



*Alberto Jaci**

SPECIAL SECTION

ECODESIGN AND CONSUMER PROTECTION

Abstract

This contribution explores the evolving relationship between ecodesign and consumer protection within the EU legal framework, in light of the adoption of Regulation (EU) 2024/1781. By introducing binding sustainability criteria at the product design stage, the Regulation not only advances the environmental agenda of the Union but also reshapes the substance and scope of consumers' contractual rights.

The paper first outlines the regulatory foundations of ecodesign and of consumer law, analysing their respective sources, objectives, and mechanisms. It then investigates the points of intersection between the two fields – particularly in relation to the obligation to inform, the notion of product conformity, and the fight against greenwashing – as well as the areas of divergence, highlighting differences in regulatory logic, enforcement structures, and personal scope.

The study further considers how ecodesign strengthens consumer rights in both substantive and procedural terms, including the effectiveness of remedies and the empowerment of consumer choice. Particular attention is given to the role of national contract law in operationalising ecodesign obligations, as well as to the future implications for private international law, especially concerning overriding mandatory rules and jurisdictional coherence.

Two additional dimensions are examined in depth: first, the potential impact of ecodesign standards on producer liability, both contractual and tortious, especially where misleading environmental information or unsafe product features are involved; second, the progressive emergence of sustainability as a general principle of contract interpretation, potentially guiding the reconstruction of parties' intent and the integration of contractual duties in light of broader EU policy goals.

The article concludes that ecodesign is not merely a technical discipline, but a structural component of an emerging European law of sustainable contracts, requiring deeper integration between private law and regulatory governance.

JEL CLASSIFICATION: D18, K12, K13, K32

SUMMARY

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* Italian/EU qualified lawyer. Ph.D. Student in “Private Law” at the Department of Political and Legal Sciences of the University of Messina.

and regulatory tensions - 2.2 How and to what extent ecodesign strengthens consumer rights - 3 The role of Italian contract law in the implementation of ecodesign obligations - 4 Producer liability between ecodesign and consumer protection - 4.1 Future prospects for harmonisation and implications for private international law - 4.2 Sustainability as an interpretative principle in contract law - 5 Conclusion

1 Introduction

In recent years, the European Union has undertaken a profound rethinking of its regulatory framework aimed at guiding the transition to a circular economy and ensuring greater environmental sustainability¹. This rethinking has manifested itself most clearly in the adoption of Regulation (EU) 1781/2024, which enshrines ecodesign as a core principle of the European strategy on sustainable products². According to the European legislator, ecodesign consists of ‘integrating environmental sustainability considerations into product characteristics and processes throughout the entire value chain’³, obliging manufacturers to assess the environmental impact of goods right from the design stage and to ensure the traceability of environmental information through tools such as the Digital Product Passport⁴.

In parallel, consumer law has been consolidated as one of the pillars of the European single market⁵, with the primary objective of rebalancing the information asymmetry between professionals and consumers and protecting them from abusive contractual practices and non-compliant products⁶. The regulatory evolution, starting from Directive 93/13/EEC⁷ on unfair terms to the more recent Directive 2019/771/EU⁸ on contracts for the sale of goods, has led to the affirmation of a protection framework based on the principles of safety, quality and transparency.

¹ Cocina Beltran Puentes, ‘The New Ecodesign Regulations: Towards More Circular Products?’ (2024) 33 (2) *Revista Galega de Economía* 1-23. For the author “The circular economy strategy of the European Union has undertaken one of its objectives, which is the need to reform ecodesign legislation, and has therefore approved several regulations for specific product categories that, for the first time, regulate material efficiency aspects such as product durability and repairability. The Commission’s proposal for a new ecodesign framework regulation seeks to extend the scope of the current directive and generalize the use of durability and repairability requirements”.

² Giacomo Furlanetto, ‘Moda, sostenibilità e pubblicità’ (2024) 4 *Rivista giuridica dell’ambiente* 1137.

³ Regulation EU 1781/2024, [2024] *OJ L*, 2024/1781, art 2 no 6.

⁴ Graziella Bernardo, Daiana Dall’Arche, Angelarosa Manicone, ‘The new European Ecodesign Regulation: a holistic vision for sustainability’ (2024) 2 5th International Congress on KHAZAR Scientific Research and Innovation 373-385.

⁵ Stephen Weatherill, *EU Consumer Law and Policy* (2nd edn, Edward Elgar Publishing 2013) 352.

⁶ Kati Cseres, ‘The Controversies of the Consumer Welfare Standard’ (2006) 3 (2) *Competition Law Review* 121.

⁷ The purpose of this Directive is to approximate the laws, regulations and administrative provisions of the Member States relating to unfair terms in contracts concluded between a seller or supplier and a consumer. See: Hans Schulte-Nölke, ‘The Objectives of Directive 93/13/EEC on Unfair Contract Terms: An Overview after 30 Years of Case Law’ (2024) 32 *European Review of Private Law* 315. For the author, the main objective of the Unfair Contract Terms (UCTD), from a regulatory point of view, is to create a judicial or administrative fairness corrective to the unilateral power to draft contractual terms that private law grants to businesses towards consumers in the formation of a contract.

⁸ This directive aims to create harmonisation across the EU for certain aspects of contracts for the sale of goods, including conformity of goods with the sales contract, remedies in the event of non-conformity (and how to exercise those remedies), and commercial guarantees. The regulations that EU Member States have adopted to comply with the Sale of Goods Directive will become effective starting January 1, 2022. Merchants must comply with their obligations under the Sale of Goods Directive. See: Elias Van Gool, Anaïs Michel, ‘The New Consumer Sales Directive 2019/771 and Sustainable Consumption: a Critical Analysis’ (2021) 10(4) *Journal of European Consumer and Market Law* 136.



The aim of this contribution is to examine the relationship between ecodesign and consumer law by investigating whether and to what extent the sustainability criteria imposed by recent legislation can be considered an integral part of consumer protection. In this investigation, the analysis of convergences and divergences between the two areas will be central, in order to assess whether ecodesign actually contributes to the strengthening of consumer rights or whether, on the contrary, it remains confined to an autonomous sectoral discipline⁹.

1.1 Definition and regulatory sources of ecodesign in the EU legal order

With the adoption of Regulation (EU) 2024/1781, the European legislator has transformed ecodesign from a mere technical policy option into a binding legal requirement, mandating that environmental sustainability be integrated from the design phase into both the characteristics of products and the processes that govern their manufacture and distribution¹⁰. This approach reflects a systemic vision in which products are no longer considered in isolation, but as integral components of an economic and environmental cycle extending from production to end-of-life¹¹. The stated objective is to reduce environmental impact throughout the entire product life cycle by promoting industrial models based on durability, reparability and recyclability, in accordance with the principles of the circular economy¹².

Within this framework lies the introduction of the Digital Product Passport¹³, established by the core provisions of the Regulation, which obliges manufacturers to collect and disclose certified information on material composition, energy efficiency, ease

⁹ Daniel Hinchliffe, Floris Akkerman, 'Assessing the review process of EU Ecodesign regulations' (2017) 168 *Journal of Cleaner Production* 16033. The author focuses the analysis on the "EU Ecodesign and Energy Labelling Directives that set regulations on the energy efficiency, environmental, and information requirements of energy related products entering the EU market. Each individual product regulation stipulates that the EU Commission must undertake a review after a certain number of years. This review stage is crucial to improve the effectiveness and ambition of regulations, and also presents an opportunity to include new resource efficiency aspects. The strength of a review depends on the review process, which has followed various approaches in each reviewed product group so far". In conclusion he based his study "on comparing the review processes to the standard Methodology for Ecodesign of Energy related Products (MEErP) used in preparatory studies to develop new Ecodesign regulations".

¹⁰ Ludwig Krämer, 'EU Ecodesign and Product Policy: from Energy Efficiency to Circular Economy' (2024) 21 (3-4) *Journal for European Environmental & Planning Law* 343. For the author «product policy plays a central role in the integration architecture of the European Union. The need to protect the environment led in the beginning of the 21st century to a Commission initiative on an "Integrated Product Policy"».

¹¹ Anja Marie Bundgaard, Rikke Dorothea Huulgaard, Arne Remmen, 'Getting the Priorities Right in Material Efficiency: From the Ecodesign Directive to the Ecodesign for Sustainable Products Regulation' (2024) *Electronics Goes Green 2024+ (EGG): From Silicon to Sustainability, EGG 2024 - Proceedings IEEE* 7.

¹² Tejendra Singh Singhal, Jinesh Kumar Jain, Atchuta Ramacharyulu, Alok Jain, Dalael Saad Abdul-Zahra, Manjunatha, Arun Pratap Srivastava, 'Eco-Design of Products and Processes: A Review on Principles and Tools for Sustainable Manufacturing' (2024) 505 *E3S Web Conf* 9.

¹³ Anna Gieß, Frederik Möller, 'Exploring the value ecosystem of digital product passports' (2025) 29 (2) *Journal of Industrial Ecology* 561. The Digital product passports (DPPs) are an emerging digital technology that advances the circular economy (CE) by facilitating inter-organizational data sharing and life-cycle management of products.

of disassembly, presence of hazardous substances and overall environmental footprint¹⁴. The passport is designed as a data repository accessible to consumers, market surveillance authorities and supply chain actors, and aims to promote full traceability of products¹⁵. The absence or incompleteness of such information constitutes a serious regulatory breach, subject to administrative sanctions at national level, thus ensuring the effectiveness of the newly established legal framework¹⁶.

Regulation 2024/1781 represents a development in continuity with Directive 2009/125/EC, which originally introduced the first European legal framework for eco-design, albeit limited to energy-related products¹⁷. That directive, still applicable in many sectors, laid the foundation for a harmonised technical regulation aimed at reducing market fragmentation and setting mandatory minimum environmental performance requirements¹⁸. The shift from a directive to a regulation, as enacted in the 2024 text, marks a significant change of regulatory paradigm¹⁹: no longer merely establishing minimum standards, but instead defining binding design, monitoring and environmental disclosure requirements directly applicable to economic operators²⁰.

The regulatory framework has been further reinforced by the Corporate Sustainability Reporting Directive (CSRD, 2022/2464)²¹ and the Corporate Sustainability Due Diligence Directive (CSDDD, 2022/2463)²², which impose far-reaching obligations on businesses to

¹⁴ Konstantinos Voulgaridis and others, 'Digital product passports as enablers of digital circular economy: a framework based on technological perspective' (2024) 85 Telecommunication Systems. Modelling, Analysis, Design and Management 699.

¹⁵ Foivos Psarommatis, Gökan May, 'Digital Product Passport: A Pathway to Circularity and Sustainability in Modern Manufacturing' (2024) 16 (1) Sustainability 396.

¹⁶ Steffen Foldager Jensen, Jesper Hemdrup Kristensen, Sofie Adamsen, Andreas Christensen, Brian Vejrum Waehrens, 'Digital product passports for a circular economy: Data needs for product life cycle decision-making' (2023) 37 Sustainable Production and Consumption 242.

¹⁷ Nicolas Prignot, Grégoire Wallenborn, 'Standardisation of practices and representations of users in the eco-design Directive' ECEEE 2009 SUMMER STUDY 9.

¹⁸ Rosalind Malcolm, 'Ecodesign Laws and the Environmental Impact of our Consumption of Products' (2011) 23 (3) Journal of Environmental Law 487.

¹⁹ Claudio Favi, Marco Marconi, 'Product Eco-Design in the Era of the Circular Economy' (2025) 17(1) Sustainability 487-503.

²⁰ Anne-Christin Mittwoch, 'The Digital Product Passport of the Ecodesign Regulation - Passport to a Successful Twin Transformation in Product Law?' (2024) 45 (3) Business Law Review 62-67.

²¹ Tania Pantazi, 'The Introduction of Mandatory Corporate Sustainability Reporting in the EU and the Question of Enforcement' (2024) 25 European Business Organization Law Review 509. For the author the Directive "introduces mandatory sustainability reporting for all large undertakings in the European Union, as well as third-country undertakings active in the Union. The new rules were mandated by the increase in investor needs, as well as the interest of civil society actors". When the question turns to the question of public and private enforcement of the new sustainability reporting obligations, he observes "public enforcement is, to a certain degree, guaranteed by the amendment of existing rules. The new Directive is silent on private enforcement issues, although it may trigger private litigation, predominantly by shareholders. Other interested groups, such as consumers and civil society actors, will not be able to directly challenge breaches of the new rules, despite the intention of the legislator to foster sustainability reporting and responsible corporate behaviour to the benefit of civil societies".

²² Nicolas Bueno, Nadia Bernaz, Gabrielle Holly, Olga Martin-Ortega, 'The EU Directive on Corporate Sustainability Due Diligence (CSDDD): The Final Political Compromise' (2024) 9 (2) Business and Human Rights Journal 294. The authors state that "The CSDDD is the first region-wide due diligence legislation, yet it is also a political compromise among EU member states, which civil society and business have been watching closely". But, obviously, "Member states are expected to implement the Directive in progressive stages, reaching the objective of covering all companies employing more than 1,000 employees and a net turnover of EUR 450 million only by 2029. The Commission will periodically assess



incorporate environmental and social factors into their governance and reporting strategies. The CSRD notably expands ESG (environmental, social and governance) disclosure requirements to a broader range of entities, including listed SMEs, demanding a systemic assessment of environmental risks, including those stemming from product design. The CSDDD, on the other hand, introduces positive obligations on companies to prevent and mitigate environmental harm throughout the supply chain, thereby generating a cascading effect that directly influences the design phase of goods.

Against this backdrop, ecodesign assumes a strategic function, no longer confined to technical compliance, but increasingly seen as a metric of corporate accountability²³ and a critical benchmark in evaluating sustainability performance²⁴. Conformity with ecodesign standards now constitutes a key component of corporate social responsibility²⁵, with significant contractual, financial and reputational implications.

The legal architecture of ecodesign thus emerges as a multi-layered and multidimensional regulatory phenomenon, transcending the boundaries of industrial product law to permeate core domains of environmental regulation and market governance²⁶. It necessitates an integrated approach capable of combining technical specifications, legal obligations, transparency mechanisms and enforcement tools in a coherent system aligned with the European Union's sustainability objectives and its broader innovation agenda for the single market.

1.2 Basics of consumer law

Consumer law constitutes one of the foundational pillars of the European Union's internal market²⁷. Its normative evolution is based on the recognition of the structurally weaker position of consumers vis-à-vis professionals, a weakness that manifests itself both contractually and informationally. Within this context, the European legislator has sought

these thresholds and the need to cover high-risk sectors and will also submit a report on due diligence requirements tailored for financial undertakings”.

²³ Pilar Portillo-Tarragona, Víctor Kuba-Khoury, Alfonso Aranda-Usón, Sabina Scarpellini, ‘Environmental Management Accounting and Accountability for Circular Eco-Innovation Projects’ (2025) 17 (6) Sustainability 2932. The findings of this paper show that companies consistently report sustainability issues and circular economy principles. Specific project information is disseminated punctually, but declines significantly over time, revealing different levels of accountability throughout the lifecycle of circular eco-innovation investments. This study advances circular accounting and the eco-innovation literature by equipping practitioners with tools to compare heterogeneous projects, even during budgeting, and introducing a novel temporal perspective on circular reporting.

²⁴ Filipe Mattos Batista de Moraes, Luiz Kulay, Andrea Trianni, ‘Integrating life cycle assessment and ecodesign to improve product effectiveness and environmental performance: A novel approach’ (2025) 55 Sustainable Production and Consumption 76.

²⁵ Krishnaveni Manubolu, Raveesha Peeriga, ‘Ecodesign Principles’ in Yingngam B, Aslam MS, Haghi AK (eds), *Sustainable Pharmaceutical Product Development and Optimization Processes* (Springer 2025) 21.

²⁶ Benjamin Goodwin, ‘Analysis of the EU Ecodesign for Sustainable Products Regulation (ESPR)’ (Environmental Coalition on Standards 2024) 12.

²⁷ Charles O'Mahony, ‘The Legal Framework for Data and Consumer Protection in Europe’ in Kuanchin Chen, Adam Fadlalla (eds), *Online Consumer Protection: Theories of Human Relativism* (IGI Global 2009) 21.

to redress the existing imbalances by ensuring transparency, access to remedies, and legal certainty in consumer relations.

Beginning with Directive 93/13/EEC, which prohibits the inclusion of unfair terms in contracts concluded with consumers, the Union has developed a progressively robust and structured body of legislation²⁸. Directive 2011/83/EU established harmonised rules for distance and off-premises contracts²⁹, imposing extended pre-contractual information duties and guaranteeing the right of withdrawal. Most recently, Directive 2019/771/EU on contracts for the sale of goods has strengthened the consumer protection framework by imposing strict conformity obligations on sellers and introducing an expanded notion of non-conformity, encompassing the failure to meet public statements made about the product³⁰.

Within this legal framework, the right to information plays a pivotal role in ensuring the substantive protection of consumers³¹. They must be entitled to receive clear, accurate and comprehensive details regarding the essential features of the product – increasingly including its durability, reparability and environmental sustainability³². These aspects, once peripheral, have become central in light of the interaction with the ecodesign legislation, which elevates them to objective criteria for contractual assessment³³.

From a private international law perspective, Regulation (EC) No. 593/2008 (Rome I) is of particular importance in cross-border contractual relations³⁴. Article 6 of the Regulation stipulates that, even in the presence of a choice-of-law clause, consumers may not be deprived of the protection afforded by the mandatory provisions of the law of their habitual residence. In the context of products designed in accordance with ecodesign criteria and sold across multiple Member States, this entails that sustainability requirements and information duties – even if formally defined by the seller's domestic

²⁸ Shpresa Alimi-Memedi, 'Consumer protection and freedom of contract in the Directive 93/13/EEC on unfair terms in consumer contracts' (2018) 6 (9) *Justicia. International Journal of Legal Sciences* 95.

²⁹ Anca Daniela Chirita, 'The impact of Directive 2011/83/EU on Consumer Rights' in Anne Keirse, Marco Loos and Ilse Samoy (eds), *Ius Commune Law Series* (Intersentia 2012) 27. The author affirms that «the scope of application of the directive shows how much of its substance, particularly on unfair contracts, has been left outside its scope». The article concludes with the need for European codification as to avoid the fragmentation of private law, but it questions the usefulness of such codes for later stages of European integration where 'borders' as trade barriers cease to exist.

³⁰ Ovidiu Ioan Dumitru, Andrei Viorel Tomescu, 'European consumer law in the digital single market' (2020) 10 (2) *Juridical Tribune* 222.

³¹ Caroline Cauffman, Catalina Goanta, 'A New Order: The Digital Services Act and Consumer Protection' (2021) 12 (4) *European Journal of Risk Regulation* 758.

³² Mark Armstrong, Jidong Zhou, 'Consumer Information and the Limits to Competition' (2022) 112 (2) *American Economic Review* 534.

³³ Karolina Vikingsson, Carl Dalhammar, Leonidas Milios, 'European Union Policy Developments Related to Ecodesign, Green Claims, and Eco-labeling: Implications for Voluntary Circular Labeling Initiatives' in Shinichi Fukushima, Tomomi Nonaka, Hideki Kobayashi, Chiharu Tokoro and Eiji Yamasue (eds), *EcoDesign for Circular Value Creation: Volume I* (Springer 2025) 14.

³⁴ John Ashley Kimbell, 'The Rome Convention on the Law Applicable to Contractual Obligations - Past, Present, and Future' in Barış Soyer (ed), *Commercial Disputes* (1st edn, Informa Law from Routledge 2024) 11.



law – must conform to the standards of the consumer’s country if these are more protective.

On the procedural side, Regulation (EU) 1215/2012 (Brussels I bis) ensures that consumers may bring proceedings, or be sued, in the courts of their place of residence, even when the professional is domiciled in another Member State³⁵. This rule significantly strengthens the enforceability of consumer rights and facilitates effective access to judicial protection, including in disputes relating to sustainability claims, non-conformity, or the absence of required environmental information, such as that contained in the Digital Product Passport.

Altogether, these provisions give rise to a multi-layered system of protection, within which the innovations introduced by ecodesign legislation can be meaningfully situated. They serve to reinforce pre-existing instruments such as the right to information, liability for lack of conformity, and protection against unfair commercial practices. However, as will be shown, the harmonisation between these two normative fields is not devoid of tensions: ecodesign and consumer law operate along partially distinct trajectories, with different aims and instruments, thus calling for careful normative and interpretative coordination³⁶.

2 Point of contact between ecodesign and consumer law

The incorporation of ecodesign into the European Union’s regulatory framework on products does not merely concern environmental or technical matters; rather, it structurally affects the configuration of contractual relations between professionals and consumers³⁷. The rules on sustainable product design intersect in multiple ways with consumer law, potentially enhancing pre-existing protection mechanisms³⁸. This convergence is most apparent in three key areas: pre-contractual information duties, the definition of contractual conformity, and the prevention of misleading commercial practices.

³⁵ Stephanie Law, ‘Lis Pendens - Related Actions’ in Marta Requejo Isidro (ed), *Brussels I Bis. A commentary on Regulation (EU) No 1215/2012*, Sec. 9 (Elgar Commentaries in Private International Law 2022) 54.

³⁶ Peter Arnt Nielsen, ‘Civil cooperation in the EU from 1960 to 2024’ in Morten Midtgaard Fogt (ed), *Private International Law In An Era Of Change* (EAPIL 2024) 18.

³⁷ Victor Mehnert, Hans Wolfgang Micklitz, ‘The Interplay between Ecodesign and Consumer Sales Law’ in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (1st edn, Routledge Handbooks 2024) 15. The authors in these papers argue that «supervisory authorities and consumers shall enforce ecodesign product standards, which can be integrated into the contractual relationship between private parties via the objective requirements. However, further adjustments regarding the legal guarantee period and the presumption period are needed to promote sustainable consumption».

³⁸ Please note a contribution highlighting the potential limits of consumer protections in the pursuit of sustainability: Felix Pflücke, ‘The limits of consumer law in pursuing sustainability’ in Julian Nowag (ed), *Research Handbook on Sustainability and Competition Law* (Edward Elgar Publishing 2024) 26. The study demonstrates that some consumer law provisions contradict consumer theories and scientific studies and provides targeted and actionable policy recommendations to address these deficiencies.

The first point of contact lies in the broadening of pre-contractual transparency obligations. Directive 2011/83/EU requires professionals to provide consumers, prior to the conclusion of the contract, with clear and comprehensible information regarding the essential characteristics of the goods, including their durability, reparability, and increasingly, their environmental credentials. The introduction of the Digital Product Passport under Regulation (EU) 2024/1781 fits squarely within this paradigm. It mandates that manufacturers produce a standardised and verifiable set of environmental data, accessible to the consumer³⁹. Once disclosed, such information acquires legal significance and becomes part of the contractual content: any inaccuracy or omission may constitute a lack of conformity under Directive 2019/771/EU, triggering the relevant remedies⁴⁰.

The second area of convergence concerns the redefinition of the concept of conformity of goods⁴¹. Article 7 of Directive 2019/771/EU provides that a product must conform not only to the contract, but also to the legitimate expectations of the consumer, particularly in light of public statements made by the seller or manufacturer. Where such statements include sustainability-related aspects – such as ecological composition, material origin or expected durability – they acquire binding force. A discrepancy between these declarations and the actual features of the product constitutes a breach of conformity, entitling the consumer to invoke contractual remedies such as repair, replacement, price reduction, or termination⁴².

A third point of intersection emerges in the regulation of unfair commercial practices, governed by Directive 2005/29/EC. The obligation to provide transparent and verifiable environmental information acts as a safeguard against greenwashing, namely, the dissemination of baseless sustainability claims aimed at unduly influencing consumer behaviour⁴³. The ecodesign framework, by imposing the integration of verifiable sustainability standards into production processes and requiring their documentation through the Digital Product Passport, contributes to preventing misleading environmental advertising and aligning promotional claims with the actual characteristics of the good⁴⁴.

³⁹ Verónica Ruiz Abou-Nigm, Antonia Sommerfeld, 'Circular Fashion and Legal Design: Weaving Circular Economy Threads into International Contracts' Working Paper IE Law School AJ8-288-I (Cátedra Cervelló IE 2024) 37.

⁴⁰ Patrizia Giampieri, 'Legal Formulae in the National Legislations and in EU Directives on Consumer Contracts' in Patrizia Giampieri (ed), *Legal Formulae. Exploring Legal Multi-words in English, Italian and French* (Palgrave Macmillan 2025) 67. The comparative analyses between Italian, French, and British national legislation on consumer contracts carried out bring to the fore discrepancies in the use and in the frequencies of the legal formulae across the different corpora.

⁴¹ Marzena Czarnecka, Grzegorz Zych, 'Consumer Protection in the European Union' in Tina Soliman Hunter, Marcin Kraśniewski, Jurgita Malinauskaite, Marzena Czarnecka (eds), *Routledge Handbook of Consumer Protection and Behaviour in Energy Markets* (1st edn, Routledge Handbooks 2024) 16.

⁴² Evelyne Terrin, 'A Right to Repair? Towards Sustainable Remedies in Consumer Law' (2019) 27 (4) *European Review of Private Law* 22.

⁴³ Geraint Howells, Hans Wolfgang Micklitz, Thomas Wilhelmsson, 'European Fair Trading Law The Unfair Commercial Practices Directive' in Geraint Howells (ed), *Markets and the Law* (Routledge Handbooks 2016) 26.

⁴⁴ Krämer (n 10).



Finally, the convergence between ecodesign and consumer law is also evident in the promotion of durability as a core element of product quality⁴⁵. Ecodesign encourages minimum standards of useful life, upgradability and maintainability, particularly in the technology sector. These features reinforce the consumer's right to reliable and sustainable goods, reducing the risk of premature obsolescence and mitigating future costs associated with frequent replacement⁴⁶s or repairs⁴⁷. Durability thus becomes not merely an environmental objective, but a crucial aspect of the consumer's economic protection.

Taken together, these points of convergence show that ecodesign, although conceived primarily as an instrument of environmental policy, has the potential to structurally enhance contractual guarantees for consumers, rendering the purchasing process within the internal market more transparent, reliable, and aligned with sustainability objectives.

2.1 Divergences, purpose, scope and regulatory tensions

Despite the substantial points of convergence with consumer law, the legal framework governing ecodesign maintains a distinct identity that is not fully overlapping with that of consumer protection. The two normative domains pursue different rationales, target different categories of subjects, and are structured through heterogeneous regulatory instruments, often operating at disparate levels of normativity. These divergences generate potential tensions which warrant a systematic reflection on the interplay between environmental protection and consumer rights.

A first and fundamental divergence concerns the different purposes pursued by each field. Consumer law is built around a protective function: it aims to rebalance asymmetric contractual relationships by conferring remedies, imposing information duties and regulating form requirements to enable informed consumer choice⁴⁸. Ecodesign, by contrast, reflects a public environmental policy, oriented towards the protection of general interests such as sustainability, emissions reduction, ecological safety and resource efficiency⁴⁹. As a consequence, consumer protection may constitute an indirect outcome of ecodesign regulation, but it is not its primary normative goal⁵⁰.

⁴⁵ For more on this topic, see: Rahul Jetli, Debayan Dhar, 'Product Durability: A Systematic Literature Review' (2024) 37 (5) Archives of Design Research 93

⁴⁶ Katarzyna Kryla-Cudna, 'Sales Contracts and the Circular Economy' (2020) 28 (6) European Review of Private Law 1207; Mireia Artigot Golobardes, 'Revisiting European Consumer Protection through the Lens of Sustainable Markets' in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (1st edn, Routledge Handbooks 2024).

⁴⁷ On this subject, we recommend reading a contribution that conducts a critical analysis of the effectiveness or otherwise of Directive 2024/1799, better known as the Right to Repair Directive: Blanka Vitová, 'The Sustainability Concept in the Consumer Purchase Contract - Is the R2R Directive Sustainable Enough?' (2024) 24 (2) International and Comparative Law Review 84.

⁴⁸ Ex multis: Giesela Ruhl, 'Consumer Protection in Choice of Law' (2011) 44 (3) Cornell International Law Journal 570.

⁴⁹ Susanna Horn, Hanna Salo, Ari Nissinen, 'Promoting ecodesign implementation: The role and development areas of national public policy' (2023) 33 (5) Environmental Policy and Governance 474.

⁵⁰ Anaïs Michel, 'The design and production stage: ecodesign requirements in Evelyne Terryn, Bert Keirsbilck (eds), *Consumer Protection in a Circular Economy* (Intersentia 2019) 20.

A second divergence emerges in relation to the subjective and objective scope of application. Consumer law applies solely to relationships between professionals and consumers, in the technical sense defined by European directives, based on economic and informational asymmetry⁵¹. Ecodesign rules, on the other hand, operate upstream – during the design and production phases – and are addressed to all economic operators, regardless of the legal status of the final recipient⁵². This disconnect may result in a lack of coherence between the technical obligation and its effective enforceability in a contractual setting.

A further divergence relates to the degree of normativity and the nature of the available remedies. Consumer law relies on remedies grounded in private law⁵³, directly enforceable by individuals: contract termination, price reduction, repair, replacement, or damages. Ecodesign, by contrast, predominantly consists of technical and administrative regulations, whose breach entails sanctions against the producer but does not necessarily give rise to subjective rights that consumers can assert before courts⁵⁴. The absence of legal integration between the two domains may hinder the translation of technical obligations into actionable private law claims.

Finally, cross-border regulatory tensions are particularly relevant in light of the partial harmonisation regarding environmental labelling and sustainability claims. While some instruments – such as the EU Ecolabel Regulation (EC) No 66/2010 – adopt a full harmonisation approach, many others allow Member States discretion in implementation, especially in the area of green claims and private environmental certifications. For instance, national interpretations of what constitutes a “misleading” green claim still vary significantly across jurisdictions. Additionally, eco-labelling schemes such as the German “Blaue Engel” or the French “Écolabel” coexist with EU-wide schemes, creating overlapping and sometimes conflicting standards. These disparities may lead to unequal treatment of consumers across Member States, thereby undermining the principle of substantive equality within the internal market⁵⁵. In this regard, the private international law instruments – such as Regulations Rome I⁵⁶ and Brussels I bis⁵⁷ – provide a basic protective framework by determining, respectively, the applicable law to contractual obligations and the competent jurisdiction in cross-border disputes. However, these instruments are procedural in nature: they establish which law applies and which court

⁵¹ Sara Perugini, ‘Evoluzione normativa nazionale e Codice del Consumo’ in Giuseppe Cassano, Massimiliano Dona, Raffaele Torino (eds), *Il diritto dei consumatori* (Giuffrè 2002) 28.

⁵² Karine Van Doorselaer, ‘The role of ecodesign in the circular economy’ in Alexandros Stefanakis, Ioannis Nikolaou (eds), *Circular Economy and Sustainability. Management and Policy* Vol 1 (Elsevier 2022) 16.

⁵³ Pietro Sirena, ‘La prospettiva dei rimedi nel diritto privato europeo’ (2012) 3 *Rivista di diritto civile* 360.

⁵⁴ Giorgia Faraca and others, ‘Ecodesign for Sustainable Products Regulation: Study on new product priorities’ (Publications Office of the European Union 2024) 386.

⁵⁵ Magdalena Tutak, Jarosław Brodny, ‘Disparities among EU-27 countries in the implementation of the European Green Deal strategy goals’ [2024] *Smart and Sustainable Built Environment* 1.

⁵⁶ Ole Lando, Peter Arnt Nielsen, ‘The Rome I Regulation’ (2008) 45(6) *Common Market Law Review* 1687.

⁵⁷ Xandra Ellen Kramer, ‘Cross-Border Enforcement and the Brussels I-Bis Regulation: Towards A New Balance Between Mutual Trust and National Control over Fundamental Rights’ (2013) 60 (3) *Netherlands International Law Review* 343.



has jurisdiction, but they do not harmonise the substantive rules that apply to environmental claims or consumer protection. Consequently, even when procedural safeguards are in place, substantive outcomes may differ depending on the national law identified as applicable. For example, a misleading environmental claim may be assessed differently under Italian consumer law than under German or French law, even though the same EU-level procedural rules were followed to determine jurisdiction and applicable law. This disconnection underscores the limited effectiveness of private international law tools in addressing divergences in substantive consumer protection related to sustainability claims.

While ecodesign undoubtedly enhances the quality and transparency of goods on the market, it cannot be regarded as a mere extension of consumer law, but rather as a distinct legal field, governed by its own purposes and regulatory techniques, which occasionally diverge from the logic of individual contractual protection. The legal challenge for the coming years lies in bridging these differences, ensuring systemic coherence such that consumers may fully benefit from instruments originally designed in the name of environmental sustainability.

2.2 How and to what extent ecodesign strengthens consumer rights

Although aware of the divergences outlined above, it is undeniable that the introduction of ecodesign into European product regulation has contributed significantly to the effective strengthening of consumer rights⁵⁸. The main effect of this regulatory evolution lies in the qualitative transformation of traditional protection⁵⁹: the focus is no longer only on the immediate safety and functionality of the good, but extends to sustainability, durability and environmental traceability, values that directly affect consumers' legitimate expectations and their ability to self-determine in the marketplace⁶⁰.

One of the most obvious aspects of this strengthening concerns the expansion of the right to information. Thanks to the Digital Product Passport provided for in Regulation (EU) 1781/2024, the consumer has access to certified data on the composition, reparability and environmental impact of purchased goods⁶¹. This information, made mandatory and standardised at European level, enables consumers to make more informed

⁵⁸ Preethish Kumar M and others, 'Empowering Consumers and Sustainability: A Global Review of Right to Repair Policies' (2024) International Conference on Distributed Systems, Computer Networks and Cybersecurity (ICDSCNC) (IEEE 2024).

⁵⁹ Fryderyk Zoll and others, 'Various Approaches to 'Greening' Consumer Sales Law' in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (Routledge Handbooks 2024) 21.

⁶⁰ Beatriz Silva, Marta Vasconcelos, Sergiy Smetana, 'Conceptualisation of an Ecodesign Framework for Sustainable Food Product Development across the Supply Chain' (2023) 10 (4) *Environments* 59.

⁶¹ Voulgaridis and others (n 14).

choices, reducing information asymmetries that, in the past, compromised their ability to assess the quality and sustainability of products⁶².

Transparency thus becomes a concrete safeguard not only against greenwashing but also against more subtle forms of misleading advertising, strengthening the consumer's right to receive truthful and verifiable commercial communications⁶³.

Secondly, ecodesign strengthens the right to compliance by making sustainability-related information part of the legal expectations of consumers⁶⁴. Directive (EU) 2019/771 establishes that conformity is not limited to the contractual terms but includes public statements – including advertising and labeling – made by the seller or manufacturer⁶⁵. With the introduction of the Digital Product Passport under Regulation (EU) 2024/1781, such public statements are no longer sporadic or informal, but systematised and standardised in a digital format accessible throughout the EU. This traceability reinforces the binding nature of environmental and sustainability claims, making them actionable benchmarks in case of dispute. For example, if the Passport specifies a recyclability rate of 90% and the product fails to meet this standard, the consumer may invoke a lack of conformity under Article 7(1)(d) of the Directive, linking ecodesign data directly to enforceable rights.

Any significant deviation between the sustainability characteristics declared – for example, energy efficiency, recyclability, or expected lifespan – and the actual performance of the goods may constitute a lack of conformity under EU consumer law. In this context, ecodesign contributes indirectly to contractual liability by supplying measurable performance benchmarks, which become part of the consumer's legitimate expectations. Regulation 2024/1781 requires that information in the Digital Product Passport be reliable, verifiable, and up to date, creating legal reliance interests.

Regarding durability, Article 5 of Regulation 2024/1781 explicitly mandates that products be designed to ensure the availability of spare parts, repairability and software upgradeability. In sectors like electronics or appliances, these ecodesign obligations directly influence contractual negotiations and consumer expectations. For instance, if a smartphone is sold with an expected software support period of five years – as declared in its Digital Product Passport – failure to provide such updates could trigger remedies under Directive 2019/771. Thus, durability-related design obligations become enforceable

⁶² José Monteiro, João Barata, Sara Gentilini, 'A Digital Twin-Based Digital Product Passport' (2024) 246 *Procedia Computer Science* 4123.

⁶³ Bakyt Tolegenov and others, 'Digital Transparency and Consumer Awareness: Digital Platforms for Educating Consumers about Product Origins and Sustainability' (2024) 12 (2) *Al-Muzara'Ah* 27710.

⁶⁴ Charlotte J S Vrendenbarg, 'Durable Design: What Role for EU Design Law in the Green Transition?' (2025) 74 *GRUR International* 525.

⁶⁵ Ivan Jokanović, 'Lack of conformity of goods with the contract and sustainability issue - Directive (EU) 2019/771' (2023) 1 (1) *Central European Academy Law Review* 93.



elements of conformity, strengthening the consumer's position in case of early degradation or unrepairable malfunction⁶⁶.

Finally, ecodesign contributes to strengthening the consumer's right to active participation in the ecological transition by institutionalising mechanisms that enable environmentally responsible behaviour⁶⁷. Regulation 2024/1781 promotes return schemes for end-of-life products, mandates design choices that facilitate disassembly and material recovery, and encourages integration of such features into contractual offers. A concrete example is the EU "Right to Repair" initiative, which requires manufacturers to inform consumers at the point of sale about the availability of repair services, spare parts and repair manuals. Another example is the requirement for certain product categories – such as washing machines and refrigerators – to be designed for dismantling and recycling, enforced under the revised Ecodesign Working Plan 2022-2024. In practice, these instruments are reflected in commercial practices, such as extended warranties conditional on proper recycling or discounts offered for returning used devices undertake-back schemes. These tools foster active consumer engagement in sustainability, moving beyond passive compliance to informed participation.

Although ecodesign was not originally conceived as a consumer protection instrument, it increasingly operates as a functional extension of consumer rights within the European single market⁶⁸. By embedding requirements for transparency (via Digital Product Passports), minimum durability standards, and repairability features into product design, ecodesign measures enhance the enforceability of existing consumer rights such as the right to information, the right to conformity, and the right to sustainability. These enhancements are not merely theoretical: they translate into concrete legal tools that consumers can invoke in disputes, thereby reinforcing the integration of sustainability into the normative framework of consumer law.

3 The role of italian contract law in the implementation of ecodesign obligations

Although Regulation (EU) 2024/1781 is binding in its entirety and directly applicable in all Member States, its tangible effects on professional-consumer legal relationships

⁶⁶ Katarzyna Joachimiak-Lechman, 'Life cycle perspective in design and product development' (2024) 16 (3) Engineering Management in Production and Services 29.

⁶⁷ Marie-France Vernier, 'Eco-Design and Ecological Transition' (2024) 42 Innovation, Entrepreneurship, Management Series, Smart Innovation Set 163.

⁶⁸ Carl Dalhammar, Eléonore Maitre-Ekern, 'How Can We Persuade Consumers to Purchase More Sustainable Products? A Review of European Legal Developments' in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (1st edn, Routledge Handbooks 2024) 15. The discussion is focused on five 'points of intervention': (1) regulatory choice editing; (2) persuading consumers to buy sustainable products at the point of purchase; (3) avoiding destruction of unsold/returned products; (4) promoting maintenance and repair of existing products; (5) ensuring that consumers make sustainable choices at the 'end-of-use'.

largely depend on its operational integration into national systems of contract law⁶⁹. Domestic legal frameworks play a crucial role in absorbing the technical and environmental provisions established by EU law and conferring legal force upon them within national contractual structures.

In the first instance, implementation occurs through the mechanism of automatic contractual incorporation. In several civil law jurisdictions - including Germany, France and Italy - public representations made by the seller or producer regarding key characteristics of the goods – such as durability, energy efficiency, or recyclability – can be treated as implied contractual terms, even if not expressly stated in the contract.

In Germany, §434 BGB (*Bürgerliches Gesetzbuch*) considers a good non-conforming if it fails to meet qualities “which the buyer may expect, considering public statements of the seller or producer”⁷⁰.

Similarly, Article 129 of the *Codice del Consumo* (as amended to implement Directive 2019/771) includes public declarations made by the trader or producer as part of the conformity requirement⁷¹.

In France, Article L 217-5 of the *Code de la consommation* recognises consumer expectations based on public declarations as a standard for conformity⁷².

This principle facilitates the incorporation of sustainability claims, including those found in a Digital Product Passport, into the contractual matrix governing consumer transactions⁷³.

Accordingly, the Digital Product Passport transcends its informational function, becoming a contractually binding source of technical obligations, with full relevance in assessing the conformity of the product⁷⁴.

A second level of interaction concerns the legal classification of non-conformity in light of environmental criteria. Pursuant to Directive 2019/771/EU and its national implementations⁷⁵ (e.g., Article 129 of the Italian Consumer Code), a product is deemed non-conforming not only if it deviates from the contract, but also where it lacks qualities

⁶⁹ Tiziano Zgaga, Asya Zhelyazkova, ‘Transposition of European Union legislation’ in Gijs J Brandsma (ed), *Handbook on European Union Public Administration* (Edward Elgar publishing 2024) 12.

⁷⁰ Christian Berger, ‘Der Beschaffenheitsbegriff des § 434 Abs. 1 BGB’ (2004) 59 (6) *Juristen Zeitung* 276.

⁷¹ Matilde Girolami, ‘I criteri di conformità al contratto fra promissio negoziale e determinazione legislativa nel sistema dell’art. 129 del codice del consumo’ (2006) 2 (1) *Rivista di diritto civile* 55; Fabio Addis, ‘Spunti esegetici sugli aspetti dei contratti di vendita di beni regolati nella nuova Direttiva (UE) 2019/771’ (2020) V (2) *Nuovo Diritto Civile* 5.

⁷² Thierry Bourgoignie, ‘Sustainable Consumption and Obsolescence of Consumer Products’ in Alberto do Amaral Junior, Lucila de Almeida, Luciane Klein Vieira (eds), *Sustainable Consumption* (Springer 2020) 20.

⁷³ Cristina Poncibò, ‘The contractualization of environmental sustainability’ (2016) 12 (4) *European Review of Contract Law* 20.

⁷⁴ Hendro Wicaksono, Abel Mengistu, Atit Bashyal, Tamas Fekete, ‘Digital Product Passport (DPP) technological advancement and adoption framework: A systematic literature review’ (2025) 253 *Procedia Computer Science* 2980.

⁷⁵ Helen Xanthaki, *Legislative drafting for the EU: transposition techniques as a roadmap for better legislation and a sustainable EU* (Edward Elgar Publishing 2024) 374; Alberto De Franceschi, Reiner Schulze, *Harmonizing Digital Contract Law: The Impact of EU Directives 2019/770 and 2019/771 and the Regulation of Online Platforms* (1st edn, Bloomsbury Publishing 2023) 784.



which the consumer may reasonably expect in view of public statements⁷⁶. It is increasingly clear that environmental attributes form an integral part of this assessment, thereby constituting qualifying elements in conformity evaluation.

The general principles of civil law play an equally important role. The principle of objective good faith⁷⁷, enshrined in many legal systems (e.g., Articles 1175 and 1375 of the Italian Civil Code, § 242 BGB in Germany), requires fair and cooperative behaviour during both formation and performance of the contract. Failure to disclose material environmental data, or the provision of misleading information regarding durability or recyclability, may amount to a breach of the duty of contractual loyalty - a principle recognised in many EU member States - potentially giving rise to not only breach of contract, but also pre-contractual (*culpa in contrahendo*) or even tortious liability, depending on the legal system.

In Germany, §311(2) BGB governs pre-contractual obligations⁷⁸, and §280 BGB allows for damages in cases of negligent misrepresentation during negotiations⁷⁹.

In Italy, Article 1337 of the Civil Code imposes a general duty of good faith in negotiations; failure to disclose relevant sustainability information may trigger liability under Articles 1337 and 2043⁸⁰.

In France, the *devoir d'information* under Article 1112-1 of the Code civil requires disclosure of material facts⁸¹, and Article 1240 provides a basis for extracontractual liability in case of misleading or deceptive practices⁸².

These national frameworks can thus give legal force to environmental data disclosures mandated by EU ecodesign rules, anchoring them within the broader discipline of contractual and extra-contractual liability.

Lastly, the national judiciary plays a dynamic role in applying EU provisions in a manner consistent with domestic legal traditions. This interpretative integration is supported by the principle of consistent interpretation established by the Court of Justice of the European Union (CJEU), which requires national courts to interpret domestic law in

⁷⁶ In this sense, with an accompanying practical case analysis: Simone Vanini, 'Violazione di norme pubblicistiche di tutela ambientale da parte del produttore e difetto di conformità al contratto del bene consegnato al consumatore: la Corte di giustizia UE e il caso «Dieselgate» (C. Giust. UE 14 luglio 2022, in causa C-145/20, Porsche Inter Auto e Volkswagen)' (2023) 1 *Rivista di diritto civile* 166.

⁷⁷ Ex multis: Emanuela Navarretta, 'Buona fede oggettiva, contratti di impresa e diritto europeo' [2005] *Rivista di diritto civile* 507; Christian Heinrich, 'Die Generalklausel des § 242 BGB' in Bernd-Rüdiger Kern, Elmar Wadle, Klaus Peter Schroeder, Christian Katzenmeier (eds), *HUMANIORA Medizin – Recht – Geschichte* (Springer 2006) 22.

⁷⁸ Dagmar Waldzus, 'Germany - Pre-Contractual Disclosure Requirements and Relevant Case Law' (2014) 12(5) *International Journal of Franchising Law* 3.

⁷⁹ Sophie Ackermann, 'Vertraglicher Unterlassungsanspruch aus § 280 Abs. 1 BGB' (2025) 9 *Juristische Rundschau* 436.

⁸⁰ Cataldo Giuseppe Salerno, 'Responsabilità precontrattuale o responsabilità per violazione dei principi della funzione? la tutela della buona fede fra responsabilità precontrattuale e violazione dei principi della funzione' (2017) 93 (2) *Diritto dell'economia* 40.

⁸¹ Caroline Asfar-Cazenave, 'Le nouveau droit français des contrats' (2015) 49 *La Revue juridique Thémis de l'Université de Montréal* 31.

⁸² Elena Giannozzi, 'Les réformes récentes du Code civil français' (2022) 43 *Roma e America: diritto romano comune: rivista di diritto dell'integrazione e unificazione del diritto in Europa e in America Latina* 251.

conformity with EU law objectives (see Case C-106/89 Marleasing SA v La Comercial Internacional de Alimentación SA).

Additionally, national courts often use judicial doctrines or analogical reasoning to align eco-design-related provisions with existing contract law standards.

For example, the German Federal Court of Justice (BGH) has applied EU consumer directives in the context of advertising claims to evaluate conformity. Similarly, in France, the Cour de cassation has interpreted the Code de la consommation in light of EU environmental regulations when evaluating misleading green claims. These examples highlight how domestic judiciaries actively participate in the operationalisation of EU eco-design norms, translating them into enforceable legal outcomes within their respective traditions.

4 Producer liability between eco-design and consumer protection

The current EU legal framework draws a clear distinction between contractual liability for non-conformity (consumer sales law)⁸³ and non-contractual liability for defective products⁸⁴ (governed by Directive 85/374/EEC, transposed in Italy by Articles 114-127 of the Consumer Code⁸⁵). However, the introduction of mandatory eco-design requirements under Regulation (EU) 2024/1781 compels a systemic reassessment of the scope of producer liability in light of new environmental, social, and informational standards.

In contractual terms, a mismatch between the environmental characteristics stated in the Digital Product Passport and the actual features of the good constitutes a non-conformity under Directive 2019/771/EU. The breach of a qualified information duty, especially when it concerns essential elements such as durability, reparability or ecological composition, may entitle the consumer to invoke traditional contractual remedies⁸⁶: repair, replacement, price reduction or rescission. In this context, producer liability becomes embedded in the distribution chain, and may operate jointly and severally with the seller's, depending on national rules on concurrent liability.

Yet the implications of eco-design extend beyond the realm of contract⁸⁷. Where failure to meet environmental requirements results in harm to persons or property – for instance, through the undisclosed use of hazardous substances, designs precluding safe repair, or software obsolescence in digital goods – liability may arise under product liability law.

⁸³ Azhar Rahadiyan Anwar, Inosentius Samsul, 'Implementation of Consumer Rights, Obligations, and Business Actors' Responsibilities in Case of Non-Conforming Goods' (2023) 11 LEGAL BRIEF 3493.

⁸⁴ Richard C Ausness, 'Tort Liability for the Sale of Non-Defective Products: An Analysis and Critique of the Concept of Negligent Marketing' (2001) 53 (1) South Carolina Law Review - Products Liability Law Symposium in Memory of Professor Gary T Schwartz 60.

⁸⁵ Giovanni Facci, 'Responsabilità per danno da prodotti difettosi, commento agli art. 114- 127, D.L.vo 6 settembre 2005, n. 206.' in Renato Rolli (ed), *I codici illustrati - Codice del Consumo* (La Tribuna 2008) 36.

⁸⁶ Carmelita Camardi, 'La protezione dei consumatori tra diritto civile e regolazione del mercato. A proposito dei recenti interventi sul codice del consumo' (2013) 5 JUS CIVILE 32.

⁸⁷ Hilja Autto, Helena Haapio, Jouko Nuottila, 'Contracts rethought and redesigned: A new era with AI' (2024) 8 (1-2) International Journal of Commerce and Contracting 7.



While traditionally governed by Directive 85/374/EEC, the framework has recently been revised by the new Product Liability Directive (EU) 2024/2853, which expressly includes digital features and sustainability-related defects within the scope of strict liability.

Under Article 6 of the 1985 Directive (and its equivalent in the 2024 revision), a product is considered defective when it does not provide the safety which a person is entitled to expect, taking all circumstances into account – including regulatory non-compliance. Ecodesign obligations, once codified, may thus serve as a benchmark for establishing product defectiveness and producer liability in both tangible and digital contexts. Another layer of liability may concern misleading or incomplete environmental information. If the Digital Product Passport contains inaccurate or omitted data regarding features essential to the safe or responsible use of the product⁸⁸, this could amount not only to non-conformity, but also to a breach of pre-contractual duties of care or violations of Directive 2005/29/EC on unfair commercial practices⁸⁹. In serious cases, such conduct may even give rise to tortious liability, grounded in either negligence or fraud⁹⁰.

Taken together, these developments⁹¹ suggest that ecodesign standards are reshaping the contours of producer liability, shifting it from compliance with technical norms to a broader responsibility for protecting consumers economic, environmental and safety interests⁹². Courts and scholars are thus called upon to accommodate this evolution, developing interpretative criteria that integrate sustainability obligations into both contractual and extra-contractual liability regimes.

4.1 Future prospects for harmonisation and implications for private international law

The ongoing development of ecodesign legislation⁹³, together with the growing relevance of sustainability in cross-border contractual relationships, invites a broader reflection on the current level of normative harmonisation within the EU and its structural limitations. This analysis requires consideration not only of the vertical relationship between technical regulations and private law, but also of the suitability of EU private

⁸⁸ Carla Lopes, João Barata, 'Digital Product Passport: A Review and Research Agenda' (2024) 246 *Procedia Computer Science* 981.

⁸⁹ Anna Aseeva, 'Liable and Sustainable by Design: A Toolbox for a Regulatory Compliant and Sustainable Tech' (2023) 16 (1) *Sustainability* 228.

⁹⁰ Ismael Illán García and others, 'Digital Product Passport Management with Decentralised Identifiers and Verifiable Credentials' [2024] *ArXiv* <<https://arxiv.org/abs/2410.15758>> accessed 18 November 2025.

⁹¹ Carl Dalhammar, Jessika Richter, Philipp Montenegro, 'Drivers and Barriers for "Circular" Consumer Electronics in the European Union' in 'Electronics Goes Green 2024+ Conference Proceedings' (IEEE 2024) 10. This paper, based on an interview study and analysis of the policies, examines what kind of changes the new policies may have on design of EE, and whether practitioners believe the policies will change consumer behaviour. The policies analysed are expected to have an impact on the future design of EEE. Digital Product Passports (DPPs) are considered to have a high potential to support new developments.

⁹² Claude Chien-Hung Liu, Ransome Epie Bawack, 'Empowering AI to optimise eco-design' [2025] *Journal of Information Technology Teaching Cases* 11.

⁹³ Camilla Tamburini, 'Unlocking Circular Economies. Exploring the Role of the Digital Product Passport' in Lerwen Liu, Shabbir H Gheewala, Maw Der Foo, Lei Shi (eds), *Handbook of Circular Economy and Sustainability Global Leadership* (Springer 2025) 16.

international law in supporting the emergence of a consistent and enforceable framework for contractual sustainability⁹⁴.

A first issue arises from the fragmented regulatory landscape that separates ecodesign rules from consumer protection legislation⁹⁵. While ecodesign measures – particularly those introduced by Regulation (EU) 2024/1781 – are progressively moving toward a horizontal scope across product categories, their historical development has been sector-specific, with technical requirements tailored to individual product types such as electrical appliances, lighting equipment and ICT devices. In contrast, consumer law combines both horizontal instruments, such as the Unfair Commercial Practices Directive (2005/29/EC) and the Unfair Contract Terms Directive (93/13/EEC), and vertical rules targeting specific types of transactions or products.

This regulatory separation creates uncertainty when sustainability-related information—such as durability, repairability or recyclability—is disclosed but not fully integrated into the contractual framework. For example, even when the Digital Product Passport makes key environmental features accessible to consumers, such features may not automatically become part of the contract of sale under national law. As a result, remedies for lack of conformity under Directive 2019/771 may not apply unless Member States or courts interpret ecodesign data as forming part of legitimate consumer expectations. The lack of coordination between these regulatory spheres therefore undermines the legal enforceability of sustainability claims and complicates access to remedies.

The proposed Green Claims Regulation aims to address this gap by introducing mandatory criteria for the substantiation, verification, and communication of environmental claims⁹⁶. Specifically, it requires that all green claims be based on recognised scientific evidence, independently verified, and clearly communicated to consumers. While this would enhance transparency and prevent greenwashing, the regulation does not in itself integrate these claims into the contractual matrix, nor does it amend the directives governing sales or consumer rights.

Therefore, its contribution lies primarily in reinforcing pre-contractual clarity and administrative enforcement, rather than in directly harmonising contract law.

In parallel, the role of private international law instruments must be revisited, particularly Regulation (EC) No. 593/2008 (Rome I)⁹⁷. In a Union where goods circulate freely but national contract laws remain diverse, it is crucial to assess whether ecodesign

⁹⁴ Fabrizio Cafaggi, 'Transnational Private Regulation of Environmental Sustainability through Commercial Contracts. Reassessing Contractual Governance in Global Supply Chains' (2024) 20 (1) *European Review of Contract Law* 25.

⁹⁵ Marco Loos, 'Repairing Consumer Sales Law' (2024) 32 (6) *European Review of Private Law* 945.

⁹⁶ Michael Jay Polonsky, Jeffrey Rotman, Virginia Weberb, Prashant Kumar, 'How meaningless and substantive green claims jointly determine product environmental perceptions' (2025) 44 (3) *International Journal of Advertising* 392.

⁹⁷ Luis Miguel Poesa Pessoa Maduro, Loïc Azoulai, *The Past and Future of EU Law: The Classics of EU Law Revisited on the 50th Anniversary of the Rome Treaty* (1st edn, Bloomsbury Publishing 2010) 8.



obligations could qualify as overriding mandatory provisions under Article 9 of Rome I⁹⁸. Such a classification would give these norms precedence over the law chosen by the parties, reflecting their public interest function and enabling their enforcement even in cross-border disputes governed by non-EU law.

However, ecodesign rules are not currently part of contract law in the strict sense. They are technical product regulations, and while they apply uniformly in all Member States as EU regulations, their contractual incorporation is mediated by national doctrines (e.g., implied terms or legitimate expectations). Moreover, the current formulation of Article 9 Rome I does not explicitly include sustainability standards among the categories of overriding mandatory provisions. Therefore, any evolution in this direction would require either judicial interpretation or a future legislative revision of the Rome I Regulation to acknowledge the imperative nature of sustainability-based product obligations—much like product safety or competition law rules.

As for jurisdiction, Regulation (EU) No. 1215/2012 (Brussels I bis) grants consumers the right to litigate in their country of residence but does not provide for specialised handling of disputes involving complex sustainability issues or misleading environmental practices⁹⁹. Given the technical complexity of ecodesign requirements and the increasing prevalence of green claims, it may be appropriate to consider the creation of dedicated ADR mechanisms or specialised court divisions, similar to what exists in fields such as intellectual property or financial services. This would enhance consistency and ensure the application of correct technical standards, particularly in litigation involving cross-border or digital products¹⁰⁰.

Looking forward, the prospect of a European contractual sustainability law—integrating ecodesign, consumer protection, and civil obligations into a unified framework—could provide much-needed coherence¹⁰¹. However, this must be carefully situated within the EU's limited competence in civil law matters (Articles 4 and 5 TEU, Article 114 TFEU). Past attempts to harmonise European contract law more broadly, such as the Common European Sales Law (CESL), failed due to lack of political consensus. Therefore, rather than aiming for a general European code of contract law, the focus should remain on targeted harmonisation of sustainability-relevant obligations, where internal market needs and environmental goals intersect¹⁰².

⁹⁸ Marie-Elodie Ancel, 'The Rome I Regulation and distribution contracts' in Andrea Bonomi, Paul Volken (eds), *Yearbook of Private International Law* Vol X (De Gruyter 2008) 11.

⁹⁹ Dominika Moravcová, 'Consumer protection under the Brussels I bis and Rome I Regulations' (2022) 2(1) *Institutiones Administrationis: Journal of Administrative Sciences* 100.

¹⁰⁰ Akash Gupta, Arushi Bajpai, 'Green Dispute Resolution: A Sustainable Way of Resolving Disputes' in Apoorvi Shrivastava, Amlan Bhusan (eds), *Sustainable Boardrooms: Democratising Governance and Technology for Society and Economy* (Springer 2023) 18.

¹⁰¹ Dario Hug, 'Towards a Sustainable Interpretation of Standard Contract Terms?' in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (1st edn, Routledge Handbooks 2024) 18.

¹⁰² Ekaterina Pannebakker, 'Sustainable development clauses in international contracts through the lens of the Unidroit principles' (2024) 29 (2) *Uniform Law Review* 9.

4.2 Sustainability as an interpretative principle in contract law

The evolution of EU sustainability regulation, and particularly the introduction of binding environmental requirements at the product design stage, raises increasingly important questions about the systemic role of sustainability within contract law¹⁰³. Specifically, it is necessary to assess whether, and to what extent, environmental sustainability may be considered not merely as a substantive obligation, but as an autonomous interpretative principle capable of guiding the construction and supplementation of contracts in light of overarching public interests¹⁰⁴.

Traditionally, contract interpretation in Europe has been informed by principles such as good faith, the socio-economic function of the agreement, and mutual reliance¹⁰⁵. However, the incorporation of sustainability into EU positive law – most recently formalised in the recitals and operative provisions of Regulation (EU) 2024/1781 – reflects a shift toward recognising environmental values as part of the normative framework within which private law operates¹⁰⁶.

This conceptual shift does not rest solely on the authority of secondary instruments. It is grounded in primary EU law, particularly:

Article 3(3) TEU, which affirms the Union's objective of sustainable development and a high level of environmental protection¹⁰⁷;

Article 11 TFEU, which imposes a duty to integrate environmental protection requirements into all EU policies and activities (integration clause)¹⁰⁸;

and Article 37 of the Charter of Fundamental Rights of the EU, which recognises a right to environmental protection, albeit as a principle rather than a directly justiciable right¹⁰⁹.

Together, these provisions form a constitutional foundation that legitimises the interpretation of private law – including contract law – in light of sustainability considerations. Regulation (EU) 2024/1781, as well as complementary instruments like the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD), operationalise these constitutional principles at the

¹⁰³ Abraham Zang, Stefan Seuring, 'Digital product passport for sustainable and circular supply chain management: a structured review of use cases' (2024) 27 (12) *International Journal of Logistics Research and Applications: A Leading Journal of Supply Chain Management* 2513.

¹⁰⁴ Lařna Droz, 'Redefining Sustainability: From Self-Determination to Environmental Autonomy' (2019) 4 (3) *Philosophies* 42.

¹⁰⁵ Guido Alpa, *IL CONTRATTO IN GENERALE: principi e problemi* (2nd edn, Giuffrè 2014) 33.

¹⁰⁶ Michael Has, *Sustainable Products: Life Cycle Assessment, Risk Management, Supply Chains, Ecodesign* (2nd edn, De Gruyter 2024) 384.

¹⁰⁷ Nicolas de Sadeleer, 'Sustainable development in EU law: still a long way to go' (2015) 6 *Jindal Global Law Review* 39.

¹⁰⁸ Beate Sjøfjell, 'The legal significance of Article 11 TFEU for EU institutions and Member States' in Beate Sjøfjell, Anja Wiesbrock (eds), *The Greening of European Business under EU Law* (1st edn, Routledge 2014) 22.

¹⁰⁹ Ottavio Quirico, 'Integrating Human Rights and Environmental Duties: Prospective Implications of Article 37 of the EU Charter of Fundamental Rights' (2021) 39 *Boston University International Law Journal* 41.



regulatory level, thereby reinforcing the systemic relevance of sustainability throughout the product lifecycle¹¹⁰.

Practically speaking, this evolution supports the use of sustainability as a subsidiary interpretative criterion in cases of contractual ambiguity, silence, or incompleteness¹¹¹. For instance, where multiple plausible interpretations of a contract clause concerning product durability, reparability or energy performance exist, it may be both legitimate and advisable to adopt the interpretation that best aligns with the Union's sustainability objectives and ecodesign framework. This interpretative orientation is not arbitrary: it draws legitimacy from the systemic integration of environmental concerns mandated by Articles 3(3) TEU and 11 TFEU, as well as from the growing body of EU regulations that explicitly impose sustainability-related obligations on producers and suppliers.

This interpretative approach proves particularly useful in cross-border transactions, where the law applicable to the contract may not reflect the most advanced implementation of sustainability obligations. In such cases, invoking sustainability as an interpretative principle may help reduce normative asymmetry between Member States, thereby promoting a more consistent and teleologically informed application of EU contract law.

Environmental sustainability is progressively emerging as an interpretative and supplementary principle in contract law, offering guidance to courts and practitioners in reconstructing contractual intent, assessing breach, and selecting appropriate remedies¹¹². This development is consistent with the EU's broader ecological transition and is likely to assume an increasingly central role in the future evolution of both international and European private law.

5 Conclusion

The analysis has demonstrated that ecodesign, in its current regulatory evolution, can no longer be considered peripheral or merely technical in relation to contract law. On the contrary, it must be recognised as a structural component of the emerging European private law of sustainability. Through the imposition of binding design obligations – including durability, reparability, and information transparency – Regulation (EU) 2024/1781 directly reshapes contractual dynamics by broadening pre-contractual duties, redefining the notion of conformity under Directive (EU) 2019/771, and reinforcing

¹¹⁰ Nicolas de Sadeleer, 'The European Green Deal: greenwashing compounded by deregulation (Omnibus law) or a genuine paradigm shift?' [2025] *European Journal of Risk Regulation* 1.

¹¹¹ Kateřina Peterková, 'Purpose of sustainability contractual clauses' in Hanna Lakkala, Jarmo Vehmas (eds), *Trends and future of sustainable development* (FFRC 2013) 14.

¹¹² Dario Hug, 'Towards a Sustainable Interpretation of Standard Contract Terms?' in Marta Santos Silva and others (eds), *Routledge Handbook of Private Law and Sustainability* (1st edn, Routledge 2024) 18.

consumers' legitimate expectations in the digital and environmental dimensions of goods¹¹³.

Nonetheless, the integration between ecodesign and consumer law continues to reveal points of friction, due to their differing regulatory logics, legal instruments, and levels of harmonisation. In this context, national contract law plays a pivotal role in operationalising sustainability-related obligations through the application of general clauses such as good faith, fairness, and liability for misrepresentation or non-performance¹¹⁴. The effective enforcement of ecodesign norms within private relationships thus depends on the interpretative and remedial tools offered by domestic legal systems.

The study has further shown that environmental non-compliance can give rise to both contractual and non-contractual liability¹¹⁵, especially where misleading environmental claims or design-related defects cause damage to persons or property. The entry into force of the new Product Liability Directive (EU) 2024/2853 confirms this trend, by expanding the scope of strict liability to include software updates, sustainability features, and digital elements embedded in products. This reinforces the contribution of ecodesign not only to product quality, but to a broader culture of corporate accountability¹¹⁶ and legal responsibility¹¹⁷.

Building on the constitutional principles set out in Articles 3(3) TEU, 11 TFEU and 37 of the Charter, the paper advocates for a progressive recognition of sustainability as an interpretative principle in contract law. This would enable courts and practitioners to favour, in cases of ambiguity or incompleteness, those contractual interpretations that align with EU sustainability objectives. Such an interpretative approach would strengthen legal certainty in cross-border relations and support the effective application of sustainability-related obligations throughout the internal market¹¹⁸. The interaction with private international law, particularly Regulations Rome I and Brussels I bis, further

¹¹³ Kayleen Manwaring, '“Slowing down the loop”: smart devices and the right to repair' (2024) 38 (3) *International Review of Law, Computers & Technology* 268.

¹¹⁴ Iryna S Lukasevych-Krutnyk and others, 'Analysis of Legal Regulation of Contractual Obligations in the Civil Law Systems' (2022) 19 *Astra Salvensis - revista de istorie si cultura* 169.

¹¹⁵ Antti Palmujoki, Katriina Parikka-Alhola, Ari Ekroos, 'Green Public Procurement: Analysis on the Use of Environmental Criteria in Contracts' (2010) 19 (2) *Review of European Community & International Environmental Law* 250.

¹¹⁶ Martin Charter, 'Managing Ecodesign' in Martin Charter, Ursula Tischner (eds), *Sustainable Solutions: Developing Products and Services for the Future* (1st edn, Greenleaf Publishing Limited 2001) 23.

¹¹⁷ Tania Pantazi, 'Consumers' contribution to climate change mitigation and their empowerment through EU law' in Elbert de Jong (ed), *Corporate Accountability and Liability for Climate Change* (Edward Elgar Publishing 2024) 25.

¹¹⁸ Some authors propose, on this point, an innovative approach to implementing ecodesign systems, exploiting the potential of technology. See: Jens Schuberth and others, 'The Front-Runner Approach-Facilitating Progressive Product Policy by Using Information from EU Product Databases' (2024) 17 (2) *Energies* 504. Within this paper, the authors said «already existing front-runner approaches and recent and ongoing product policy-making processes were reviewed. Based on the results, an EU front-runner approach is outlined. The presented approach (i) refers to performance levels of the best products already available on the market, (ii) aggregates information in existing databases, and (iii) works semi-automated. Together, all three attributes have a high potential to facilitate and accelerate the specification of appropriate minimum requirements for products at the EU level. This way, EU policymakers can deliver on the core objectives of the Ecodesign legislative framework much better».



illustrates the need to reassess the systemic status of ecodesign obligations. Their potential classification as overriding mandatory provisions under Article 9 of Rome I – in light of their public interest function and their foundation in EU law – may enhance their cross-border enforceability and promote consistency between environmental regulation and contractual practice¹¹⁹.

In conclusion, ecodesign today constitutes not merely a tool of environmental policy, but a catalyst for the transformation of European contract law. It integrates sustainability, transparency, and responsibility into the architecture of legal obligations, positioning itself at the intersection of market regulation, consumer protection, and civil liability. As such, it plays a central role in the evolving relationship between private autonomy and public interest within the European legal order.

¹¹⁹ Jakub Kanický, ‘Sustainable and Climate-Friendly Products: What Role Is There for Product Standards?’ (2024) 70 (1) *Acta Universitatis Carolinae Iuridica* 131.