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The right to repair in the EU and the US. A comparative perspective*

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CONTENTS: 1. Introduction – 2. Manufacturers' restrictions on repair within and beyond the products' early obsolescence – 2.1 Legal shields for OEMs' barriers to repair – 2.2 Other factors hindering repair – 3. The EU common rules promoting repair – 3.1 Promoting repair within the legal guarantee – 3.2 Promoting repair beyond the legal guarantee – 4. The right to repair in the US – 4.1 Common and uncommon rules in state right-to-repair laws – 4.2 The potential unfairness of digital fair repair laws – 5. Conclusion.

1. Introduction

Repair is a long-standing conservative practice, developed as a practical necessity since the earliest technological societies, with significant economic, environmental, and social benefits[1]. Product maintenance activities return a defective product to a condition that fulfils its intended purpose. This reduces consumers' spending on new, unnecessary substitute goods and provides savings for investments, also sustaining secondary markets, which is generally positive, especially for marginalised and low-income communities relying on second-hand goods. Apart from the economic advantages, repair also contributes to decreasing waste and consumption of natural resources, extending the product lifespan and fostering reuse without fuelling new production. Furthermore, engaging in self-repair empowers people, reinforcing self-reliance, developing knowledge and skills shareable with the community[2], and even promoting technological innovation, which, contrary to "the dominant productivist imaginings"[3], may flow from device failure, as a highly creative occasion.

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[1] On the origins of repair, see A. Perzanowski, *The Right to Repair. Reclaiming the Things We Own*, Cambridge, 2022, p. 50 ss.

[2] On repair as a community-empowering idea, see J. Lloveras, M. Pansera, A. Smith, *On 'the Politics of Repair Beyond Repair': Radical Democracy and the Right to Repair Movement*, 196 *J Bus Ethics* 325 (2025), p. 336.

[3] S.J. Jackson, *Rethinking Repair*, in T. Gillespie, P. J. Boczkowski, K. A. Foot (eds.) *Media Technologies: Essays on Communication, Materiality, and Society*, Massachusetts, 2014, p. 227.

Despite such relevant advantages, however, surveys show that consumers tend not to repair defective goods, opting to dispose of and replace them with new ones[4]. This outcome stems from several factors affecting customers' decision-making process. Such variables are partly related to subjective preferences, depending on one's internal discount rate, wage, time constraints and tendency to conspicuous consumption[5], and partly to objective elements. Indeed, some external drivers – technical, economic and legal – consciously leveraged by manufacturers discourage people from repairing their goods[6]. Producers can limit consumers' options by adopting a panoply of strategies. They can design non-disassemblable products, raise service costs, restrict access to spare parts, tools and information necessary to diagnose and remedy a defect, and even rely on legal instruments, such as warranties or intellectual property rights, to thwart any consumer repair attempt. These strategies are particularly effective for digital devices whose functioning depends on embedded or attached software, which allows manufacturers to remotely control them and any diagnostic, maintenance or repair activity.

In response to such restrictions, a global right-to-repair movement has emerged, gathering diverse supporters, including consumers, environmental activists, technological enthusiasts and professionals, like independent repair providers, farmers[7], healthcare[8] and military personnel[9], who have been prevented from autonomously servicing their equipment. They all reclaim the right to restore the functionality of their goods without being restrained by manufacturers[10]. Building on the successful campaign previously led in the automobile sector on both sides of the Atlantic[11], repair advocates call for legislative intervention ensuring greater access to

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[4] Cfr. Directorate-General for Justice and Consumers (DG JUST), *Study to support the Commission's policy development on promoting repair of consumer goods and contracts in the data economy* – Part A, 2023, p. 97, available at commission.europa.eu.

[5] J. McCollough, *Consumer Discount Rate and the Decision to Repair or Replace a Durable Product: A Sustainable Consumption Issue*, 44(1) *Journal of Economic Issue* 182 (2010); Id., *The Impact of Consumers' Time Constraint and Conspicuous Consumption Behaviour on the Throwaway Society*, 44 *Int J Consum Stud.* 33 (2020).

[6] A. Perzanowski, *Consumer Perceptions of the Right to Repair*, 96 *Ind. L. J.* 361 (2021), p. 365 – 375.

[7] K. O'Reilly, *Why Farmers Need Right to Repair* (US PIRG Education Fund, 2022), available at pirg.org.

[8] N. Proctor, K. O'Reilly, *Hospital Repair Restrictions* (US PIRG Education Fund, 2020), available at publicinterestnetwork.org.

[9] D. Dayen, *When Big Business Won't Let the Troops Repair Their Equipment*, *The Am. Prospect* (September 19, 2019), available online at prospect.org.

[10] On the heterogeneous nature of such a movement promoting the right to repair, seen as an "empty signifier" able to cluster disparate demands and values, see J. Lloveras, M. Pansera, A. Smith, cit., p. 334 ss.

[11] In the early 21st century, car independent repairers and end users advocated for accessing the same spare parts, information, diagnostic and repair tools made available to dealers. In 2012, Massachusetts passed automotive right-to-repair legislation, and, in 2014, automakers and repair provider associations entered into a national Memorandum of Understanding. In the EU, similar sectoral provisions were introduced with Commission Regulations 715/2007/EC for light-duty vehicles and 595/2009/EU for heavy-duty vehicles, subsequently amended by Regulation 2018/858/EU of the

information, spare parts and tools, as well as software updates and reset codes needed to cure mass-produced goods defects.

Lawmakers have not ignored this demand, all centred on introducing new obligations for manufacturers to facilitate repair. In June 2024, with Directive 2024/1799[12], the European Union adopted uniform rules promoting repair in all Member States, which are expected to implement them by July 2026. It complements other regulatory initiatives aimed at fostering the production of long-lasting products[13] and informing consumers about the durability and repairability of goods[14]. Similarly, dozens of right-to-repair bills have been brought before the US Congress[15] and state legislatures[16], and, from March 2023 to May 2024, five states, namely New York[17], Minnesota[18], California[19], Oregon[20] and Colorado[21], have signed them into law.

Despite this convergence, the EU and US regulatory approaches appear to diverge in policy goals. European legislative initiatives have been presented as an integral part of the Green Deal[22] and the New Circular Economy Action Plan[23] to ensure sustainable consumption patterns and foster the market green transition[24]. Conversely, in the US, the right to repair has been promoted primarily as a powerful

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European Parliament and the Council, and with the Motor Vehicle Block Exemption Commission Regulation 461/2010/EU, recently prolonged until May 2028.

[12] Directive (EU) 2024/1799 of the European Parliament and of the Council 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.

[13] Regulation (EU) 2024/1781 establishing a framework for the setting of ecodesign requirements for sustainable products.

[14] Directive (EU) 2024/825 empowering consumers for the green transition through better protection against unfair practices and through better information.

[15] E.g., *The Fair Repair Act*, H.R. 8544, S. 4422, 118th Cong. (2024) congress.gov; *The National Defense Authorization Act* (NDAA), H.R. 8070, S. 4638, 118th Cong (2024) congress.gov; *The Agricultural Right to Repair Act*, H.R. 5604, 118th Cong, (2023) congress.gov.

[16] N. PROCTOR, *Already, 20 states have active Right to Repair legislation in 2025* (US PIRG Education Fund, 2025), available at pirg.org.

[17] Digital Fair Repair Act (Repair Act), NY Gen. Bus. L. §399-NN (2023) law.justia.com. Adopted on March 3, 2023, it entered into force on December 29, 2023.

[18] Digital Fair Repair Act, Minn. Stat. § 325E.72 (2024) revisor.mn.gov. Adopted on May 24, 2023, it entered into force on July 1, 2024.

[19] Right to Repair Act, CA Pub Res Code §§42488 — 42488.3(2024) leginfo.legislature.ca.gov. Adopted on October 10, 2023, it entered into force on July 1, 2024.

[20] Right to Repair Act, S.B. 1596, 82nd Leg. Assemb., 2024 Reg. Sess. (Or. 2024) legiscan.com. Adopted on March 28, 2024, it took effect on January 1, 2025.

[21] Consumer Repair Bill of Rights Act, Colo. Rev. Stat. Ann. §§6-1-1501 — 6-1-1505 (2024) leg.colorado.gov. Adopted on May 28, 2024, it will take effect on January 1, 2026.

[22] EC, *The European Green Deal* (Brussels, 11.12.2019), COM (2019) 640 final, 8.

[23] EC, *A new Circular Economy Action Plan* (Brussels, 11.3.2020), COM(2020) 98 final, 5; Id., *New Consumer Agenda. Strengthening consumer resilience for sustainable recovery* (Brussels, 13.11.2020), COM(2020) 696 final, 7.

[24] Dir. 2024/1799/EU, Recital 5.

instrument for breaking the original equipment manufacturers' monopoly and establishing a fair and competitive aftermarket[25].

The essay examines the regulation of the right to repair in the context of the European Union and the United States to verify whether and to what extent the rules enacted to promote products' repairability and reinforce consumers' rights mirror the ultimately different objectives, respectively, pursued in each legal system on a declamatory level[26]. The legal comparative study will investigate the consistency between rules governing repair and the related legislative explanations, providing additional tools of inquiry to assess the effectiveness of the EU and US laws in addressing repair barriers.

The paper unfolds as follows. The second section will analyse the main restrictions adopted by manufacturers to hinder repair, distinguishing between strategies aimed at causing product premature obsolescence and encouraging goods replacement and strategies adopted to control the aftermarket and avoid consumers seeking third-party services or relying on self-repair. The third and fourth sections will dive into the EU and the US right-to-repair laws, exploring their impacts on the economy, consumers and the environment. In the final section, both legal systems will be compared, arguing that the EU law, contrary to the US, is still far from effectively removing barriers to repair, promoting competition and broadening consumers' choice. In obliging some producers to service defective goods, the new Directive may reinforce manufacturers' power instead, confirming Europe to remain an essentially "producerist" legal order[27]. This result consistently aligns with the core of the continental political frame on the right to repair, ultimately regarded not as leverage for the liberalisation of the aftermarket but for the green transition, even at the expense of consumers.

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[25] E.g., Right to Repair Act, CA Pub Res Code §42488.1 (2024) ("It is the intent of the Legislature to provide a fair marketplace for the repair of electronic and appliance products and to prohibit intentional barriers and limitations to third-party repair"). See also White House, *Executive Order on Promoting Competition in the American Economy*, Exec. Order No. 14036, 86 Fed. Reg. 36987 (July 9, 2021) (encouraging the FTC to address restrictions on third-party repair or self-repair of items imposed by powerful manufacturers as "persistent and recurrent practices that inhibit competition"); FTC, *Policy Statement of the Federal Trade Commission on Repair Restrictions Imposed by Manufacturers and Sellers* (July 21, 2021) (committing the Commission to "closely coordinate with state law enforcement and policymakers to ensure compliance and to update existing law and regulation to advance the goal of open repair markets").

[26] As Rodolfo Sacco observed, "declamatory statements often make explicit an ideology, be it the ideology that actually inspired the system in question or the one that a given authority believes to have inspired it or the one this authority wishes people to think inspired it" (R. Sacco, *Legal Formants: A Dynamic Approach to Comparative Law (Installment I of II)*, 39 *Am. J. Comp. L.* 1 (1991), p. 31).

[27] On the distinction between producerist and consumerist law, depending on whether it is more oriented toward the demand or supply side of the market and as a meaningful classificatory scheme for comparing legal systems and understanding persistent differences between Europe and the US, cf. J. Q. Whitman, *Consumerism Versus Producerism: A Study in Comparative Law*, 117 *YALE L.J.* 340 (2007).

2. Manufacturers' restrictions on repair within and beyond the products' early obsolescence

Manufacturers have implemented many strategies to prevent consumers from repairing their defective goods[28], experimenting with heterogeneous and ever-changing forms that can be grouped into two macro-sets[29]. Some barriers to repair aim to reduce product lifespan and encourage early replacement. Others intend to discourage product maintenance activities, not per se, but only if performed by independent service providers or consumers, preserving manufacturers' control over the aftermarket.

The repair barriers of the first category, i.e., for inducing consumers to replace still viable objects, stem from the need of firms to increase revenues and avoid market saturation in an industrialised economy by rendering products prematurely obsolete[30]. Early obsolescence indicates, in fact, a general loss of utility of the good before it has reached its life expectancy. This is due, on the one hand, to discretionary evaluations of the users, who, shortly after purchase, wish to buy a brand-new object (psychological obsolescence) and, on the other hand, alternatively or conjunctively, to clear production choices objectively making products useless[31]. The entry of new and more advanced technology in the market (technological obsolescence), as well as the use of poorer components (functional obsolescence), or deliberately setting the date of a product breakdown (planned obsolescence), are all examples of decisions firms can take to reduce product lifespan. Firms can easily realise all these forms of early obsolescence by leveraging marketing, economic, design, and technological tools. Manufacturers, for instance, can instil in individuals the desire for a new product through advertisements that make the older one appear unfashionable or through incentives like discounts or overpricing for repair services[32]. Costs are "clearly a game-changer in the consumers' decision to repair"[33], and the lesser the difference between repair and replacement prices, the more likely consumers will prefer buying a new good[34].

Beyond these marketing and economic tools, original equipment manufacturers (OEMs) can also use design to trigger early obsolescence. They can glue or solder components, making opening the product for repair impossible or too complex, or discontinue the production of parts needed to address even simple defects.

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[28] Cf. A. Perzanowski, *Consumer Perceptions of the Right to Repair*, cit., p. 365-375.

[29] Cf. Lloveras, M. Pansera, A. Smith, cit., p. 331-333.

[30] G. Slade, *Made to Break. Technology and Obsolescence in America*, Cambridge, 2006, p. 30-36.

[31] On the difference between psychological obsolescence and the other forms of premature obsolescence, regarded as non-discretionary and objective, see S. I. Becher, A.-L. Sibony, *Confronting Product Obsolescence*, 27 *Colum. J. Eur. L.* 97 (2021), p. 101-104.

[32] A. Perzanowski, op. ult. cit., p. 368.

[33] N. Roskladka, A. Jaegler, G. Miragliotta, *From "right to repair" to "willingness to repair": Exploring consumer's perspective to product lifecycle extension*, 432 (139705) *Journal of Cleaner Production* 1 (2023), p. 6.

[34] J. McCollough, A. Qiu, *Rising repair costs and the throwaway society*, 41 *Economic Affairs* 284 (2021).

Digitalisation has also enabled a new set of sophisticated restraints, allowing manufacturers to control products' embedded software after sale and condition their functionality and performance. Even if the hardware is repairable and the sensors can be replaced, the product may no longer have any utility because of the device makers. They may shut down their remote server connected to the product[35], release updates deliberately degrading the software or refrain from providing updates needed to correct errors and maintain or improve the device's security and functionality[36].

In addition to these barriers, manufacturers may adopt other repair restrictions falling into the second category, i.e., measures intended not to make products obsolete but to bind consumers to the OEM's authorised repair network, limiting their ability to service their goods by themselves or independent providers. This happens when companies deliberately adopt nonstandard hardware components requiring extraordinary tools and skills to be removed and installed[37], as well as software impeding unauthorised repairs[38]. For example, telematics allows firms to exclusively retain data collected by software-embedded products, whose retrieval is critical for diagnosing, maintaining, and repairing mechanical and technological issues. Moreover, manufacturers can adopt technological protection measures (TPMs) controlling access to software code, including encryption and authentication means, sometimes called "digital locks", to hinder independent repair or limit product functionality when it occurs. The software instructs the product to stop working or slow down after detecting the presence of some non-OEM replacement parts, like a smartphone's connector[39]. Even servicing goods with identical, authentic or genuine components can be prevented using serialised parts, having a unique code paired to an individual unit of a specific device. The agriculture sector offers an emblematic example in this regard. Indeed, the John Deere company has increasingly equipped its large tractors

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[35] In 2019, the electronic retailer company Best Buy shut down the servers for smart refrigerators, making many of their digital functions inoperable (A. Perzanowski, *The Right to Repair*, cit., p. 93).

[36] On September 25, 2018, the Italian Competition Authority fined Apple and Samsung for introducing updates capable of slowing down the processors of smartphones without warning consumers, as unfair commercial practices in violation of Articles 5, 6, 7 and 8 of Directive 2005/29/EC. See A. De Franceschi, *Planned Obsolescence Challenging the Effectiveness of Consumer Law and the Achievement of a Sustainable Economy*, 6 *EuCML* 217 (2018).

[37] Apple's switch to uncommon security screws, such as Pentalobe screws, to fasten only external components of their products has made repair very challenging and labour-intensive (cf. A. Perzanowski, *op. ult.* cit., p. 82-86).

[38] C. J. Hoofnagle, A. Kesari, A. Perzanowski, *The Tethered Economy*, 87 *Geo. Wash. L. Rev.* 783 (2019).

[39] In 2016, Apple released an update that equipped iPhones with a code that detected the presence of a replacement connector between the device's home button and the Touch ID sensor, making smartphones inoperable, displaying the cryptic message "Error 53". Despite providing owners further updates to restore their devices successfully, the Australian Federal Court ordered the company to pay A$9 million in penalties for making false or misleading representations (see Australian Competition Consumer Commission (ACCC), *iPhone and iPad misrepresentations cost Apple Inc. $9 million in penalties* (June 19, 2018) at accc.gov.au).

and combine harvesters with computerised components (called "electronic control units" or "ECUs"), gathering information relevant to optimising farming. In case of malfunction, servicing such sophisticated agricultural equipment is possible only by using a unique software repair tool that interacts with the onboard equipment system. When performing any repair involving the replacement of ECUs (e.g., sensors and valves), the new Deere spare part needs to be initialised with the correct customised ECU software code ("payload file"), as downloaded and installed through the manufacturer's repair service tool; otherwise, the equipment will not work. The result is that consumers and independent repairers, despite their expertise and the availability of spare parts, need Deere dealer technicians to complete repairs[40].

2.1 Legal shields for OEMs' barriers to repair

Manufacturers can also rely on the law to implement restrictions preventing third-party and do-it-yourself repairs. Indeed, firms can adopt many intertwined practices that force consumers to restore the functionality of their products through their services and exclude them from accessing the necessary parts, information, tools, and software codes without incurring liability. Such behaviours range from the manufacturer's refusal to sell the key inputs required to mend their devices to anyone but their preferred providers who entered exclusive deals, to adopting tying arrangements that condition access to spare parts on the buyer's purchase of the company's repair services[41]. This is not merely the case of OEMs voiding the product warranty coverage for the sole reason that a previous independent repair has occurred – a widespread practice in the market[42] generally deemed unlawful[43] – but mainly of other equivalent tying conducts that are perfectly legal unless they interfere with developing a competitive aftermarket.

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[40] Deere developed the Customer Service ADVISOR tool after entering a Memorandum of Understanding with the American Farm Bureau Federation. However, this tool does not perform all critical repair tasks, including those related to ECUs, limiting the ability of farmers and independent repairer providers to service Deere equipment. On January 15, 2025, the FTC, the State of Illinois, and the State of Minnesota sued John Deere before the US District Court for the Northern District of Illinois over its use of unfair practices (the complaint is available at ftc.gov).

[41] Cf. D.A. Hanley, C. Kelloway, S. Vaheesan, *Fixing America: Breaking Manufacturers' Aftermarket Monopoly and Restoring Consumers' Right to Repair*, Open Market Institute Report (2020), available at openmarketsinstitute.org).

[42] In 2018, a study showed that forty-five of the fifty manufacturers surveyed automatically voided the warranties due to independent or self-repair (cf. N. PROCTOR, *Warranties in the Void*, U.S. PIRG Education Fund, 2018, available at publicinterestnetwork.org).

[43] Such tying practice, generally considered unfair under Directive 2005/29/EC, is now prohibited under the new Right to Repair Directive 2024/1799/EU, art. 5(7). In the US, it is prohibited under Section 102 (c) of the Magnuson Moss Warranty Act (codified 15 USC §2302(c)).

Indeed, restrictions forcing consumers to use authorised repair services are prohibited only if and to the extent they are performed by manufacturers with sufficient market power to exclude competitor organisations from post-sale services and spare parts supply, raise repair time and cost, while lowering the quality. However, the antitrust liability risk for manufacturers with such a dominant position appears relatively unlikely since, in evaluating the allegations on a case-by-case assessment of the relevant market conditions, courts could, in the end, consider repair restrictions acceptable[44]. This may happen, for example, in the US, when the firm, in advance, has conspicuously made its repair policy known to consumers who can thus estimate, at the time of purchase, the product life-cycle pricing, i.e., the total cost of the "package"—equipment, service, and parts[45]. The same is true in Europe when the company offers repair through a network of affiliates selected based on qualitative criteria, allowing independent technicians who meet them to join in[46]. Indeed, as clarified by the EU General Court[47], when the OEM's repair system and the refusal to supply spare parts are objectively justified, non-discriminatory and proportionate, there is no risk that effective competition will be eliminated. More generally, in both legal systems, manufacturers can excuse their anti-competitive behaviours in the aftermarket by offering legitimate justifications, including, among others, the complexity of the product and the need to maintain high and uniform quality repair services, prevent counterfeiting and preserve the brand image[48].

Another common justification is to protect intellectual property rights, which inherently possess a monopolistic nature. Indeed, OEMs can patent products, their components and design, trademark external and internal spare parts, copyright works, software and manuals, and protect schematics and diagnostic information as trade secrets. They may thus allege that any repair restriction is required only to protect these exclusive rights[49]. In adopting such justifications, manufacturers introduce an

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[44] Cf. FTC, *Nixing the Fix: An FTC Report to Congress on Repair Restrictions* (May 2021), p. 9-16, available at ftc.gov.

[45] *Eastman Kodak Co. v. Image Technical Services*, 504 US 451 (1992), at 473. In this leading case, the US Supreme Court rejected Kodak's allegation that "competition in the equipment market necessarily prevents market power in the aftermarkets" (Id., at 470). However, relying on Justice Scalia's dissenting opinion, some courts (cf. *Alcatel USA, Inc. v DGI Technologies*, 166 F3d 772 (5th Cir. 1999)) interpreted the holding as if aftermarket restrictions by a company acting in a competitive equipment market, to be unlawful, required a change in repair policy after the consumer's purchase, showing that the firm had deceived or surprised its customers.

[46] *Confédération européenne des associations d'horlogers-réparateurs (CEAHR) v. Commission*, T-712/14, Oct. 23, 2017, §107.

[47] *Ivi*, at §111.

[48] FTC, *Nixing the Fix*, cit., p. 10.

[49] In the *Magill* case (*RTE and ITP v Commission*, C-241/91P and 242/91P (1995)), the ECJ clarified that the exercise of intellectual property rights and the refusal to license them only in exceptional cases could rise to antitrust liability as an abuse of dominant position. In particular, this may happen when an objective justification for the refusal to license is lacking, preventing the emergence of a new product and excluding any competition in the secondary market. On whether intellectual property

additional layer to the already significant potential of intellectual property law in obstructing repair. Indeed, even the manufacturers' mere assertion of holding patents, trademarks, copyrights, or trade secrets may hinder or at least deter consumers from attempting any unauthorised interventions on their products[50]. Although generally repairing owned objects does not infringe IP rights[51], some activities do, such as altering a patented item so substantially and unexpectedly as to amount to a new one[52], replicating a patented design (either internal or external) spare part[53], using trademarked refurbished parts not labelled as non-new[54], or resetting software security locks after repair[55]. Even using the OEM's logo to advertise repair businesses, for example, or the diffusion of information on how to service products and to turn off digital locks may also well ground trademark, copyright and trade secret infringement claims[56].

Yet, identifying such impermissible repairs often lies in an area of legal uncertainty, and manufacturers may take advantage of it by using end-user license agreements (EULA), contractually obliging consumers not to seek independent services[57]. OEMs may also rely on TPMs to control access to copyrighted works and

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rights holders enjoy immunity from antitrust law in the US and the EU, see M. Maggiolino, L. Zoboli, *The Intersection Between Intellectual Property and Antitrust Law*, in I. Calboli, M.L. Montagnani (eds), *Handbook of Intellectual Property Research: Lenses, Methods, and Perspectives*, Oxford, 2021, p. 121 ss.; A. Perzanowski, *The Right to Repair*, cit., p. 176-177.

[50] L. C. Grinvald, O. Tur-Sinai, *Intellectual Property Law and the Right to Repair*, 88 *Fordham L. Rev.* 63 (2019), p. 102; see also: A. Perzanowski, *Consumer Perceptions of the Right to Repair*, cit., p. 370.

[51] As an inherent incident of ownership, repair does not tolerate post-sale restrictions. Accordingly, the exclusive rights holder's control over the sold embodiment exhausts after its sale, under the first-sale doctrine and the principle of exhaustion. On the issue, in the US and the EU, cf. A. PERZANOWSKI, *The Right to Repair*, cit., p. 110 ss.; T. Pihlajarinne, *Repairing and re-using from an exclusive rights perspective – towards sustainable lifespan as part of a new normal?*, in O. Rognstad, I. B. Orstavik (eds.) *Intellectual Property and Sustainable Markets*, Cheltenham, 2021, p. 81–100.

[52] On 'reconstruction' or 'modification' as patent law infringement, respectively, in the US and the EU, see S. Svensson-Hoglund, J. L. Richter, E. Maitre-Ekern, J. D. Russell, T. Pihlajarinne, C. Dalhammar, *Barriers, enablers and market governance: A review of the policy landscape for repair of consumer electronics in the EU and the U.S.*, 288 *Journal of Cleaner Production* (2021) available at sciencedirect.com; see also A. Perzanowski, *The Right to Repair*, cit., p. 128-132.

[53] On the expansion of patent design protecting the appearance or ornamentation of products in the US as a substantial barrier to repair, see A. PERZANOWSKI, *The Right to Repair*, cit., p. 133-144.

[54] On the relevance of the risk of consumer confusion or harm in prohibiting the importation, selling and use of trademarked refurbished components in the US and EU, see S. SVENSSON-HOGLUND, J. L. Richter, E. Maitre-Ekern, J. D. Russell, T. Pihlajarinne, C. Dalhammar, cit., p. 4; see also A. Perzanowski, *The Right to Repair*, cit., p. 152-159.

[55] Cf. L. C. Grinvald, O. Tur-Sinai, *The Right to Repair: Perspectives from the United States*, 31 AIPJ 98 (2020), p. 107.

[56] L. C. Grinvald, O. Tur-Sinai, *Intellectual Property Law*, cit., p. 106-111 (discussing the limits of the 'fair use' doctrine).

[57] The US Supreme Court has not excluded that a patent holder can enforce clauses restricting repair under contract law (cf. *Impression Products, Inc. v. Lexmark International, Inc.*, 137 S. Ct. 1523 (2017)). On enforcing EULA clauses introducing repair restrictions under contract, despite the exhaustion of IP

software, making repairs not merely technically challenging but even unlawful. Indeed, with some exceptions, bypassing digital locks, likewise circulating or offering means for doing it, is generally prohibited under EU and US anti-circumvention and anti-trafficking laws, even if the ultimate use of the copyrighted work would not infringe IP law[58].

2.2 Other factors hindering repair

Beyond these supply-related fundamental barriers preventing consumers from repairing their products, other factors can determine individuals not to seek to maintain or service their defective goods.

On the one hand, the willingness to engage in repair activities, directly or through third-party professionals, significantly depends on one's propensity, which, as some scholars have unveiled[59], can vary according to established habits and skills, personal values and preferences, and emotional attachment to the product. Indeed, the lack of familiarity with maintenance practices and the absence of necessary expertise to perform them, or even to recognise repair as a viable option, may adversely affect individual attitudes toward repair and refraining from disposal in case of product failure. Consumers with low or no awareness and experience are unlikely to perform repairs themselves or trust third-party services. Conversely, personal values such as frugality and stewardship, concern for the environment, and individual preferences for non-instant gratification and inconspicuous consumption[60] might be crucial in favouring repair. Even emotions associated with the product, reinforcing the bond between individuals and their goods, may strengthen the intention to service them. Yet, consumers devoted to a "throwaway culture" and fast-paced innovation might

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rights, in the US and the EU, see S. Svensson-Hoglund, J. L. Richter, E. Maitre-Ekern, J. D. Russell, T. Pihlajarinne, C. Dalhammar, cit., p. 8; L. C. Grinvald, O. Tur-Sinai, *Intellectual Property Law*, cit., p. 101.

[58] In the US, circumvention of TPMs is prohibited by the Digital Millennium Copyright Act (DMCA) (17 USC §1201), which makes it illegal to hack digital locks on copyrighted works and software (§1201(a)) and disseminate the tools and the knowledge of how to do it (§1201(b)). However, the Librarian of Congress has recognised some temporary exemptions to circumventions (but not trafficking) for repairing limited objects, including smartphones, home appliances and home systems. In the EU, circumvention and trafficking of TPMs on copyrighted works are forbidden under the InfoSoc Directive 2001/29/EC (art. 6). It does not apply to TPMs protecting software, whose circumvention is allowed instead. Indeed, the Software Directive 2009/24/EC prohibits only the circulation of means of circumvention of TPMs applied to protect a computer program (art. 7(1)(c)). For the comparison between US and EU TPM anti-circumvention laws, see A. D. Rosborough, *Unscrewing the Future: The Right to Repair and the Circumvention of Software TPMs in the EU*, 11(1) *JIPITEC* 26 (2020).

[59] S. Svensson-Hoglund, J. D. Russell, J. L. Richter, *A process approach to product repair from the perspective of the individual*, 3 *Circular economy and sustainability* 1327 (2023), p. 1337 ss.

[60] J. McCollough, *Consumer Discount Rate*, cit., p. 185 ss.

not have sufficient time to develop an attachment to their objects, especially electronic devices, hardly renouncing replacement in the face of breakdown[61].

On the other hand, some repair-related inconveniences or burdens can induce consumers to opt for new products[62]. Indeed, beyond the monetary costs of repair, individuals could be discouraged by bearing the search costs of locating a suitable repairer nearby, finding information on the price, time and conditions of the service, and acquiring tools and instructions needed for self-repair. Similarly, they may refrain because of the waiting costs associated with the repair process itself. Product transportation, disassembly, diagnostics, and performing repairs are all lengthy phases that may have to be repeated if unsuccessful. Such costs may appear even more unbearable to consumers when, in the meantime, they are not even provided with a replacement product.

Along with these factors, the consumer's choice can be influenced by some regulatory drivers, especially by the law defining minimal requirements for conformity of sold goods and liability regime in case of noncompliance (i.e., breach of legal guarantee in the EU and implied warranty in the US) or additional contractual undertakings made by sellers or manufacturers. Indeed, in Europe, if a product lacks conformity due to a defect that has existed since that good was delivered and became apparent within two years of that time, the consumer has the right to claim a remedy from the seller free of charge and within a reasonable time[63]. The EU Sale of Goods Directive gives the consumer the right to choose between repair and replacement unless the remedy chosen would be impossible or impose disproportionate costs on the seller[64]. As a recent study shows[65], such a legal guarantee framework, per se, stimulates consumers to opt for the replacement of defective goods and sellers to perform it to satisfy their customers, relying on their right to seek redress against the person liable in the chain of transactions. In this context, manufacturers under trade agreements with sellers can also encourage replacing products that are still repairable by offering consumers an additional two-year free commercial guarantee[66].

A similar legal framework stimulating the replacement of defective goods is not to be found in the US, where consumers do not enjoy the right to choose between repair or replacement in case of non-conformity. Indeed, the breach of so-called implied warranties of merchantability and fitness for purpose does not allow specific

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[61] D. Marikyan, S. Papagiannidis, *Exercising the "Right to Repair": A Customer's Perspective*, 193 *J Bus Ethics* 35 (2024), p. 54.

[62] N. Roskladka, A. Jaegler, G. Miragliotta, cit., p. 5.

[63] Directive 2019/771/EU, art. 10.

[64] Directive 2019/771/EU, art. 13.

[65] DG JUST, cit., p. 129-135. The survey revealed that, if a defect occurred within the legal guarantee period, 65% of consumers would always or probably have a product replaced, compared with only 31% who would probably or always have it repaired.

[66] DG JUST, cit., p. 130.

performance[67], which is supposed to be an exceptional remedy in common law[68]. Even when state laws overtly address repair and replacement, such as the California Song-Beverly Consumer Warranty Act, they refer to them only as ordinary remedies for the breach of express warranties (or commercial guarantees as they are known in Europe). In this case, manufacturers must maintain sufficient service and repair facilities in the state[69], and the buyer "has a concomitant duty to allow a reasonable number of opportunities for repair before it can demand a replacement of the goods or reimbursement"[70]. Demanding warrantors to substitute defective goods instead of repairing them is thus not the first best for California consumer law. The same tendency to consider repair as the preferable remedy also emerges nationally in the US from the Magnuson-Moss Warranty Act. To meet federal minimum standards set for a written warranty, the warrantor must permit the consumer to elect either a refund for or replacement without charge of a product or part only after a reasonable number of attempts to remedy defects or malfunctions[71]. Against this regulatory backdrop, consumers may be less likely to replace their products under warranty than in the EU.

3. The EU common rules promoting repair

Enhancing the right to repair in all the Member States has been regarded as crucial within the roadmap of the Green Deal to transform the EU into a climate-neutral and prosperous circular economy, in which resource use and economic growth are decoupled, and goods are not prematurely disposed of but kept in the loop longer[72]. The new Right to Repair (R2R) Directive is part of this sustainable transition pathway of the internal market. It intends to facilitate access to cross-border repair services by setting uniform rules promoting the repair of defective products, with a threefold beneficial effect of enhancing consumer rights, boosting the development of the aftermarket and reducing waste[73].

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[67] Consumers may reject nonconforming goods or seek damages after acceptance. See Uniform Commercial Code (UCC), sec. 2-711 and 2-714 (despite not being a federal law, this model statutory law has been enacted in any state but Louisiana). On the issue, see also T. Davis, *UCC Breach of Warranty and Contract Claims: Clarifying the Distinction*, 61(3) *Baylor Law Review* 783 (2010).

[68] On the resistance to equitable remedies in American contract law despite people expecting them, see T. Wilkinson-Ryan, D. Hoffman, E. Campbell, *Expecting Specific Performance*, 98(5) *NY Univ. Law Rev* 1633 (2023).

[69] Cal. Civ. Code. §1793.2.

[70] *Mocek v. Alfa Leisure, Inc.*, 114 Cal.App.4th 402, 7 Cal. Rptr. 3d 546 (Cal. Ct. App. 2003), at 407 (explaining the content of the rule stated in Cal. Civ. Code. §1793.2(d)).

[71] 15 USCS §2304.

[72] Cf. EC, *The European Green Deal*, cit., p. 8; Id., *A New Circular Economic Action Plan*, cit., p. 5; Id., *New Consumer Agenda*, cit., p. 7.

[73] Directive 2024/1799/EU, Art. 1(1): "This Directive lays down common rules strengthening the provisions related to the repair of goods, with a view to contributing to the proper functioning of the internal market while providing for a high level of consumer and environmental protection".

Implementing such ambitious objectives, however, requires a targeted approach. As the Commission clarified[74], shifting consumers' preference to repair in the after-sales phase implies precise measures addressing product failures occurring during and outside the legal guarantee period. Indeed, when defects appear within two years of the delivery of goods, European consumers already enjoy a right to repair under the Sale of Goods Directive, which obliges the seller to bring the product into conformity free of charge by carrying out the remedy (usually replacement) chosen by the buyer. On the contrary, when the guarantee has expired, or the defect was absent at the delivery, consumers are not entitled to such a right. Consequently, the legislative intervention promoting sustainable consumption in the EU after sale requires a twofold strategy, consisting, on the one hand, of amending the current seller's liability regime to address barriers preventing repair from being a more attractive remedy than replacement and, on the other hand, providing consumers with a new right to repair their products outside the legal guarantee period, encouraging them not to dispose of still viable goods prematurely.

The Directive takes this dual course of action through two separate sets of rules, respectively extending the liability of the seller if consumers opt for repair over replacement to remedy product non-conformity (art. 16) and obliging some manufacturers to provide repair at the consumer's request (art. 5).

3.1 Promoting repair within the legal guarantee

To discourage the early disposal of goods within the legal guarantee, Article 16 of the R2R Directive modifies the Sale of Goods Directive, extending the liability period of the seller by twelve months if the consumer, instead of asking for a new product, opts for having the defective one brought into conformity by repair[75].

Contrary to the Commission's initial proposal of prioritising repair over replacement[76], this amendment maintains the buyer's free choice between these remedies, even though precisely this faculty has been regarded as the primary cause for consumers' preference to replace nonconforming goods. The underlying legislative idea is thus that introducing a one-time extension of the seller's liability may invert such a trend. Yet, it is likely to impact only a few consumers, especially since sellers

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[74] Cf. *Impact Assessment Report accompanying the document Proposal for a Directive of the European Parliament and of the Council on common rules promoting the repair of goods* (Brussels, Mar. 22, 2023) SWD (2023) 59 final.

[75] Directive (EU) 2024/1799, Art. 16(2).

[76] In the proposal presented in March 2023, sellers should have always repaired the goods "where the costs for replacement are equal to or greater than the costs for repair" (Article 12, *Proposal for a Directive of the European Parliament and of the Council on common rules promoting the repair of goods*, COM (2023) 155 final). However, in February 2024, the Council and the European Parliament presented a new version of the Directive, changing that provision.

may still consider the repair disproportionate or impossible. The new rule has provided little help in this regard, offering no presumption alleviating the burden of proof on consumers who, having opted for repair, enjoy a prolonged seller's liability[77]. Moreover, the one-time liability extension may not effectively address the widespread manufacturers' practice of making defects not apparent until two years after delivery, when the guarantee is over. As several studies suggested[78], providing a general expansion of the legal guarantee period could have been more effective without significant cost implications[79], at least for more durable goods. Aligning the seller's liability to each product's lifespan could stimulate manufacturers to make products last longer while inducing consumers to choose repair without altering the hierarchy of remedies.

Yet, as noted, the R2R Directive took another path, allowing consumers to enjoy only a twelve-month guarantee extension if opting to repair. In this case, sellers may also loan replacement goods free of charge while carrying out the service by using refurbished products[80]. At the consumer's request, sellers can even use such goods to fulfil their obligation to replace the non-conforming product. With consumers' consent, refurbished goods may thus be equated to new ones, contrary to the general perception, upheld by state courts, which have repeatedly denied that using these goods for replacing defective products complies with the Sale of Goods Directive[81].

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[77] M. Bujalski, *How to amend the Sales of Goods Directive with a view to promote the circular economy? In search for final shape of ecological sales law*, in V. Ťažká (eds.) *Mílniky Práva v Stredoeurópskom Priestore 2024: Zborník Príspevkov z Medzinárodnej Vedeckej Konferencie Doktorandov a Mladých Vedeckých Pracovníkov* (Ktorá Sa Konala 22. a 23. Marca 2024 v Častej-Papierničke), Bratislava, 2024, p. 838 ss.

[78] S. Augenhofer, *European Commission's Public Consultation on Sustainable Consumption of Goods. Promoting Repair and Reuse – Response of the European Law Institute*, Austria, 2022; BEUC, *Sustainable Consumption of Goods – Promoting the Right to Repair and Reuse* (BEUC-X-2022-034 - 05/04/2022) available at beuc.eu; Id., *Durable and Repairable Products* (BEUC-X-2021-061 - 28/06/2021) available at beuc.eu; E. Terryn, *A Right to Repair? Towards Sustainable Remedies in Consumer Law*, 27(4) *European Review of Private Law* 851 (2019). See also R. Potenzano, *Obsolescenza precoce e garanzia di durabilità nella vendita di beni di consumo. Note comparatistiche*, 1 *Rivista di Diritti Comparati* 243 (2023).

[79] K. Tonner, R. Malcolm, *How an EU Lifespan Guarantee Model Could Be Implemented Across the EU* (Study for the European Parliament), Brussels, 2017.

[80] Directive (EU) 2024/1799, Art. 16(4).

[81] The Danish Consumer Complaints Board (*Forbruger-klagenævnet*) and the Glostrop District Court stated that replacing a new iPhone 4 with a refurbished one violates the Danish Sale of Goods Act "*købeloven*" (KBL), Article 78, paragraph 1, nr. 2, implementing the Sale of Goods Directive (cf. Danish Consumer Complaints Board, Decision 14 July 2014, case FRE-12/17282; Glostrop District Court, Judgment 9 December 2016, case BS 10E-3689-2014. The case is cited by D. Watson, A.C. Gylling, N. Tojo, H. Throne-Holst, B. Bauer, L. Milios, *Circular Business Models in the Mobile Phone Industry (Nordic Council of Ministers)*, Copenhagen, 2017, p. 58, and commented by K. Kryla-Cudna, *Sales contracts and the circular economy*, in *European Review of Private Law*, 2020, 6, p. 1223). Similarly, the Amsterdam District Court ruled on an analogous case, declaring the termination of the sale contracts at the consumers' request after Apple replaced a nonconforming iPhone 6 with a refurbished one (Judgment 8 July 2016, case n. 4677931 - CV EXPL 15-35149, ECLI:IT: RBAMS:2016:4197, available at uitspraken.rechtspraak.nl) and substituted a faulty iPad with a remanufactured one (Judgment 18 April

Nevertheless, there is no incentive for sellers and consumers, respectively, to temporarily provide goods on loan or require refurbished goods as a definitive replacement. It is unclear why parties would do so, especially for consumers who do not even enjoy an extension of the seller's liability period for requesting such a circular remedy.

In this context, only an amendment of the Sale of Goods Directive introduced by the new common rules promoting repair may likely foster it within the legal guarantee framework, enhancing consumer and environmental protection. That is the first paragraph of Article 16 of the R2R Directive, which modifies the objective requirements that the goods shall comply with to conform to the sale contract, inserting 'repairability' among these. Such integration of Article 7(1), point (d) of Directive 2019/771 allows consumers to regard as product defects those flaws unrelated to the good functioning and performance, but regarding, for instance, the lack of disassembly or the unavailability of spare parts or repair services, which are "normal for goods of the same type and which the consumer may reasonably expect given the nature of the goods and taking into account any public statement made by or behalf of the seller, or other persons in previous links of the chain of transactions"[82].

Beyond advertising or labelling, some Union product-specific legal acts may well ground the consumer's request to remedy the lack of repairability of the product[83]. Indeed, some delegated regulations adopted under the Ecodesign Directive 2009/125/EC, recently repealed by Regulation 2024/1781/EU, set the repairability requirements some energy-related products must comply with to be placed on the market or put into service[84]. More precisely, such design rules do not regard consumer goods in general or broad categories thereof but a specific minority of energy-consuming products, ranging from some household appliances, like washing machines, washer-dryers, tumble dryers, dishwashers, refrigerators, and vacuum cleaners, to electronic displays, mobile phones, tablets, and welding equipment. Complementing the mandatory energy-efficiency standards of each product, repairability requirements are distinctively characterised for prescribing that manufacturers make available, for a minimum of years after placing the last unit of the model on the market, some repair and maintenance information, spare parts and software, ensuring their prompt delivery, to professional repairers and, to a minimal extent, to end-users. The explicit reference to "repairability" in Article 7(1), point (d) of the Sale of Goods Directive, far

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2017, case n. 4708463 - CV EXPL 15-36253ECLI:IT: RBAMS:2017:2519, available at uitspraken.rechtspraak.nl). Both the decisions flowed from an interpretation of Article 21, paragraph 1, letter c, book 7, title I of the Dutch Civil Code (*Burgerlijk Wetboek*) implementing the Sale of Good Directive, in the light of the ECJ *Quelle* case stating that "by receiving new goods to replace the goods not in conformity, the consumer — who, for his part, paid the selling price and therefore correctly performed his contractual obligation — is not unjustly enriched" (C-404/06, 17 April 2008, par. 41).

[82] Directive (EU) 2019/771, Art. 7(1), point (d).

[83] Directive (EU) 2019/771, Art. 13.

[84] Other repairability requirements concern goods incorporating light means of transport batteries under Regulation (EU) 2023/1542 of the European Parliament and of the Council.

from being just a formal integration, would thus allow consumers to enforce the EU eco-design legislation by private law remedies, as a breach of product legal guarantee. Yet, it is plausible that, especially in this case, the only primary remedy sought by consumers would be replacement.

3.2 Promoting repair beyond the legal guarantee

The EU has intended to facilitate consumers in choosing not to replace products even beyond cases where the legal guarantee covers defects, providing them with a new stand-alone right to repair. To reduce the premature disposal of still viable goods whose failures do not appear or occur within the seller's liability period, the new R2R Directive imposes on manufacturers the obligation to service them. The pivotal provision is Article 5, which obliges OEMs subjected to repairability requirements prescribed by the Union legal acts (e.g., the eco-design delegated regulations) to offer repair at a reasonable price and within a reasonable time, as close as possible to the consumers requesting this service, even by sub-contracting it to local repairers.

The new obligation to repair, however, applies only to a limited range of products, namely those currently regulated by the eco-design framework, and operates to the extent of its scope[85]. Consumers can thus claim repair to manufacturers if product defects concern a hardware or software component among those that OEMs must already make available to professional repairers and end-users, and occur within the period in which, according to each specific product legislation, manufacturers must ensure third-party access to product spare parts, information, updates and tools. Moreover, in offering such spare parts and tools and repairing goods, manufacturers must apply "a reasonable price"[86], which the Directive allows OEMs to determine, without requiring equivalence to the most favourable terms offered to authorised providers.

Under these conditions, the new obligation mandating manufacturers (even those who have not done so far) to provide repair will hardly stimulate, contrary to the EU legislator's expectations[87], fair competition between OEMs, affiliated repairers and independent providers. Nor does the new ban on using contractual clauses, hardware, or software techniques preventing repair, equally stated in Article 5, seem likely to temper such manufacturers' competitive advantage. Indeed, in mandating producers not to adopt legal and technical strategies that impede the repair of goods for which repairability requirements are provided, the R2R Directive introduces some exceptions. Namely, "legitimate and objective factors, including the protection of intellectual property rights under Union and national law"[88], may justify manufacturers

[85] Directive (EU) 2024/1799, Recital 21 and Art. 5(1).
[86] Directive (EU) 2024/1799, Art. 5, par. 2(a) and par. 4.
[87] Directive (EU) 2024/1799, Recital 16.
[88] Directive (EU) 2024/1799, Art. 5, par. 6.

adopting these repair restrictions. Regrettably, as noted above[89], OEMs are familiar with leveraging their exclusive rights to limit third-party repairs, even by using additional protective layers, such as TPMs, which hinder access to copyrighted software-enabled goods. The new directive is unlikely to change such a state of the art. Divulging the means repairers and end-users adopt to circumvent technological protection measures, for example, already prohibited by the Software Directive[90], will continue to be illegal under the new rules promoting repair. Consequently, consumers in the EU still do not enjoy the full right to repair their items or have them repaired by a technician of their choice, as it cannot reasonably be expected that they will be able to identify ways to circumvent TPMs individually[91].

The only legislative instrument that might promote repair beyond the manufacturers' authorised channels seems to be the European Repair Information Form, regulated by Article 4. This standardised document contains all relevant elements usually affecting repair choice, including the nature of the defect, the price and the time required to solve it. It may be provided for any consumer good, regardless of whether repairability requirements cover them, free of charge (except for preliminary diagnostic services) by any professional repairer, including manufacturers, sellers or independent or affiliated service providers. All of these may voluntarily offer the form at consumers' request, who may easily find and contact them through the new European digital platform for repair and the linked national sections. Its establishment should also facilitate seeking sellers of refurbished goods, purchasers of defective goods and community-led repair initiatives[92]. To enable consumers to confront the offers and select the most advantageous one, the Directive imposes on repairers providing the new European form to maintain the service conditions mentioned in it unaltered for a minimum of 30 days. They will indeed be an integral part of the contract, and if the consumer accepts them, repairers will be obliged to service the goods in compliance with the information released in that document. Yet, as it has been noted[93], while improving certainty and transparency about the time and costs of the service, this measure increases bureaucracy and workload related to initial repair evaluation and directly exposes repairers to contractual liability. This could appear overly burdensome for many providers, especially small enterprises, with the risk of such a form ultimately being adopted only by OEMs and their affiliates.

Overall, the R2R Directive appears to fail to address many significant barriers to repair. While some inconveniences related to the search costs of finding accurate and

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[89] *Supra* par. 2.1.

[90] Directive 2009/24/EC, art.7 (1)(c).

[91] On this issue, see R. CASO, *Capitalismo dei monopoli intellettuali, pseudo-proprietà intellettuale e dati nel settore dell'agricoltura di precisione e dello smart farming: note a margine del right to repair*, in 1 *Rivista di Diritto Alimentare* 36 (2023).

[92] Directive (EU) 2024/1799, Art. 7.

[93] See F. López-Bermúdez, X. Vence, *A critical assessment of the European Directive proposal on the common rules promoting the repair of goods*, *Resources Conservation and Recycling* 212 (2025) 107996.

reliable information about the place, time and price of the service are somewhat effectively considered, other repair barriers, especially those allowed by the legal framework or deliberately adopted by manufacturers, are not. Indeed, on the one hand, the EU repair law has not conditioned the demand for replacement to repair, regardless of the sharp consumers' preference for the first in case of defects occurring within the seller's liability. Such a result may reflect, to some degree, the legislative attempt to promote sustainability without weakening consumers' rights. Yet, on the other hand, in introducing the right to have defective goods repaired by manufacturers, without effectively shielding independent repair and self-repair from infringing on OEMs' rights, the EU Directive seems to have boosted producers' interests over consumers' interests instead. Far from promoting competition and broadening consumers' choice, the new stand-alone right to repair has the potential to strengthen original equipment manufacturers' and their affiliates' position in the aftermarket.

4. The right to repair in the US

Repair has gained prominence in the United States and has been regarded as crucial for developing the American economy in recent years. As highlighted by the former administration, "unfair anti-competitive restrictions on third-party repair or self-repair of items, such as the restriction imposed by powerful manufacturers"[94], may cause an excessive concentration of industry, abuses of market power, and monopolisation. This may inhibit competition, increasing service costs while lowering quality, opportunities for local businesses and consumers' choice. Repair has thus been considered a key pillar for an open, wealthy and leading economy, not only by social movements lobbying for consumers' rights against manufacturer-imposed restrictions but also by federal agencies, which, under the Biden administration, have actively addressed challenges posed by OEMs preventing consumers and businesses from servicing goods.

The Federal Trade Commission, for instance, has unanimously committed to pursuing this goal[95] and has brought several enforcement actions against companies adopting unlawful practices that hinder or hamper customers from repairing objects out of the OEM-authorised channels[96]. Along the same line, the Copyright Office has considered repair relevant in the triennial rulemaking proceeding for the renewal and expansion of exemptions to section 1201 of the Digital Millennium Copyright Act[97].

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[94] White House, *Executive Order on Promoting Competition in the American Economy*, cit.

[95] FTC, *Policy Statement of the Federal Trade Commission on Repair Restrictions*, cit.

[96] These enforcement actions range from sending warning letters (e.g., to Aeris Health, Blueair, Medify Air, Oransi, InMovement, ASRock, Zotac, and Gigabyte, in 2024) and entering into consent agreements (e.g., Harley-Davidson, Westinghouse, and Weber, in 2022) to filing suit against companies restricting customers' right to repair the goods they own (e.g., Deere & Company, in 2025).

[97] *Supra* note 58.

The Librarian of Congress has indeed recognised the need to allow circumventing a technological measure that effectively controls access to copyrighted works for diagnosis, maintenance, and repair. Bypassing for repair purposes software embedded in medical devices, in vehicles and vessels (whose operational and telematics data have also been made accessible, storable and sharable for owners and repair shops), and in any device designed primarily for consumer use is no longer infringing, at least for the next three years[98]. No similar wide-ranging temporary exemption has been introduced for equipment primarily designed for commercial use, save for retail-level food preparation devices (e.g., ice-cream machines[99]), notable for digital locks impeding third-party repair, as publicly discussed during recent political campaigns[100].

The pro-repair trend appears to be stable and, as it has been observed[101], may be further encouraged by the restrictive tariff policies announced by the current administration. Due to rising production costs, consumers are likely to reduce purchases and prioritise the maintenance of their products. Yet, it is unclear whether such policies might result in lower service prices, especially in aftermarkets primarily relying on importing spare parts and tools, as manufacturers' limitations on third-party repairers and end-users might persist. Such restrictive practices continue to trigger, in fact, bipartisan criticism and (at least in the car sector[102]) growing consensus for federal legislation to make accessing goods' parts, information, software and hardware needed to repair, and user-generated data easier. So far, however, there has been little progress on the issue in Congress[103]. Conversely, state legislatures have taken significant steps forward in promoting repair[104], not just for specific items – such as cars[105],

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[98] 37 CFR §201.40, paragraphs (b)(17) (medical devices), (b)(13) and (b)(14) (vehicles and vessels), (b)(15) (consumer devices).

[99] K. Melnick, *Tired of broken McFlurry machines? The Copyright Office has a fix*, *The Washington Post* (October 31, 2024), available at *washingtonpost.com*.

[100] 37 CFR §201.40, paragraphs (b)(16). See also U.S. Copyright Office, Library of Congress, *Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies* (Oct. 28, 2024), 89 FR 85437, at *public-inspection.federalregister.gov*.

[101] B. Ashworth, *The Right to Repair Movement Will Keep On Fixin'*, Wired (Nov. 18, 2024) available at *wired.com*; J. Frank, M. Dunn, J. Griem, *Trump, Tariffs and Tech: The Right to Repair in 2025*, Law360 (March 28, 2025) available at *clm.com*.

[102] First introduced in 2023, the Right to Equitable and Professional Auto Industry Repair (REPAIR) Act was reintroduced in the House (H.R.1566) in February 2025 to ensure consumers have access to vehicle-generated data and critical repair information and tools, without manufacturers' restrictions or limitations.

[103] I. Bowers, *Right to Repair legislation hits Congress* (US PIRG Education Fund, 2024) available at *pirg.org*.

[104] N. Proctor, J. Goodrich, *The State of Right to Repair* (US PIRG Education Fund, 2025) available at *publicinterestnetwork.org*.

[105] In 2020, Massachusetts overwhelmingly passed by ballot initiative the Right to Repair Act, requiring manufacturers selling cars with wireless systems in the state to allow vehicle owners and independent repairers to access mechanical data and run diagnostics through a mobile-based application. Challenged by automakers in the federal court, the law became effective only in 2025, along with Maine's Right to Repair Law, approved in the 2023 ballot.

wheelchairs[106] and farm equipment[107] – but also within a wide-ranging category like digital electronics, i.e., products that depend for their functioning, in whole or in part, on software embedded in or attached to the object. Such broad right-to-repair laws are mainly based on the model state legislation proposed by the Repair Association, entitled "Digital Right to Repair Act"[108]. As the following subsection will show, all enacted state laws promoting repair of digital electronic and appliance products present many core similarities while differing in some critical aspects.

4.1 Common and uncommon rules in state right-to-repair laws

Since 2023, New York[109], Minnesota[110], California[111], Oregon[112], and Colorado[113] have enacted legislation to facilitate the repair of digital electronic equipment. The pivotal rule pursuing this goal in any of these laws is the obligation on manufacturers to make parts, documentation, and tools needed to service products available, on fair and reasonable terms, to independent repair providers and owners, either directly or via authorised providers[114]. OEMs must comply with this provision for any digital device first sold or used (and also manufactured, according to New York, California and Colorado statutes) in the state starting from July 1, 2021[115]. Rather than prescribing some uniform product-based design repairability requirements, this common rule obliges manufacturers to provide authorised and non-authorised repairers, as well as customers owning or leasing the equipment, with equal repair chances. That leaves

[106] In 2022, Colorado passed the Consumer Right to Repair Powered Wheelchairs Bill (HB22-1031), adding Part 15, entitled "Consumer Right to Repair", in Colorado Revised Statutes, and requiring manufacturers of powered wheelchairs to provide access to parts, tools and information necessary to repair wheelchairs to owners and independent technicians. The same provision was introduced in California in 2024 by passing the Consumer Wheelchair Right to Repair Bill (SB1384), which added Chapter 8.5 to Division 8 of the Business and Professions Code.

[107] In 2023, Colorado signed the Consumer Right to Repair Agricultural Equipment Bill (HB23-1011), amending Colorado Revised Statutes, Part 15, to extend the obligation to provide parts, tools and information needed to repair to agricultural equipment manufacturers.

[108] See Legislative Template for Digital Right to Repair (REPAIR.ORG) available at repair.org.

[109] Digital Fair Repair Act (Repair Act), NY Gen. Bus. L. §399-NN (2023).

[110] Digital Fair Repair Act, Minn. Stat. § 325E.72 (2024).

[111] Right to Repair Act, CA Pub Res Code §§42488 — 42488.3(2024).

[112] Right to Repair Act, S.B. 1596, 82nd Leg. Assemb., 2024 Reg. Sess. (Or. 2024).

[113] Consumer Repair Bill of Rights Act, Colo. Rev. Stat. Ann. §§6-1-1501 — 6-1-1505 (2024).

[114] In case of violation, the Attorney General can impose civil penalties widely varying among legislations, ranging from no more than $500 (NY Gen. Bus. L. §399-NN (7)(e) (2023)) to $20,000 (Colo. Rev. Stat. § 6-1-112(1)(b) (2023)) or $25,000 (Minn. Stat. § 325E.72, Subd. 4 (2024)) per violation or even $1,000 per day (Oregon's Right to Repair Act (SB 1596), sec. 3(4)), doubling for the second violation until $5000 from the third one onwards (CA Pub Res Code §§42488.3(2024)).

[115] Exceptions are New York, which applied the original equipment manufacturer's obligation for digital electronic equipment first manufactured on or after July 1, 2023, and Oregon, which extended it to all devices except cell phones manufactured on or after July 1, 2015.

OEMs free to decide how to make products and whether to ensure their disassembly and service, mandating them to distribute only those components and information (like diagrams, manuals, and schematics) along with software, hardware or apparatus necessary for diagnosis, maintenance and repair, which producers have available already and supplied to those providers acting under their name or on their behalf. Should such parts, documents and tools no longer be in hand with the original equipment manufacturer, there is no obligation to provide them to third-party repair providers and customers[116].

Beyond such a core provision intended to ensure fair access to the repair market of digital equipment, however, these laws show significant differences, especially regarding their scope. First, the New York Digital Fair Repair Act applies only to personal electronics, such as cell phones, laptops and tablets, excluding home appliances[117]. This broad product category is covered instead by other state laws, as it is increasingly made of objects commonly equipped with software, like refrigerators, ovens, microwaves, or washing machines. Second, not every transaction involving digital electronic equipment, as defined by each state's legislation, triggers the obligation for new manufacturers. Access to necessary parts, information, and tools shall always be guaranteed only within business-to-consumer contracts, not business-to-business and government transactions, which the sole Colorado, California and Minnesota right-to-repair laws include. In addition, some digital devices, whether or not directly sold to retail, are exempted. Along with products manufactured and sold before July 2021 (at a wholesale price lower than $50 under California law), even motor and recreational vehicles, vessels, construction, industrial and farm equipment, as well as medical devices, alarm systems and energy storage systems are not covered by any of the right-to-repair acts. While some carveouts are intelligible due to the presence of specific voluntary regulations in place (as in the case of the automotive industry or tractors) or for evident safety reasons (such as medical equipment or security systems), other exceptions more likely testify to the massive lobbying that has accompanied the approval of these bills. Such is the case for game consoles, technically covered only by New York law[118], which instead excludes e-bikes, and for electric toothbrushes, exempted under Oregon law.

Another key distinction between digital repair laws lies in the standard defining the manufacturer's obligation to enable independent repairers and owners to restore equipment functionality. OEMs must make documentation, tools and parts available

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[116] California represents the only exception in this regard, mandating OEMs to still make documents and tools (but not service parts) available for at least three years (or seven years for devices with a wholesale price of $100 or more) after the last date a product model or type was manufactured (Cfr. CA Pub Res Code §§42488.2(a), (b) and (g) (2024)).

[117] NY Gen. Bus. L. §399-NN (3)(g).

[118] However, NY Gen. Bus. L. §399-nn (3)(f) clarifies that OEMs of gaming and entertainment consoles shall not be required to make available any parts, tools or documentation "in a manner that is inconsistent with or in violation of any federal law".

"on fair and reasonable terms"[119]. In some laws, this implies that information, software, and hardware needed to diagnose, maintain, and repair the products shall be disclosed and made available by manufacturers at no charge or, if requested in physical form, at the actual costs of preparing and sending the copy[120]. Conversely, other legislations have provided for charging for documents and tools at costs and conditions equivalent to the most favourable offered to authorised repair providers, accounting for any applied discount or other incentives[121]. This second criterion has also been adopted for spare parts in Oregon and California, contrary to those states that preferred to maintain a vaguer language, generically relying on "costs fair to both parties" and "terms under which an original equipment manufacturer offers the part to an authorised repair provider"[122].

In any case, what appears crucial from the text of any of these state laws for ensuring fair access to repair of digital electronics is that manufacturers do not impose on repairers and customers unnecessary burdens and restrictions, such as conditioning full access to information or full functioning of tools and spare parts to OEMs' intervention, authorisation or approval. Yet, several practices burdening third-party and do-it-yourself repairs might still fall outside this prescription. The disclosure of security codes needed to reset the digital locks disabled for purposes of repair, for example, is mandated only by Oregon[123], which, with Colorado, also prohibits the use of "part pairing" (i.e., using software to identify components – serialised parts – through a unique identifier) to limit device functionality after repair. Away from those states, OEMs might also supply pre-assembled spare parts, which may unreasonably limit repair and increase costs for independent providers and owners.

4.2 The potential unfairness of digital fair repair laws

All state digital right-to-repair laws enacted in the US focus on providing a fair marketplace for repairing digital electronics. The affirmative duty of manufacturers to disclose information and supply independent technicians and consumers with tools and spare parts made available to authorised service providers precisely pursues this goal. Predictably, such a way of protecting the right to repair has raised many concerns

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[119] NY Gen. Bus. L. §399-NN (2); Minn. Stat. § 325E.72(3); CA Pub Res Code §§42488.2(a) and (b); S.B. 1596, Sec. 1(2)(a) (Or. 2024); Colo. Rev. Stat. Ann. §§6-1-1503.

[120] NY Gen. Bus. L. §399-NN(1)(d)(i) and (ii); S.B. 1596, Sec. 1(1)(d)(A) and (B) (Or. 2024); CA Pub Res Code §§42488.2(j)(4)(B) and (C).

[121] Minn. Stat. § 325E.72(2)(h)(2); Colo. Rev. Stat. Ann. §§6-1-1502(5.5)(a)(I).

[122] Minn. Stat. § 325E.72(2)(h)(1)(i) and (ii); Colo. Rev. Stat. Ann. §§6-1-1502(5.5)(d). See also NY Gen. Bus. L. §399-NN (1)(d)(iii).

[123] S.B. 1596, Sec. 1(1)(c)(Or. 2024). Colorado obliges manufacturers to make any document, tool, or part needed to reset security locks disabled in the course of providing services available only concerning agricultural equipment and powered wheelchairs, not digital electronic equipment (Colo. Rev. Stat. Ann. §§6-1-1503(1)(b)).

among companies that enjoy inherent advantages in nearly completely controlling the after-sales services of their equipment and will suffer significant economic losses from opening the repair market for competition. Manufacturers and trade associations have vigorously opposed these legislative initiatives, unveiling the "unintended and potentially harmful consequences"[124] of digital fair repair laws, which may be detrimental to businesses, consumers, and the environment.

As to businesses' downsides, firms argue that consenting to unfettered access to information, software and parts necessary to restore the functionality of objects can expose OEMs to several risks, ranging from violating their intellectual property rights to compromising their brand reputation and burdening, especially small enterprises, with unfair costs.

The leading assertion over IP law, reinforced by considerations of the potential federal pre-emption of right-to-repair state laws[125], is that in mandating making available to repair shops and customers documentation, tools and components, these acts may force device makers to reveal software codes or manuals, protocols and other information protected as copyright or trade secrets[126]. Repairing items may also require patented replacement parts, depriving manufacturers of the core of their exclusive rights: to prevent others from accessing their inventions and to decide whom to license them[127]. Yet, in response to these predictable claims, states have adopted some legal arrangements to safeguard companies' intellectual property. On the one hand, OEMs have been overtly exempted from disclosing security and source codes, divulging trade secrets, and licensing intellectual property. In New York and Minnesota, they are also clearly allowed to abstain from making available any means or parts permitting any modification of the product[128]. On the other hand, such protections work unless overriding them is "necessary to provide repair documentation, parts and tools on fair and reasonable terms"[129]. Strengthening the effectiveness of the right to repair, such a clarification reflects the general lawfulness of repair activities under copyright and patent law, also relying on the non-secrecy of any information, guide or instruction already shared with authorised repairers. Nevertheless, this may not satisfy manufacturers, who, to protect their intellectual property, may decide to provide

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[124] I. Brannon, K. Seyfert, *The Economic Downsides of "Right-to-Repair"*, Study released by the National Association of Manufacturers in December 2023, available at documents.nam.org.

[125] On this issue, cf. D. Hartline, A. Mossoff, *State Right-to-Repair Laws Need to Respect Federal Copyright Laws: A Constitutional, Legal and Policy Assessment*, Hudson Institute, 2022, available at media.hudson.org; Sarnoff J.D., *The Right to Repair, Intellectual Property, Exhaustion, and Preemption*, Elvy S-A, Kim NS (eds.) *The Cambridge Handbook of Emerging Issues at the Intersection of Commercial Law and Technology*, Cambridge, 2025, p. 215-229.

[126] FTC, *Nixing the Fix*, cit., p. 24-26.

[127] See L. C. Grinvald, O. Tur-Sinai, *Intellectual Property Law and the Right to Repair*, cit., p. 120.

[128] NY Gen. Bus. L. §399-NN (3)(d); Minn. Stat. § 325E.72(5)(d).

[129] Minn. Stat. § 325E.72(5)(a). In equivalent terms, S.B. 1596, Sec. 1(3)(a) (Or. 2024); Colo. Rev. Stat. Ann. §§6-1-1503, Subsections (2)(a)(I) and (6)(a); CA Pub Res Code §§42488.2(c). New York did not introduce such an exception.

documentation, tools and parts no longer, making them unavailable even to their authorised repairers[130].

Another stream of criticisms on right-to-repair laws has concerned businesses' reputations and costs. Consumers may blame the company for any malfunction or impairment resulting from the repair activities performed by independent providers or themselves. Regardless of who repaired the good (or produced faulty non-original spare parts), customers tend to associate that fault with the brand displayed on the device[131]. In the OEMs' view, this may be enough to compromise the company's reputation, even though state laws have introduced manufacturers' liability exemptions for any damage or injury resulting from interventions by independent providers or customers[132]. In addition, right-to-repair legislation would excessively burden original equipment manufacturers, who, to comply with the law, must develop a complete distribution system or network that guarantees consumers and independent repairers full access to documents, tools, and parts at "fair and reasonable costs". Such a subjective standard, as observed in the previous subsection, may include only the charge for actual costs of preparing and sending physical materials without adequately compensating OEMs' efforts in researching, designing, developing and implementing a supply system for repair manuals, software, hardware, and components[133]. Likewise, the complementary requirement adopted in other fair repair laws of applying costs equivalent to the most favourable offered to authorised repair providers may "decimate the OEM network because authorised dealers would no longer have a cost advantage in providing parts to their customers"[134]. This may lead to a general increase in costs for documents, tools, and spare parts or a rise in digital electronic equipment retail prices to the detriment not only of businesses but also of consumers. Yet, regarding the potential shifting of costs of complying with right-to-repair laws to consumers, some researchers showed that this would depend on the specific production costs of each device[135]. For durable goods that are relatively low-cost to make, such as smartphones and microwaves, manufacturers may even react by lowering the prices to stimulate sales of new products and compensate for losses from losing control of the repair market. For goods with high production costs, instead, they may raise prices but offer their customers a free repair to dominate the post-sale

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[130] See L. C. Grinvald, O. Tur-Sinai, op. ult. cit., p. 112.

[131] M. MacAneney, *If It Is Broken, You Should Not Fix It: The Threat Fair Repair Legislation Poses to the Manufacturer and the Consumer*, 92 *ST. John's L. Rev.* 331 (2018), p. 342.

[132] NY Gen. Bus. L. §399-NN (5); Minn. Stat. § 325E.72(7); S.B. 1596, Sec. 1(3)(C) (Or. 2024); Colo. Rev. Stat. Ann. §§6-1-1503(3); CA Pub Res Code §§42488.2(h).

[133] M. MacAneney, op. cit., p. 344.

[134] I. Brannon, *A Criticism of 'Right to Repair' Laws*, 47(1) *Regulation* 20 (2024), p. 24, available at cato.org.

[135] C. Jin, L. Yang, C. Zhu, *Right to Repair: Pricing, Welfare, and Environmental Implications*, 69(2) *Management Science* 1017 (2023) available at doi.org (arguing that OEMs' price-response to right-to-repair laws may lead to divergent scenarios that do not always benefit consumers, improve overall social efficiency, and reduce the environmental impact).

services market. The manufacturers' price adjustment to right-to-repair laws can thus be more nuanced than suggested.

Manufacturers' criticisms of right-to-repair laws have also focused on their adverse effects on consumers' safety and security. Digital electronics are highly complex and can contain components, such as high-energy lithium batteries, which may injure unskilled customers and untrained repairers who incautiously attempt to service them[136]. Improper repair can also cause significant harm, even long after its completion, to end users and even the public if performed on medical devices or objects whose malfunction may cause fires or other hazards. Beyond such safety risks, giving consumers and repair shops unfettered access to repair may also raise serious security concerns. Inexperienced technicians may compromise sensitive data collected by digital and interconnected devices and alter, unintentionally or deliberately, perhaps to boost product performance, hardware security and safety features that make them resistant to cyberattacks and compliant with federal safety and environmental regulations[137]. Despite the lack of evidence grounding the OEMs' assertion that such threats are more significant outside the authorised repair network[138], these arguments have been cautiously heard in the repair legislative debate. First, several products, including health-related devices, alarms, and energy storage systems, have indeed been excluded for their intrinsic safety risks from the scope of each enacted fair repair legislation. In the same vein, original equipment manufacturers have been exempted from providing documentation, tools and parts that would disable or override anti-theft or privacy security measures without the owner's authorisation, as well as passwords and security codes. They can even continue to sell pre-assembled parts or use part pairing if this is functional to ensure consumers' safety[139] or the proper functioning of standalone biometric components used for authentication purposes[140]. Second, states have also shown primary consideration for guaranteeing safe and quality independent repair services. Indeed, right-to-repair laws have made it clear that protecting consumers' right to repair requires not just new obligations for manufacturers but also for third-party repairers. Unaffiliated technicians must notify, in writing and in advance, that they are not authorised providers and whether they use non-original parts[141]. Furthermore, they must remind customers to check the product warranty coverage before seeking their service[142] and warn them about the potential repair-related risks, recommending steps to minimise them[143]. Oregon has gone even

[136] FTC, *Nixing the Fix*, cit., p. 26-30.
[137] I. Brannon, op.cit., p. 22-23.
[138] FTC, *Nixing the Fix*, cit., p. 28-32.
[139] Cf. NY Gen. Bus. L. §399-NN (3)(i); S.B. 1596, Sec. 1(3)(f) (Or. 2024).
[140] Colo. Rev. Stat. Ann. §§6-1-1503, Subsections (7)(b)(II).
[141] Colo. Rev. Stat. Ann. §§6-1-1503(8); CA Pub Res Code §§42488.2(e); S.B. 1596, Sec. 2(3)(Or. 2024).
[142] Cf. NY Gen. Bus. L. §399-NN (6).
[143] S.B. 1596, Sec. 2(2)(Or. 2024).

further in this regard, requiring third-party repairers to "possess a valid and unexpired certification that demonstrates that the person has technical capabilities and competence necessary to safely, securely and reliably repair consumer electronic equipment in accordance with widely accepted standards[144]". Independent service providers are thus expected to invest considerably in their product-specific training to protect consumers' privacy and security as adequately as authorised dealers.

Manufacturers' concerns about right-to-repair laws have also included some environmental apprehensions. In fact, by mandating that original equipment manufacturers provide every component and tool necessary to service devices, such laws may foster industries intensifying crafting, shipping, and warehouse processes, resulting in more carbon emissions. Conversely, to evade that obligation, firms may dramatically change their design decisions and flood the market with disposable products, contributing to the amount of e-waste. These scenarios might reflect some manufacturers' reactions to state right-to-repair laws, challenging the assumption that giving consumers the right to repair naturally benefits the environment by extending product lifespan, reducing pollution and the early disposal of products[145]. Yet, repair advocates have replied that OEMs' repair restrictions have had the same environmental impact[146]. In any case, sustainability is not the core focus of the US repair legislation, nor the movement[147], primarily emphasising the need for enabling competition and protecting consumers' rights by broadening their choice in the aftermarket. Minnesota and California have offered further reassurance on the issue since they have even exempted manufacturers from right-to-repair laws if they provide "equivalent or better" replacement products at no charge to their consumers[148]. This provision does not promote repair as a circular economy practice unless it is implemented to include remanufactured and refurbished goods. Nevertheless, this approach may be met with consumer resistance, as such products are considered neither equivalent nor better than new ones[149].

5. Conclusion

[144] S.B. 1596, Sec. 1(1)(e)(B)(Or. 2024).

[145] C. Jin, L. Yang, C. Zhu, op. cit., p. 1033.

[146] FTC, *Nixing the Fix*, cit., p. 41-42.

[147] Even the state model legislation clearly defines the objectives of the Digital Right to Repair Act as "to promote equipment owner choice and competition" without mentioning any sustainability goal.

[148] Minn. Stat. § 325E.72(5)(g); CA Pub Res Code §§42488.2(k).

[149] *Maldonado, et al. v. Apple, Inc., et al.*, No. 3:16-cv-04067-WHO (N.D. Cal. April 17, 2019), granting class certification to consumers complaining of receiving a remanufactured replacement device under AppleCare or AppleCare+, promising "new or equivalent to new" products. On April 29, 2022, US District Judge William H. Orrick granted final approval of the parties' $95 million settlement.

Recent reforms in the European Union and the United States promoting repair have been centred on protecting the right of consumers to maintain their defective products by imposing new obligations on manufacturers. Namely, the R2R Directive and the US state digital fair repair laws converge on a twofold outcome. Both require OEMs, on the one hand, to facilitate access to documentation, software and replacement parts needed to diagnose and service items on fair and reasonable conditions and, on the other hand, not to impose unnecessary burdens, including contractual clauses, software or hardware techniques, that may impede restoring the complete functionality of the product. These obligations apply, whether or not producers provide commercial guarantees, to specific digital electronic equipment: the sole devices for which the EU has introduced design repairability requirements, and those not exempted (for safety, security or lobbying reasons) by the US state laws.

Apart from this underlying convergence, the study has highlighted some significant differences between these right-to-repair rules. Indeed, unlike the US, the EU has not required OEMs to make documentation, tools, and replacement parts available to independent technicians and customers to the extent that these are available to manufacturers and their authorised providers. Instead, the R2R Directive, complementing the eco-design prescriptions – which mandate producers to provide some components, information and tools to professional repairers and, in limited part, to consumers – has imposed on these same companies to service defective products, at the customers' request. In so doing, the European rules, supposedly enhancing consumer protection, appear to place little or no focus on facilitating consumers to decide by whom to have goods repaired. These norms seem more functional in consolidating further original equipment manufacturers' control of their products' aftermarket, expecting OEMs to provide instructions, tools and spare parts, and even to begin carrying repair services. The Directive tends thus to defend a "closed right to repair"[150], enabling consumers to access not all post-sale services but only those provided by producers. On the contrary, US state laws – far from interfering with manufacturers' decisions on whether to design repairable goods and offer after-sale services – centre on liberalising the aftermarket and broadening consumers' choice, by ensuring that independent repairers and customers enjoy equal opportunities to service products as authorised providers.

Such a feeling may also sound plausible considering other divergences marking the distance between the EU and the US approaches. First, these differences regard the price and terms, fair and reasonable, under which manufacturers shall offer repair to consumers and provide instructions, spare parts and tools to independent technicians and owners. Relying apparently on the same subjective standards, these provisions are certainly vaguer in the EU. The Directive only impose on manufacturers

[150] S. Svensson-Hoglund, J. L. Richter, E. Maitre-Ekern, T. Pihlajarinne, A. Maigret, C. Dalhammar, *The Emerging 'Right to Repair' legislation in the EU and the U.S.*, Paper presented at *Going green - Care Innovation* (2018), Vienna, Austria, available at http.lub.lu.se.

to set a reasonable price, without clarifying, as nearly all US right-to-repair laws examined do instead, that such a price cannot be higher than that offered to authorised repair providers. Second, the European and US laws have differed in introducing limitations to the widespread use of strategies, such as TPMs or part pairing, hindering access to repair. Apart from stating the general rule prohibiting OEMs from adopting such techniques, the R2R Directive leaves room to still implement them under the excuse of considering their use necessary to protect intellectual property rights. In addressing the same need to defend copyrights, patents, and trade secrets, American digital fair repair acts have instead overtly prevented companies from relying on these rights to elude the duty to provide repair documentation, parts and tools on fair and reasonable terms. Lastly, the two legal systems also differ in encouraging do-it-yourself. Aligning with the eco-design framework, the Directive confirms that consumers may have access at a reasonable price to a residual part of instructions, tools and components that manufacturers must make available to professional technicians. In contrast, no similar distinction emerges from US state right-to-repair laws, which have obliged manufacturers to make the same information, parts and tools available to authorised, independent and amateur repairers.

Overall, these rules may ensure that European OEMs can maintain a significant competitive advantage in the aftermarket, making the facilitation of independent repairs and lowering service costs highly unlikely. Conversely, the US state laws show a sufficiently strong commitment to broaden consumers' choice in the repair market, providing measures genuinely intended to make it open and competitive. Yet, the effectiveness of such measures may falter because of other factors, ranging from the unpredictable companies' reaction to their new obligations in the long run, especially since, as noted, they may decide to craft only disposable goods to evade them, to the lack of consumers' awareness of their rights[151]. According to a recent survey, only 25% of people living in a state with right-to-repair laws are aware of having the right "to take their broken product to an independent repair shop, or fix it themselves, instead of needing to use the manufacturer's repair service"[152]. After all, American repair legislation has not introduced specific norms to address information gaps affecting customers' decision-making process, either at the post-sale stage when the product is defective or before, at the sale point, making buyers aware of the repairability of the products on the market. Quite the opposite, despite their weakness in addressing OEMs' barriers to repair, the EU rules might have a sharp advantage in gradually shifting consumers' preferences toward restoring the functionality of their products. Indeed, the mix of legislative measures complementing the R2R Directive may act as bulwarks against the manufacturers' decision to make non-repairable products while inducing consumers to make sustainable consumption choices. The Directive

[151] D. Golubock, *Fixing Right-to-Repair Law: Why Efforts to Hold Manufacturers Accountable Are Faltering*, 7 *Ariz. L.J. Emerging Tech.* 1 (2024).

[152] Consumer Reports, American Experiences Survey: A Nationally Representative Multi-Mode Survey (June 2024), p. 10, available at consumerreports.org.

mandates Member States to make manufacturers inform consumers about their repair services[153] and to select appropriate measures to make customers aware of their rights under the new legislation[154]. Ecodesign standards (although still too limited in scope unless the repairability requirements are extended to other products) act as a supply-side intervention by obliging manufacturers to bring repairable goods to the market. In addition, some mandatory pre-contractual information acts on the demand side, notifying consumers about product durability and reparability[155].

The highlighted divergences between the EU and the US on promoting the right to repair may be unsurprising if traced back to the political frame and the legal order within which they have developed. In focusing on fostering repair as part of implementing the objectives of the Green Deal, the R2R Directive lays out rules primarily oriented to encourage actions enabling the extension of product lifespan and reducing waste. It obliges manufacturers to repair goods, disregarding the main repair restrictions impeding third-party businesses and owners from maintaining and servicing devices. The potential enhancement of the OEMs' market power stemming from such rules does not break with the EU's openly stated policy goals, as it is not inconsistent per se with the possibility of still promoting repair as a circular practice, although carried out by original equipment manufacturers. This result also reflects the European legal order's deeply rooted "producerist" trait, which, as Whitman has noted, makes it "remain much more likely than Americans to perceive rights and interests on the supply side, rather than on the demand side"[156]. Within such a producer-oriented legal framework, even the further-claimed legislative commitment to enhance consumer protection may coherently find its place, as far as intended to guarantee the service's high-quality, safety and security standards[157]. Conversely, the US approach to repair has revolved around removing barriers that hinder or hamper independent technicians and individuals from servicing defective products outside the manufacturer's authorised network, relying on competition in a free market economy to maximise consumers' economic interests to enjoy the broadest possible choice and lowest possible prices. Within this consumer-oriented framework, the right to repair is regarded primarily as the banner of economic freedom and, as such, potentially equivalent to product replacement, as clarified by some state laws, and even consistent with the OEMs' choice to stop making repairable goods or offering after-sale services.

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[153] Directive (EU) 2024/1799, art 6.

[154] Directive (EU) 2024/1799, art 12.

[155] Directive (EU) 2024/825, art 2.

[156] J. Q. Whitman, op. cit., p. 348.

[157] *Ivi*, p. 370-371 (marking the difference between 'consumer protection interests' and 'consumer economic interests', which are mainly favoured by continental Europe producer-oriented law and US consumer-oriented law, respectively).

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ABSTRACT: The essay examines the regulation of the right to repair in the European Union and the United States to verify whether and to what extent the rules enacted to promote product repairability in both legal systems mirror the objectives pursued in each, respectively. Indeed, in recent years, the EU and the US have adopted policies and regulations to facilitate access to repair. However, European initiatives have been presented as an integral part of the plan to ensure sustainable production and consumption patterns and foster the transition towards a circular economy. By contrast, in the US, repair has been promoted primarily as a powerful instrument for breaking the original equipment manufacturers' monopoly and establishing a fair and competitive aftermarket. The legal comparative study will illuminate the similarities and differences between the two policies and legislative approaches, providing additional tools of inquiry to assess the effectiveness of right-to-repair laws.

KEYWORDS: Right to repair – Product obsolescence – Sustainability – Consumer law – Comparative law.

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