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Kayleen Manwaring

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UNSW Law & Justice
UNSW Sydney NSW 2052 Australia

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‘Slowing down the loop’: smart devices and the right to repair

Kayleen Manwaring 

School of Private and Commercial Law, Faculty of Law & Justice, University of New South Wales, Sydney, Australia

ABSTRACT

The last decade has seen a significant increase in new product lines in ‘smart’ consumer products. These products have been manufactured and released in the wake of technological developments allowing for everyday objects and environments to be computerised and connected to the Internet. Some of these new products will inevitably contain or develop defects compromising their function, and when they are discarded they have the potential to add substantially to the ever-growing global e-waste problem. A stronger right to repair, particularly in the context of these new products, would assist in reducing e-waste, promoting sustainability, and growing a circular economy. This paper examines the recommendations of the recent Australian Productivity Commission Inquiry regarding the ‘right to repair’ through the lens of sustainability principles for consumer products agreed upon by the United Nations. The Productivity Commission’s recommendations unfortunately contain some significant gaps in relation to reducing e-waste and promoting sustainable production and consumption. However, some significant lessons can be learned by the international community from the Australian experience.



KEYWORDS

Right to repair; internet of things; sustainability

1. Introduction

Better waste management and more effective recycling are important – but they aren’t enough on their own. As a country we must do more to design-out waste in the first place, and make better use of recovered resources. (Plibersek 2022)

On 25 November 2022, the federal Minister for the Environment and Water announced the formation of a new national expert group, the Ministerial Advisory Group on the Circular Economy, ‘to identify meaningful and direct changes the government and industry can make to drive the transition to a circular economy’ (Environment Ministers 2022). This announcement derived from a commitment made by all federal, state and territory environment ministers ‘to work with the private sector to design out waste and pollution, keep materials in use and foster markets to achieve a circular economy by 2030’ (emphasis

CONTACT Kayleen Manwaring  kayleen.manwaring@unsw.edu.au  School of Private and Commercial Law, Faculty of Law & Justice, University of New South Wales, Sydney, NSW 2052, Australia

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in original) (Environment Ministers 2022). A circular economy attempts to achieve sustainability goals by implementing:

business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. (Kirchherr, Reike, and Hekkert 2017, 224)

As its name suggests, a circular economy constitutes a move from the current linear 'take-make-dispose' production cycle to one which aims at a closed-loop system, where products and materials are kept in use, waste is minimised and natural systems are regenerated (Ellen MacArthur Foundation n.d.; Gallaud and Laperche 2016). Circular economy systems are intended to encourage 'reuse, repair, recycl[ing] ... eco-design ... sustainable supply and responsible consumption' (Gallaud and Laperche 2016, x).

A key part of promoting sustainable consumption is ensuring products are *repairable* (Bradley and Persson 2022, 1321). Repair can reduce waste and act to 'slow ... down the loop' (Bradley and Persson 2022, 1333), rather than putting used materials back *into* the loop through recycling. This paper discusses the effect of a 'right to repair' on the plethora of 'smart' consumer products released in the last decade in the wake of technological developments allowing for many previously 'dumb' objects, buildings, environments and living things to be computerised and connected to the Internet (Manwaring and Clarke 2015). These products are a substantial existing and potential source of e-waste (Higginbotham 2020), but also have the potential to be transformed into significant inputs into a repair market as part of a circular economy.

In 2015, the United Nations General Assembly approved a set of guidelines (United Nations 2015) for consumer protection ('UN Guidelines'). The UN Guidelines contain principles that are helpful for Member States (such as Australia) in, amongst other goals, building sustainable consumption, legal and practical capacities to repair, and a circular economy. In 2020, the Australian Federal government tasked the Productivity Commission ('Productivity Commission') with investigating barriers to repair of products by consumers and independent repairers, and the reduction of e-waste. In response, the Productivity Commission released a report in 2021 ('Right to Repair Report') (Productivity Commission 2021).

This paper critically examines the Right to Repair Report and its recommendations in the light of the principles supporting sustainability in the UN Guidelines. Part 2 outlines the UN Guidelines most relevant to repair and sustainability practices. Part 3 describes the nature of 'eObjects' (the types of 'smart' consumer products discussed in this paper), and proceeds to explain the nature and importance of, and barriers to, a right to repair for these products. Part 4 sets out some overseas responses to the right to repair. Part 5 analyses the current Australian situation and the Productivity Commission's recommendations, in the light of identified barriers to repair and the UN Guidelines. Part 6 discusses some of the implications for the international community. Part 7 concludes.

2. The United Nations Consumer Protection Guidelines

Unsustainable patterns of production and consumption, particularly in industrialized countries, are the major cause of the continued deterioration of the global environment ... [D]eveloped countries should take the lead in achieving sustainable consumption patterns ... (United Nations 2015, 8)

The UN Guidelines document contains a set of objectives, principles and guidelines intended to describe ‘the main characteristics of effective consumer protection legislation’ (United Nations 2015, 3). The last of seven objectives in the UN Guidelines document is ‘to promote sustainable consumption’ (‘Sustainability Objective’).

Supporting the objectives and principles in the document are the guidelines themselves. The most relevant to the Sustainability Objective and the right to repair are:

1. UN Guideline H ‘Promotion of sustainable consumption’, particularly:
 - a. [H.52] encouragement of ‘design, development and use of products and services that are safe and energy- and resource-efficient, considering their full life-cycle impacts’, as well as ‘recycling programmes that encourage consumers to both recycle wastes and purchase recycled products’; and
 - b. [H.59] consideration of ‘a range of economic instruments, such as fiscal instruments and internalisation of environmental costs, to promote sustainable consumption, taking into account social needs, the need for disincentives for unsustainable practices and incentives for more sustainable practices’
2. UN Guideline B.16, requiring Member States to adopt measures ‘ensur[ing] that products are safe for either intended or normally foreseeable use’
3. UN Guideline C, obliging Member States to adopt policies requiring:
 - a. [C.23] producers to meet ‘reasonable demands of durability, utility and reliability’; and
 - b. [C.25] manufacturers and retailers to ensure ‘adequate availability of reliable after-sales service and spare parts’.

Part 3 describes the types and attributes of consumer products discussed in this paper, the nature and importance of the right to repair and current barriers.

3. The right to repair

3.1. The effect of new consumer products

A new model of computing has emerged, based on widespread embedding of remote connectivity, sensor and processing capabilities into various everyday objects and environments. This model encompasses the development and commercial and consumer use of previously unconventional forms of distributed information technologies. The Productivity Commission explicitly recognised the importance of this model on consumer markets in the Right to Repair Report:

increasingly many internet-connected products with embedded software have come to market, beyond just computers and phones – including doorbells, lights, toothbrushes, televisions, vacuum cleaners, mops, fridges, cooking appliances and security cameras. (Productivity Commission 2021, 95–96)

Various terms have been used to describe this model, including ‘ubiquitous’ and ‘pervasive’ computing, ‘ambient intelligence’, ‘smart’ devices, the ‘Internet of Things’ (‘IoT’) and ‘eObjects’. These terms are discussed in detail in Manwaring and Clarke (2015, 588–598).

In this paper, I use the term ‘eObjects’, which consists of objects not inherently computerised, but into which have been embedded one or more *computer processors* with *data collection*, *data handling* and *data communication* capabilities (Manwaring and Clarke 2015). The core attributes of an eObject mean there are really no ‘simple’ eObjects. Some eObjects are less complex than others, but even the most basic eObject is a hybrid of software, hardware and physical object (Coll and Simpson 2016; Helberger 2016; Noto La Diega and Walden 2016). Additionally, many eObjects have some form of *active capacity* (that is, a capacity to act on the physical world, such as a robot vacuum cleaner (iRobot n.d.)) and are also *dependent* on some form of external services (Manwaring and Clarke 2015, 600), such as cloud data storage and processing for fitness devices (Du Preez 2020). Depending on the circumstances, all of these attributes may be as relevant to repair as they are to the original functioning of the eObject (see paragraph 3.3).

3.2. Nature and importance of the right to repair in the context of eObjects

The Productivity Commission defined the right to repair as ‘the ability of consumers to have their products repaired at a competitive price using a repairer of their choice’ (Productivity Commission 2021, 2). This formulation is consistent with the dominant US narrative, which focuses on the famous (or infamous) declaration of repair advocates in North America:

‘We have the right to repair everything we own’. (The Repair Association n.d.)

However, the growth of the consumer market in various hybrid eObjects has significantly disrupted legal and practical concepts of ownership and possession of consumer products. This disruption has shaped some of the normative and legal conflicts applicable to right to repair.

However, there are narratives other than the protection of private rights attaching to personal ownership supporting a right to repair, and these align substantially with the Sustainability Objective and UN Guideline H. For example, much of the existing EU regulation relating to empowering repair centres on ‘eco-design’ principles, arising out of policy drives towards circular economies in EU countries (Pihlajarinne 2020, 112–113). Circular economy initiatives emphasise notions of shared rather than individual ownership (Rios, Carolina, and Charnley 2017), and seek to ‘construct ... more regenerative cultures of consumption’ (Manwaring et al. 2022, 180). In response, some providers are already moving to models of shared ownership or ‘custodianship’ of physical consumer products which include ongoing subscription fees for repair and maintenance (Bundles n.d.).

Additionally, repair and maintenance are fundamentally *practices* and *skills*, and not merely consumer ‘rights’. It is arguable that these skills, particularly in relation to eObjects and other electronics, have been ‘radically undervalued’ (Carr 2017, 644) in modern culture. This is a concern as the skills and knowledge needed for repair are likely to be more rather than less needed in future generations (Carr 2017, 652). While automated assembly of complex electronic products is commonplace, repair is much less so, and the physical practicalities of repair mean this is unlikely to change substantially in the medium term. Policy- and law- makers considering reform in this area should not confine themselves to protecting *rights*: they also need to consider to what extent they can support development and maintenance of the practical *skills* necessary for eObject

repair (Manwaring et al. 2022). The potential loss of repair skills is concerning in a world with increasingly scarce resources, such as rare earth metals (US Department of the Interior 2014) vital to many eObjects.

3.3. Barriers to repair

Barriers to repair in eObjects are various and include: repair-unfriendly design; lack of access to essential repair information, specialised tools and spare parts; lack of necessary repair skills; cost, time and location barriers; and potential infringement of statutory intellectual property ('IP') rights and licence conditions (Productivity Commission 2021).

Additionally, there are features of eObjects intensifying issues with repairability. Notably, many eObjects are dependent for full functionality on embedded or remote software, services and/or infrastructure (Manwaring 2017, 283). Essential software, services and infrastructure provide continuing value to original providers and other parties in the provider network,¹ resulting in the imposition and enforcement of post-supply restrictions designed to extract and maintain an income stream. This value can be extracted in several forms, most notably in direct income (eg licence or maintenance fees for software), extracted data (eg usage patterns of products which can then be exploited by advertisers of consumer goods), and brand 'stickiness' (e.g. in circumstances when consumers choose to buy a new good to replace an old one, or buy additional goods).

The barriers to repair can increase in difficulty when attempting to diagnose defects in eObjects. Complex eObjects contain multiple potential failure points such as the physical object, software, computing hardware, sensors, actuators,² network connectivity, and remote services (such as cloud data processing and storage) (Manwaring 2017, 273). Defects may also arise in the interaction points between components and external objects and systems.

Many consumers lack (or feel they lack) the skills, time, or desire to repair products themselves (Wiseman, Kariyawasam, and Rui 2022, 129). However, they are currently willing to take expensive electronic devices to third-party repairers whether commercial or community-based (Productivity Commission 2021, 62–77). This willingness is likely to continue for eObjects, if and where such repair facilities exist.

Original providers have both incentives and ability to limit an eObject's repairability and availability of repair materials. For example, many consumer electronic devices have design elements making repair difficult or impossible, such as glued or welded components, rather than those connected by removable and non-proprietary screws. Additionally, providers have been known to impose restrictive licence terms for embedded software prohibiting or limiting copying and/or modification, and refusing to make publicly available spare parts, tools and equipment and/or repair information (including passwords), particularly for complex eObjects such as agricultural machinery and consumer electronics. Providers have been known to deny access to proprietary screwdrivers, diagnostic software tools for agricultural machinery, calibration tools for re-tuning or reinitialising consumer electronics after parts are replaced, diagnostic and telemetry data related to motor vehicles, product schematics for domestic appliances and initialisation codes for agricultural equipment (Productivity Commission 2021).

Many providers argue access to information, tools and parts is restricted:

as a safeguard for public safety, cyber security and environmental standards, as well as to protect the reputation and quality of branded products, or the IP attached to some products. (Productivity Commission 2021, 126)

Specifically, providers claim consumer, community and independent repairers lack necessary training and qualifications for quality and safe repairs, may not comply with safety and environmental standards either intentionally or out of ignorance, and also may use low-quality parts (Productivity Commission 2021, 126). The safety argument is on its face a compelling one (and the need to ensure safety in consumer markets is reflected in UN Guideline B.16). However, the US Federal Trade Commission recently reported there is little real data underpinning the providers' concerns, and some manufacturers' practices around design and in limiting supply of original parts are the real cause of some safety issues (Federal Trade Commission 2021b, 26–30).

Original providers clearly have financial incentives to minimise competition in repair markets where they operate or receive licence fees, and/or promote a 'throwaway' culture, in order to make it more likely consumers will buy a new product from them rather than repairing the original.

The growth in the market for eObjects also raises concerns about the level of control retained by providers post-sale. In traditional consumer transactions involving household products, the consumer typically gains full ownership and possession of the product. However, with eObjects, the nature of transfer of property rights and the extent of control mechanisms may differ dramatically. For example, the consumer may only have full proprietary rights over the physical product and may be limited in their IP rights, such as the copyright in embedded software, which remains with the original provider under a software licence.³ Even the nature of *possession* of the physical object (at least in a practical sense) has the potential to be much more easily disrupted for many eObjects. In some circumstances, original providers will have the technological capability to *remotely disable* or *modify* eObjects due to their connected nature and their reliance on remote software (Manwaring 2017, 275). This capability can augment the power of providers to disrupt repair practices. This 'erosion of norms around ownership and control' (Coll and Simpson 2016, 34) therefore can have significant implications for consumers, particularly when post-sale control tightly limits consumer autonomy. Not *all* of the implications may be negative, however, when considering sustainability trade-offs, such as the value of shared ownership models in the circular economy (see paragraph 3.2).

4. Responses to the right to repair movement

Advocacy from a variety of groups, including independent commercial repairers, consumer organisations, individual hobbyists, farmers, advocates for sustainability, and supporters of circular economy thinking, has led to policy discussions and legal reforms in key consumer markets. These include many US states, the US federal legislature, the pan-European legislature, and some individual European states. This section 4 summarises the main thrust of law reform and policy developments relating to the right to repair in the US and EU, but it does not attempt to be comprehensive.

4.1. United States

In 2012, the Massachusetts legislature became the first in the US⁴ to legislate for a right to repair motor vehicles. This led to a 2014 agreement between car manufacturers⁵ and third-party repairers⁶ allowing access for owners and independent repairers to diagnostic and repair information, software and tools (Alliance of Automobile Manufacturers et al. 2014). This agreement has forestalled any further substantial attempts at legislating a right to repair for motor vehicles, at least for the moment. However, after amendments to the Massachusetts law in 2020 extended its scope to telematic systems (which track and report vehicle movement and performance), a constitutional challenge to the law was instigated by one of the major car manufacturer industry groups (Acosta, Mark Gidley, and Kertesz 2023; Alliance for Automotive Innovation v Healey 2020).

However, at least three US states have passed and many others have introduced right to repair legislation in other contexts (Proctor 2021, Sidley 2023). On 29 December 2022 (New York State 2022), the *Digital Fair Repair Act* (DFRA) made New York the first US state to enact a right to repair for digital electronic products. However, vigorous lobbying by large technology companies led to a significant watering down of the DFRA in provisions relevant to many consumer eObjects (Purdy 2022). Extensive exceptions include ‘any home appliance that has a digital electronic product embedded within it, including, but not limited to, refrigerators, ovens, microwaves, air conditioning and heating units’ (DFRA §3(G)). However, California’s new law (Right to Repair Act (SB 244)), which comes into force on 1 July 2024 is broader in its scope (Sidley 2023).

In May 2022, Colorado mandated access for owners and independent repairers of powered wheelchairs ‘any documentation, parts, embedded software, firmware, or tools ... intended for use with the equipment’ (Colorado Revised Statutes, 6-1-1503(a)), as well as anything required to unlock a digital security lock (Colorado Revised Statutes, 6-1-1503(b)), at ‘fair and reasonable terms and costs’ (Colorado Revised Statutes, 6-1-1503(a)).

US farmers have long fought back at the federal level against moves by agricultural equipment manufacturers to limit both farmers’ and independent repairers’ ability to repair farm equipment (Cline 2022; Wiens 2015). Nowadays, this equipment frequently includes embedded software with technical protection measures (‘TPMs’), generally understood to be software, components or other technologies used to restrict or deny access to, or acts related to, a copyright work. Restrictive terms in end-user licence agreements (‘EULAs’) and the TPM anti-circumvention provisions of the US federal Digital Millennium Copyright Act (‘DMCA’) (Digital Millennium Copyright Act 17 USC § 1201(a)(1)), could be infringed if the software is accessed for diagnosis or repair by someone other than the original manufacturer or its authorised service provider. Facing hefty repair costs and delays, some farmers have even turned to offshore ‘hackers-for-hire’ to repair their farm machinery in defiance of EULAs and the DMCA (Koebler 2017). However, farmers and independent repairers saw some success in 2015. Despite manufacturers’ objections (US Copyright Office 2015b), the US Copyright Office granted a renewable exemption to the DMCA anti-circumvention provisions (US Copyright Office 2015a) for vehicle software access and modification for the purpose of repair, which was expanded to boats, consumer devices and medical devices in 2020 (US Copyright Office 2020).

In July 2021, US President Biden ordered the Federal Trade Commission to exercise its statutory rulemaking authority to prohibit ‘unfair anticompetitive restrictions on third-

party repair or self-repair of items' (Biden Jr 2021). The Commission responded by stating it would 'devote more enforcement resources to combat ... practices ... [and] prioritize investigations into unlawful repair restrictions' (Federal Trade Commission 2021a). According to the Federal Trade Commission (2021a), some repair restrictions will be unlawful under federal statutes as constituting 'unfair or deceptive acts or practices in or affecting commerce' (15 USC. § 45), or anticompetitive tying arrangements (15 USC. § 2301 ff) (where a supplier sells a product or service on condition the customer also buys a second product or service).

4.2. European Union

While the US reform motivation has concentrated on individual rights of consumers and promoting competition, 'EU actions to promote repairs derive mainly from its goals of transition towards the CE [circular economy]' (Pihlajarinne 2020, 113, 112–114). The first major moves of the EU legislature regarding right to repair mandated product design obligations consistent with the Sustainability Objective. A 2009 EU Directive (2009/125/EC) ('Ecodesign Directive') legislated a framework for its member states to set eco-design requirements for the manufacture and sale of energy-related products. In 2019, implementing regulations (European Commission n.d.) under the Ecodesign Directive have been issued for 31 product groups, including many consumer products likely to be sold in eObject form (ie containing computing, internetworking, and data collection and transmission capability) such as refrigerators, vacuum cleaners, washing machines and driers, air conditioners and fans, electronic displays and TV boxes, kitchen appliances, and game consoles (European Commission 2019; Pihlajarinne 2020; Van Acker 2020). Each implementing regulation also requires manufacturers to provide 'access to repair and maintenance information' to 'professional repairers', who can be charged 'reasonable and proportionate fees' after a period of time on the market (Rosborough 2022, 119–120).

Recent EU survey results indicated that 79% of EU citizens think 'manufacturers should be required to make it easier to repair digital devices or replace their individual parts' and 77% of EU citizens 'would rather repair their devices than replace them' (European Parliament 2022, recital E). In response, the European Parliament recently called for legislative reforms addressing:

aspects of the product lifecycle and includ[e] product design, key ethical principles of production, standardisation, consumer information, including labelling on reparability, and on lifetime where possible and appropriate, consumer rights and guarantees, and public procurement. (European Parliament 2022)

In May 2023 the European Commission released a Proposal to introduce common EU rules (via Directive) relating to a right to repair (2023). Both the European Parliament (2022) and the Council (2023) tabled responses to the European Commission's Proposal in late 2023. The Proposal's terms (still under negotiation at the time of writing) include provisions relating to:

- a consumer right to require manufacturers to repair products within a reasonable time and at a reasonable price. This right is currently confined to 10 categories covered by

the EU's eco-design requirements discussed above: namely smartphones and tablets, bicycles, washing machines, dryers, dishwashers, fridges, displays, welding equipment, vacuum cleaners and servers;

- providing replacement items on loan while goods are repaired;
- an amendment to Directive (EU) 2019/771 (the Sale of Goods Directive) requiring sellers to offer repairs for free when the cost equals or is less than replacement;
- access to spare parts, repair information and manuals, and repair tools for third-party repairers and refurbishers, and end-users;
- manufacturer obligations to inform consumers about their rights;
- a European repair information form containing standardised information and conditions (although note the European *Parliament* supports only voluntary, not mandatory, use of the form);
- online repair matchmaking platform to connect consumers with repair providers (there is dissent between the European Parliament and Council as to whether the platform/s should be national or EU-wide);
- extension of the period of liability of the seller where the goods are repaired; and
- the provision of financial incentives via 'national repair funds'.

5. The Australian response

5.1. The current position

Some limited protections for a right to repair are implemented in various parts of Australia's IP, consumer and competition laws. However, Australia's compliance with the UN Guidelines is currently variable and unsatisfactory. Most however are relevant to eObjects. In particular:

- a mandatory scheme for access to service and repair information for motor vehicles (including any connected vehicles) has been in force since 1 July 2022, constituting Part IVE of the Competition and Consumer Act 2021 (Cth) ('CCA');
- there is a long-standing spare parts defence to design infringement actions in s 72 of the *Designs Act 2003* (Cth) (see paragraph 5.2.2.2); and
- the Australian Consumer Law ('ACL') (Schedule 2 of the CCA) contains a guarantee (consistent with UN Guideline C.25) the manufacturer must take 'reasonable action' to ensure spare parts and repair facilities are 'reasonably available' for a 'reasonable period' after sale (the 'spare parts guarantee') (ACL s 58(1)).

However, Australian-based advocates in recent years have been able to push policy discussions forward. Following on from the Australian Competition Commission ('ACCC') 2020 discussion paper on repair issues in agricultural machinery (ACCC 2020), in October 2020, the Productivity Commission was further tasked with examining:

the barriers and enablers of competition in repair markets and the costs and benefits of a regulated 'right to repair', including facilitating access to embedded software in consumer and other goods. (Productivity Commission 2021)

The Productivity Commission produced the Right to Repair Report in December 2021, and found 'significant and unnecessary barriers to repair' (Productivity Commission 2021, 2) in the Australian market. Therefore, the Productivity Commission recommended a range of

Table 1 Productivity Commission recommendations relevant to eObjects.

Recommendation/s	Legislation	Amendment/action
3.1	ACL	'include a new consumer guarantee for manufacturers to provide reasonable software updates for a reasonable time period after the product has been purchased, with no option to limit or exclude that guarantee'
4.4	r. 90 of the Competition and Consumer Regulations 2010	'require manufacturer warranties ('warranties against defect') on goods to include text (located in a prominent position in the warranty) stating that entitlements to a remedy under the consumer guarantees do not require consumers to have previously used authorised repair services or spare parts'
3.2	Not specifically mentioned, likely CCA and/or ACL	'enable designated consumer groups to lodge 'super complaints' on systemic issues associated with access to consumer guarantees'
3.4	ACL	'make it a contravention for suppliers and manufacturers to fail to provide a remedy to consumers when legally obliged to do so under the consumer guarantees ... empowering the [ACCC] to seek pecuniary penalties'
5.1	Copyright Act 1968 (Cth) ('Copyright Act') and Copyright Regulations 2017	'amend the technological protection measures (TPM) regime ... to better facilitate repairers' access to embedded information protected by TPMs necessary for issue diagnosis and repair'
5.2	Copyright Act	'include an exception that allows for the reproduction and sharing of repair information'
5.3	Copyright Act	'make unenforceable any part of an agreement restricting or preventing a use of copyright material permitted by copyright exception'
6.1	Not specifically mentioned, likely either sui generis or part of the ACL	'develop a product labelling scheme that provides consumer information about product reparability and/or durability'
7.1	Recycling and Waste Reduction (Product Stewardship – Televisions and Computers) Rules 2021 (made under the Recycling and Waste Reduction Act 2020 (Cth))	'count e-waste products that have been repaired and reused'
7.2	Not specifically mentioned	'make greater use of electronic tracking devices to determine the end-of-life outcomes of Australian e-waste collected for recycling'
4.2	Therapeutic Goods (Medical Devices) Regulations 2002 (made under the Therapeutic Goods Act 1989 (Cth))	'conduct an independent public review of existing medical device regulations to assess whether they strike a balance between repair access and device safety that maximises community wellbeing', as well as
4.3 and 4.1	N/A	conduct further investigations into the watch repair market, and the mobile phone and tablet markets
8.1	CCA	'establish an independent valuation of the Motor Vehicle Service and Repair Information Sharing Scheme'
8.2	Not specifically mentioned, likely CCA	'introduce a repair supplies obligation on agricultural machinery that requires manufacturers to provide access to repair information and diagnostic software tools to machinery owners and independent repairers on fair and reasonable commercial terms'

long-overdue law reform measures designed to assist product owners and independent repairers undertake repairs. Several of these recommendations are directly relevant to supporting a right to repair for eObjects, as set out in [Table 1](#).

5.2. Analysis of the Productivity Commission's proposed reforms

In this section, I critically analyse the Productivity Commission's proposed reforms in the areas of consumer protection, intellectual property, competition, environment and sustainability laws, in the context of eObjects. The criteria for the analysis is the reforms' likely effectiveness in achieving the Sustainability Objective through implementation of the UN Guidelines. It concentrates on those recommendations likely to affect eObjects in ways over and above the effect they may have on the underlying physical object or environment.

5.2.1. Consumer guarantees

5.2.1.1. Nature of the Australian consumer guarantee regime. UN Guideline C.23 requires products be 'durable'. Part 3-2, Division 1 of the ACL mandates certain guarantees by manufacturers and/or suppliers relevant to both durability in general, and specifically a right to repair. These include guarantees that:

- (1) products are of 'acceptable quality' (s 54);
- (2) manufacturers will make *spare parts* and *repair facilities* available for a reasonable period (s 58); and
- (3) products sold are fit for any disclosed purpose (s 55).

Section 54(2) requires products to be 'durable' to comply with the guarantee of acceptable quality. Note, however, that the durability requirement is subject, in accordance with s 54(3), to pre-purchase representations. Essentially, the provider can *choose* the level of durability on notice to the consumer, reducing the effectiveness of the guarantee in driving sustainability outcomes and promoting a circular economy.

This lack of effectiveness is exacerbated when it comes to the many eObjects constituting hybrid products, dependent on ongoing *services* for essential or useful functionality. No 'durability' or equivalent requirement is contained in the equivalent consumer guarantee for 'services', but merely that 'services will be rendered with due care and skill' (s 60). If the services are terminated by the provider, an eObject may be 'bricked': that is, rendered useless for its original purpose and *accelerating* rather than slowing down its life cycle (Manwaring 2017, 275; Tusikov 2019).

When guarantees are breached, consumers can claim a refund, replacement or repair for 'minor' failures – but the *supplier* is the only one with the statutory right to choose between these options (ACL s 261). For 'major' failures, consumers can choose: but only between refund or replacement (ACL s 263), *not* repair.

5.2.1.2. Software updates. The Productivity Commission recognised (Productivity Commission 2021, 96) faulty software (including post-sale updates) would attract remedies under s 54(1) of the ACL, citing *ACCC v Apple* (2018). However, the Productivity Commission was not convinced it obliged providers to provide updates after sale. Although s 58

mandates provision of spare parts and repair facilities for a reasonable time post-supply, the Productivity Commission felt it was at the best *uncertain* whether these provisions required ongoing supply of software updates for embedded software, despite the evident need for such updates in areas such as cyber security and feature maintenance (Productivity Commission 2021, 96).

The growth in the market for consumer eObjects and the uncertainty around update obligations significantly influenced the Productivity Commission in its recommendation of a new consumer guarantee that:

manufacturers will provide reasonable software updates for a reasonable period of time ... to provide access to software updates that are critical to maintaining the quality (functionality, security and safety) of software enabled products ... the guarantee could, at minimum, cover updates that correct operating problems and address security vulnerabilities ... (Productivity Commission 2021, 96)

The *current* spare parts guarantee in s 58 is limited because it is not mandatory, allowing manufacturers to opt out by notifying consumers. However, the Productivity Commission recommended *against* an opt-out provision for the new software guarantee, proffering the justification that ‘the need for software updates is likely to be a systemic issue that affects the functionality or operation of an entire product line’ (Productivity Commission 2021, 96). While a software update guarantee is welcome, it is unclear why the availability of many other types of spare parts would not fall into the same category. Better sustainability outcomes would be achieved if the Productivity Commission had broadened its recommendation to the spare parts guarantee as a whole, at least for more environmentally costly products.

In contrast to the Productivity Commission’s approach, in 2021, the Department of Home Affairs proposed for public discussion the viability of a *labelling* scheme that would include details on the availability of software security updates for consumer IoT products (a major subset of eObjects) (Department of Home Affairs 2021, 36–42). In December 2023, the federal government announced that it would co-design a voluntary labelling scheme around cyber security in conjunction with industry (as well as a mandatory secure-by-design standard), but no details on update availability were available at time of writing (Australian Government 2023). The Productivity Commission’s proposal on labelling for consumer products (in addition to its proposal on software security updates) is discussed in paragraph 5.2.1.3.

In any event, a labelling scheme (whether mandatory or voluntary) suffers from one of the major limitations limiting the effectiveness of s 58: the onus of supporting sustainability sits squarely on the consumer, and business practices are only constrained by market forces which have been demonstrably ineffective to date in promoting sustainability and a circular economy.

5.2.1.3. Better information for consumers. Some original providers have engaged in questionable (and sometimes unlawful) conduct to obfuscate consumers’ knowledge of their existing ACL guarantee rights. For example, in 2018 Apple Inc and Apple Pty Ltd (together ‘Apple’) were fined AUD9 million for breach of the ACL, after Apple advised customers that if they had used a third-party repairer for their Apple devices, they could not get a software error corrected without cost. However, many customers were actually

entitled to a costless replacement, repair or refund for breach of the section 54(1) *ACL* guarantee, which does not mandate any particular repairer. Apple was fined for multiple contraventions of the *ACL* (*ACCC v Apple*).

In response, the Productivity Commission recommended:

- (1) manufacturers' warranties must contain an *explicit* statement that consumers will not lose their rights under the *ACL* consumer guarantees merely because the consumer did not use an 'authorised' repairer; and
- (2) the introduction of durability or repairability labelling on consumer products.

In the context of eObjects, labelling setting out durability and repairability may be particularly useful on more expensive products such as connected washing machines. Australia's current 'star' labelling schemes for electricity and water-use efficiency⁷ could provide a useful domestic model for durability comparisons. Internationally, the French repairability index with scores based on price and availability of spare parts, ease of disassembly and ease of access to repair information (*Ministre de la Transition Ecologique 2023*) could also assist. However, labelling schemes are much more likely to be effective if mandated (Lai and Becher 2020; Bennett Moses et al. 2021, 20–21). Consumers should take responsibility, but the burden should be shared with business.

The potential for conflict between the software updates guarantee and the product labelling scheme must be considered and avoided. The maintenance period for software (the time where service and/or software updates are guaranteed) is traditionally much shorter than for larger consumer products, such as whitegoods and televisions. For example, a connected fridge might cool and freeze food adequately for 10 years, but the provider of the embedded software may only be ready to support it, particularly with cyber security updates, for 2 years. Consequently, some of the functionality of the connected fridge (such as a touchscreen allowing grocery ordering) may not be useable. Alternatively, where cyber security updates are no longer provided, the touchscreen may be useable, but *unsafe* due to the increased risk of successful cyber attacks, well before the useful life of the freezing and cooling functionality has expired. Therefore, any durability labelling scheme should be explicit on the continuity guarantee of *any and all* services required for full functionality.

5.2.1.4. Expanded compliance and enforcement options. The Productivity Commission recognised (*Productivity Commission 2021*, 96) part of the problem regarding the application of the consumer guarantees to faulty software updates was non-compliance by providers with existing laws (Davis 2021, 1). This recognition at least partially motivated its recommendation to expand regulators' enforcement powers (*Productivity Commission 2021*, 96). This expansion, if implemented, has the potential to move a large part of the burden from individual consumers to others with more power, skills and/or resources to enforce existing consumer rights.

5.2.2. IP

The UN Guidelines are not only applicable to consumer protection legislation, but also other areas such as IP, competition and environmental protection.

Sound policy based on the Sustainability Objective suggests the preservation of commercial IP rights should not unduly hinder right to repair, the protection of consumer rights, and improved competitiveness and sustainability (Chan Grinvald and Tur-Sinai 2019, 127). Excessive IP rights protection arguably goes far beyond defending the legitimate commercial interests of the IP holders and instead serves to stifle innovation and competition (Productivity Commission 2016, 2).

Additionally, any implementation of rules around UN Guideline H.52 concerning the encouragement of the design, development and use of energy- and resource-efficient products has to operate within, or amend the effect of, IP rules as they are currently constituted in Australia. The obligation within UN Guideline H.52 to consider energy and resource efficiency in the context of the ‘full lifecycle’ of the product, and the potential for eObjects to contribute substantially to the existing e-waste problem, means issues of reparability must constitute a vital factor in rules concerning design and development. Reparability considerations should also be considered when policymakers are deciding to what extent businesses claiming economic gain from design and development of new products should be able to legitimately protect their profits under IP rules and contractual arrangements.

5.2.2.1. Copyright. The Productivity Commission proposed expanding copyright exceptions and restricting contractual terms to facilitate repair (Productivity Commission 2021, Chapter 5).

Repair information accessibility. The capacity to repair eObjects by consumers or third-party repairers is often constrained by a lack of access to repair information. Although it is almost costless to digitally disseminate repair guides, this would usually constitute copyright infringement. Original providers have been known to bring (or threaten) copyright actions in these circumstances (Productivity Commission 2021, 162–164), depriving non-authorised repairers of essential knowledge. Helpfully, the Right to Repair Report proposed broadening existing ‘fair dealing’ copyright exceptions in Part II, Division 3 of the Copyright Act 1968 (Cth) (‘Copyright Act’) to allow reproduction of repair information, as a temporary first step towards a more comprehensive US-style ‘fair use’ exemption in the future (Productivity Commission 2021, 19).

Locking up diagnosis and repair. Under s 10(1) of the Copyright Act, a ‘technological protection measure’ (‘TPM’) is defined as a ‘device, product, technology or component (including a computer programme) that ... in the normal course of its operation, controls access to the work ... [or] prevents, inhibits or restricts the doing of an act comprised in the copyright’. Currently, the circumvention of TPMs is prohibited as is manufacturing and sale of circumvention devices and services (Copyright Act ss 116AN–116A). These are criminal if undertaken for commercial advantage or profit (Copyright Act ss 132APRA–132APE), with limited exceptions (Copyright Act ss 116AP, 132A). Many jurisdictions have similar provisions due to widespread ratification of the *WIPO Copyright Treaty* (1996), particularly Article 11 (Obligations concerning technological measures). However, TPMs have significant capacity to limit functionality, customisation and repair, almost inevitably resulting in ‘self-help’ by consumers: for example, the circumvention of TPMs in mobile phones is already commonplace (LeMay 2013) and this ‘jailbreaking’ has already extended to other eObjects. For example, in August 2022 at DEF CON, an annual hacking convention

held in Las Vegas, an Australian hacker known as ‘Sick Codes’ demonstrated jailbreaking of an Internet-connected tractor (Newman 2022).

Diagnosis and repair information, including re-initialisation codes, is currently often locked by TPMs in software and firmware embedded in or servicing eObjects. The impact of this practice on repairability is exemplified in the years-long dispute between US farmers and Deere & Company (John Deere), where the farmers protested that only authorised dealers had the right and the information needed to repair John Deere’s agricultural machinery (many of whose products, such as smart tractors, constitute eObjects). This machinery, which contains embedded software and TPMs (Koebler 2017), was *prima facie* protected by the anti-circumvention provisions of the DMCA (DMCA 17 USC § 1201 (a)(1)). However, as discussed in paragraph 4.1, against the objections of John Deere and others, in 2015 the US Copyright Office granted a three-year exemption (since renewed (US Copyright Office 2020)) for vehicle software modification, granting farmers the right to repair their own tractors or take them to independent repairers.

Recognising the detrimental effects on rights to repair from TPMs, the Productivity Commission recommended changes to the *Copyright Act’s* TPM regime (*Copyright Act* ss 10, 116AN; Copyright Regulations 2017 r 40), allowing repairers to copy and share TPM circumvention devices. This recommendation would provide a broader right for repairers than the US exemptions, as it is not restricted by products or industry.

Changing the game: contracting out of copyright. Well after the US copyright exemption to DMCA had come into force, John Deere issued contracts to its customers containing provisions prohibiting most software modification and TPM circumvention (Deere 2016), appearing to constitute an attempt to replace its DMCA rights with contractual rights (Koebler 2017; Manwaring 2017, 282–283). By mid-2022, these practices were the subject of at least 10 US class action law suits (Dickey 2022).

The Productivity Commission found (Productivity Commission 2021, 177) that some EULAs operating in Australia:

- (1) incorporated terms purporting to restrict repair practices, including ‘prohibitions on disassembly, reverse engineering, and bypassing digital locks and encryption’; and
- (2) in some (but not all) cases these conditions applied ‘*even where acts may be permitted under law*’ (emphasis in original).

In response, the Productivity Commission proposed to amend the Copyright Act ‘to make unenforceable any part of an agreement restricting or preventing a use of copyright material permitted by copyright exceptions’ (Productivity Commission 2021, 196).

Both the TPM reforms and contracting out reforms are good news, at least in theory, for repair advocates. However, some skepticism as to the likelihood of their implementation is warranted, as they merely repeat those made by the Productivity Commission in 2016 (Productivity Commission 2016), which have never been implemented by Parliament.

5.2.2.2. Other IP rights. UN Guideline H.59 encourages the use of economic instruments to promote sustainable consumption and discourage unsustainable practices. IP rights are property which can be transferred and licensed for valuable consideration. Income streams from royalty-based IP agreements based on sales volumes can incentivise unsustainable practices, such as limiting repair. This constitutes a major economic barrier to

developing the repair side of a strong circular economy. Enforcement of design, trade mark, and patent rights by providers have been cited as constituting unjustified impediments to the right to repair by academics, repair activists, courts, and regulators (Productivity Commission 2021; Williams and Farago-Diener 2020; Wiseman and Kariyawasam 2020).

However, disappointingly, the Productivity Commission refused to recommend any amendments of IP rights except for copyright. Issues around the barriers that Australian design, trade mark and patent rights pose to the right to repair have been exhaustively discussed before (eg Rimmer 2021; Rimmer 2023; Williams and Farago-Diener 2020; Wiseman and Kariyawasam 2020; Wiseman, Kariyawasam, and Rui 2022), so the below discussion is deliberately brief to avoid unnecessary repetition.

Designs. Section 72 of the *Designs Act* constitutes recognition of a *restricted* right to repair in Australia, allowing a ‘spare parts’ defence against registered design infringement (*Designs Act* s 72). However, s 72 has been criticised as ‘complicated and convoluted’ (Rimmer 2021, 41), so much so that its uncertainty could inhibit innovation (Rimmer 2021, 39). The defence has also been criticised for its limitation to components of *complex products* (Wiseman and Kariyawasam 2020, 143).

Although in one sense eObjects are complex, in terms of their incorporation of hardware, software, physical device, data and associated services, some are far simpler than others. For example a connected motor vehicle will usually be more complicated than a connected toy. However, between these two extremes, the existing legislation and case law do not assist in unravelling uncertainty. While judicial clarification may be forthcoming *eventually*, the delay may have its own negative effects on regulatory effectiveness and legitimacy (Brownsword 2008).

Trade mark rights. Inquiry participants were concerned allegations of trade mark infringement might be used both to restrict the importation of spare parts and advertising independent repair services. Both successful (*Huseby v Apple Inc* (2020)) and unsuccessful (*Commercial Auto Glass v BMW* (2007); *Toyota v Tabari* (2010)) actions asserting trade mark rights in these circumstances exist in other jurisdictions (Productivity Commission 2021, 166) leaving Australian uncertainty under the *Trade Marks Act 1995* (Cth) unresolved.

Patent rights and the exhaustion doctrine. The so-called ‘patent exhaustion doctrine’, in its simplest form, dictates that after a product’s first sale, a patentholder’s exclusive rights to control use and resale is exhausted (Lieberman 2021, 21). The doctrine in its strongest form could protect repair activities from attack on the basis of patent rights under the *Patents Act 1990* (Cth) (Patents Act). However, the High Court decision accepting this doctrine in Australia still allows a patent holder to impose restrictions through the law of contract or equity (*Calidad v Seiko* (2020)). Consequently, a business can ‘contract out’: that is, sell patented eObjects subject to contractual restrictions on repair.

Uncertainty and the abuse of IP rights. The Productivity Commission recognised existing uncertainty around the legality of certain repair practices under IP law, but did not recommend change. Instead, it left the resolution of uncertainties to future litigation, despite recognising the potential for future problems (Productivity Commission 2021, 167, 178, 180 fn 64). This decision is short-sighted, particularly given the inevitable uncertainty arising from the application of existing laws to sociotechnical change brought

about by emerging technologies like eObjects. There are significant risks associated with the right to repair in the face of eObjects and the remaining uncertainties.

In 2021, Leah Khan, FTC Chair, stated providers ‘routinely use’ practices to create barriers to repair that include ‘making assertions of patent and trademark rights that are unlawfully over-broad’ (Khan 2021). Many original providers are large multinationals with access to top-tier litigators, but litigation is likely to be directed against those with fewer resources. IP litigation is often complex and expensive, and the purported rightsholder will have significant advantages. As a result, even mere assertions of IP rights are likely to have a chilling effect on repair practices, even if those repair practices would be held lawful if defence was practicable. Statutory protections against unjustified or groundless threats of IP infringement proceedings (*Copyright Act ss 202, 202A; Trade Marks Act s 129; Designs Act s 77(1); Patents Act s 128(1)*) will also be attenuated in cases where counter-claimants face resource constraints. So uncertainty around the legality of individual repair practices will, in most cases benefit providers, not potential repairers.

5.2.3. Competition

The Right to Repair Report recommended that owners and third-party repairers of agricultural machinery be provided access to repair information and diagnostic software tools on ‘fair and reasonable commercial terms’ (Productivity Commission 2021, 39). While the Productivity Commission remained skeptical of claims that manufacturer restrictions were hindering most other third-party repair markets, they urged further scrutiny of repair markets for medical devices, watches, mobile phones, and tablet computers (Productivity Commission 2021, 32–33).

5.2.3.1. Repair of medical objects. Medical device manufacturers have a long history of restricting repair rights to their own or third-party authorised technicians. Recent technological advances have also enabled them to integrate TPMs in the form of software locks that can only be bypassed with override codes or resets, and some newer devices even force technicians to log in to a company server for verification (US PIRG Education Fund 2020).

Medical eObjects bring with them some of the highest risks for physical harm to individuals, and therefore appropriate maintenance and repair is vital for achieving UN Guideline B.16 (safety). For example, failure of the software or data collecting sensors, or the actuators, in a connected pacemaker or insulin pump can lead to serious illness or death of the user. Even inaccurate data can be dangerous in medical devices: for example, multiple deaths and injuries were caused over several years when computerised radiotherapy machines in North American hospitals administered massive overdoses of radiation to patients, partially due to a failsafe counter erroneously set to zero (Leveson and Turner 1993, 34). Original providers have argued that safety concerns in medical devices, and the risk that inappropriate repair might cause physical harm, dictate that repair must be strictly controlled to authorised repairers (Wiseman and Kariyawasam 2022, 6–7). However, the Productivity Commission recognised ‘regulations to reduce safety risks may also be encouraging repair restrictions, generating harm through delays and higher costs’ (Productivity Commission 2021, 11). Therefore, safety regulations should be (1) assessed as to whether they appropriately deal with real risks; and (2) be

balanced against the damage that delay from limited repair options can cause. Where hospital equipment is unusable for long periods of time because there are barriers to repair, this can cause detrimental effects to many patients, as well as additional costs.

During the worst days of the pandemic (pre-vaccine), hospitals and their medical technicians in many countries were faced with a global shortage of ventilators as well as extended wait times for (expensive) repair technicians (Scher 2020). Manufacturers did not initially make technical service information and other important material freely available. For example, during the early stages of the COVID-19 pandemic, repairs to much-needed ventilators were delayed because of supplier restrictions on access to 'tools, parts and instructions' (Rosa-Aquino 2021). Hospital technicians reverted to desperate (and illegal) measures in order to save lives. Repair communities published ventilator repair manuals online (iFixit n.d.), while hackers in Poland released copies of proprietary software code used in Medtronic PB804 ventilators and an aftermarket dongle was distributed to medical device technicians that enabled components taken from different ventilators to work together (Koebler 2020).

These problems are not confined to hospitals: the Colorado wheelchair repair legislation (see paragraph 4.1) was passed in response to lobbying by disability groups who faced long delays in fixing wheelchairs through authorised repairers, immobilising users for months at a time (Hawryluk 2022). Wheelchair users in Australia have reported similar issues (Palipana 2022) with particularly acute problems in remote and rural areas (Edmonds 2022; Wiseman and Kariyawasam 2022).

Additionally, where repair is not possible, broken medical eObjects will add to hospitals' existing issues with e-waste (and Australia's failures to address the Sustainability Objective), a problem acknowledged even by medical technology manufacturers (Medical Technology Association of Australia 2022).

5.2.3.2. Planned and premature obsolescence. The Productivity Commission's findings on planned and premature obsolescence were unexpected. Although the Productivity Commission acknowledged a growing concern in the community about the shortening of product lifespans and their negative impact on consumers and the environment, it found evidence on a significant premature obsolescence problem was 'mixed' (Productivity Commission 2021, 226). The Productivity Commission attributed shorter product lifespans to a widespread consumer desire to upgrade products rather than repair them, and doubted that any planned obsolescence initiatives by suppliers were having a significant impact, despite the contrary views of some submitters (Productivity Commission 2021, 111). However, the Productivity Commission approach seems flawed, as they did not expressly consider the possibility that some users' desires to update may have been due to previous negative experiences with repair, such as the limited availability and high cost of replaceable batteries in smartphones. An Australian research survey (reported after the inquiry) indicated a high number of Australian consumers had 'negative experiences with repair in terms of easy access to components ... availability of information and parts ... , and costs of repair information and parts' (Wiseman, Kariyawasam, and Rui 2022, 128, Tables 8 and 9).

This issue has long been a source of significant frustration for consumers, as well as obfuscation by manufacturers (Ravenscraft 2021). Research has shown that changes in supplier practices can significantly affect consumers' willingness to keep their old

devices rather than upgrade. For example when Apple (briefly) made its iPhone batteries cheaper in 2019, consumers reportedly replaced their batteries *10 times* more often than previously (Porter 2019). EU consumer surveys predominantly supporting repair (see paragraph 4.2) were also supported by the (post-inquiry) Australian survey results where most of the survey participants thought they could ‘contribute to improving the environment by repairing broken consumer goods’ (Wiseman, Kariyawasam, and Rui 2022, 181).

In relation to eObjects, the Productivity Commission’s adoption of the ACCC’s statement that ‘competition limits the incentives for planned obsolescence’ (Productivity Commission 2021, 211; ACCC 2021, 4) is particularly problematic, as the Productivity Commission ignored the ACCC’s subsequent qualification that the market for eObjects may not actually *be* competitive (ACCC 2021, 4). Consumer ‘lock-in’ has long been identified as a significant risk for eObjects, particularly where data portability is important (Hon, Millard, and Singh 2016, 31; Coll and Simpson 2016, 37–38, 47). Where data portability is impossible or impracticable, particularly in healthcare eObjects like connected insulin pumps, consumers face significant barriers to switching providers (Manwaring 2019, 224–225; ACCC 2021, 4).

5.2.4. Environment and sustainability

5.2.4.1. E-waste and product stewardship. In the context of the Sustainability Objective, widespread eObject repair has the potential to significantly reduce e-waste. The Productivity Commission did consider right to repair issues in the context of wider e-waste concerns, but its immediate recommendations were insignificant (Productivity Commission 2021, Recommendations 7.1 and 7.2), that is:

- counting of e-waste products which had been repaired and reused towards annual recycling targets for TVs and computers; and
- using more tracking devices to verify the final location of e-waste collected for recycling, and monitor the percentage that ends up in landfill or other hazardous sites, often in the Global South (Manwaring et al. 2022, 180).

However, the modest extent of the Productivity Commission’s recommendations leaves some important gaps, especially for eObjects. The definition in Part 1, Schedule 1 of the Recycling and Waste Reduction (Product stewardship-televisions and computers) Rules 2021 (‘the Rules’) would probably include Internet-connected ‘televisions’. However, the classification of ‘computers’ under the Rules (Recycling and Waste Reduction Rules 2021 Schedule 1 Part 2), relies on specific product codes in the *Combined Australian Customs Tariff Nomenclature and Statistical Classification* (the ‘Working Tariff’), issued under the *Customs Tariff Act 1995* (Cth). Time spent on debates over whether a ‘smart’ lamp (eg one controlled by voice commands to a smart home hub or remote instructions from a smartphone) would be classified as a ‘lamp’ under chapter 94 of Schedule 3 of the Working Tariff or an ‘other automated data processing machine’ under chapter 84 are unlikely to further the cause of sustainability. Additionally, the need for such debates would provide a ‘red tape’ disincentive for start-up businesses in a circular economy.

5.2.4.2. Incentives for sustainable design and repair practices. The Productivity Commission discussed various literature⁸ on encouraging circular economy development, but

missed its opportunity to align Australia's stance on production and consumption with the UN Guidelines' Sustainability Objective. Recommendations implementing Australia's compliance with the UN Guidelines H.52 (product life cycle) and H.59 (economic incentives and disincentives for sustainability practices) could have promoted a circular economy, but the Productivity Commission believed that reforms aimed at improving consumer access to their rights and the durability labelling scheme would be sufficient to address current problems. It ignored the significant potential contained in systemic initiatives such as compulsory durability product design standards, tax incentives and/or repair subsidies to encourage sustainable design and vigorous repair markets (Pihlajarinne 2020, 114).⁹ The absence of hard incentives for businesses to adopt sustainable design practices is unsatisfactory, given the role that current market practices in the consumer electronics industry have played in the global e-waste problem.

Additionally, the Productivity Commission overlooked the need for incentives in other key areas, such as repair skills and practices (Manwaring et al. 2022). A legal right to repair will not automatically create individuals with the necessary skills and desire to do so. While it is possible that market incentives may emerge as a result of a legal right to repair lowering barriers to entry for third-party repair markets, it is unlikely these incentives alone will be sufficient, or sufficiently timely. Repair skills and practices require knowledge, time to develop, and experienced mentors to train new repairers. Given the current trade skills shortage in Australia, particularly in trades key to eObject repair (Australian Government 2022), it is essential to support the development and maintenance of repair skills to ensure their survival. Transformation and adaptation of those skills is also required, as new eObject products emerge with their own unique repair needs.

6. Implications for the international community

It is important that the policy solutions ... not only permit repair but also promote and encourage it. (Rosborough, Wiseman, and Pihlajarinne 2023)

The relevance of the Productivity Commission's analysis in the Right to Repair Report is not confined to Australia. The Productivity Commission had the benefit of observing many (although not all) of the major developments in law and policy in the US and EU. A significant advantage of the Right to Repair Report lies in its synthesis of the policy issues emerging in those jurisdictions, as well as Australia, resulting in a holistic understanding of the multifaceted nature of the challenges of permitting, promoting and encouraging repair.

While this paper argues that the Productivity Commission's analysis is flawed and somewhat incomplete, this paper's analysis of the Sustainability Objective, the UN Guidelines and the emerging literature allows for major policy gaps still remaining to be filled out. Therefore, the issues raised in this paper relating to the Right to Repair Report and eObjects can be useful to consider in the context of the international community.

Australia's experience as represented in this paper presents a useful case study for other jurisdictions who wish to commence or continue their right to repair journey. And there are many who wish to do so. In addition to the EU, the US and Australia, there are growing international calls for a right to repair, such as in India (Ministry of Consumer Affairs, Food & Public Distribution n.d.), Nigeria (Policy Lab Africa 2021), Canada

(Rosborough, Wiseman, and Pihlajarinne 2023; Tusikov 2023) and South Africa (Right to Repair South Africa n.d.). Most of these jurisdictions are still very early on in their contemplation of regulatory support of a right to repair. Observation of some of the major gaps in the EU, US and the proposed Australian frameworks can assist in those jurisdictions in coming to grips with the necessity of a comprehensive and interlocking framework.

The analysis in this paper shows that this framework should not only comprise reform ideas for environmental, intellectual property, consumer protection, and competition law, but also in somewhat neglected areas such as developing repair skills in populations, removing the ability of companies to stultify reform initiatives by imposing commercial and contractual barriers, and providing economic incentives to build robust circular economies. It also emphasises the need to examine the *interconnectedness* or ‘interoperability’ between traditionally siloed areas of law, such as the impact of contractual terms on legislative exceptions in intellectual property, the application of and potential conflicts between core intellectual property and product liability concepts to products which comprise substantial tangible and intangible property, and how consumer protection may help or hinder environmental law attempts to encourage sustainability. It also emphasises the potential for disconnection between current legal ideas and protections and the true nature of how repair practices and skills are implemented in society, which involves a combination of corporate, professional, community and consumer participants.

A brief revisit of the EU and US approaches assist in illustrating these points.

The EU’s existing ecodesign regulatory framework, along with the new Proposal, contains some substantial provisions supporting a right to repair in relation to environmental and consumer protection law. However, it exhibits some significant gaps in terms of the barriers posed by intellectual property law and access to repair information and tools (Rosborough, Wiseman, and Pihlajarinne 2023). Some intellectual property provisions, such as in design and copyright, theoretically applicable to the repair of eObjects do exist in the EU. However, they all face problems particularly due to their fragmented nature.

For example, Article 110(1) of the Community Design Regulation (6/2002/EC) protects spare parts from design infringement actions. However, it is framed in a similar way to the ‘spare parts’ exception under s 72 of the *Designs Act*, and contains comparable challenges around complexity and uncertainty (discussed in paragraph 5.2.2.2).

Additionally, Art 5(3)(l) of Directive 2001/29/EC contains an exception to communication and reproduction rights under copyright for ‘use in connection with the demonstration and repair of equipment’. However it is inadequate to the task of useful support of a right to repair: for example, its scope is uncertain and generally judicially untested, and it is a *non-mandatory* exception that has been subject to inconsistent implementation and interpretation in the various EU Member States (Rosborough 2022, 124–125).

An exception for circumventing TPMs for the purposes of ‘error correction’ exists under Directive 2009/24/EC, but since it only applies where the relevant TPM solely protects software, it is clearly incompatible with repair of most eObjects considering their hybrid nature.

Finally, the limitation of the EU Ecodesign Directive implementing regulations’ repair information access right to ‘professional repairers’ ignores the role of user-repairers and community repairers such as ‘repair cafes’ (Rosborough 2022, 121), as well as the

nature of repair as ‘a social and political act, beyond its marketisation’ (Manwaring et al. 2022, 184).

It is clear that the EU could benefit from considering regulation of the right to repair from a perspective that recognises some manufacturers have and will continue to use IP rights as a way to limit repair in various ways in order to protect their markets.

In contrast, the US approach, with its emphasis on individual ownership and rights, has resulted in a harder and more sophisticated focus on removing intellectual property barriers to repair, and, to a more limited extent, targeting anticompetitive conduct by providers. However, John Deere’s actions in implementing contractual barriers after copyright exceptions were granted by the US Copyright Office show that problems of failure of interoperability of different areas of law are alive and well. The US approach has also faltered in the absence of comprehensive legislation mandating spare parts availability, and the availability of repair manuals and diagnostic tools. This creates scenarios where individual ownership rights, while technically guaranteed, face practical limitations imposed by corporate gatekeeping. This corporate gatekeeping does not only take the form of denying or limiting access to necessary repair accessories, but also to parts of the product itself.

Additionally, the US approach does not generally incorporate regulatory interventions in environmental law core to the Sustainability Objective, a significant limitation considering the size of the US population and its substantial consumption of eObjects. Nor are its consumer protection interventions consistent or common across the individual state jurisdictions. The scope of the right to repair is also severely limited in relation to many eObjects, as rights tend to be granted to specific products or industries, without convincing justification for such discriminatory treatment other than corporate self-interest.

7. Conclusion

While the Productivity Commission recommendations supporting a right to repair are welcome, they fall short of transformative change, particularly if considered in the context of building a circular economy. In terms of promoting the sustainability and durability of products, in conformance with the UN Guidelines, the Right to Repair Report’s conclusions fail to address some significant issues related to the repair of eObjects. These include the chilling effect of uncertain limits on IP rights, and the lack of incentives for sustainable product design and the development of repair skills.

To avoid repeating the mistakes of the past, it is essential to reconsider the Productivity Commission’s recommendations in the light of the Sustainability Objective, and to implement legislative and market reforms more fairly balancing consumer and IP rights with the right to repair. This can also be encouraged through law reform and economic incentives focussing on promoting sustainable design, resource re-use and limiting waste.

As the market for eObjects grows, it is important to recognise the value of independent or self-repair and the development of repair skills as important economic, social and cultural capabilities, and support them with regulatory reform. This reform should aim to remove existing legal barriers to independent and self-repair, incentivise the growth of repair skills, and encourage global sustainability initiatives such as those outlined in the Sustainability Objective and the supporting UN Guidelines.

A narrative based solely on rights attaching to ‘ownership’ of eObjects, such as is common in US jurisdictions, is inadequate as a policy base. To support the Sustainability

Objective, focal points for regulatory reform should extend beyond rights and protection based on concepts of individual ownership. Jurisdictions considering a right to repair should also consider a narrative of ‘custodianship’ derived from existing circular economy initiatives, such as used in cutting-edge urban policies in European cities (Nugent 2021; European Commission n.d.), which better promote sustainable production and development. However, lawmakers should not allow ideas of ‘custodianship’ to be co-opted by businesses to restrict and delay the capacities of others in ‘the loop’ to repair, reuse and repurpose consumer goods, particularly eObjects. It is to be hoped the Australian Ministerial Advisory Council, and similar bodies in other countries, will consider these initiatives when investigating regulatory barriers and solutions to promoting sustainability and a circular economy.

Overall, building a robust circular economy requires a more holistic approach to the right to repair. This approach must consider the interconnectedness of legal frameworks, comprehensively address but go beyond individual ownership rights in hybrid products, and promote sustainable practices throughout the product lifecycle of eObjects. Additionally, we need to protect and promote a repair *culture* and its associated skills and practices, above and beyond repair *markets*. Embracing this broader perspective will be crucial for achieving the Sustainability Objective and creating a more sustainable future.

Australia’s own right to repair journey is unfortunately stalled at the starting line. However, the work of the Productivity Commission viewed through the lens of the Sustainability Objective and the UN Guidelines still holds considerable value for members of the international community who see the benefits of a right to repair. By learning from its strengths and addressing its limitations, other nations and regions can develop a robust and effective right to repair policy.

Notes

1. The terms ‘provider’ and ‘provider network’ is used rather than ‘supplier’ and ‘supply chain’, as the latter term implies linear progressive connections. In an eObject context, the provider connections are much more likely to be distributed or weblike in nature rather than linear (Manwaring 2017, 269).
2. Devices that move things.
3. Eg Gear and Gear Fit series fitness watches (Samsung n.d).
4. Commonwealth of Massachusetts, *An Act protecting motor vehicle owners and small businesses in repairing motor vehicles* H.4362 (2012). The scope of the law was extended to include telematic systems (which track and report vehicle movement and performance) in *An Act to Enhance, Update and Protect the 2013 Motor Vehicle right to repair Law* H. 4362 (2020). See also: Chan Grinvald and Tur-Sinai (2020).
5. The Alliance of Automobile Manufacturers and the Association of Global Automakers.
6. The Automotive Aftermarket Industry Association and the Coalition for Auto Repair Equality.
7. See Australian Government (n.d.a), ‘The Energy Rating Label’ (Web page) <www.energyrating.gov.au/label> and Australian Government (n.d.b), ‘Water Rating’ (Web page) <www.waterrating.gov.au/> accessed 23 August 2023.]
8. The Right to Repair Report mentions ‘circular economy’ 30 times in its text, and cites 17 policy documents from various Australian state and territory and foreign jurisdictions, submissions and journal articles in its bibliography.
9. For example, some repairs, such as for shoes and bicycles, in both Sweden and the Netherlands incur a lower value added tax rate (European Commission 2020).

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ORCID

Kayleen Manwaring  <http://orcid.org/0000-0002-1970-3430>

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