriers and their presentation (on the product, its packaging, or on accompanying documents), as well as access to the DPP's data will be laid down for specific product groups in delegated acts (Arts 9(2)(b)-(i), 10(1)(b)).

The information that is generally to be included in the DPP —product group-specific requirements may vary in accordance with future delegated acts— encompasses a wide range from general information such as the product's origin and composition,[43] as well as use and maintenance instructions, over data regarding the product's durability, repairability, and its recycling, to data on its resource consumption during its lifecycle and contained substances, particularly those of concern (Art 9(2)(a), Annex III). Data stemming from information obligations in other EU law can be included in the DPP if the regulation in questions facilitates this (Art 10(2)), eg, information from EPREL (Rec 34). Customers' personal data may only be included in the DPP with the customers' express consent (Art 10(1)(e)).

3.3 The ESPR's Labels

The ESPR contains two provisions on labels: Articles 16 and 17 in its Chapter IV. The first provision deals with labels generally but does not provide a definition. Generalising from the definition laid down in Art 2 point 19 Energy Label Regulation, a label is

> *a graphic diagram, either in printed or electronic form, including a closed scale using only letters from A to G, each letter representing a class and each class corresponding to [one product parameter], in seven different colours from dark green to red, in order to inform customers about [product aspects like] energy efficiency and energy consumption[…].*

[43] Green Deal 8.

Labels are named as one alternative information communication method to DPP among others (Art 7(7)(c) ESPR); however, the DPP is the main information source, while labels are complementary.[44] Their function is to 'provide a quick visual basis for consumers to distinguish between products' (Rec 46). Specific regulation of the content, presentation, and layout of any labels are left to future delegated acts (Art 16(1) and (5)); however, they generally need to present information in a clear and easily comprehensible manner (Rec 46). In this vein, Art 16(2) foresees that labels for a class of performance need to have a clear and easily understandable layout to facilitate comparisons of products by customers based on specific parameters. Moreover, they may need to incorporate a data carrier to access the DPP and other product information (Art 16(4)), as well as sources like websites (Rec 46).[45]

The notion of a label as outlined above would seem to encompass scores, as foreseen in Art 7(2)(b)(i) and Rec 30 ESPR as an information requirement on the durability and repairability of products. Like labels, scores are to be easily comprehensible and include pictograms, while 'the repairability score [must be] be based on a harmonised methodology specified for the product or product group and which aggregates parameters, such as the availability and price of spare parts, the ease of disassembly and the availability of tools, into a single score' (Rec 30).

A new repairability score introduced for energy labels is based on a method developed by the Joint Research Centre (JRC) and is represented by a pictogram of tools that are accompanied by an A-to-E score, whereby A stands for the highest and E for the lowest repairability of the product.[46] The following six factors make up the score: Disassembly depth (number of steps required to remove one part from a product), fasteners (reusable or removable devices used to connect parts or pieces, eg, screws), tools (type required for disassembly and reassembly), spare parts (availability of replacement parts with the same or similar functions, eg, battery, buttons, charger, over a specified period of time, its delivery time, and price[47]), software updates (availability over time of security and functionality updates), repair information (availability, comprehensiveness, and price of

[44] See Ecodesign Working Plan 10: '[Mandatory product] information will generally be provided in the digital product passport. Some *products may also carry an ESPR label* and/or other labels governed by specific EU legislation […]' (emphasis added).
[45] For comparison, an example image of a new energy label that integrates information like energy rating, durability, and repairability can be seen at <https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/new-eu-labels-help-consumers-choose-more-repairable-electronics-2025-06-20_en> accessed 3 November 2025.
[46] See ibid.
[47] This aspect is considered further in Section 5.2 below.

information, eg, user manuals).[48] This scoring system will likely be used for ecodesign labels as well, as the JRC's report makes frequent reference to the ESPR.[49]

Article 17 ESPR is concerned with protecting consumers from misleading information and establishes a prohibition to place products on the market or put them into service where they bear confusing or misleading labels by mimicking labels prescribed under the ESPR. Recital 48 clarifies that the EU Ecolabel[50] or other recognised ecolabels on national or regional level will not be considered confusing, unless the label criteria is less strict than under the ESPR. The German ecolabel 'Blue Angel' (*Blauer Engel*) is one national ecolabel that will be recognised, as it too, like the EU Ecolabel, fulfils the EN ISO 14024 type I requirements.[51]

As mentioned above, previous EU legislation exists for labels, specifically for energy labels in the form of the Energy Label Regulation from 2017. In order to avoid duplications, the Commission aims to include ecodesign information in the existing energy labels, where this is feasible.[52] A label for ecodesign parameters may only be established for products where this integration is not possible (Rec 47), with the effect of the energy label being replaced by the ecodesign label (Art 16(3)).

4 The DPP as an Information Tool and consumers

DPPs are not a new invention of the Commission, nor will DPPs be supplied by it. This is not necessary, because there already are service providers that offer a DPP commercially.[53] One example is Circularise, established in 2016, offering DPPs for '[e]nd-

[48] See Christoforos Spiliotopoulos and others, 'Product Reparability Scoring System: Specific application to Smartphones and Slate Tablets' (Report 2022, EUR 31057 EN), <doi:10.2760/340944> accessed 3 November 2025, in particular 6, 10-15. While this score is for smartphones and tablets, a general score and adaptations for laptops, washing machines, and vacuum cleaners have been developed as well, see Mauro Cordella and Felice Alfieri and Javier Sanfelix, 'Analysis and development of a scoring system for repair and upgrade of products' (Final report, 2019), <https://data.europa.eu/doi/10.2760/725068>, accessed 3 November 2025. Cordella and Alfieri and Sanfelix (ibid) note other factors beside the cost of repairs influencing the consumer's willingness to undertake repair at 57: remaining expected product lifetime (willingness decreasing with approaching expected lifetime end) and time required for repair (1-2 weeks generally acceptable).

[49] See Spiliotopoulos and others (n 48).

[50] This label is a voluntary scheme that certifies 'environmental excellence', ie, that 'goods and services [have] a guaranteed reduced environmental impact throughout their entire life cycle'. See <https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel_en#:~:text=Launched%20in%201992%2C%20the%20EU,the%20growing%20EU%20Ecolabel%20Community> accessed 3 November 2025.

[51] For further information on this label, see <https://www.blauer-engel.de/en> accessed 3 November 2025.

[52] See fn 45 above.

[53] A large number of projects on DPP exist in various sectors and constellations. For a structured overview of 76 of these, see Maike Jansen and others, 'Current Approaches to the Digital Product Passport for a Circular Economy: An Overview of Projects and Initiatives' (Wuppertal Paper no. 198, 2022) <https://wupperinst.org/en/a/wi/a/s/ad/7852> accessed 3 November 2025. The 'living document' overview table of the listed projects can also be accessed at <https://tinyurl.com/widpp22> accessed 3 November 2025. Another detailed overview of DPP projects is provided by Marcello Colledani and Abdelrahman Abdalla, 'Benchmark of Existing DPP-oriented Reference Architectures. Deliverable D3.1 within WP3 of the CIRPASS Project' (2023) 24-86. The document is available at <https://cirpassproject.eu/wp-content/uploads/2023/03/CIRPASS_Benchmark-of-existing-DPP-oriented-reference-architectures.pdf> accessed 3 November 2025.

to-end Supply Chain Traceability' that also comply with the ESPR.[54] Another example is FoodInsights, which allows food products to be traced along a supply chain using blockchain technology, and can provide a DPP.[55]

Despite the idea still being new, the expectations placed by the Commission on the DPP are high,[56] as is evidenced by the central role of the DPP as an information tool within the ESPR's framework. In view of the fact of a yet-to-be-defined technology,[57] the question arises whether these hopes are warranted. Can the DPP not only put customers (consumers) in a position to but actually push them to make more informed and sustainable choices while improving the traceability of products, and also ease administrative burdens for businesses and public authorities by facilitating product compliance? An evaluation will be conducted by examining the DPP's general efficiency as an information tool (4.1), its interaction with other information channels like labels (4.2), and how the DPP is likely to affect the position of consumers (4.3). The dimension of regulatory compliance control will not be investigated in this paper.

4.1 The Efficiency of the DPP as an Information Tool

As an information tool, DPPs are meant to 'significantly enhance end-to-end traceability of a product throughout its value chain' (Rec 32 ESPR). Let us consider how this will work in practice from the perspective of the customer and of the economic operator responsible for the DPP.[58] Beginning with the latter, the economic operator will first need to gather the necessary product information and create a DPP along with a unique product identifier and a data carrier (compare Art 10(1)(a)). They are free to create their own technical infrastructure or use commercially available DPP infrastructures.[59] The economic operators need to include information about the manufacturer and other relevant operators like importers and their unique identifiers, the unique product identifier, relevant product data relating to its performance and sustainability, as well as digital copies of documentation like instructions, data sheets, or safety information sheets (see Annex III and Arts 9(2)(a), 7(2)(b)). The DPP's data will then be registered in the Commission's DPP registry for access by public authorities, customs authorities, and for general authentication purposes. The data carrier will be

[54] See <https://www.circularise.com/company> and <https://www.circularise.com/dpp-for-espr> both accessed 3 November 2025.
[55] See <https://foodinsights.nl/> and <https://foodinsights.nl/projects/de-kloeke-kip-healthy-chicken-meat/> both accessed 3 November 2025.
[56] Compare Adisorn and Tholen and Götz (n 10) in Section 1, noting a general high level of political expectations.
[57] The Commission has been in an open dialogue with stakeholders in relation to the technical requirements, see DPP Standardisation Webinar (n 22).
[58] The following business and user stories are based on explanations provided by the Commission in the DPP Standardisation Webinar (n 22), unless indicated otherwise. Further technical details on both stories can be found in Abdelrahman Abdalla, 'DPP User Stories' (March 2024) 12 and 13, available at <https://cirpassproject.eu/wp-content/uploads/2024/04/DPP_User_Stories_V2.0_Final.pdf> accessed 3 November 2025.
[59] See note 53 above.

supplied to dealers and online marketplace providers, and be placed either on the product itself, the packaging, or any documents accompanying the product like a data sheet (see Art 10(1)(b)). While specifics for the data carrier's presentation under the ESPR have not yet been laid down, it has been established that data carriers in the form of QR codes must be engraved on batteries.[60] After the initial creation process, the operator must keep the data complete and up to date, and continue to provide the DPP and the data, even after they cease their business activities (Arts 9(1) and 11 point e). This is a challenge and incurs costs for the economic operator.[61]

Moving on to the customer, they will first need to scan the data carrier like a QR code of a product they are interested in. The DPP reader on their device will then show them basic product information and a link to the product's DPP. This information set will be available from the data carrier itself, offline; the DPP and other product information needs to be accessed online. In order to avoid counterfeits and fake data carriers, the data carrier will include a link to an online verification service. After scanning the data carrier, the service will show the user whether the carrier is authentic by comparing the data carrier's hash code to the records of the DPP Registry. If the data is shown to be authentic, the customer can rely on the DPP's data with confidence and make an informed and sustainable purchase decision.

After considering these use stories, it is apparent that the DPP is a comprehensive information tool that is nevertheless easily understandable. The idea of having all product data in one place, namely, the DPP, which can be retrieved by scanning a data carrier found on the product or its packaging, means that the product data will be readily available at the customer's fingertips. As such, the DPP presents itself as a convenient and comprehensive information tool that empowers consumers and is reminiscent of EPREL. This hypothesis is weakened by two significant practical matters.

One important limitation to the DPP's effectiveness is that not all consumers will be able to access the DPP: Not those who do not have a device or an internet connection required to download and read the DPP's information, like the less affluent; neither those who do not possess the necessary digital literacy skills to gain access, like some elderly people; nor those with disabilities, like people with a visual impairment, or those with literacy or numeracy difficulties. This wide field of exclusion impacts the DPP's

[60] Recital 44 and Art 13(6)-(7) Regulation (EU) 2023/1542 of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC [2023] OJ L191/1. See also DPP Standardisation Webinar (n 22). On the problems of data carrier presentation, namely, of how to present a data carrier on the product in a way that is durable and allows it to be machine readable, see Colledani and Abdalla (n 53) 20.

[61] Compare Josefin Lövdahl and Sophie I Hallstedt and Jesko Schulte, 'Implications of EU Instruments on Company Capabilities to Design More Sustainable Solutions – Product Environmental Footprint and Digital Product Passport' (2023) 3 Proceedings of the International Conference on Engineering Design 2245, 2250, 2251.

inclusivity and diminishes the DPP's effect of empowering consumers (on which see further 4.3 below).[62]

Even when leaving the inclusiveness issue aside, the act of retrieving the DPP by the customer (scanning data carrier, downloading DPP) is a hurdle that may impair the DPP's effectiveness. This is particularly true at the pre-purchase stage, where the customer is in a physical store. Here, the customer may not have internet access, or neither the time nor the willingness to download the DPP and to browse the information in it.[63] The latter two reasons equally apply to online stores, although here, the hurdle will arguably be lower than in a physical store: Customers have an electronic device at their disposal, which may be specialised equipment or contain assistive technology to enable people with disabilities to use the DPP.[64] Moreover, the DPP can be made accessible through a link on the product's webpage, the clicking of which is an easier action than scanning a QR code. While the retrieval hurdle is a drawback, it can be argued that this effect is generally minor. The average consumer[65] is versed in accessing information online, so scanning a QR code to obtain the DPP and going over the information should not be an inconvenience for most. In addition, many public places offer free internet, which reduces this hurdle. But the fact remains that some consumers may not have a device available to view the DPP. Short of retailers lending consumers devices to do so, or the DPP's information being provided in print, there may be no solution. However, the former does not seem feasible on a global scale, while the latter would not be ecological and thus defeat the DPP's sustainability purpose. Moreover, a printed version of the DPP will not be accessible to consumers with disabilities and no device. Unless consumers have the possibility to consult DPPs at some other place prior to purchase and do so, the DPP will therefore practically remain inaccessible for some consumers at the time of making a purchasing decision.

It ought to be noted that the DPP's effect is not limited to the pre-purchase stage. Its data is relevant for customers after the sale transaction as well. It is convenient when setting up a product, when looking for information on how best to maintain and repair it, and where and how to dispose of it. Similarly, economic operators like repairers, refurbishers, or waste managers may need to access the DPP in order to properly handle the product and update the product's data,[66] eg, where a product is repaired with spare

[62] Beside this, there is of course the general difficulty of consumers to process the information and act on it rationally. This is another, general limit on the empowerment effect of information. A summary of these consumer limitations can be found in Geraint Howells, 'The Potential and Limits of Consumer Empowerment by Information' (2005) 32 Journal of Law and Society 349, 359-362.

[63] In this vein, Adisorn and Tholen and Götz (n 14) note in Section 3.4 that '[i]n order for customers to make sustainable purchasing decisions, information needs to be accessed with least possible effort.'

[64] On these technologies, see Bryan Boyle and Fiachra O'Brolcháin, 'Understanding the Assistive Potential of Consumer Technologies: A Case Example of Smartphones, Smart Speakers, and Internet of Things Technologies' in Alejandro Rafael Garcia Ramirez and Robert Koprowski, *Trends in Assistive Technologies* (IntechOpen 2023) doi: <10.5772/intechopen.105664> accessed 3 November 2025.

[65] cf the cases discussed in the previous paragraph.

[66] See on this Abdalla (n 58) 13, 16-17, 21-22. See also Adisorn and Tholen and Götz (n 14) in Section 3.2.

parts but these 'are used differing [sic] from the original product set up, [then] waste operators could require adjusted product information for recycling purposes.'[67] Nevertheless, the DPP's continued usefulness over the product's lifetime does not do away with the loss of impact at the time of making the purchase decision.

All of this means that while the DPP has the potential to be a powerful and versatile information tool for all economic actors, there are practical limitations that lead to some customers being excluded categorically or situationally from the DPP's benefits (see also Section 4.3 below).

4.2 The Interaction of the DPP and Labels under EU Law

EU law already foresees a range of information tools, with labels being one. Energy labels are a prominent[68] example; quality labels under the Geographical Indications System[69] are another, albeit less conspicuous one.[70] As stated above, energy labels are foreseen as an information requirement under the Energy Label Regulation.[71] This covers 19 product groups ranging from cooking appliances (eg, ovens), over cleaning machines (eg, vacuum cleaners) and heating (eg, space heaters), to electronic products (eg, TVs and smartphones).[72] As these products are also covered by the ESPR and the Energy Label Regulation was not repealed, energy labels and ecodesign labels could potentially appear on these products in parallel, provided the information required under the ESPR cannot be incorporated into the energy label and that the Commission does not dispense with the energy label requirement (Art 16(3) ESPR). Energy labels are said to be 'the default option' over ecodesign labels.[73]

This interaction between the two pieces of legislation, possibly resulting in several labels being placed on products with each bearing a number of different product attributes, brings the risk of a visual and consequently information overload for customers at the point of sale.[74] Rather than informing consumers, the labels may have

[67] Adisorn and Tholen and Götz (n 14) in Section 4.
[68] According to a survey from 2019 (five years after the label's launch), 93% of consumers in the EU recognised the label and 79% referred to it when making a purchase decision, see <https://commission.europa.eu/news-and-media/news/commission-launches-eprel-database-help-consumers-energy-efficient-products-2022-05-17_en> accessed 3 November 2025.
[69] On this system, see <https://agriculture.ec.europa.eu/farming/geographical-indications-and-quality-schemes/geographical-indications-and-quality-schemes-explained_en> accessed 3 November 2025.
[70] The Commission's evaluation of the scheme in 2021 stated that around 3300 geographical indications were registered with a sales value equivalent to 6.8% of the total food and drink sales in the EU in 2017, but that consumer awareness of the scheme is 'generally lower than recognition of national/regional schemes' and remains limited. See Commission, 'Evaluation of Geographical Indications and Traditional Specialities Guaranteed Protected in the EU' SWD (2021) 427 final 13, 16, 36, 40, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2021:427:FIN> accessed 3 November 2025.
[71] A summary of the requirements is provided by Adisorn and Tholen and Götz (n 14) in Section 3.1.
[72] See <https://energy-efficient-products.ec.europa.eu/product-list_en> accessed 3 November 2025.
[73] Ecodesign Working Plan 10.
[74] Compare Han-fen Hua and Anjala S Krishen, 'When is enough, enough? Investigating product reviews and information overload from a consumer empowerment perspective' (2019) 100 Journal of Business Research 27, 28, noting that a number of product attributes or alternatives may cause information overload, because such an overload occurs where

the reverse effect of confusing them, as the consumer may be unsure what each label stands for Section 5.2 offers suggestions for mitigating this risk.

4.3 The DPP and Consumers

As stated above, the ESPR's main objective is to support the development of a circular economy and thus 'contribute to achieving the Union's climate and energy objectives' (Recs 3, 9 ESPR). At the same time, the interests of consumers —sometimes referred to as citizens or customers— are referenced several times in the ESPR's recital. In particular, the possibility for consumers to make informed decisions on sustainable choices through reliable, clear, and non-misleading product information is stressed (Recs 3, 32, 48). As such, the ESPR also pursues consumer protection goals. Indeed, the ESPR's information duties are a classical instrument of EU consumer law,[75] which seeks to empower the consumer.[76]

The ESPR is interesting in terms of its consumer policy in two respects: First, the Regulation seems to signal a further shift in the EU's consumer protection approach as it merges classical consumer law and the protection of businesses (SMEs) by adopting the term 'customer' to encompass both businesses and not just private individuals.[77] Secondly, its approach of empowering consumers rather than protecting them. While the product performance requirements will set minimum values for product parameters and this could be seen as a protection of consumers against ecologically badly performing products, the ESPR's focus is rather on enabling consumers to act, to make sustainable choices.[78] As mentioned, this approach was already adopted in the European Green Deal with respect to the other sustainability initiatives,[79] as well as in the New Consumer Agenda.

This focus on empowerment brings with it the risk of losing sight of the 'protective instinct' of EU consumer law, so that it is accepted that at least some consumers may be harmed in the single market.[80] In this context, the risk is of a disadvantage rather than harm for some consumers: Not being able to act in the sustainable way that a

'the information load exceeds the individual's cognitive capability'. The number and variety of sources of information are a contributing factor to information overload, see Leila Shahrzadi and others, 'Causes, consequences, and strategies to deal with information overload: A scoping review' (2024) 4 International Journal of Information Management Data Insights 100261, <https://doi.org/10.1016/j.jjimei.2024.100261> accessed 3 November 2025.

[75] Information issues were addressed in early EU consumer legislation, like misleading information (Council Directive 84/450/EEC of 10 September 1984 concerning misleading and comparative advertising [1984] OJ L250/17), and information obligations were introduced (Council Directive 85/577/EEC of 20 December 1985 to protect the consumer in respect of contracts negotiated away from business premises [1985] OJ L372/31).

[76] See on this De Almeida and Esposito (n 6) 410. See also Stephen Weatherill, 'Empowerment is not the only Fruit' in Dorota Leczykiewicz and Stephen Weatherill (eds), *The Images of the Consumer in EU Law* (Bloomsbury 2016) 203, 211.

[77] See on this trend Jorge Morais Carvalho and Mateusz Grochowski and Joasia Luzak, 'EU Consumer Law: a Few Prognoses for 2025' [2025] Journal of European Consumer and Market Law (EuCML) 1–2, noting that the traditional distinction between businesses and private persons 'is increasingly blurred'.

[78] Compare De Almeida and Esposito (n 6) 410, discussing consumer empowerment in EU law more generally.

[79] See European Green Deal 8. See also De Almeida and Esposito (n 6) 412.

[80] Weatherill (n 76) 203-204.

consumer may wish. This stems from the flaw that groups of vulnerable consumers (less affluent, elderly, disabled) are seemingly being left out categorically (see Section 4.1 above). Due to their situation, these consumers are excluded from the benefit of the DPP and must rely on other information sources, like labels, scores, and any advertising material provided by the dealer.

The fact that the ESPR's primary objective is ecological, the question arises whether the information requirements under the ESPR generally and the DPP particularly are truly meeting consumer interests or whether these measures serve to digitise and strengthen the internal market further.[81] Since concrete provisions are yet to be laid down in delegated acts, the following observations are necessarily crude. They assume that consumers are interested in acting in a sustainable manner when making purchases, and that they want to make informed choices.[82] On this premise, it would seem that the DPP can 'close the gap between consumer demands for transparency and the current lack of reliable product data',[83] and increase the reliability of green claims.[84] This removes barriers for consumers to take up sustainable purchase options,[85] leading to more sustainable products being purchased and used. At the same time, the DPP facilitates trust in product authenticity and supports consumers when it comes to disposing of their products.[86] Moreover, accessible information will reduce hurdles to engage with a product and may increase the rate of consumers making use of their rights, in particular the newly introduced right to repair.[87] In this way, the DPP will not only empower consumers but help safeguard their rights.

[81] Contrast Bert Keirsbilck, 'Empowering Consumers for the Green Transition: Overview of Directive (EU) 2024/825' [2024] EuCML 205, 206, noting that '[a]rguably, environmental protection is seen by the EU legislature as 'ancillary' to, or as a mere 'by-product' of, the objective of consumer protection, just like consumer protection is traditionally seen as a 'by-product' of the objective of internal market building.' This argument is true for the Directive (EU) 2024/825 of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information (2024) OJ L2024/1 (hereinafter 'Green Transition Directive'), which states consumer and environmental protection in its Rec 1; however, the ESPR clearly focusses on environmental protection (see above).

[82] The Commission has stated previously that consumers 'are showing a growing interest in contributing personally to achieving climate neutrality, preserving natural resources and biodiversity, and reducing water, air and soil pollution', see Green Deal 5. This implies an interest in sustainability. Of course, this premise will not apply to all European consumers, either due to their choice, their (financial) needs, or their simple disinterest. Compare Abraham Zhang and Stefan Seuring, 'Digital Product Passport for Sustainable and Circular Supply Chain Management: A Structured Review of Use Cases' (2024) 27 International Journal of Logistics Research and Applications 2513, 2527, pointing out the necessity of the customer's willingness to engage with the DPP at the time of purchase and disposal. See more generally Stefan Grundmann, 'Targeted Consumer Protection' in Leczykiewicz and Weatherill (n 76) 223, 227, noting that consumers with different characteristics have 'diverging interests'.

[83] Anonymous, 'EU's Digital Product Passport: Advancing Transparency and Sustainability' (*European Data*, 27 September 2024) <https://data.europa.eu/en/news-events/news/eus-digital-product-passport-advancing-transparency-and-sustainability>, accessed 3 November 2025.

[84] Compare Lövdahl and Hallstedt and Schulte (n 61) 2247.

[85] See New Consumer Agenda 7.

[86] See Zhang and Seuring (n 82) 2524.

[87] Directive (EU) 2024/1799 of 13 June 2024 on common rules promoting the repair of goods and amending Regulation (EU) 2017/2394 and Directives (EU) 2019/771 and (EU) 2020/1828 [2024] OJ L1799/1 (hereinafter 'Right to Repair Directive'). For a brief comment on this right, see, eg, Keirsblick (n 81) 216; Alberto de Franceshi, 'The Sustainability of Consumer and Market Law: Green Claims, Greenwashing and the Right to Repair' [2023] EuCML 45-48.

For this to come true, however, the DPP's inclusivity will need to be safeguarded so that —ideally— all consumers can have access to the DPP's information (see above). Furthermore, the information needs to be kept simple in order to allow consumers to make sustainable choices; an overwhelmed consumer will not make the 'best' choice. This raises the question whether the DPP can deliver information on which product out of a group selection is 'the most "circular" or sustainable' in a way that is persuasive for customers.[88] This will depend on subsequent regulation.

5 Interim evaluation, improvements, and outlook

The examination of the ESPR's information requirement framework and considerations of some potential issues of these measures allows for an interim evaluation of the ESPR (Section 5.1). To round off the discussion, suggestions for improvements of open problems are made (5.2) and an outlook on the EU's sustainability measures is given by way of a conclusion (5.3).

5.1 Interim Evaluation of the ESPR

The ESPR promises to be a powerful measure with a wide scope that sets minimum performance requirements and sees to the delivery of an array of information to customers through several channels. The DPP is the main communication method, complemented by labels and the traditional document form. For consumers, the DPP will be convenient, as it will put trustworthy information about a product at the consumer's fingertips. This empowerment comes with an essential limitation: Consumers with disabilities, those who do not have the necessary (digital) literacy skills, or those with no access to electronic devices required to view the DPP, will be excluded from this benefit. This has a knock-on effect on the DPP's efficiency as a tool for providing information and for empowering consumers. Nevertheless, the ESPR's goal to foster sustainability can still be said to be successful to the extent that the overall benchmark for sustainable products will be raised: After the ESPR and the delegated acts have come into force, consumers will have less options for making unsustainable choices; there will be only 'more or less sustainable products' to choose from.[89]

From a business perspective, despite the extra effort of its setup and maintenance, the DPP may well turn out to be a beneficial tool for supply chain management that will

[88] Compare Adisorn and Tholen and Götz (n 14) in Section 4.

[89] Compare Keirsblick (n 81) 216. Having said this, consumers can still act unsustainably in other ways, like purchasing more goods than needed, or by disregarding repair or recycling options and replacing items with new ones. On another note, the ESPR contains weak points, namely, a loophole in the form of voluntary industrial agreements and the questionable enforcement of the ESPR against online platforms, both of which may lessen the ESPR's sustainability effect. See on this Cristina Ganapini, 'New Ecodesign for Sustainable Products Regulation (ESPR) – What does it mean for Repair?' (20 June 2024) <https://repair.eu/news/new-ecodesign-for-sustainable-products-regulation-espr-what-does-it-mean-for-repair/> accessed 3 November 2025.

reduce carbon emissions and enhance sustainable production. The administrative burden of creating and maintaining the DPP should not be disproportionate, as businesses are already obliged to collect and provide product data, like energy efficiency. Moreover, seeing as though DPPs will enable customers to compare products based on their sustainability, this will increase competition in the market and, in turn, foster product development (improvement) so that businesses can maintain their reputation and keep their customers.[90] The reliability of the DPP data will also cultivate the consumer's trust in the business.

In terms of the Commission's various deals, agendas and action plans that relate to the ESPR, the DPP will contribute to their achievement: The DPP itself realises part of the CEAP, and this being an initiative of the Green Deal, therefore also materialises part of that goal.[91] For the reasons mentioned, the DPP will also support the Green Transition proposed in the New Consumer Agenda, albeit with the caveat of not managing to include all consumers, irrespective of their financial situation and whether they are vulnerable or average. Nevertheless, the ESPR is a move towards a circular economy in that the DPP will put many —if not most— consumers into a position where they can inform themselves about sustainable product aspects and make corresponding choices both prior to and after the purchase. It has been said that consumers have a duty to contribute to the Green Transition.[92] The DPP will be their tool to do so, although it has limitations.

5.2 Suggestions for Improvements of the ESPR

Despite the ESPR's positive prospects, there are aspects that require further attention. One concerns the ESPR's reach in two ways, namely, its product scope and its inclusiveness of consumers. While delimiting the ESPR's scope is necessary in order for this already broad framework to be workable, the exclusion of the product groups of food and second-hand goods from the ecodesign requirements is an important opportunity that is being missed. Both exclusions are surprising.[93]

With regard to second-hand goods, the Commission deliberated the promotion of 'new consumption concepts and behaviours, such as […] support for repairs through community and social economy organisations actions (eg, repair cafés) and for second-hand markets' in the CEAP.[94] In 2024, 87% of European citizens were engaged in used goods transactions.[95] While the lack of a DPP for second-hand products will not

[90] Compare Zhang and Seuring (n 82) 2526. The authors point out other advantages and challenges for customers and businesses at ibid 2527.
[91] See Lövdahl and Hallstedt and Schulte (n 61) 2246.
[92] De Almeida and Esposito (n 6) 411.
[93] Due to the complexity of the matter both from a regulatory and behavioural economics perspective that deserves deeper consideration, food will not be discussed further in this paper.
[94] CEAP 8.
[95] See Anonymous, 'The latest Figures on Europe's Explosive Second-Hand Market' (*Wavestone*, 15 February 2024) <https://www.wavestone.com/en/news/the-latest-figures-on-europes-explosive-second-hand-market/> accessed 3 November 2025.

discourage those that already purchase such products, providing product information through a DPP may encourage part of the 23% of consumers who are currently not in the habit of purchasing used products: Knowing about things like origin, lifespan, or how to handle a product in terms of its maintenance, repair, and disposal, may reassure consumers and give them the confidence to enter the second-hand market, ie, it will increase the buyer's trust.[96]

The difficulty with used products that are resold is, of course, who ought to be responsible for the establishment of the DPP where none exists, or its update where a DPP is already in place. Unlike with new products, where the DPP's creator will usually be the product's manufacturer, there is no appropriate subject with second-hand products. The seller of the used product would be an obvious candidate; however, private persons, independent stores, and perhaps neither SMEs should be expected to bear the burden of this task. Such a measure is likely to dissuade current second-hand market participants. While an obligatory DPP for second-hand products therefore seems unreasonable, incentives for businesses (particularly online platforms like ebay, momox, etsy, etc) or charities like Oxfam and the British Heart Foundation may persuade these entities to invest in technical infrastructures allowing for the creation of DPPs for these goods. In this case, manufacturers ought to cooperate in the creation process to supply basic product data. Allowances ought to be made for incompleteness of information, which may not be available for all products, depending on their age, origin, or state. The age of a product may also act as a cut-off criterion, so that products over a certain age or those whose the age cannot be determined, need no DPP. As for the storage of the DPP's data, this may need to be centralised, for instance in a European second-hand DPP register. Such a move would truly support circularity and sustainability.

In this respect, the connection of DPPs of original products and the DPPs of their 'second life' form, which may arise through recycling, is an important issue that needs to be addressed. Currently, the ESPR makes no provision for this; however, the Commission is investigating how the transfer of data between DPPs may be possible and for which product-groups this is feasible.[97]

In terms of the ESPR's inclusivity and empowerment, care must be taken to give all consumers potential access to the information that is mandated by the Regulation. Currently, there is a danger that several groups of consumers will be excluded from the benefits of the DPP, which contradicts the aims of the New Consumer Agenda (see 1. above). Nevertheless, it is not clear how this issue can be tackled satisfactorily.

The issue of digital literacy and access to digital devices go beyond the ESPR and ought to be addressed through EU-wide measures. For instance, digital literacy might be raised through incentivised education campaigns across the EU. As for the less affluent

[96] See Zhang and Seuring (n 82) 2523, 2524.
[97] See DPP Standardisation Webinar (n 22).

consumers who do not own digital devices, the Commission might nudge Member States to establish collection and redistribution schemes of unwanted but working digital devices, akin to food banks. This would support sustainability, as devices are reused purposefully. Both measures would promote the New Consumer Agenda's green and digital transitions.

With disabled people, it should not be presumed that they have devices with assistive technology that would enable them to access the information, as several barriers to these technologies exist.[98] Therefore, active measures to support people with disabilities are necessary. Providing consumer information, including labels and instructions in alternative formats, that is, in 'more than one sensory channel', and presented in an understandable and perceivable way, is one strategy that is being realised for specific products and services through Art 4(2) and Art 1 Sec I Annex I Accessibility Act[99]. Accordingly, products like e-readers and 'consumer general purpose computer hardware systems and operating systems for those hardware systems' need to be accessible in this way when placed on the market after 28 June 2025 (Art 2(1)(e) and (a) Accessibility Act). Measures include Braille, audio, and allowing text sizes to be changed (see Annex II Accessibility Act). While the ESPR makes no explicit reference to the Accessibility Act, the DPP ought to be designed so as to be accessible to vulnerable consumers. In other words, the DPP ought to be able to provide the information in alternative formats. This would allow those with reading difficulties, whether due to a visual impairment or poor eyesight, to access the information. Moreover, interoperability with assistive technologies should be ensured. This would support accessibility further, as not only specialised assistive devices, but standard digital consumer devices such as smartphones and tablets can be equipped with assistive technology apps; and Smart Speakers offer accessibility through voice commands.[100]

Another aspect that needs to be addressed carefully is the information load for consumers, particularly at the point of sale. If (all) products in a shop have several labels, stickers, and scores attached to them, this can lead to a visual overload, with the consequence of a confused rather than informed consumer. Accordingly, it would be best to avoid two labels on one product wherever possible and have either an energy label or an ecodesign label. Alternatively, confusion may be avoided by designing the ecodesign labels in a distinctive way from energy labels, eg, by using a different but complementing colour scheme.[101] This will allow consumers to distinguish between them

[98] On these technologies and the barriers to them, see Boyle and O'Brolcháin (n 64).
[99] Directive (Eu) 2019/882 of 17 April 2019 on the accessibility requirements for products and services [2019] OJ L 151/70. On the situation prior to the enactment of this directive, see, eg, Ieva Eskyte, 'Disabled People's Vulnerability in the European Single Market: The Case of Consumer Information' (2019) 42 Journal of Consumer Policy 521-543, particularly 524.
[100] See on this Boyle and O'Brolcháin (n 64).
[101] Where too much of the same colour is used, this can be overwhelming, so complementing and non-clashing colour schemes should be combined, see Anonymous, 'How Colour Affects Consumer Behaviour' (*UKPOS*, January 2020), <https://www.ukpos.com/knowledge-hub/how-colour-affects-consumer-behaviour> accessed 3 November 2025.

at a glance.[102] In either case, information on the labels should be kept to a minimum and as simple as possible to maximise their effect and counteract information overload.[103] Instead of cramming various pieces of information into different labels, the DPP ought to be presented as a comprehensive and yet easy-to-understand data source. Here, overload may be reduced by ordering information according to its importance (highest comes first) and highlighting the most salient pieces of information.[104] Moreover, visualisations in the form of pictograms or graphs should be used rather than information tables whenever possible, as the latter will increase the risk of information overload.[105]

In relation to the repairability score, the price of spare parts is an important factor that has not received sufficient attention: The scoring systems developed by the JRC factor in the price of spare parts; however, only the publication of spare part prices is measured.[106] In other words, the criteria is that *information on* the price of spare parts is published; but there is no regulation of the *price itself*. This conflicts with Rec 30 and Annex I ESPR, which list the price (affordability) of spare parts explicitly as one parameter for repairability scores (see 3.3 above). As has been noted, repair costs of anything over 40% of the purchase price will dissuade users from repairing a product, whereby this includes the price of spare parts and labour costs of the repair.[107] This limit is surpassed by a range of products,[108] yet the duty to provide spare parts at 'reasonable prices' under Art 5(4) Right to Repair Directive will likely not resolve this, as the criteria is not defined.[109] This necessitates regulation of a maximum price for (vital) spare parts in the form of a percentage of the original purchase price that is fixed and published, as apparently originally envisaged by the Commission.[110] This would counteract price

[102] Colour is the first thing a consumer processes, before text or images, see, eg, ibid. See also Daivata Patil, 'Coloring consumer's psychology using different shades the role of perception of colors by consumers in consumer decision making process: a micro study of select departmental stores in Mumbai city, India' (2012) 7 Journal of Business and Retail Management Research 60, 65 <https://www.jbrmr.com/cdn/article_file/i-16_c-135.pdf> accessed 3 November 2025. Patil, ibid, goes on to note at 66 that information retention increases with information in colour over that presented in black and white.

[103] Compare Shahrzadi and others (n 74).

[104] Suggested by Grundmann (n 82) 237.

[105] Compare Lisa Falschlunger and Othmar Lehner and Horst Treiblmaier, 'InfoVis: The Impact of Information Overload on Decision Making Outcome in High Complexity Settings' (2016) Special Interest Group on Human-Computer Interaction (SIGHCI) 2016 Proceedings 3, 4, noting from their study that '[t]ables seem to trigger information overload more frequently than graphs'.

[106] See Cordella and Alfieri and Sanfelix (n 48) 43. cf Spiliotopoulos and others (n 48) 13, where it states that only the availability of spare parts to different groups of people (all end users or professional repairers only) is factored into the score. The reason is that 'the draft ecodesign regulation sets the requirement that the maximum pre-tax price of spare parts […] shall be disclosed and not raised later on'. Sadly, this requirement cannot be found in the ESPR.

[107] See Thomas Opsomer, 'The Price Is Not Right' (*RepairEU*, 7 November 2023), <https://repair.eu/news/the-price-is-not-right/> accessed 3 November 2025. See also Cordella and Alfieri and Sanfelix (n 48) 55, stating 30-40% of the product's value generally and 30% for electronic products to be the upper limit.

[108] See Opsomer (n 107) for examples and an exploration of the possible reasons.

[109] Cf Cristina Ganapini, 'Ecodesign Information Requirements on Original Spare Parts Prices' (White Paper, February 2025) 5, 7 <https://repair.eu/wp-content/uploads/2025/02/White-Paper-on-Price-of-Spare-Parts-Final.pdf> accessed 3 November 2025.

[110] See Spiliotopoulos and others (n 48) 13 and n 106 above. See also Ganapini, 'Spare Parts' (n 109) 5.

fluctuations and extortions, thus contributing to truly informed consumer choices and greater consumer willingness to repair products.[111] Moreover, fragmentation in the single market would be avoided, while including the fact of spare part prices in the repairability score would not only meet consumer expectations but maintain trust in the score.[112] These prices could be included in the DPP so as to be available to customers when making the purchasing decision.[113]

A final improvement is suggested for the DPP Registry or the DPP system: If either allowed for the automatic generation of a data carrier, a label, and a product information sheet, as is the case in the EPREL Compliance system, this would be a cost and time efficient tool for businesses.[114] No such plans seem to exist on the Commission's side, as it has opted for a decentralised data storage approach and will not provide the DPP technical infrastructure;[115] but it is a feature that commercial DPP providers may want to try and include in their services.

5.3 Conclusion and Outlook for EU Sustainability Measures

The ESPR is a remarkable endeavour. It is set to support the interrelated goals and initiatives of the Green Deal, the CEAP, and the New Consumer Agenda, in particular its Green Transition. The ambitious measures include performance requirements and information obligations, which are geared towards making products in the European single market more sustainable. The ESPR manages to target both businesses as the economic operators, as well as customers. The DPP will prove to be a useful tool to achieve the ESPR's aims of enhancing supply chain management and allowing consumers to make sustainable choices across a wide range of products. Nevertheless, it must be ensured that the DPP and other information sources are accessible, so as not to deprive certain customer groups (particularly vulnerable consumers) of the benefits of these sources and the chance to be empowered to make informed and sustainable choices. It remains to be seen from the implementation measures and the DPP service providers how great the ESPR's empowerment effect will be. Irrespective of this, in order to strengthen the Regulation's influence on sustainability further, its range of products could and should be expanded to include — in the form of a voluntary scheme— second-hand goods. While this seems like a radical proposal, this responds to consumer demands and trends and further supports the EU's move towards circularity and sustainability.

By placing the DPP as the primary information source, with labels, scores, and more detailed sources like manuals or data sheets to complement it, information will be

[111] Ganapini, 'Spare Parts' (n 109) 5-6.
[112] See ibid 5, 7-8. Indeed, uniformity on repair is a declared aim of the Right to Repair Directive (see Rec 2).
[113] Cf Ganapini, 'Spare Parts' (n 109) 11, who states that a survey on the best way to make spare part prices available to consumers ought to be conducted, but names accessibility through a QR code as one possibility.
[114] On the EPREL Compliance system and this function, see <https://energy-efficient-products.ec.europa.eu/suppliers/eprel-generated-labels-and-pdfs_en> accessed 3 November 2025.
[115] See DPP Standardisation Webinar (n 22).

bundled. The availability of information will also support customers in being aware and making use of their rights, thus empowering them and safeguarding their rights. Furthermore, by setting performance parameters, the most unsustainable products will leave the market, which indirectly pushes consumers towards sustainable choices. From a business perspective, the bundling of information in one place, namely, the DPP, ought to balance the newly added burden of creating and maintaining the DPP. It will enhance trust in products and move businesses to improve their products. If seen as a tool to differentiate one's own products from competitors, the DPP can also be used to appeal to customers.[116]

The DPP has been criticised for not providing for a move towards transformational change in sustainability, but rather leading to 'products that might be better from a sustainability point of view than the status quo, but that are blind alleys on the way towards full sustainability', since circular products are not necessarily sustainable.[117] It is submitted that while this may be true, the ESPR will set a minimum benchmark of product performance. It will then be up to the market, namely, the competing actors, and, of course, customers, to move further towards sustainability. Similarly, the DPP's sustainability criteria have been criticised for being based 'on either fragmented approaches like circular economy, or some symptoms of unsustainability[; … i]nstead, these instruments should be designed starting from the root-causes of unsustainability'.[118] One example that comes to mind here is (electronic) products breaking wholly or partially relatively quickly. The Commission is aware of this issue of premature obsolescence and has addressed it in the ESPR (Rec 7, Art 5(2)).[119] The effectiveness of these measures will depend on what is laid down in future delegated acts. Irrespective of this, the DPP will facilitate products being repaired rather than being thrown away.[120] Again, it will be on customers and economic operators to change patterns of behaviour.

It has been duly noted that 'the DPP will not be a silver bullet for achieving a circular economy alone, but its realization might make particular sense to form a key instrument in a well-orchestrated policy mix'.[121] Indeed, it is not the perfect answer; however, the DPP is a step forward in that it will support product circularity and sustainability by facilitating improved data flows along the supply chain and enable the transition to a circular and carbon-neutral economy.[122] The Green Transition Directive, the Right to

[116] Compare Bär and others (n 103).
[117] Lövdahl and Hallstedt and Schulte (n 61) 2252. Furthermore, note the weaknesses identified by Ganapini, 'ESPR' (n 89).
[118] Lövdahl and Hallstedt and Schulte (n 61) 2252.
[119] Keirsblick (n 81) 211 notes that the ESPR's premature obsolescence concept conforms with the Green Transition's notion of early obsolescence, which in turn covers planned and functional obsolescence: 'where goods become non-functional or less performant without it being the result of normal wear and tear'. See also ibid 212. The issue has also been tackled by the introduction of the consumer's right to repair (see n 87 above).
[120] The DPP will thus support the consumer's right to repair, see Zhang and Seuring (n 86) 2524.
[121] Adisorn and Tholen and Götz (n 14) in Section 4.
[122] See Zhang and Seuring (n 82) 2514, 2529.

Repair Directive, as well as the Energy Label Regulation among others are other components that together with the ESPR will seek to change consumer behaviour in order to truly bring about a green transition and a circular, sustainable EU economy.[123]

[123] Compare Keirsblick (n 81) 216-217, noting that limitations of consumer choice are necessary to make this successful.