



Australian Government
Productivity Commission

Right to Repair

Productivity Commission Draft Report

June 2021

This is a draft report prepared for further public consultation and input. The Commission will finalise its report after these processes have taken place.

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au).

Opportunity for further comment

The Commission thanks all participants for their contributions to the inquiry and now seeks additional input for the final report.

You are invited to examine this draft report and comment on it by making a written submission by 23 July 2021. Further information on how to provide a submission is included on the inquiry website: www.pc.gov.au/inquiries/current/repair/make-submission#lodge

The final report will be prepared after further submissions have been received, and will be submitted to the Australian Government by 29 October 2021.

Public hearing dates and venues

The Commission is holding public hearings using a video and teleconference service, with the option of some in-person appearances. Please contact us if you would like to participate in-person in Canberra, Sydney or Melbourne as spots are limited.

Location	Date	Venue
Sydney	Monday, 19 July 2021	Wesley Conference Centre 220 Pitt Street, Sydney
Melbourne	Tuesday, 20 July 2021	Level 8, 2MQ, 697 Collins Street, Docklands
Canberra	Wednesday, 21 July 2021	Forrest Room 1 Rydges Canberra 17 Canberra Avenue, Forrest

Commissioners

For the purposes of this inquiry and draft report, in accordance with section 40 of the *Productivity Commission Act 1998* the powers of the Productivity Commission have been exercised by:

Paul Lindwall

Commissioner

Julie Abramson

Commissioner

Terms of reference

I, the Hon Josh Frydenberg MP, Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby request that the Productivity Commission undertake an inquiry into the Right to Repair within Australia.

Background

The term *right to repair* describes a consumer's ability to repair faulty goods, or access repair services, at a competitive price. This can relate to a range of product faults, including those for which the consumer is responsible. It may include a repair by a manufacturer, a third-party, or a self-repair option through available replacement parts and repair information.

The *Competition and Consumer Act 2010* (CCA) prohibits anti-competitive behaviour such as exclusive dealing (section 47); however, many right to repair issues are the result of conduct that is not being captured by the prohibition. In many cases, suppliers do not impose any such restrictions on consumers with respect to the repair of products they supply. Instead, consumers or third parties are prevented from being able to repair the products due to a lack of access to necessary tools, parts or diagnostic software.

For these reasons, existing provisions amount to some limited rights or protections in relation to repair facilities in Australia, but do not amount to a full 'right to repair'. As such, premature product obsolescence and a lack of competition in repair markets remain. The expense of repair and product design accelerate the transfer of consumer goods into waste.

Scope of the research study

The Productivity Commission is to examine of the potential benefits and costs associated with 'right to repair' in the Australian context, including current and potential legislative, regulatory and non-regulatory frameworks and their impact on consumers' ability to repair products that develop faults or require maintenance. In examining the Australian context, the Productivity Commission should identify evidence of the impact of relevant international approaches.

In undertaking the inquiry, the Commission should consider:

1. The legislative arrangements that govern repairs of goods and services, and whether regulatory barriers exist that prevent consumers from sourcing competitive repairs;
2. The barriers and enablers to competition in repair markets, including analysing any manufacturer-imposed barriers, and the costs and benefits associated with broader application of regulated approaches to right of repair and facilitating legal access to embedded software in consumer and other goods;

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3. The impact of digital rights management on third-party repairers and consumers, and how intellectual property rights or commercially-sensitive knowledge would interact with a right to repair;
 4. The effectiveness of current arrangements for preventing premature or planned product obsolescence and the proliferation of e-waste, and further means of reducing e-waste through improved access to repairs and increased competition in repair markets; and
 5. The impact on market offerings, should firms have their control over repair removed.

Process

In undertaking this inquiry, the Commission should consult broadly, including with state and territory consumer affairs regulators. The Commission should undertake an appropriate public consultation process including holding public hearings, inviting public submissions and releasing a draft report to the public.

A final report should be provided to the Government within 12 months of the receipt of these terms of reference.

The Hon Josh Frydenberg MP
Treasurer

[received 29 October 2020]

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Abbreviations

ABF	Australian Border Force
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACL	Australian Consumer Law
AIIA	Australian Information Industry Association
ALRC	Australian Law Reform Commission
ANZSIC	Australian and New Zealand Standard Industrial Classification
AT	Assistive Technology
AUSFTA	Australia-United States Free Trade Agreement
BLADE	Business Longitudinal Analysis Data Environment
COVID-19	Coronavirus disease
CPI	Consumer Price Index
DAWE	the Department of Agriculture, Water and the Environment
DIY	Do it yourself
EC	European Commission
EU	European Union
EULA	End-user licence agreement
FTC	Federal Trade Commission
GDP	Gross domestic product
GST	Goods and services tax
GPS	global positioning system
HHI	Herfindahl-Hirschman Index
HP	Hewlett Packard
IP	Intellectual property
IT	Information Technology
LCA	Life cycle analysis
MAS	Massachusetts 'right to repair' legislation
MOU	Memorandum of Understanding
NTCRS	National Television and Computer Recycling Scheme
OECD	Organisation for Economic Co-operation and Development

OEM	Original equipment manufacturer
PBDEs	polybrominated diphenyl ethers
SLC	Substantial lessening of competition
TPM	Technological protection measure
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
UK	United Kingdom
US	United States
UCPD	Unfair Commercial Practices Directive
WCT	WIPO Copyright Treaty
WIPO	World Intellectual Property Organization
WRA	Waste Reduction Act
WTP	Willingness to pay

OVERVIEW

Key points

- This report finds that there are barriers to repair for some products and that there is scope to reduce these barriers. The proposed reforms would improve consumers' right to repair, without the uncertainty and costs associated with more forceful policy interventions.
- A 'right to repair' is the ability of consumers to have their products repaired at a competitive price using a repairer of their choice. Realising this aspiration in a practical way involves a range of policies, including consumer and competition law, intellectual property protections, product design and labelling standards, and environmental and resource management.
- Consumers already have considerable rights to have their products repaired, replaced or refunded under guarantees in Australian Consumer Law. These guarantees are comprehensive and generally work well, but they could be improved by:
 - the Australian Competition and Consumer Commission (ACCC) providing guidance on the reasonable period of product durability for common household products, so that consumers and manufacturers can better understand when consumer guarantees apply
 - providing regulators with alternative dispute resolution processes to assist consumers to resolve their claims, and enabling designated consumer groups to lodge 'super complaints' about consumer guarantees, with these fast tracked by the ACCC
 - the inclusion of text in manufacturer warranties that prominently states that consumers are not required to use the repairers or spare parts specified by the product's manufacturer to access their rights to a guarantee under consumer law.
- The Commission is seeking further evidence on other reforms that could help consumers obtain repairs and make more informed purchase choices. These potential reforms involve:
 - requiring manufacturers to provide software updates for a reasonable period
 - amending copyright laws to enable third-party repairers to copy and share repair manuals, and access repair data hidden behind digital locks
 - prohibiting manufacturer warranties from being voided if consumers do not use the repairers and spare parts specified by the manufacturer
 - developing a product durability or repairability labelling scheme to help consumers identify products that best meet their needs.
- There is also scope to improve the way products are managed when they become 'e-waste' by amending regulated product stewardship schemes to remove current incentives that focus solely on product recycling, rather than repair and reuse. Global positioning system (GPS) trackers should also be used to improve monitoring of e-waste.
- The Commission is seeking evidence on the net benefits of a more extensive right to repair policy through a 'positive obligation' that would require manufacturers to provide third-party access to repair information and supplies.
 - The Commission's preliminary analysis suggests that restrictions on third-party repair supplies could be harming consumers in repair markets for agricultural machinery and mobile phones and tablets. However, the evidence base on the magnitude of repair barriers in these markets is patchy and largely anecdotal, preventing a rigorous assessment of whether additional policies would provide net benefits to the community.
 - At a minimum, a review of the policy landscape in the coming years would be warranted, supported by an evaluation of the proposed mandatory scheme for the sharing of motor vehicle service and repair information, once it has been in operation for at least three years.

1 The ‘right to repair’ is a multifaceted policy issue

There are growing concerns in Australia and overseas that repairs of consumer products are becoming progressively more difficult (sometimes impossible), resulting in costly and wasteful outcomes for consumers and broader society.

The difficulty of repair, at least in part, reflects growth in the number of products that incorporate sophisticated technology. It is now commonplace for cars, fridges, and even coffee machines to have embedded software in them. These technological advances have provided many benefits to consumers, but can also increase the cost and complexity of repairs. The rise in tech-enabled products means that much of the information required to diagnose a fault is digital, embedded into the product itself and held behind ‘digital locks’, requiring passwords or special tools to bypass.

Increasing product complexity means that consumers often have to rely on the manufacturer of the product (or their authorised repairer) to fix or maintain their product. Manufacturers are typically the main and sometimes only provider of repairs for their products. This has contributed to widespread concerns that some manufacturers are using their dominant position in repair markets to restrict competition. Many participants made claims of manufacturers refusing to supply independent repairers with the parts, tools and information they need to do repairs.

Relatedly, there are concerns that the lifespans of everyday products are becoming unnecessarily short and that products are being discarded prematurely, contributing to wasted resources and the proliferation of ‘e-waste’. Some groups also claim that manufacturers are intentionally shortening product life through software updates and design strategies that force consumers into buying new products (‘planned obsolescence’). Such claims are often made with respect to consumer electronics, particularly smart phones.

These concerns have led to calls for government to introduce a ‘right to repair’. The ACT Minister for Consumer Affairs, Shane Rattenbury, noted that ‘the right to repair movement has been gaining momentum around the world. Legislative reforms are being introduced and strategies are being prepared.’ Although there is no universal definition of a right to repair (box 1), in essence it is about the ability of consumers to have their products repaired at a competitive price using a repairer of their choice. While on face value this is a desirable objective, it is not immediately clear what government should do to enable such a right. This is because no single policy alone enables a right to repair; a broad range of policies are involved, covering consumer and competition law, intellectual property protections, product design and labelling standards, and environmental and resource management.

Implementing or amending policies in any of these areas requires careful consideration, balancing the (sometimes competing) interests of consumers, manufacturers, suppliers and repairers. In weighing up the costs and benefits of potential right to repair reforms, the Commission has been mindful that it is not always preferable or cost effective for consumers to repair their products, or to keep them going for as long as possible. Consumers make

choices to repair their products by weighing up the cost and convenience of repair, their preferences for newer products, and concerns about the environmental impacts of their consumption choices. Further, it is not reasonable or efficient to require a manufacturer to support a product for an indefinite amount of time; at some point it becomes prohibitively costly for manufacturers to repair older products. Thus, the inquiry's focus has been on identifying if there are any unnecessary barriers to repair that are leading to adverse outcomes for the community as a whole, and if so, what policy responses may be needed.

Box 1 What is a 'right to repair'?

There was no single view of a 'right to repair' presented in submissions to this inquiry. Participants most commonly associated a right to repair with:

- independent repairers and consumers having access to the necessary parts, information and equipment needed to repair products, including access to embedded software in products
- consumers having the choice of repairer, with price competition in the repair market
- consumers being able to buy products that are repairable and durable
- repair/reuse of products to reduce e-waste and encourage the growth of the circular economy.

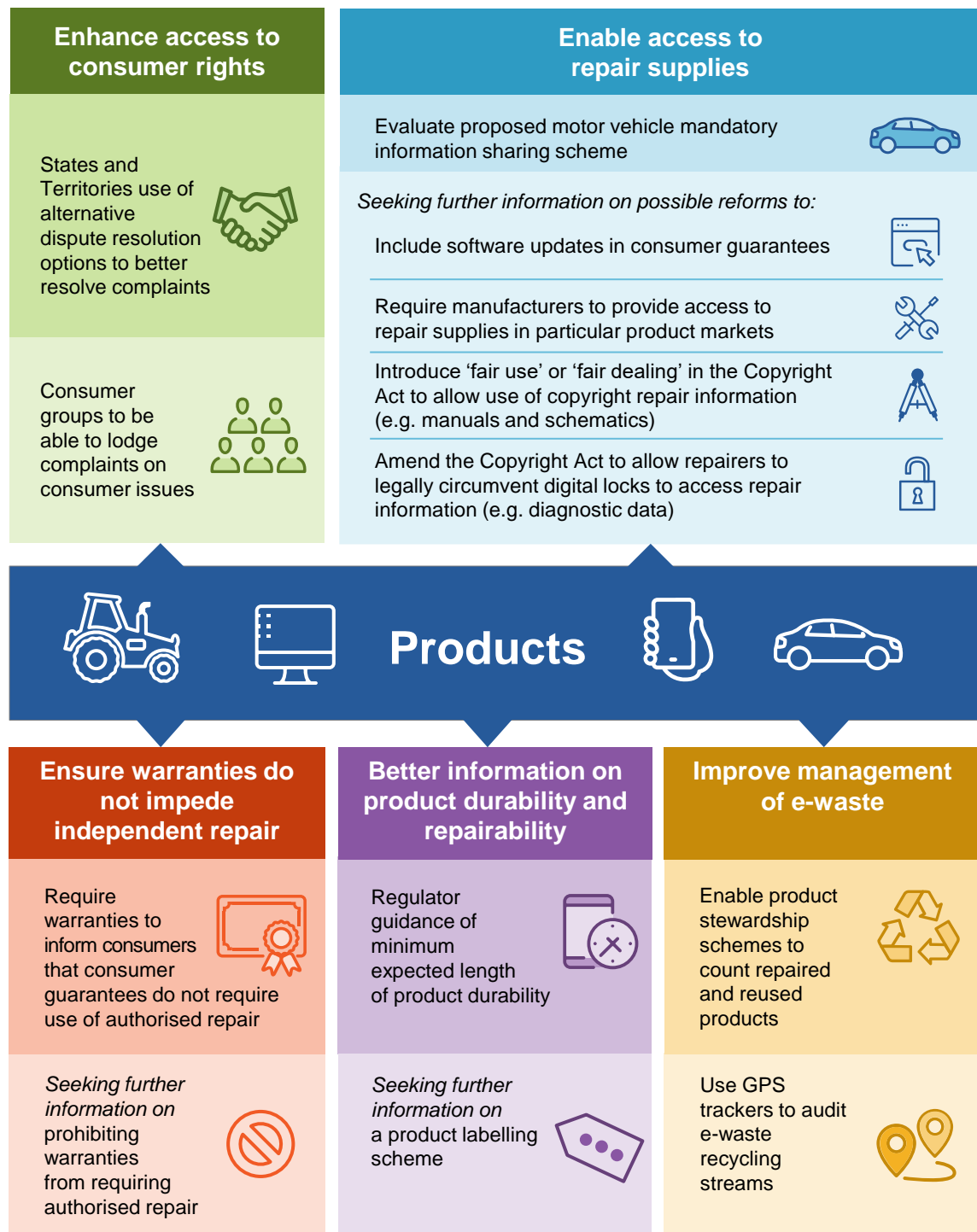
These differing views on what a right to repair entails were reflected in the broad range of policy proposals that were put forward, which included: legal obligations on manufacturers to provide access to repair inputs; strengthening of the consumer guarantees under Australian Consumer Law; changes to intellectual property protections to facilitate sharing of repair information and access to embedded software; introduction of unfair conduct provisions to address behaviours of manufacturers; and use of minimum product standards and labelling.

A wide range of reforms have also been connected to right to repair policies around the world. Many of these changes have been concentrated in the United States and the European Union.

- In the United States, much of the debate has focused on consumer and competition issues, particularly access to necessary spare parts, tools and information, and the tension this can create with intellectual property rights. The term 'right to repair' appears to have originated from legislation in Massachusetts requiring motor vehicle manufacturers to provide access to diagnostic and repair information. An industry agreement then led to nationwide adoption of this approach. Some US states have also proposed broader right to repair legislation for digital products, such as consumer electronics and agricultural machinery.
- In Europe, a right to repair is more commonly associated with product design and resource management, and is generally pursued through EU environmental regulations. For example, household appliances are required to have spare parts available to professional repairers for up to ten years, as well as repair and maintenance information. The European Union has also had similar requirements to the Massachusetts 'right to repair' law for motor vehicles since 2010.

Overall, this draft report finds that there are barriers to repair for some products that policy reforms could reduce. The proposed reforms fall into five broad categories that collectively support consumers to repair their products (where they choose to do so) (figure 1). In some areas, evidence on the materiality of barriers to repair is lacking, so the draft report also contains a number of requests for further information and feedback to inform the final report.

Figure 1 **Possible reforms to overcome barriers to repair**



2 Consumer law provides some rights to repair

Consumers already have considerable rights under the consumer guarantees in the Australian Consumer Law (ACL). The guarantees automatically (with some exceptions) provide consumers with a range of protections when they buy a product. Among other things, they require manufacturers and suppliers to guarantee that the products they sell are of acceptable quality (including that they are reasonably durable) and that manufacturers have spare parts and repair facilities available for a reasonable period. Suppliers are also required to guarantee that the products they sell are fit for any disclosed purpose. When these guarantees are not met, consumers may be entitled to a repair, refund or replacement, although the choice between remedies often rests with the supplier or manufacturer.

The consumer guarantees framework is comprehensive and operates reasonably well but it is sometimes difficult for consumers to access the remedies they are entitled to. There is lack of clarity in some areas (particularly regarding product durability timeframes) and it can be challenging for consumers to negotiate a remedy with a supplier when their product fails.

Uncertainty about the durability of consumer products

A guarantee that products will be of acceptable quality is at the heart of the consumer guarantees under the ACL. This includes that the durability of the product will be acceptable to a ‘reasonable consumer’. There is currently limited specificity in the ACL as to what reasonable durability is for various product classes — it is largely left up to the consumer and supplier or manufacturer to determine and negotiate an outcome. This uncertainty can lead to disagreement about whether a guarantee applies at all, or result in some consumers not seeking (or being offered) a remedy under the ACL.

One area of uncertainty appears to be for high value products that the consumer has owned for some time (such as high value washing machines and other household appliances that break after several years) rather than for products that fail in a short period of time. Improved regulatory guidance in this area could help to provide certainty for both consumers as well as manufacturers and suppliers, which would not only improve access to repair but would also improve access to refund and replacement remedies.

Greater clarity on reasonable product durability under consumer guarantees

Greater clarity could be achieved by the Australian Competition and Consumer Commission (ACCC) developing and publishing estimates for how long products could reasonably be expected to last without fault. Such estimates would be a guide only, developed in consultation with State and Territory ACL regulators, consumer groups (some of which have already developed estimates of product durability) and business groups (including those representing manufacturers and suppliers).

This guidance would build upon current guidance developed by the ACCC, by including more specific durability estimates for particular product classes, and should also draw on

estimates developed by manufacturers. Given the large number of different products available, and new products continually coming onto the market, specific guidance could be developed for common household electrical appliances and white goods, within specific price ranges. The time period estimates could also be a minimum and, given variability of performance of any particular product in practice, the time period could be a range. For example, a fridge could be estimated to last for a minimum of five to seven years without fault, with the upper and lower bounds of the range reflecting lower and higher value fridges. Technological developments would necessitate these estimates being reviewed regularly.

Accessing guarantees is often a struggle for consumers

Consumers often find it difficult to exercise their rights under guarantees, particularly for higher value products such as cars, electronics and white goods. Federal and State and Territory regulators receive thousands of complaints each year about consumer guarantees. For example, in 2019-20, the ACCC reported over 37 600 complaints about consumer guarantees and warranties, with motor vehicles (27 per cent) and electronics and consumer white goods (26 per cent) accounting for over half of these complaints. At the State and Territory level, complaints about motor vehicles are the most common.

It is largely left up to consumers to be aware of their rights and to be willing and able to pursue a remedy, such as repair of a broken or faulty product. But recourse through tribunals, if even available, can be costly (in terms of tribunal fees, legal advice, and costs of technical reports) and act as a deterrent. The process can also take significant time and can be inconvenient for consumers if they are required to go without their product for long periods.

Consumers can also get stuck in a cycle of repairs for multiple minor defects (particularly for motor vehicles), which is driven by sellers' preferences to repair defective (high price) products rather than offer a replacement. (In December 2020, changes to the ACL to clarify that multiple minor repairs constitute a major failure were passed, which may help to resolve some of the issues relating to motor vehicles).

Collectively, these costs and inconvenience mean that courts and tribunals are not an effective form of redress for many consumers. Often, the cost and effort involved in seeking a remedy through a court or tribunal will be greater than the value of the product. And while consumers can seek help from their State and Territory ACL regulator, most of these regulators have limited powers in dispute resolution as they are unable to compel businesses to participate in a conciliation process or make determinations.

Enhancing access to remedies under the consumer guarantees

Better complaint and enforcement options would improve the practical functioning of the consumer guarantees and provide consumers with increased access to remedies.

Additional enforcement powers for ACL regulators

Some jurisdictions have alternative dispute resolution processes that make it easier for consumers to obtain a remedy under the consumer guarantees.

- *Compulsory conciliation* — South Australia has introduced powers to compel businesses to participate in conciliation processes. When a consumer and business cannot come to an agreement privately, the regulator, Consumer and Business Services, can arrange a compulsory conference, acting as a neutral third party. In its first 2 years of operation (2013 and 2014), the conciliation process resolved 86 per cent of the 403 cases escalated to conciliation. And in 2018, the process resolved 90 per cent of cases (169 cases). The Australian Consumer Survey reported that 75 per cent of people who had participated in third party conciliation in 2015 found it either very or extremely helpful.
- *Enforceable directions* — New South Wales has introduced the ability for its regulator to make an enforceable direction for a business to comply with the consumer guarantees. The NSW Commissioner for Fair Trading can issue a consumer guarantee direction requiring the business to repair, replace or refund certain products (up to the value of \$3000 within 6 months of the date of purchase). If the business does not comply with the direction, the consumer can apply to their local court to have it enforced.

Other Australian jurisdictions should adopt similar alternative dispute resolution processes, to better resolve complaints about consumer guarantees, potentially using the models in place in South Australia and New South Wales. Sufficient regulator resourcing would be required prior to implementation.

Enabling designated consumer groups to lodge complaints

A complementary reform would be the introduction of a ‘super complaint’ mechanism, whereby designated consumer organisations are able to lodge complaints on consumer guarantee issues. Once a complaint is lodged by the consumer group, it would be fast tracked by the regulator, who would be required to provide a response within a certain period (such as 90 days). The response would state how the regulator proposes to deal with the complaint and whether any action will be taken. The United Kingdom operates a super complaint process and one was trialled in New South Wales between 2011-2013. Complaints lodged as part of the NSW trial related to misleading free range egg labelling and a complaint on electricity switching websites. The NSW trial did not lead to a super complaint regime in New South Wales. The Commission understands that this was not due to its failure, but rather because such a scheme would best reside with a national regulator, given the nationally significant issues super complaints focus on. For this reason, the Commission proposes that a super complaint mechanism be directed to the ACCC.

A key benefit of a super complaints process is that it provides regulators with an additional source of intelligence and ensures that major consumer issues are responded to by the regulator (due to the time-limited and public nature of the process). On this point, CHOICE claims that the super complaints lodged with NSW Fair Trading were escalated to wider,

national processes, resulting in outcomes that they did not believe would have been achieved outside of the super complaints mechanism.

Although the process could arguably divert regulator resources away from higher-priority activities, there is no indication that well-established consumer groups are likely to use super complaints processes inappropriately or derail regulatory priorities. Gathering the necessary evidence and lodging a complaint could be a costly exercise for a consumer group both in terms of resources and in reputation and influence should such a complaint be founded on scant evidence.

Nonetheless, a super complaints process in Australia would need to be supported by operational guidance and principles, to ensure that the process is effective and efficient. This should include requirements for designating (and removing) consumer bodies, evidentiary requirements to support a claim, and the process by which the ACCC will respond.

These reforms would enhance consumers' ability to exercise their existing rights under guarantees. However, additional reforms are also needed to address barriers to repair identified in this inquiry.

3 Overcoming barriers to repair in Australia

Concerns have been raised about barriers to third-party repair arising from:

- manufacturers limiting third-parties from accessing the parts, tools, equipment and information they need to conduct repairs, including diagnostic tools (such as software and code) that are needed to diagnose repair issues
- the use of contractual arrangements that discourage independent repair, particularly manufacturer warranties that become void if third-party repairs are undertaken.

Actions of manufacturers can impede access to repair supplies

While the evidence is incomplete, some inquiry participants have raised concerns that product manufacturers are using their dominant position in the repair markets for their products to impede independent repairers from accessing the necessary parts, information and equipment needed to repair products. Of the concerns raised in submissions, about 80 per cent related to a 'refusal to deal', where manufacturers refused to provide repair supplies to anyone outside their authorised network. For example, a medical equipment supplier said that it 'has made many attempts to purchase parts, components and equipment from [manufacturers] and these have been flatly rejected'. Similarly, the National Farmers Federation said that agricultural machinery manufacturers refuse to supply technical information, diagnostic tools and parts to anyone outside their authorised network.

While less common, other inquiry participants noted that some manufacturers will sell repair supplies to any purchaser, but set their prices prohibitively high (*'margin or price*

squeezing’) or only sell the necessary repair supplies with other repair services or products (*tying*’ or *bundling*’). For example, an independent phone repairer claimed that Samsung sets its prices for replacement mobile phone parts at the same level as the cost of parts *and* services in its authorised repair network.

Such impediments were commonly reported for consumer electronics, agricultural machinery, cars and high-end watches. Concerns about limited access to repair supplies were roughly evenly split across the different types of repair supplies (such as spare parts, tools and equipment and information).

- *Spare parts* — concerns about accessing spare parts mostly related to manufacturer-branded spare parts. For watches, issues accessing spare parts comprised more than half of all complaints received relating to watches. The Watch and Clockmakers of Australia said that ‘the watch repair industry around the world has been subjected to the effects of a policy by many major watch brands of not supplying spare parts to independent watchmakers’. Another participant noted that some manufacturers of electronic devices often refuse to distribute parts that are essential to repair and maintenance.
- *Tools and equipment* — issues accessing tools and equipment was more of a barrier to repair for agricultural machinery and consumer electronics. For agricultural machinery, access to diagnostic software tools was the primary barrier, whereas for consumer electronics, access to calibration tools (such as computer equipment to fine-tune products after new parts are installed) was the main issue. iFixit said that agricultural machinery manufacturers do not make diagnostic software available to anyone except their authorised technicians, making it impossible for farmers to debug their own equipment, although this was denied by the manufacturer concerned. Another participant noted that some printing manufacturers restrict access to calibration software needed to use refilled (or non-manufacturer) ink cartridges.
- *Repair information* — accessing repair information was more of a barrier to repair for cars and household appliances. For cars, access to data (such as diagnostic, product-use or consumer data) was the primary barrier, whereas for household appliances, access to product schematics was the primary issue. The Australian Automotive Aftermarket Association suggested that most car manufacturers in Australia are not fully sharing technical data (including diagnostic and product-use data).

Are restrictions on repair supplies harming competition and consumers?

One of the main ways that repair barriers can generate harm to consumers is through higher-priced repairs. Much of this depends on the characteristics of the individual product market. There are some features of repair markets that can indicate when a product manufacturer may be more likely to restrict competition — including where consumers are ‘locked in’ to using authorised repairers or face difficulties estimating repair costs, and where manufacturers are able to generate significant revenues from repair (box 2).

The strength of competition in the market for the original product (the primary market) is also critical to considering consumer harm. Where product markets are highly competitive, manufacturers may ‘compete away’ the profits they earn in the repair market by lowering prices for the original product, thus compensating consumers for higher repair prices. The Commission conducted some empirical analysis to test the extent to which this effect exists. It used a natural experiment created by policy interventions in the United States (that mandated sharing of repair information and tools for motor vehicles). By comparing new car prices and repair prices in the United States and Australia around the time of policy change, the analysis found some evidence that the benefits of the policy for consumers seeking repair was somewhat offset by higher new car prices.

Beyond changes in prices, repair barriers can also lead to other adverse outcomes for consumers, such as reduced repair access or choice, and increased time and travel costs for repairs (particularly for people living in regional and remote areas). Higher repair prices (and lower primary product prices due to any offsetting price changes) may also tilt consumer decisions towards replacement rather than repair, leading to product disposal.

Overall, while there is some evidence that third-party repairs are being inhibited, the evidence is patchy and reliant on claims made in submissions. On the one hand, manufacturers often have valid reasons for why they limit third-party repair of their products (such as risks to safety, security or brand reputation). However, in some cases, these risks appear to be overstated. Many common, low-risk repairs (such as replacements of smart phone screens or batteries) do not require extensive expertise. Further, many higher-risk repairs are governed by occupational and product licensing requirements (such as gas and hot water appliance technicians or medical products requiring approval from the Therapeutic Goods Administration). On the other hand, the consumer harm from limits to third-party repair is also likely to be less than suggested by many inquiry participants, as offsetting gains from lower primary product prices often benefits consumers. And non-price outcomes (such as reduced choice and convenience) are likely to have small effects for most products, particularly those that do not require regular maintenance.

However, consumer harm varies between product markets based on the market characteristics discussed above. To determine whether barriers to repair are generating harm in any given product market, an in depth, case-by-case analysis (of both the repair market and primary market for each product) is required. This analysis is complex and resource-intensive, with data limitations hindering quantitative evaluation. Undertaking such a detailed assessment was beyond the scope of this draft report. Instead, the Commission has taken a largely qualitative approach, supported with data where possible, to arrive at a judgment about whether there appear to be competition issues in select repair markets, and where further investigation may be warranted.

Overall, the assessment (box 2) finds several products (agricultural machinery and mobile phones and tablets) for which market characteristics (particularly consumer lock-in and limited competition in the primary markets for these products, combined with a relatively large repair market) indicate that consumers may be harmed from limits on repair supplies.

Box 2 Preliminary assessment of competition in key repair markets

The Commission's approach to assessing competition in repair markets involved analysing market features that indicate whether consumers may be harmed from limits to third-party repair.

Approach to identifying possible competition issues in repair markets

A. Is there evidence that competition in repair markets is restricted?

- ☐ High-level measures indicate a lack of competition (concentration, barriers to entry, profit margins)
- ☐ Specific cases of manufacturers restricting competition (limits on third-party access to repair supplies)

B. Is there harm to consumers?

- ☐ Consumers are 'locked-in' to the repair market (high switching costs)
- ☐ Consumers face difficulties estimating repair costs (lack of information, complexity)
- ☐ The repair market is large (relative to the primary market)
- ☐ Manufacturers have financial ties to the repair market (in-house repair, contracts)
- ☐ Consumers are not compensated by lower prices in the primary market
- ☐ Adverse non-price outcomes for consumers (reduced choice, inconvenience)
- ☐ Risk from third-party repair (to safety, security, quality or innovation) are limited

This required a case-by-case analysis of select product repair markets, focusing largely on those markets where participants raised concerns about lack of competition.

- Agricultural machinery — manufacturers have an incentive to increase repair prices as this repair market is large compared to the market for new equipment. Consumers can also face: a high cost of switching to other products; financial losses if they cannot access timely repair; and reduced access or choice due to the primarily regional customer base. While most farmers are businesses that are likely to consider the cost of repair at the initial purchase, competition in the market for new machinery may not be sufficient to compensate consumers through lower product prices. A recent Australian Competition and Consumer Commission (ACCC) market study also found that weak competition in this market may result in less choice, higher prices and delays.
- Mobile phones and tablets — the market for new devices is dominated by Apple, followed by Samsung, indicating that competition may be insufficient for manufacturers to compete away repair market profits. And some consumers cannot easily switch to alternative products, due to lock in from low product compatibility and the loss of content. While any harm may be small per consumer, it could add up to be significant across the economy.
- Motor vehicles — manufacturers have an incentive to limit access to repair supplies because this repair market is large. Further, it can be difficult for consumers to assess the cost of repairs at the initial purchase and they can face a high cost of switching to alternative brands. In 2017, the ACCC found that limited access to motor vehicle repair information increased costs, and reduced choice and convenience for consumers. It recommended a mandatory repair information sharing scheme for motor vehicles, which was recently introduced to Parliament.

The Commission also analysed several other repair markets, however, these appear less likely to result in material consumer harm. For example, although construction machinery shares similar characteristics to agricultural machinery, the Commission did not uncover evidence of constrained competition in its repair market. Medical equipment is also a sizeable market and involves high switching costs, but most customers are businesses that are likely to consider the cost of repair at the initial purchase. And while high-end watches are expensive and repair is highly technical, consumer harm is likely to be small given the small size of that repair market.

The ACCC has also previously raised concerns about consumer harm (in terms of increased repair costs, inconvenience and delays) from limited access to repair information for motor vehicles. This led to the development (and introduction into Parliament in March 2021) of a mandatory repair information sharing scheme for motor vehicles.

The Commission is seeking views on its preliminary assessment, and further information and evidence to support a more detailed analysis for the final report. This would help determine whether additional policy responses are required to reduce barriers to third-party access to repair supplies. A ‘positive obligation’ on manufacturers (to provide greater access to repair supplies) is one possible approach. A positive obligation could target specific product markets and types of repair supplies (such as repair information for motor vehicles (as above), or repair information, diagnostic software tools, and spare parts for agricultural machinery, as recently proposed by the ACCC in its market study into agricultural machinery). Further evidence on the extent of consumer harm from impediments to third-party access to repair supplies would help to inform the Commission’s view on whether a positive obligation is likely to provide net benefits to the community.

Manufacturer warranties can discourage independent repair

Most goods come with a time-limited manufacturer warranty (‘warranty against defects’), outlining the available remedies if the product develops a fault. Some of these warranties include terms that permit the product manufacturer to void the warranty should *any* non-authorised repairs, maintenance or modification occur, even where those repairs are unrelated to a subsequent fault covered by the warranty. A prominent version of these clauses are warranty seals, such as the common ‘warranty void if removed/broken’ stickers found on some products (for example, the PlayStation 4). Examination of over 30 warranties by the Commission found examples of these warranty voiding clauses in 7 warranties, covering a range of products, including washing machines, mobile phones, gaming consoles and high-end watches.

Even where the warranty does not contain these voiding clauses, reports from the United States suggest that customer service representatives often (in 28 of 31 companies tested) tell consumers their warranty is void anyway (whether this occurs in Australia does not appear to have been tested). Many warranties also use dense and difficult to understand language, leading consumers to incorrectly believe that their warranty would be void if they sought independent or self-repair services. For example, manufacturer warranties on motor vehicles generally do not contain voiding clauses, but a survey conducted for the ACCC found that 30 per cent of people cited worries about voiding the warranty as a reason for getting vehicle repairs at dealerships, while 28 per cent stated it was mandatory under the warranty.

Although most consumers would not seek repairs from an unauthorised repairer for a defect that is covered by a warranty (as the repairs are typically provided for free by the manufacturer), warranties seldom cover accidental damage. Independent repair may also be more convenient or cost effective, particularly if the warranty does not cover shipping costs.

Several participants raised concerns that warranty voiding clauses are restricting competition within the repair market by discouraging consumers from seeking independent repair during the period of their warranty coverage. Manufacturers, however, raised concerns about being held liable for poor-quality repair work by unauthorised parties, or of safety issues for their staff conducting subsequent repairs.

Manufacturer warranties are also separate to the consumer guarantees and cannot displace the guarantees. A recent court case has also confirmed that non-authorised repairs do not extinguish the right to a remedy under the guarantees. Yet suppliers have no obligation to mention a consumer's rights when discussing remedies, leading to potentially disparate outcomes for identical defects, depending on whether a claim is under the warranty or the guarantees.

Proposed changes to ensure warranties do not impede independent repair

The Commission is considering a recommendation prohibiting manufacturer warranties from containing 'warranty void' terms (including warranty seals) that require consumers to use authorised repair services or parts from a particular company to keep their warranty coverage. By making such terms (or any statements from customer service representatives that such terms exist) unlawful, a prohibition could help to simplify and clarify some of the ambiguous warranty language, reducing misconceptions and improving access to independent repair for consumers. This kind of prohibition already exists across most products in the United States under the Magnuson-Moss Warranty Act, and for motor vehicles in the European Union.

To inform its final recommendation, the Commission is seeking feedback on the costs and benefits of prohibiting warranty voiding clauses. These could include benefits to independent repairers and consumers (from greater choice and convenience of repair) but also potential costs for consumers (if warranty coverage is scaled back or product prices increase to compensate for the regulatory change). Costs to businesses include potential exposure to liability for defects or failures created by poor-quality independent repairs, although these could be reduced by allowing warranty terms to limit manufacturer liability for defects or failures created by poor-quality independent repairs.

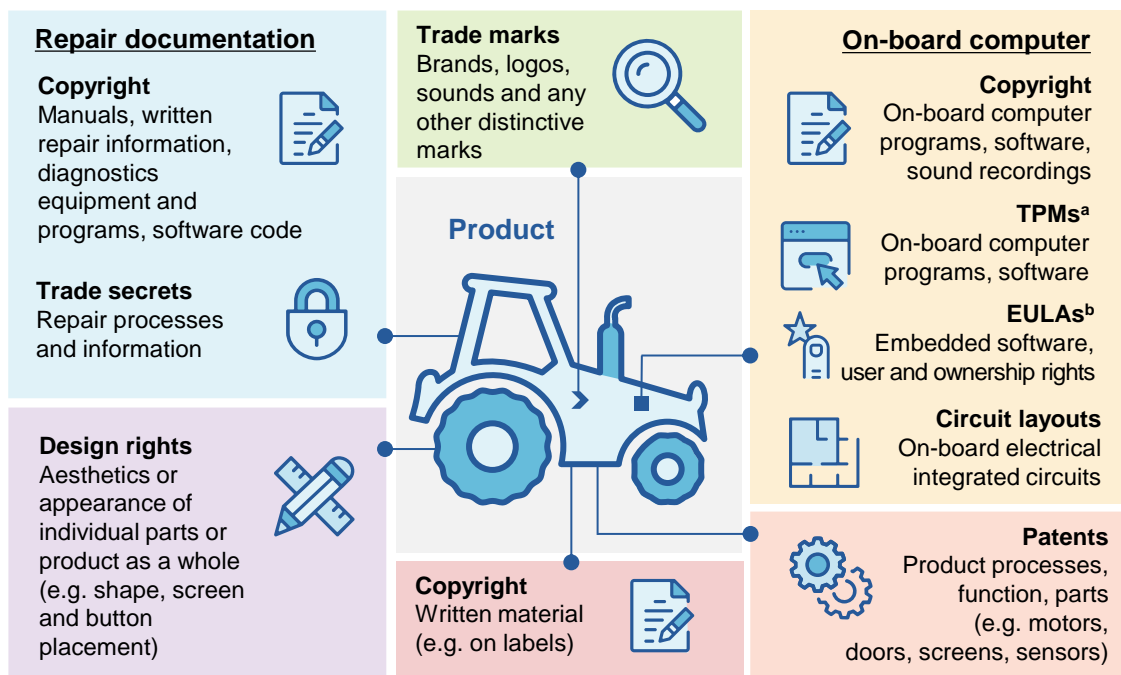
As a complementary policy option, the Australian Government should aim to improve consumer awareness about the consumer guarantees, particularly that the guarantees do not cease to apply simply because of independent repair or the use of third-party parts, and cannot be extinguished or altered by the terms of a manufacturer warranty. This would require changes to existing regulations that require all manufacturer warranties to contain text about consumer guarantees. New text should be included stating that entitlements to consumer guarantees under the ACL do not require consumers to use an authorised repair service or authorised spare parts. The warranty text should be placed in a prominent position on the warranty to improve awareness for consumers. Public communication of the changes from the ACCC could also help to ensure that consumers are aware of and understand the changes. Although changing the required warranty text would create some implementation

costs for manufacturers — as the text of their warranties would need to be updated and their customer service support staff trained on the new requirements — these should be minimal.

Intellectual property protections can impede access to repair information

Various concerns have been raised during this inquiry that intellectual property (IP) protections are being used to unnecessarily restrict repairs. Different IP rights provide different forms of protection and manufacturers may use multiple IP rights to protect a single product (figure 2). Based on the evidence presented to this inquiry, the most significant IP-related barrier to repair appears to be the inability of independent repairers to access repair information. Concerns about IP protections impeding access to repair information have been raised for products such as consumer electronics and agricultural machinery.

Figure 2 A single product may be covered by multiple IP protections



^a Technological protection measures. ^b End-user licence agreements.

Copyright may be used to impede access to two main types of repair information.

- *Repair information such as manuals* — advocates for a right to repair have expressed concern about how easily manufacturers can use copyright protections to restrict the accessibility and distribution of information (such as repair manuals) on how to repair products. For example, iFixit raised issues with some product manufacturers (including Apple) exerting their copyright and using legal threats to prevent retransmission of service schematics. Such restrictions can prevent owners and repairers from learning about their products, effectively blocking repair (or at least making it more difficult).

There has been a high-profile case in Australia of a laptop manufacturer, Toshiba, exerting its rights under copyright to prevent reproduction and dissemination of repair manuals for its products. Overseas, similar instances have been reported, for example, for Apple laptop manuals and schematics and hospital ventilator manuals.

- *Embedded (digital) repair information such as diagnostics* — manufacturers can also use technological protection measures (TPMs) or ‘digital locks’ that protect embedded software and computer code to prevent third-parties from accessing embedded repair data (such as diagnostic data, and consumer and product-use information that would be important to know when troubleshooting and debugging problems). Further, independent repairers are unable to bypass or circumvent manufacturers’ TPMs (even when doing so for the purposes of repair may be lawful) because copyright laws prevent a person (including repairers) from buying or selling or even just distributing devices to circumvent TPMs. For example, one repairer of agricultural and earthmoving equipment submitted that lack of access to diagnostic equipment meant that he had to rely on manual diagnostic processes, which are time consuming and increase repair costs to farmers. Another submitter stated that independent repairers are unable to repair Touch ID sensors on iPhones, as they do not have access to the necessary diagnostic software.

Manufacturers cite a range of reasons for why they restrict access to repair information. In the case of restrictions on information such as repair manuals, they claim that their information is proprietary, or that there are safety and other concerns resulting from the use of information by unskilled repairers. For TPMs, concerns have been raised by the Interactive Gaming and Entertainment Association, which suggests that ‘TPMs underpin the entire video game ecosystem and the willingness of developers to invest the tens or hundreds of millions of dollars that it can take to innovate their products and to develop new games’. The association raised concerns that greater access to TPM circumvention devices would better arm malicious actors. While such risks need to be balanced against the benefits of reforms in this area, it is important to emphasise that unauthorised use of copyright material carries with it substantial penalties which would still provide deterrent to non-repair TPM circumvention.

Proposed changes to the copyright regime to facilitate sharing of repair information

There are two broad ways the government could amend copyright laws to assist independent repairers access copyright repair information. The *Copyright Act 1968* (Cth) could be amended:

- so that repairers can legally procure tools required to access repair information hidden behind TPMs (such as digital locks)
- to allow repairers to reproduce and share copyright repair information (such as repair manuals and schematics) without the need to seek permission from the copyright holder under certain circumstances. This could be done through either:
 - a **specific** copyright exception for the reproduction and sharing of information for the purpose of repair (a new **fair dealing** exception in Copyright Act)

-
- a **general** copyright exception that may encompass the reproduction and sharing of information for the purpose of repair (a broad **fair use** exception in the Copyright Act).

A repair-specific *fair dealing* exception has the benefit that it specifically identifies ‘repair’ as a circumstance under which third-parties may use (including reproduce) and share copyright information. This could provide certainty to independent repairers that use of the information for repair purposes is lawful, provided that such use is considered ‘fair’. This approach provides scope for government to clarify the circumstances under which third parties may (or may not) use and share copyright information for the purposes of repair. Indeed, the Australian copyright regime currently provides for a range of specific ‘fair dealing’ exceptions — for example, where copyright material is used for research or study; criticism or review; parody or satire; or reporting news.

A general *fair use* exception may not provide as much certainty for repair uses. However, it is broader, more flexible and technology-neutral, and applicable to any potential use of copyright material, including currently non-existent or unforeseen uses and contexts. This approach therefore provides other benefits to the community. As previously argued by the Commission in its 2016 inquiry into Intellectual Property arrangements — in which it recommended the introduction of a fair use exception similar to the system in the United States — allowing for greater use of copyrighted material would facilitate new, valuable and socially-beneficial uses of copyright material by members of the public, thereby improving local creative industries, culture and knowledge.

Both approaches could help promote competitive repair services by increasing third-party repairers’ access to repair information. However, on their own they do not overcome all barriers to accessing repair information, as they would not prevent manufacturers from using TPMs to protect digital repair information in the first place. Additionally, they would not address instances where manufacturers are in sole possession of the desired information and use confidentiality agreements to prevent access to it. This could potentially be addressed, in part, by including in the exception (or Copyright Act generally) a prohibition on the use of contractual arrangements that seek to ‘override’ exceptions. To address these issues, some form of ‘positive obligation’ on manufacturers to make their repair information available may also be required.

To inform a decision for the final report, the Commission is seeking feedback on the proposed copyright changes outlined above. In particular, to what extent the proposed reform options would assist repairers in accessing repair information, and therefore facilitate independent repair, and the costs, benefits and risks of pursuing each option.

4 Product design, obsolescence and e-waste

There is growing concern in Australia and overseas that the lifespans of everyday products are becoming unnecessarily short (‘premature obsolescence’) with detrimental impacts on consumers and the environment (including by contributing to the proliferation of e-waste). Some consumer groups claim that manufacturers are intentionally shortening the lifespan of

products, such as consumer electronics and white goods, to force consumers to purchase new products (planned obsolescence). This view is based on the premise that the product as a whole had not reached the end of its technical lifespan, and that consumers would have preferred to continue using their product longer. Claimed planned obsolescence strategies include:

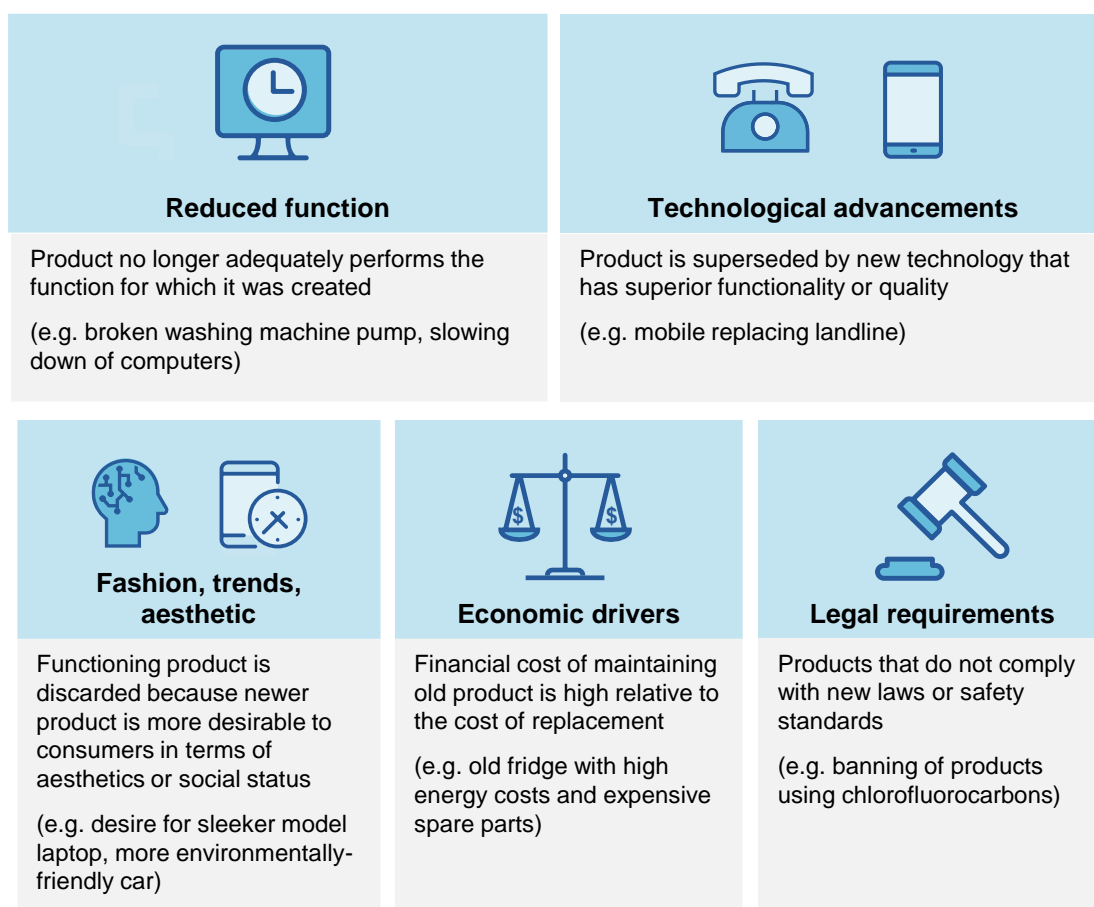
- designing products with structural weak points so they fail after limited usage (for example, designing fans with poor quality metal components)
- software that reduces a product's performance (for example, software updates that slow down older model smart phones)
- designing products in a way that prevents repair or upgrade (for example, using glue instead of screws or soldering components together to construct a device can make it more difficult to disassemble for repair).

Such strategies can be frustrating for consumers if it means that product repairs are more difficult or they have to replace their products sooner than expected. However, product obsolescence does not always result in negative outcomes for consumers as it may simply reflect that a product that better meets consumer preferences has replaced an older 'obsolete' product. Indeed, a variety of factors contribute to product obsolescence, including changes in product function, technology, fashion, regulatory standards, and the relative cost of maintenance and repair (figure 3).

Various arguments have been made for governments and regulators to step in and prevent premature obsolescence (whether due to an intentional strategy by the manufacturer or some other reason). These include to: protect consumers from unfair or misleading conduct; overcome information asymmetries regarding product qualities (such as durability and repairability) that prevent consumers making informed purchase decisions; and reduce external environmental impacts associated with short-lived products.

While it is not possible to rule out that some manufacturers engage in strategies to intentionally reduce product lifespans, the Commission has not found evidence to suggest that such practices are widespread. The ACCC submitted that it has seen little evidence of manufacturers designing a product to fail, and competitive pressures and reputational risk will often mitigate incentives for such behaviour. Although a recent German study found evidence that the first useful life of some products (such as washing machines, televisions, and notebook laptops) are becoming shorter, this was often driven by consumers choosing to replace their products with newer ones, rather than because the products broke. There is also evidence that some products are becoming more reliable or durable. For example, data from surveys conducted by Consumer NZ reveal that product reliability of a range of white goods (such as dishwashers) increased between 2009 and 2018.

Figure 3 **Mind, matter, money: factors contributing to obsolescence**



Further, Australian consumer and competition laws contain provisions that provide some protection against behaviours commonly associated with planned obsolescence (such as prohibitions on misleading conduct). For example, in 2018 the ACCC required HP PPS Australia to compensate customers for misleading information and conduct for failing to disclose at the time of sale that a subsequent software update would cause the printer to reject non-HP printer cartridges (at the time of purchase the printer accepted non-HP printer cartridges). Similar cases have been filed overseas against large tech companies (box 3).

In many cases, consumers' decisions to 'prematurely' dispose of their products, or to opt for shorter lived or less repairable products, reflect personal preferences, rather than information gaps on product durability or repairability at the time of purchase. And for some types of products, such as smart phones, there is publicly-available information on product qualities such as durability or repairability if consumers are sufficiently motivated to seek them out.

With respect to environmental concerns relating to premature obsolescence, there is a clear role for government to reduce the external environmental impacts associated with the production, consumption and disposal of goods. However, studies used to support policies to reduce environmental impacts by extending product lifespans (such as mandatory

durability standards) often omit or do not fully consider other impacts that matter to the community (such as the effect of new policy measures on business costs and product prices). And in many cases, there are more effective and efficient ways (other than product design requirements) to address environmental concerns (particularly with respect to e-waste).

Additional policies to combat premature product obsolescence (in the form of product standards or expanded consumer protection laws to address planned obsolescence) would be unlikely to have net benefits for the community. However, the Commission is seeking views and evidence on whether product labelling standards would provide net benefits to the community, and how the government and industry might jointly approach such a scheme, given such schemes are still in their early stages of development overseas. Other potential reforms relating to enhancing consumer rights (such as making it easier for consumer groups to lodge complaints about current consumer protection laws) and enabling access to repair supplies (such as expanding the consumer guarantee to include software updates) could also help address some concerns associated with premature obsolescence.

Box 3 Legal cases relating to ‘big tech’ and software

There have been a number of cases filed against tech companies internationally in response to concerns they were using software or other technical devices to deliberately reduce product performance. In 2017, for example, the French environmental association ‘Halte à l’obsolescence programmée’ (HOP) filed a criminal complaint to the DGCCRF (French regulator) that printer companies including Epson, Hewlett Packard, Brother and Canon were inserting sensors into their printer cartridges to stop them working before they were actually empty. The outcome of this case is still pending. In 2017, HOP filed another complaint against Apple claiming it was using software updates to deliberately slow down the performance of older smart phone models. Although the French regulator did not find that Apple used updates to deliberately slow down the performance of older models, it fined Apple for not informing iPhone owners that the updates would likely cause their device to run more slowly.

In Italy, in 2018 the AGCM (Competition Authority) investigated claims that Samsung and Apple had deliberately used software updates to slow down the performance of their smartphones. The AGCM subsequently found that the software updates were misleading to consumers and fined both companies €5 million. The AGCM also fined Apple an additional €5 million Euros for inadequately informing consumers about the essential characteristics of lithium batteries (such as average duration and deterioration factors).

In the United States, Apple settled a class action lawsuit in 2020 in regard to software updates slowing down devices. A lawsuit was also issued against Tesla in 2019 in regard to software updates reducing the battery capacity of Model S and X cars.

Improving the management of e-waste in Australia

Australia’s generation of e-waste is growing relatively quickly compared to other forms of waste (more than doubling over the past decade) (box 4), but remains less than one per cent of total waste generation. And roughly half of Australia’s e-waste is recycled, with the remainder sent to landfill. Key drivers of global growth in e-waste include population and

economic growth and increasingly fast product turnovers (linked to consumer preferences and advancements in technology). The electrification and computerisation of previously simple or analogue products (such as toothbrushes) has also been a contributing factor.

The relatively fast growth in e-waste has led to community concerns about valuable resources that are lost when e-waste is landfilled, and the subsequent risks to the environment and human health caused by the hazardous materials contained in e-waste.

While many of the materials in e-waste are relatively inert and no more harmful than general waste — such as glass, silver and aluminium — other materials in e-waste are hazardous to the environment or human health. However, the potential impacts on the environment and health from such hazardous materials is estimated to be moderate and manageable due to Australia's generally well-developed landfill management practices (box 4). Further, markets typically provide incentives to prevent the loss of valuable materials contained within e-waste (such as copper, zinc and other rare earth metals), when their value exceeds the costs of extraction.

The main way that Australian Governments have sought to address concerns about e-waste in Australia is through product stewardship schemes. The Australian Government established product stewardship schemes through the *Product Stewardship Act 2011* (Cth) (which was recently replaced with the *Recycling and Waste Reduction Act 2020* (Cth)).

Product stewardship aims to manage the environmental, health and safety impacts of products, including electrical and electronic products that become e-waste. It promotes the shared responsibility of these impacts between consumers, producers, manufacturers and retailers across the full life cycle of a product. Existing Australian product stewardship schemes collect and recycle a range of products, including televisions, printers, computers, mobile phones, printer cartridges and some lighting units. And a new battery recycling scheme is under development. These are mostly voluntary industry schemes, although there is one co-regulatory scheme — the National Television and Computer Recycling Scheme (NTCRS), which covers televisions, computers, printers and computer parts. Manufacturers, importers and distributors of NTCRS products are required to fund the scheme through a levy payable to one of three co-regulatory bodies, which are responsible for recycling the products, based on a recycling target set by government. To meet the recycling targets, products must be recycled to a specified standard.

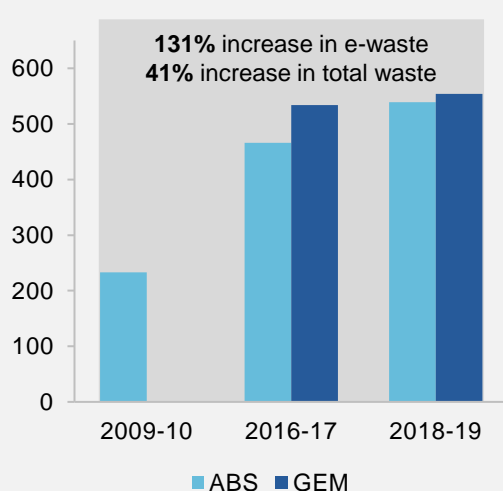
The NTCRS has had some success. Since 2012-13, about 350 000 tonnes of televisions, computers and printers have been recycled. However, the current design of the scheme may be generating adverse incentives that limit its capacity to provide net benefits to the community. There is little incentive for NTCRS bodies to do anything other than recycle collected e-waste, resulting in some otherwise functional products being dismantled and destroyed for their component materials, rather than being put to higher value uses through repair and resale.

Box 4 E-waste growth in Australia and potential impacts

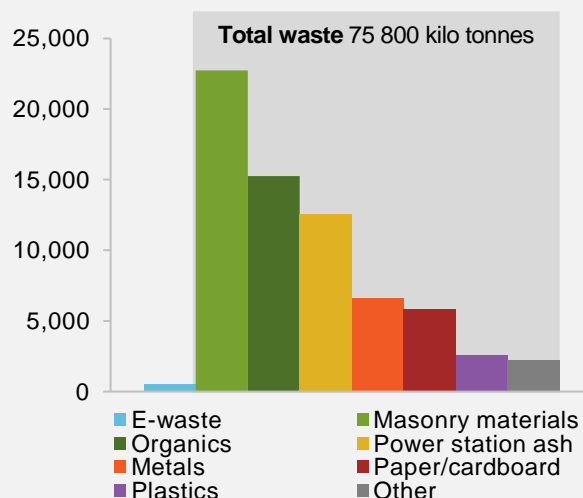
'E-waste' refers to a broad range of electrical and electronic products (including batteries and all products with plugs or cords) that become waste once they are discarded. Australia's annual generation of e-waste has grown relatively quickly over the past decade, compared with other types of waste. Between 2009-10 and 2018-19, the weight of e-waste generated annually has more than doubled (a 131 per cent increase), while total waste increased by 41 per cent (figure).

E-waste generation has grown but is a small share of total waste

(a) Australia's annual generation of e-waste (kilo tonnes)^a



(b) Mass of different types of waste, 2018-19 (kilo tonnes)^b



^a GEM refers to the Global E-waste Monitor estimates of Australia's annual e-waste generation.

^b E-waste figures are double counted, as e-waste is not a formal waste stream. 'Other' includes glass, textiles, leather and rubber, and other wastes.

The relative hazardousness of e-waste is difficult to measure. Everyday use of electrical and electronic products is unlikely to cause harm, with risks mostly arising during disposal and varying both by disposal method and product materials. Many materials (such as aluminium and gold) are relatively inert and recyclable, others (such as lead and, lithium) can be hazardous but are recyclable, and some (such as arsenic and brominated flame retardants) are hazardous and cannot be recycled.

When disposed to landfill, e-waste can affect the environment and human health. For example, heavy metals used in e-waste products and brominated flame retardants (used to coat plastics in a range of products to reduce flammability) can be toxic to humans, plants and aquatic organisms. However, Australian landfills are generally well-managed, significantly reducing hazards associated with e-waste. And thus, the overall impacts of e-waste in landfill are estimated to be relatively moderate (ranging from \$11 to \$17 per tonne, compared to e-waste recycling costs ranging from \$490 to \$1198 per tonne).

Proposed changes to the NTCRS to facilitate repair and reuse of e-waste

Reuse of e-waste helps to extend product lifetimes and potentially lead to better environmental outcomes compared to recycling. In addition, it may help to reduce the overall cost of the scheme, particularly given the high cost of recycling in Australia (due to limited domestic recycling capacity, which is driven in part by insufficient scale for cost-effective mechanical recycling and a highly dispersed population).

The Australian Government should amend the NTCRS to include repair and reuse as an option. To do so, annual recycling targets for the NTCRS should be modified to count products that have been repaired or refurbished for reuse by co-regulatory bodies. This would allow NTCRS co-regulatory bodies to jointly determine the best outcome for collected e-waste. As part of these changes to the target, reuse would need to be clearly defined, to avoid double-counting of the same e-waste.

Permitting reuse under the NTCRS also requires careful management of the export of e-waste, to reduce the risk that existing e-waste export controls will be circumvented. To support better monitoring and enforcement of e-waste, the scheme should be amended as necessary so that scheme regulators can track high-risk e-waste streams using global positioning system (GPS) transmitters.

5 Are broader ‘right to repair’ policies needed?

The policy and regulatory changes outlined above (summarised in table 1) are aimed at enhancing access to existing consumer rights under the Australian Consumer Law, as well as removing unnecessary barriers to repair in several areas. These reforms are expected to increase consumers’ ability to access their existing rights and to obtain repairs of their products when they choose to do so. But they stop short of compelling manufacturers to provide third-party access to their repair supplies. Views are polarised on whether such a ‘positive obligation’ is needed.

Some participants (mostly independent repairers and consumer groups) called for an economy-wide policy that would oblige manufacturers to make repair supplies (such as repair information, tools, equipment and parts) available to third-parties. Yet others, including some manufacturers and the Law Council of Australia, argue that existing laws generally provide adequate rights and remedies to consumers in relation to repairs. There are existing remedies available under Part IV of the *Competition and Consumer Act 2010* (Cth), including a new effects test, to address anti-competitive behaviours in repair markets, such as provisions to prevent the misuse of market power, exclusive dealing or anti-competitive agreements.

Introduction of an obligation on manufacturers to provide repair supplies (in addition to the current regulatory requirements), could in principle improve access to repair supplies for independent repairers and consumers. The benefits might be expected to flow through to consumers as a greater choice of repairer and improved convenience, as well as lower priced repairs, although this may be offset (entirely or in part) by higher new product prices. However, it would be a significant regulatory step that could impose considerable compliance costs on manufacturers, and may have unintended consequences, particularly if restrictions to access to repair information and supplies are necessary to protect public safety or cyber security.

A broader issue relates to which product markets such arrangements would apply to. As noted above, a mandatory service and repair information sharing scheme is being implemented for motor vehicles. Expansion of such a scheme to other product markets would need to be carefully considered.

At this stage, it is not clear that the benefits of such a regulatory intervention would outweigh the costs. However, there may be some product repair markets, such as for agricultural machinery, mobile phones and tablets, that exhibit features that present a higher potential for consumer harm from third-party restrictions on repair. As noted earlier, the Commission is seeking further evidence to support a more in depth analysis of these markets for the final report.

The reforms proposed above go in the direction of enabling consumers to access repair services at a competitive price, without the uncertainty and costs associated with more significant regulatory intervention. Nevertheless, there would be merit in further assessment of the policy landscape in the coming years, supported by an evaluation of the costs and benefits of the repair information sharing scheme for motor vehicles after it has been in operation for at least three years.

Table 1 Possible reforms to reduce barriers to repair

Barrier	Draft recommendation or information request	Number
Enhance access to consumer rights		
Consumers can find it difficult to obtain a remedy under consumer guarantees and regulators have limited powers to assist.	State and Territory Governments to introduce alternative dispute resolution mechanisms to better resolve consumer complaints (such as compulsory conciliation or directions).	Draft rec 3.2
	The Australian Government to enable designated consumer groups to lodge 'super complaints' on consumer guarantee issues, with complaints to be fast tracked by the Australian Competition and Consumer Commission (ACCC).	Draft rec 3.3
Enable access to repair supplies		
Limited access to repair supplies (such as spare parts, repair information and tools) can impede competition from independent repair.	The Australian Government to evaluate the costs and benefits of the proposed motor vehicle mandatory information sharing scheme after three years.	Draft rec 4.1
	The Commission is seeking further evidence on the extent of consumer harm in different repair markets, to determine if an additional policy response is needed.	Info request 4.1
	The Commission is seeking evidence on the costs and benefits of a 'positive obligation' that requires manufacturers to provide access to repair supplies in different repair markets.	Info request 4.2
Manufacturers may not provide reasonable access to repair facilities and spare parts (including software updates).	The Commission is seeking evidence on whether repair facilities, spare parts and software updates are adequately available under consumer guarantees.	Info request 3.1
Third-party repairers may be unable to access repair information under copyright law.	The Commission is seeking feedback on the merits of introducing a 'fair use' or 'fair dealing' exception in the Copyright Act to allow third-party repairers to share copyright information (such as manuals and schematics).	Info request 5.1
Third-party repairers may be unable to obtain tools to circumvent digital locks to access repair information.	The Commission is seeking feedback on the merits of amending the Copyright Act to allow third-party repairers to legally procure tools to circumvent digital locks to access repair information (such as diagnostic data).	Info request 5.1
Ensure warranties do not impede independent repair		
Manufacturer 'warranty void' clauses can deter consumers from using third-party repairers, impeding competition.	Require additional text in warranties to inform consumers that consumer guarantees do not require authorised repair or spare parts.	Draft rec 4.2
	The Commission is seeking further information on prohibiting warranties from containing terms that require use of authorised repairers or spare parts to maintain the warranty.	Info request 4.3
Better information for consumers on product durability and repairability		
Uncertainty about what constitutes a reasonable period of product durability and whether consumer guarantees apply.	ACCC to develop and publish guidance on how long common household products could reasonably be expected to last without fault (durability) under consumer guarantees. Guidance could use ranges for different value products.	Draft rec 3.1
Consumers may lack durability and repairability information, affecting purchase decisions.	The Commission is seeking further evidence about how significant these information gaps are, as well as the costs, benefits and design of a product labelling scheme.	Info request 6.1
Improve management of e-waste to facilitate repair and reuse		
Existing product stewardship schemes do not enable e-waste to be reused.	Amend the National Television and Computer Recycling Scheme (NTCRS) to count repaired and reused products in annual targets.	Draft rec 7.1
Risks of stockpiling, and unlawful exports of e-waste.	Amend the NTCRS to use global positioning system (GPS) trackers to monitor e-waste recycling streams.	Draft rec 7.2

Draft findings, recommendations and information requests

The Australian repair sector

DRAFT FINDING 2.1 THE AUSTRALIAN REPAIR SECTOR

A consumer's decision to repair or replace a broken product is principally driven by price. Convenience, product repairability and consumer preferences for up-to-date products can also be important.

The repair sector accounts for about one per cent of all business revenue in Australia and has grown modestly over the past decade.

- Most repair activity (revenue, number of businesses and workers) comes from industries with more expensive products, such as motor vehicles and machinery, that require regular maintenance and where repair is often more cost-effective than replacement.
- There was less activity in repair industries for less expensive products, such as electronics and appliances, where replacement tends to be more attractive. This is likely due to the relatively low and falling prices of these products over time, rapid technological development, and consumer preferences for new and up-to-date products.

Existing consumer rights under consumer law

DRAFT FINDING 3.1 SCOPE TO IMPROVE THE APPLICATION OF CONSUMER GUARANTEES

The Australian Consumer Law provides consumers with considerable legislative rights to obtain a remedy (repair, replacement or refund) for defective products through consumer guarantees.

The consumer guarantees are comprehensive and operate reasonably well but there is scope to enhance consumers' ability to exercise their rights when their product breaks or is faulty — by providing guidance on the expected length of product durability and better processes for resolving claims.

DRAFT RECOMMENDATION 3.1 GUIDANCE ON REASONABLE DURABILITY OF PRODUCTS

The Australian Competition and Consumer Commission (ACCC) should develop and publish estimates of the minimum expected durability for products within major categories of common household products.

The estimates would be a guide only to support application of the acceptable quality consumer guarantee in section 54 of the Australian Consumer Law. It could use ranges to take into account lower and higher value products in each category.

The ACCC guidance should be developed in consultation with State and Territory consumer law regulators, consumer groups and business groups representing product suppliers and manufacturers, and should be updated over time.

DRAFT RECOMMENDATION 3.2 POWERS FOR REGULATORS TO ENFORCE GUARANTEES

State and Territory Governments should introduce alternative dispute resolution mechanisms to better resolve complaints about the consumer guarantees, such as compulsory conciliation or direction powers (as are used in South Australia and New South Wales).

To inform the most effective design and use of any alternative dispute resolution mechanism, appropriate cost-benefit analysis and sufficient regulator resourcing would be required prior to implementation.

DRAFT RECOMMENDATION 3.3 ENABLING A SUPER COMPLAINTS PROCESS

The Australian Government should enable designated consumer groups to lodge 'super complaints' on systemic issues associated with access to consumer guarantees, with the complaints to be fast tracked and responded to by the Australian Competition and Consumer Commission (ACCC).

The Australian Government should design the super complaints system in consultation with the ACCC, relevant State and Territory regulators and consumer groups. The system should be underpinned by sound operational principles — including criteria for the assignment (or removal) of designated consumer bodies, evidentiary requirements to support a complaint, and the process and time period by which the ACCC should respond.

INFORMATION REQUEST 3.1 REPAIR FACILITIES, SPARE PARTS AND SOFTWARE UPDATES

To better understand whether consumers have reasonable access to repair facilities, spare parts and software updates, the Commission is seeking further information on:

- whether consumers have faced difficulties accessing spare parts or repair facilities under guarantees when their product breaks or develops a fault, including specific examples of the type and age of the product, and the costs incurred by the consumer*
 - costs and benefits of businesses being required to hold physical spare parts or operate repair facilities for fixed periods of time*
 - whether consumers are experiencing problems using their products due to a software fault or lack of software updates, including specific examples where manufacturers have not addressed the problem because of claims that it is not covered by consumer guarantees*
 - the costs and benefits of requiring that software updates be provided by manufacturers for a reasonable period of time after the product has been purchased.*
-

Competition in repair markets

DRAFT FINDING 4.2 LIMITS ON THIRD-PARTY ACCESS TO REPAIR SUPPLIES

Available evidence does not point to a systemic competition problem in repair markets. However, for some products, anecdotal evidence suggests that manufacturers are limiting third-party access to repair supplies (such as spare parts, repair information and tools). While manufacturers often justify these limits as a way to safeguard against risks from poor-quality repair (such as to safety and security), these risks can be overstated.

The Commission's preliminary assessment indicates that limits to repair supplies could be leading to consumer harm in some repair markets.

- **Agricultural machinery** — manufacturers have an incentive to limit third-party access to repair supplies to increase repair prices because these markets are large relative to the market for new machinery. Competition in the market for new machinery may be insufficient to compensate consumers through lower product prices. Further, consumers can be exposed to large financial risks if they are unable to access timely repair and face a high cost of switching to alternative products.
- **Mobile phones and tablets** — there is a high concentration of manufacturers in these markets, suggesting competition in the market for new devices may not be strong enough to compensate consumers through lower product prices. Some consumers may also be locked-in to using authorised repairers as they cannot easily switch to alternative brands (for example, due to low product compatibility or the loss of content). While any harm may be small per consumer, it could add up to significant harm across the economy.

INFORMATION REQUEST 4.1 CONSUMER HARM FROM LIMITS ON ACCESS TO REPAIR SUPPLIES

The Commission is seeking feedback and evidence on its preliminary assessment of consumer harm (chapter 4) in repair markets for agricultural machinery, mobile phones and tablets. In particular:

- is there any evidence of systematic differences in quality, safety or security between authorised and third-party repairers? If so, what is the cost to manufacturers (for example, damaged brand reputation, determining the cause of a fault, or other liability issues)?*
- what is the size of the repair market compared to the primary market? What proportion of repairs are conducted by authorised repairers?*
- how difficult is it for consumers to estimate the lifecycle costs of these products at the time of purchase?*
- to what extent are consumers locked in to using authorised repairers (for example, can consumers easily switch to other products or non-manufacturer repair supplies)?*
- is competition in the primary market sufficient to compensate consumers for any harm in the repair market (as indicated by low concentration and/or barriers to entry)?*
- to what extent are consumers harmed by less choice, high transportation or travel costs, delays, and inconvenience, particularly in regional and remote locations?*

The Commission is also interested in evidence of where there is substantial consumer harm in other repair markets, including but not limited to medical equipment and high-end watches (which were raised as areas of concern by participants to this inquiry) as well as construction machinery.

DRAFT FINDING 4.3 COMPETITION PROVISIONS ARE AVAILABLE TO ADDRESS REPAIR ISSUES

Although infrequently relied upon, there are existing remedies available under Part IV of the *Competition and Consumer Act 2010* to address anti-competitive behaviours in repair markets, such as provisions to prevent the misuse of market power, exclusive dealing or anti-competitive agreements.

Based on the evidence presented to this inquiry, the Commission does not see a strong case for changes to these provisions to address specific issues in repair markets (such as refusals to deal or tied servicing arrangements), particularly as the remedies have had recent changes that are yet to be fully tested in court.

INFORMATION REQUEST 4.2 A POSITIVE OBLIGATION TO PROVIDE ACCESS TO REPAIR SUPPLIES

The Commission is seeking feedback and evidence on the costs and benefits of different approaches to designing and implementing a positive obligation on original equipment manufacturers to provide access to repair supplies to third-party repairers. In particular:

- evidence on the effectiveness of positive obligation schemes overseas (such as motor vehicle repair information schemes in the United States and Europe, and spare parts requirements in Europe)*
 - should a positive obligation be applied across all product markets or targeted towards particular product markets? If so, which product markets, and why?*
 - should a positive obligation mandate access to all repair supplies or a subset of repair supplies (such as repair information, spare parts, or diagnostic tools)?*
 - how should a positive obligation be implemented and enforced in practice?*
-

DRAFT RECOMMENDATION 4.1 EVALUATE MOTOR VEHICLE INFORMATION SHARING SCHEME

The Australian Government should evaluate the Motor Vehicle Service and Repair Information Sharing Scheme that is designed to improve access to repair information, once it has been in operation for three years.

The evaluation should focus on compliance with the scheme, the costs imposed on manufacturers, the benefits to independent repairers and consumers, and any implementation issues that require changes to the scheme, including consideration of whether the scheme should continue.

Manufacturer warranties and their influence on repair

DRAFT FINDING 4.1 VOIDING WARRANTIES FROM INDEPENDENT REPAIR

Terms within manufacturer warranties that automatically void such warranties if non-authorised repairs are undertaken (including ‘warranty void if removed’ stickers) can deter consumers from using third-party repair during the warranty period. The Commission found examples of such terms in warranties for mobile phones, gaming consoles, washing machines and high-end watches.

Even where these terms do not exist, many consumers appear to be under the mistaken belief that their warranties will be void if they undertake third-party repair. They may also not be aware that consumer guarantees (that they are entitled to under the Australian Consumer Law) cannot be displaced by terms in warranties and are not extinguished due to independent repairs.

DRAFT RECOMMENDATION 4.2 ADDITIONAL MANDATORY WARRANTY TEXT

The Australian Government should amend r. 90 of the Competition and Consumer Regulations 2010, to require manufacturer warranties ('warranties against defect') on goods to include text (located in a prominent position in the warranty) stating that entitlements to consumer guarantees under the Australian Consumer Law do not require consumers to use authorised repair services or spare parts.

INFORMATION REQUEST 4.3 A PROHIBITION ON WARRANTY VOID TERMS

The Commission is considering recommending provisions similar to the Magnuson-Moss Warranty Act in the United States, which prohibit manufacturer warranties from containing terms that require consumers to use authorised repair services or parts to keep their warranty coverage. We are seeking feedback and evidence on the costs and benefits of this approach. In particular:

- would manufacturers respond by increasing product prices or making their warranties less generous? Would this latter change have any practical impact on consumers given they are also covered for defects under consumer guarantees?*
- how could such a prohibition be designed and communicated to ensure that consumers are aware that voiding terms are now prohibited?*
- how could the prohibition be designed to limit manufacturer liability for damage beyond their control? For example, the Magnuson-Moss Warranty Act permits warranty terms that limit manufacturer liability for damage caused by unauthorised repairs or parts, if they can demonstrate third-party fault.*

In a similar vein, should terms within end-user license agreements that purport to restrict repair related activities (discouraging third-party repair) also be prohibited? Is a disclosure as proposed under draft recommendation 4.2 sufficient or is a legislative prohibition required?

Intellectual property protections and repair

DRAFT FINDING 5.1 INTELLECTUAL PROPERTY-RELATED BARRIERS TO REPAIR

In Australia, evidence on the extent to which intellectual property protections restrict repair is patchy and largely anecdotal. Notwithstanding this, copyright laws that prevent third-party repairers from accessing repair information (such as repair manuals and diagnostic data) appear to be one of the more significant intellectual property-related barriers to repair.

DRAFT FINDING 5.2 OPTIONS TO IMPROVE ACCESS TO REPAIR INFORMATION

There are two main options to amend intellectual property protections to improve access to repair information.

- Amend the *Copyright Act 1968* to allow for the reproduction and sharing of repair information, through the introduction of a *fair use* exception or a repair-specific *fair dealing* exception.
- Amend the *Copyright Act 1968* to allow repairers to legally procure tools required to access repair information protected by technological protection measures (TPMs), such as digital locks. This may also require the Australian Government to clarify the scope and intent of the existing (related) exception for circumventing TPMs for the purpose of repair.

To reduce the risk of manufacturers using contractual arrangements (such as confidentiality agreements) to ‘override’ the operation of any such reforms, it may also be beneficial to amend the *Copyright Act 1968* to prohibit the use of contract terms that restrict repair-related activities otherwise permitted under copyright law.

INFORMATION REQUEST 5.1 IMPROVING ACCESS TO REPAIR INFORMATION

The Commission is considering recommending amendments to intellectual property laws to improve access to repair information through the options outlined in draft finding 5.2. It is seeking views on each option, in particular:

- *whether the proposed reform options will assist repairers in accessing repair information, and therefore facilitate third-party repair*
 - *what types of contractual arrangements that could override such reforms are most likely to be of concern*
 - *the costs, benefits and risks of pursuing each option.*
-

Product obsolescence and e-waste

DRAFT FINDING 6.1 PREMATURE OBSOLESCENCE IN AUSTRALIA

There is growing community concern in Australia and overseas that product lifespans are becoming unnecessarily short (premature obsolescence), with detrimental impacts on consumers and the environment.

Premature obsolescence is unlikely to be a significant problem in Australia.

- There is little evidence that manufacturers are intentionally reducing product lifespans.
- Consumers often choose to upgrade their products well before they come to the end of their useful life or break.

Additional policies to prevent premature product obsolescence (in the form of product standards or expanded consumer protection laws to address planned obsolescence) would be unlikely to have net benefits to the community.

Further views and evidence (in response to information request 6.1) will help clarify the potential net benefits of a product labelling scheme in Australia.

INFORMATION REQUEST 6.1 PRODUCT LABELLING SCHEME

The Commission is seeking further evidence on the significance of information gaps that might contribute to premature obsolescence, including:

- *the specific type of information gaps (such as on product repairability, durability, or the environmental impacts of products) that prevent consumers from making informed purchase decisions*
- *the significance of these information gaps (for example, the cost to consumers from obtaining information independently)*
- *evidence that these gaps are undermining the efficient operation of the market (for example, evidence that consumers are systematically overestimating product durability and repairability when making purchase decisions)*
- *whether these information gaps affect specific types of products more than others.*

The Commission is also seeking input on how government and industry might work together to design a product labelling scheme to maximise the net benefits to consumers and the community.

DRAFT FINDING 7.1 E-WASTE IS A SMALL BUT GROWING WASTE STREAM

Annual e-waste generation is growing relatively quickly (more than doubling by weight between 2009-10 and 2018-19), but is a small share (less than one per cent by weight) of total waste generated in Australia.

Information on e-waste is limited, but available data suggests that:

- the main sources of e-waste (by weight) over the past decade were tools, washing machines, air conditioners, small domestic appliances (such as adapters, irons and clocks), cooking appliances (such as food processors and grills), and cathode ray tube televisions
- solar panels and lithium-ion batteries are expected to generate growing quantities of e-waste over the coming decade.

Although e-waste contains some hazardous materials that can be harmful to the environment and human health, Australia's landfill management systems and regulations are generally effective in substantially reducing these impacts (particularly in newer and larger landfills).

DRAFT RECOMMENDATION 7.1 IMPROVING THE MANAGEMENT OF E-WASTE

The Australian Government should amend the National Television and Computer Recycling Scheme (NTCRS) to allow e-waste products that have been repaired or reused by co-regulatory bodies to be counted towards annual scheme targets.

The exact design features that need to be incorporated into the NTCRS to enable reuse options should be determined in consultation with the scheme's liable parties and co-regulatory bodies. The changes should be designed in a way that minimise any adverse incentives, including risks from:

- double-counting, where the same products cycle through the scheme without legitimately being reused
- unlawful exports for reuse that result in more products in the informal recycling sector, generating worse health and environmental outcomes.

Any future co-regulatory or mandatory product stewardship schemes should also include repair and reuse as options within their targets.

DRAFT RECOMMENDATION 7.2 USE OF GPS TRACKERS TO MONITOR E-WASTE EXPORTS

The Australian Government should amend the monitoring arrangements for the National Television and Computer Recycling Scheme so that global positioning system (GPS) trackers can be used to determine the end-of-life location of e-waste collected for recycling as part of the scheme. This should be done using a risk-based sampling approach that focuses on the types of products and supply chains that present the highest risk of unlawful exports or disposal of e-waste.

1 About this inquiry

Given enough time, most consumer products eventually stop functioning — they may break or fail, develop a defect, require maintenance (such as a replacement battery) or need a software update. At that point, repairing these products could enable their reuse, extending their lives and preventing their replacement.

In recent years, however, there have been growing concerns in Australia and overseas that repairs of consumer products are becoming progressively more difficult, resulting in costly and wasteful outcomes for both consumers and broader society. The difficulty of repair, at least in part, may reflect growth in the number of products that incorporate sophisticated (and miniaturised) technology — it is now commonplace for cars, fridges, and even coffee machines to have firmware and software embedded in them (as part of the Internet of Things). These technological advances have provided many benefits to consumers, but in some cases have also increased the cost and complexity of repairs. Other products have always been complex or required a high degree of technical skill to repair, such as mechanical watches.

Partly as a result of this complexity, consumers often have to rely on the original manufacturer of the product to fix or maintain their product, either directly or indirectly through a manufacturer-authorised repairer. Manufacturers are typically the main (and sometimes the only) provider of repair services for their products. This has contributed to widespread concerns that some manufacturers are using their dominant position in repair markets to restrict competition in repair markets, including by refusing to supply independent repairers (or owners) with the parts, tools and information they need to do repairs.

Relatedly, there are also concerns that the lifespans of everyday products are becoming unnecessarily short and that products are being discarded prematurely, contributing to wasted resources and the proliferation of ‘e-waste’. Some consumer groups claim that manufacturers are intentionally shortening product lives through software updates and design strategies that force consumers into buying new products (‘planned obsolescence’). Such claims are often made with respect to consumer electronics, particularly smartphones.

As a result of such concerns, there have been numerous calls for governments around the world to introduce a ‘right to repair’. In Australia, the ACT Minister for Consumer Affairs, Shane Rattenbury, noted that ‘the right to repair movement has been gaining momentum around the world. Legislative reforms are being introduced and strategies are being prepared’ (sub. 133, attach. A, p. 11).

1.1 The Commission's task

The terms of reference for this inquiry ask the Commission to ‘examine the potential benefits and costs associated with “right to repair” in the Australian context’ through a number of different frameworks. The Commission has also been asked to consider several specific issues during the course of the inquiry, including:

- regulatory barriers that prevent consumers from sourcing competitive repairs
- barriers and enablers to competition in repair markets
- the costs and benefits associated with regulated ‘right to repair’ approaches
- how intellectual property (IP) rights or commercially-sensitive knowledge interact with a right to repair
- the effectiveness of current arrangements for preventing product obsolescence and the proliferation of e-waste
- the impact on market offerings from any policy changes.

What is a ‘right to repair’?

Although there is no universal definition of a ‘right to repair’ (box 1.1), it typically relates to the ability of consumers to have their products repaired at a competitive price, by the repairer of their choice. No single policy alone would enable a right to repair, however — it involves a broad range of policies, including competition and consumer policies, IP protections, and product design and labelling standards.

The differing views on what a right to repair entails were reflected in the broad range of policy proposals put forward by inquiry participants, including:

- legal obligations on manufacturers to provide access to repair inputs (Abbas, sub. 34, p. 3; Marriott, sub. 16, p. 1)
- strengthening or extending the consumer guarantees under the Australian Consumer Law or similar warranty protections (GPA, sub. 27, pp. 7–8, 15–16; NFF, sub. 55, pp. 1, 5)
- changes to IP protections to facilitate information sharing and access to embedded software (McGrath, sub. 15, pp. 2, 11; Pirate Party, sub. 74, pp. 10–11)
- introduction of unfair conduct provisions to address manufacturer behaviours that prevent independent repair (ACCC, sub. 106, p. 5)
- minimum product design standards to improve durability and repairability (Barwon South West Group, sub. 33, p. 2; Scallan and Gertsakis, sub. 125, p. 16)
- product labelling for improved information about durability and repairability (Buckingham, sub. 22, p. 4; Norris, sub. 89, p. 1)
- tax incentives for consumers or subsidies for repairers (comment 93; Horan, sub. 11, p. 1; Lewis-Fitzgerald, sub. 75, p. 2; Transition Town Sunshine Coast, sub. 28, p. 1).

Box 1.1 Participant's views on a 'right to repair'

Several participants agreed with the Commission's definition in the issues paper, that a 'right to repair' relates to a consumer's ability to have their products repaired at a competitive price by the repairer of their choice (DRC, sub. 69, p. 1; GAMAA, sub. 58, p. 2; RA and AREMA, sub. 62, p. 5).

Other participants viewed the 'right to repair' as a focus on the removal of unnecessary barriers to repair, such as by ensuring that independent repairers and consumers have access to the spare parts, information and equipment needed to repair products, including access to embedded software in products. For example, the National Farmers Federation stated that:

The right to repair should serve a single purpose: to make illegal any barriers which prevent the owner of a product making repairs to that product themselves or using a contractor of their choice, where these barriers are not necessary to protect the legitimate commercial interests of the manufacturer or supplier. (sub. 55, p. 4)

A number of other stakeholders framed the 'right to repair' in environmental and ecological terms, where repairing and reusing products is a necessary ingredient for reducing waste and moving towards a 'circular economy'. For example, one submission noted that it 'should be defined as a consumer getting an economic incentive to shift behaviour towards repairing an item, away from wastefully disposing and purchasing new' (Hamilton, sub. 57, p. 2). Similarly, Karl May stated:

The concept of the right to repair has at its heart the widely agreed need to reduce the environmental damage being caused by our 'throw away' society, damage that begins at the raw material extraction stage, proceeds through the basic processing and manufacturing stages, and finally into the marketing, consumption and disposal stages, with all of the attendant wasteful packaging, transport, and energy costs. (sub. 129, p. 1)

Relatedly, some inquiry participants viewed the 'right to repair' as being about the ability of consumers to purchase products that are repairable and durable.

This right is a proxy for the planet we depend on, its health underpins all life. That needs to be the starting point as this is causal in the need for, not just repair but superior product design overall. It should be a right to not have shit products that degrade the Earth's natural capital, which we all depend on. (Scallan and Gertsakis, sub. 125, p. 3)

Other submissions took a broader approach, defining 'right to repair' to touch on several of these objectives at once. For example, the Australian Democrats suggested that the right to repair is:

... the right for a consumer, on their own or through a third party, to repair or upgrade the product they own with ease, for a fair price and with access to components required to undertake a work — with an emphasis of repair or upgrade over replacement. (sub. 100, part 1, p. 5)

Similarly, Professor Wiseman and Dr Kariyawasam took an overarching approach to the definition, putting the right to repair movement within an historical context:

... put simply, at the heart of the right to repair movement is recognition of the fact that legal, regulatory and policy reform is needed to rebalance the relationship between global and national manufacturers of digital (or smart) goods and machinery and the customers who buy those goods, to ensure that those consumers have reasonable access to the repair information and services, spare parts and tools that are necessary to keep those goods in good working order for reasonable product life spans. It also recognises that the inability to repair that consumers are currently experiencing is increasingly and globally important as countries transition to circular economies. (sub. 105, p. 3)

Some participants also encouraged the Commission to avoid defining a 'right to repair' at all, and to 'instead define the problems that most urgently need addressing and then look at best fit solutions, which may go beyond a "right to repair" in other countries' (CHOICE, sub. 126, p. 5).

Around the world, a wide range of reforms have also been connected to right to repair policies. Many of these changes have been concentrated in the United States (US) and the European Union (EU), which have taken different approaches — with the US approach focusing on consumer rights and competition issues, whereas the EU approach focuses more on resource management (box 1.2).

Repair rights are not unlimited or unconstrained

Like most other rights, a right to repair is not unlimited or unconstrained. As the Australian Law Reform Commission (ALRC) noted in its 2015 report *Traditional Rights and Freedoms — Encroachments by Commonwealth Laws*, that ‘it is widely recognised that there are reasonable limits even to fundamental rights’ (2015, p. 43).

One such limit is that a right to repair is not necessarily the same as an *obligation* to repair. Although more repairs may be beneficial to the environment, consumers make choices to repair their products by weighing up a range of other factors, including their preferences for newer products. Newer products may also contain fewer hazardous materials and have lower energy requirements as well, making the environmental consequences more ambiguous.

A right to repair will also be constrained by the cost of providing repairs, whether to manufacturers, consumers or others. As such, it is not always preferable or cost-effective for consumers to repair their products or to keep them going for as long as possible, nor desirable to require a manufacturer to provide repairs and support at *any* cost. As the ACCC noted:

In many circumstances it will not be reasonable or efficient to require a manufacturer to support a product for an indefinite amount of time. At some point it may be cost prohibitive for manufacturers to continue to support older products. What is ‘reasonable’ will be circumstance-specific and depend on a number factors such as what a reasonable consumer would expect for goods of that kind. (sub. 106, p. 4)

Relatedly, a right to repair may create tensions with other rights — as the ALRC noted, ‘important rights often clash with each other, so that some must necessarily give way, at least partly, to others’ (ALRC 2015, p. 43). For example, one consumer’s right to repair may conflict with another consumer’s ‘right’ to affordable products, such as if product durability requirements increase the costs of the original product (chapter 6). Similarly, a consumer’s right to repair their goods could infringe on a manufacturer’s right over their IP, or their right to not be held liable for the unreasonable actions of others, such as through claims under the warranty or consumer guarantees.

And some constraints on a right to repair may also be justified on other grounds — for example, it may be reasonable to limit a right to repair for those without adequate training or skills to repair products with a high safety risk, such as for gasfitters servicing hot water systems (chapter 4). Indeed, some participants suggested that a ‘right to repair’ should be contingent on the quality of the repairer (AIIA, sub. 127, p. 4).

Box 1.2 The ‘right to repair’ in the United States and Europe

United States (US)

In the US, much of the debate has focused on consumer and competition issues, particularly access to necessary spare parts, tools and information for consumers and independent repairers, and the tension this can create with intellectual property rights.

The term ‘right to repair’ originated in the state of Massachusetts, when it passed legislation for a motor vehicle ‘right to repair’ in July 2012, followed by a ballot initiative to strengthen the law later that year, which passed with overwhelming (86 per cent) support (Boston Globe 2012). The Act required manufacturers to give independent repairers the same diagnostic and repair information made available to dealers and authorised repairers, including diagnostic tools (Commonwealth of Massachusetts, *An Act Relative To Automotive Repair*, 2013, ch. 165).

In 2014, with multiple states considering similar legislation, a coalition of organisations representing motor vehicle manufacturers and repairers introduced a nationwide memorandum of understanding in the US, effectively replicating the Massachusetts policy across the country (Wiens 2014). In 2020, almost 75 per cent of the Massachusetts electorate voted in favour of a subsequent ballot initiative, expanding the state’s scheme to cover telematic systems that collect and wirelessly transmit mechanical and repair data (Galvin 2020, p. 4; Robertson 2020).

More broadly, over 30 US states have also been considering wider right to repair legislation for digital products, such as consumer electronics and agricultural machinery, although none has yet enacted such changes (The Repair Association 2021).

European Union (EU)

In Europe, a right to repair is more commonly associated with product design (both for repairability and durability) under the EU’s Ecodesign Directives, as well as resource management through the European Commission’s (EC) Circular Economy Action Plans. For example, from March 2021, household appliances are required to have selected spare parts available to professional repairers (and some parts for end-users) for a minimum period of seven or ten years (depending on the part), as well as repair and maintenance information. The requirements cover washing machines and washer-dryers (EU Regulations 2019/2023), dishwashers (2019/2022), refrigerators (2019/2019), and televisions and other electronic displays (2019/2021).

In March 2020, the New Circular Economy Action Plan committed the EC to ‘work towards establishing a new “right to repair” and consider new horizontal material rights for consumers’, such as access to spare parts, repairs and upgrading services (EC 2020b, p. 8). Much of the focus is on consumer electronics, including a right to update obsolete software, regulatory requirements for a common mobile phone charger, and expanded e-waste recycling schemes (EC 2020b, p. 10).

Since 2010, the EU has also had similar requirements to the Massachusetts ‘right to repair’ law (under EC and EU Regulations 715/2007, 692/2008, 595/2009 and 566/2011), providing ‘unrestricted and standardised access to vehicle repair and maintenance information to independent operators through websites using a standardised format ... in a manner which is non-discriminatory compared to ... authorised dealers and repairers’ (art. 6(1), EC Regulation 715/2007).

However, this relationship works both ways — a manufacturer’s actions may similarly (and sometimes disproportionately) infringe on a consumer’s right to repair their products. The Northern Sydney Regional Organization of Councils noted that an Australian right to repair:

... will need to balance the delicate relationships between consumer rights and producer requirements eg. IP, warranties, safety, performance. (sub. 117, p. 3)

Moreover, none of the constraints necessarily undermine the basic concept of a right to repair as a consumer’s ability to repair faulty goods, or access repair services, at a competitive price. And as the ALRC noted in its report, ‘much of the value of calling something a right will be lost if the right is too easily qualified or diluted’ (ALRC 2015, p. 44).

1.2 The Commission’s approach

In assessing the case for a right to repair in Australia, the Commission has taken a community-wide view, balancing the (sometimes competing) interests of consumers, manufacturers, retailers and repairers, to achieve the greatest benefits for the community as a whole (including the environment). This includes considering of the effects of policy intervention over time, such as on incentives for product innovation and on international trade. Where the Commission has established that a regulatory response to enable a right to repair may have merit, it has also endeavoured to demonstrate that any potential new regulation will deliver net benefits to the community.

A focus on unnecessary barriers to repair

As part of this community-wide approach, the Commission’s focus has been on whether there are any barriers to repair that may require a policy response. Not all impediments to repair require government intervention. For instance, high repair costs may discourage some consumers from repairing their products. Similarly, consumer attitudes and preferences for new products are likely to reduce the number of repairs. But neither of these automatically imply a role for government.

The Commission’s focus has instead been on any *unnecessary* regulatory or manufacturer-imposed barriers to repair that arise due to market failures or poor regulatory design. For example, market power, such as when a manufacturer has a monopoly over the repair of a product, can impede competition in repair markets and distort consumer decisions about whether to repair or replace their products. That said, strong competition in the primary market for the product may offset higher prices from a lack of competition in repair markets (chapter 4). Other forms of market failure relate to difficulties that consumers can face when seeking information — for example, in relation to the durability or repairability of products (chapters 3 and 6). Regulations can also pose a barrier to repair where they are poorly targeted or there are gaps in the arrangements.

The scope of products considered

Some inquiry participants suggested that the Commission should examine the concept of a right to repair for *all* products (LGNSW, sub. 97, p. 4), seeking to encourage additional repair across the entire economy. Other submissions listed broad categories that would, in effect, encompass almost all products, such as anything with a circuit board or made of plastic (ZWV, sub. 90, p. 2), or all consumer durables and devices with a power cord (ALGA, sub. 79, p. 2).

However, barriers to repair are not necessarily present across every product market. As one stakeholder noted, a right to repair is ‘likely to have different connotations in different industries and market segments’ (MD Solutions, sub. 41, p. 1), due to the unique circumstances of each market.

As such, the Commission has focused on some products and repair markets more than others, depending on where there appear to be barriers to repair and based on views raised during meetings and in submissions.

Overall, the Commission has focused primarily on repair services for *physical* products, given the inherent difficulty of ‘repairing’ intangible goods or services. To further narrow the scope of potential product markets to examine, the issues paper sought views from inquiry participants on the types of products that the Commission should consider, and also suggested a number of product characteristics that may be of most concern, which a number of participants agreed with.

- High-cost durable goods (such as motor vehicles, agricultural machinery and mechanical watches) require a significant and infrequent outlay to replace, making the consequences of barriers to repair costly and salient to consumers (AIIA, sub. 127, p. 6; Barwon South West Group, sub. 33, p. 2; NSROC, sub. 117, p. 4).
- Goods with proprietary technology, embedded software (or firmware), or that collect data (such as telematics) can blur the line between a physical product and an intangible good or service, and can have added repair complexities, justifying a particular focus on these types of products (GEOTAB Australia, sub. 61, p. 2; iFixit, sub. 107, pp. 10–11; LAQ, sub. 68, p. 4; McGrath, sub. 15, p. 3; Wiseman and Kariyawasam, sub. 105, p. 4).
- The proliferation and ubiquity of consumer electronics (including mobile phones and computers) mean that barriers to repair can generate broad-based harm, even if only minor in their individual impact (Australian Democrats, sub. 100, part 1, p. 5; CALC, sub. 119, pp. 4–5; East Waste, sub. 18, p. 3; iFixit, sub. 107, pp. 10–11).

Other participants suggested that, rather than focus on durable items with established (though possibly imperfect) repair markets, the Commission should instead focus on products that lack such a market at all, such as the ‘low-cost, short-life electrical and electronic products such as solar garden lights, power tools, toys, small appliances and portable consumer electronic devices (eg. cameras, wearables)’ (NSROC, sub. 117, p. 5). A number of other submissions agreed that these kind of small domestic electrical appliances should be a focus

for the inquiry (LG Electronics, sub. 38, p. 8; Repair Cafe Woolloongabba, sub. 42, p. 1; SA Repair Café Coordinators, sub. 46, p. 6).

A number of stakeholders suggested the Commission should also focus on the right to repair environmentally-damaging products, particularly those with hazardous materials, made from non-renewable or finite resources, or that contribute to the growth of solid waste or e-waste (Barwon South West Group, sub. 33, p. 2; City of Melbourne, sub. 20, p. 2; LGNSW, sub. 97, p. 5; WALGA, sub. 86, p. 2). For example, the Waste Management and Resource Recovery Association suggested that priority products for a right to repair should be those covered by a current or prospective product stewardship scheme (sub. 85, pp. 4–5). Another participant suggested that the Commission ‘should focus on consumer items that one sees in a typical local council clean-up’ (Hamilton, sub. 57, p. 2).

Rather than focus on products within scope for the inquiry, some participants instead focused on products that should *not* be in scope, for a number of reasons.

- Several manufacturers and industry associations suggested that their product and repair markets have no apparent issues, so should not be in scope. Examples included agricultural machinery (JDL, sub. 84, p. 1; TMA, sub. 111, p. 1), video game consoles (IGEA, sub. 103, p. 8), and a number of home appliances, such as fridges and air conditioning units (RA and AREMA, sub. 62, p. 5), gas appliances (GAMAA, sub. 58, p. 2) and water heaters (AWHF, sub. 94, p. 2; Dux Hot Water, sub. 21, p. 2).
- Other participants stated that motor vehicles should not be covered by the inquiry, as there is already a proposed information sharing scheme (chapter 4) (AADA, sub. 98, p. 5; Toyota, sub. 118, p. 2; Wiseman and Kariyawasam, sub. 105, p. 4).
- Some stakeholders also suggested that safety concerns from repairs mean that some products should be excluded — such as for medical and assistive equipment (ATSA, sub. 23, pp. 8–9; Stryker, sub. 87, p. 2).

However, the Commission did not exclude any particular product market from analysis, and instead sought to consider the veracity of concerns put forward in submissions with respect to particular product types, as well as the appropriateness of different policy responses to individual product markets, with an emphasis on products that align with the categories outlined above.

A guide to this report

The remainder of this report sets out the Commission’s draft findings and recommendations on a right to repair in Australia, and areas where it is seeking further information.

The next chapter looks at the nature of repair markets and how consumers make repair decisions, while chapter 3 examines the scope and limitations of existing rights to repair under the Australian Consumer Law.

Chapter 4 looks at the state of competition in different repair markets, including the nature of barriers to competition in repair markets, their justifications, and some possible policy options. Chapter 5 then explores the ways that IP can act as a barrier to repair, the evidence for this in Australia, and what the Government could do to address these barriers.

Chapter 6 looks at claims of, and evidence for, premature or planned product obsolescence, before chapter 7 examines current systems for managing Australia's e-waste generation, including the design of product stewardship schemes.

1.3 Conduct of the inquiry and further consultation

In conducting this inquiry, the Commission met with a range of individuals and groups across the country and around the world, representing manufacturers, retailers, consumers, repairers (both independent and authorised by manufacturers), waste managers, environmental groups, and a number of government agencies and policy experts. Following the release of an issues paper on 7 December 2020, we received 146 submissions from a wide range of interested parties, including numerous groups and individuals. The Commission also received 196 brief comments from interested parties.

The Commission greatly appreciates the contributions of everyone who provided input to the inquiry (appendix A).

This draft report sets out the Commission's preliminary analysis and draft findings and recommendations. It is provided to elicit further views and information, and to provide an opportunity for participants to raise any additional issues that should be considered for the final report.

The Commission welcomes written comment on this draft report, and will undertake further consultation (including public hearings) to facilitate feedback from participants. Submissions are due by 23 July 2021. Further information on how to provide feedback on the draft report is provided at the front of this report.

2 The Australian repair sector

Key points

- Many factors can influence a person's decision to repair or replace a product.
 - The price of repair and replacement is generally the most important factor. It tends to be more cost-effective to repair (rather than replace) more expensive products, such as cars, when they break. For less expensive items such as small household appliances, it is often cheaper to replace them.
 - Some products that have an investment purpose (such as mechanical watches) or a workhorse purpose (such as washing machines) are more likely to be repaired, whereas products that are fashionable or offer newer features (such as mobile phones and clothing) are more frequently updated (sometimes before they break).
 - Consumer preferences for new technology can make replacement more appealing, whereas some consumers who are concerned about the environmental impacts of consumption may prefer to repair their products.
 - Even if a consumer would prefer to repair their product, constraints such as the accessibility of repair and the repairability of the product can make repair impractical.
- Australia's repair sector experienced steady growth in revenue, the number of businesses and employment over the past decade, although this varies by industry.
 - Repairs of expensive products, such as motor vehicles and machinery, dominate the sector. This is likely in part because these products require ongoing maintenance, and repair is often only a fraction of the cost of replacement. These industries have grown over the past decade, reflecting increased demand for motor vehicles as well as mining and construction activity.
 - Repairs of relatively less expensive products, such as appliances and electronics, are a smaller portion of the sector. The electronics repair industry has shrunk over the past decade. This likely reflects falling prices for new electronics, rapid technological development, and consumer preferences for up-to-date products, making replacement attractive.
- There are challenges across repair industries that make repair less appealing.
 - Some repair industries face difficulties finding appropriately skilled workers, which is reflected by broader skills shortages across many trades in Australia.
 - Repair is becoming more complex and expensive, largely due to the increasing computerisation of products as well as the cost of labour, specialist tools and spare parts.
 - The price of new products is declining in some industries, such as appliances and electronics.

This chapter analyses how consumers decide to repair or replace products and describes the major repair industries in Australia. Section 2.1 provides a framework to examine the repair–replace decision faced by consumers and identifies some of the key factors influencing their decisions. Section 2.2 examines the Australian repair sector by industry and the drivers of industry trends.

2.1 To repair or replace, that is the question

The repair sector consists of repairers and consumers of repair services. Repairs can be conducted in several ways:

- in-house by a manufacturer
- by a repairer that is authorised by the manufacturer (‘authorised repairer’)
- by a third party, including ‘independent repairers’, community repairers and repair cafés (box 2.1), and consumers repairing their own products (‘Do it yourself’ (DIY) repairers).

Many manufacturers prefer that their products are repaired in-house or through an authorised repairer, and claim this is necessary to protect product quality because staff are trained appropriately and they use manufacturer-specified repair diagnostics, tools and spare parts (chapter 4).

During the short warranty period, manufacturers seek to reduce their risk and the complexity of administration and verification by ensuring only authorised repairers who have undertaken factory provided training perform the repairs and servicing. (McIntosh and Sons, sub. 24, p. 2)

Franchised new car [d]ealers receive ongoing factory training and are contractually obliged to use the latest [original equipment manufacturer] specified special tools, equipment and genuine parts. (AADA, sub. 98, p. 8)

Many manufacturers use authorised repair networks instead of, or in addition to, in-house repairs. Authorised networks can be used to service more consumers in more areas. Some repairers are authorised to conduct repairs on behalf of multiple manufacturers.

Both individuals and businesses are consumers of repair services. Consumers can repair and reuse, or discard and replace, a broken or faulty product. Sometimes, the decision is made by an insurer (as part of an insurance claim) or by the supplier or manufacturer (under a warranty or the consumer guarantees under the Australian Consumer Law) (chapter 3).

There is limited evidence of the rate of repair of consumer products in Australia, although one submission noted a moderate level of repair engagement:

In our recent survey of the Australian population, when asked generally about repair in the last year, more than 20% of Australians reported that they have never or rarely repaired products. (BehaviourWorks Australia, sub. 95, p. 4)

Box 2.1 **Community repairers are becoming more prevalent**

Community repairers are typically not-for-profit organisations where consumers can take their broken products to be repaired, either by volunteer repairers (such as in repair cafés) or by themselves (such as in community workshops). Other organisations, such as tool libraries, loan consumers the tools needed for repair. Community repairers are becoming more prevalent across Australia. The first repair café was opened in Sydney in 2014, and there are now over 40 repair cafés across Australia (Harari 2019; Repair Cafe Foundation 2021, p. 1). Some common items taken to these organisations include electronics, coffee machines, clothing, vacuum cleaners and clocks (Postma, de Boer and van Zeeland 2020, p. 3; Mend It Australia, sub. 101, p. 4).

Several organisations have reported high rates of repair success. For example, the Campbelltown Repair Café and the Darebin Repair Café reported success rates of 80 and 70 per cent, respectively (South Australian Repair Café Coordinators, sub. 46, p. 10; DRC, sub. 69, p. 1). However, electrical products tend to be less repairable than other products. Repair Café Hobart reported that 77 per cent of the unrepairable items presented to their café were electrical (sub. 14, p. 2). The Darebin Repair Café noted:

In our experience, electrical items outnumber others in demand — and sadly also in inability to repair. This stems to some extent from item design (planned obsolescence) but also from lack of availability of skilled repairers in this field. (sub. 69, p. 2)

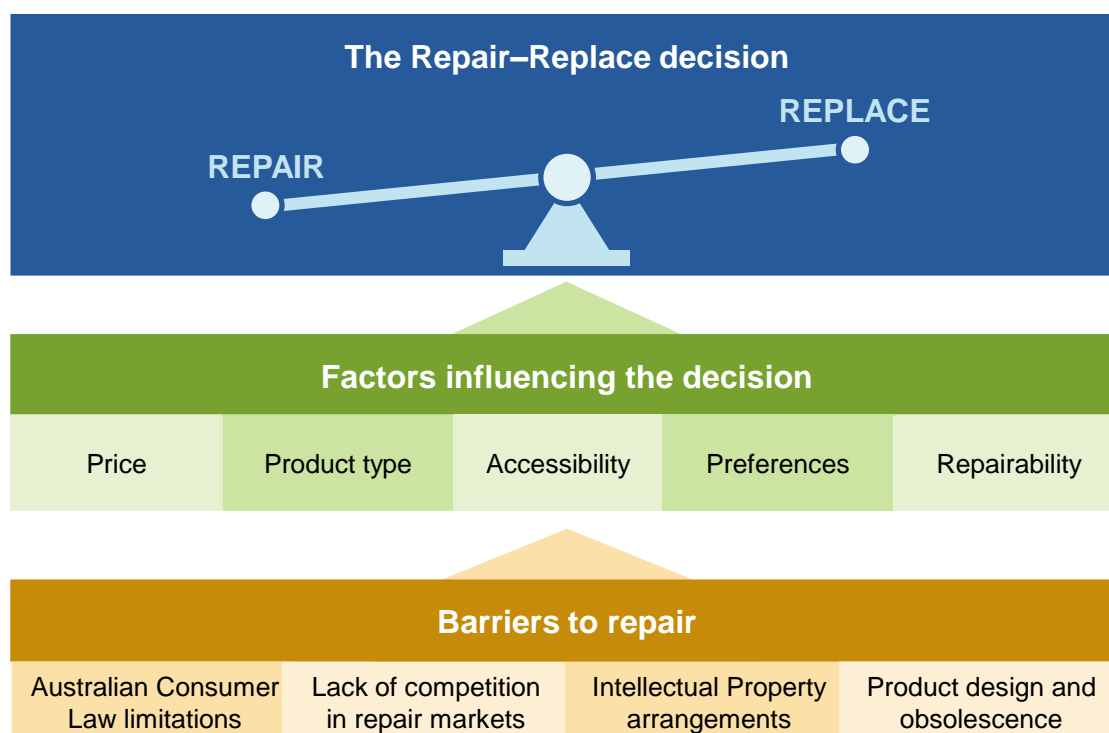
Indeed, analysis by the Repair Café International Foundation found that computers and laptops had a relatively low repair success rate of 45 per cent, compared with other products, such as clothing (89–96 per cent) and vacuum cleaners (63 per cent) (Postma, de Boer and van Zeeland 2020, p. 16).

Some repair organisations have indicated that they face barriers to repair. The South Australian Repair Café Coordinators reported that common barriers include poor product design, products that are unable to be dismantled, as well as repairs that require specialist tools and spare parts that are unavailable or prohibitively expensive (sub. 46, p. 7). Darebin Repair Café also noted barriers, particularly the ‘... lack of a required part or equipment or expertise, sometimes due to product design’ (sub. 69, p. 1).

The repair–replace decision can be simple, such as replacing an old, broken fridge with a newer, more energy efficient one. In other instances, it can be more complex, such as for a mobile phone with a faulty battery that is just beyond the warranty period. The decision to repair or replace can be influenced by many factors, including the price of repair and replacement, and consumer preferences for new technology (figure 2.1). However, potential barriers to repair can affect these factors by making repair less appealing.

While the focus of this inquiry is on consumers’ ability to repair broken or faulty products, it is important to note that in some cases consumers do not reach this decision at all because they replace their products before they break. Consumers tend to replace working products if they are inefficient, lack newer features, become obsolete, or are unfashionable (Hennies and Stamminger 2016, p. 73; Wieser and Troeger 2017, p. 11).

Figure 2.1 **Framework of the repair decision**



Many factors make repair less appealing to consumers

Consumers can compare many different costs and benefits that are associated with repairing and replacing a product. The price of repair relative to replacement is often a key consideration, particularly for consumers with low incomes. Other factors include product type, the accessibility of repair services, consumer preferences and product repairability:

As things stand, it is generally less rational — whether due to higher cost, more time, greater inconvenience, *or all three* — to repair something than to buy it new. By and large, the benefits to consumers of buying new and thus reinstating manufacturer warranties and enjoying broader consumer rights outweigh less immediate self-interests such as environmental costs or supporting local jobs. (GiveGet, sub. 35, p. 1)

The price of repair and replacement is often a major determinant of repair

The price of repair relative to the price of replacement is often the key factor influencing consumers' decisions (EC 2018, p. 11; Sabbaghi et al. 2017, p. 137). This can be the case even if a consumer would prefer to repair their product.

When the price of repair is a small fraction of the price of replacing a product, consumers are more likely to consider repair. For example, many types of repair to a new car will likely be less expensive than replacing the car, whereas the cost of repairing a toaster can be greater than replacing it (table 2.1). In the case of small domestic appliances, it is often less costly to simply replace them:

It is standard practice that we go to a mechanic to repair a broken car, but when it comes to white goods and devices, it is cost prohibitive to repair. (Horan, sub. 11, p. 1)

Consumers with lower incomes are more likely to repair their products, and consumers with higher incomes tend to be less motivated by the relative price of repair and replacement (especially for smaller, cheaper products) (McCollough 2007, p. 217, 2010, p. 198). Therefore, even though there are potentially many factors that consumers will consider in their repair–replace decision, they are ultimately constrained by their financial resources. Several stakeholders raised concerns about the cost of repairs for people on low incomes (for example, Carmichael, sub. 17, p. 1; South Australian Repair Café Coordinators, sub. 46, p. 3).

... the lack of access to reasonable repair prices results in individuals and families either needing to spend more money or do without necessary items. (Cooper, sub. 67, p. 1)

Table 2.1 Examples of the relative price of repair and replacement

<i>Product</i>	<i>Repair price</i>	<i>Price of replacement</i>	<i>Repair price as a per cent of replacement</i>
Two-slice toaster with a broken toasting lever.	One-hour repair may cost \$45 ^a (plus the cost of parts) if taken to a repairer.	Several popular toasters retail for \$50–70. ^b Kmart sells a toaster for \$7.50. ^c	64–600 per cent
iPhone 8 with a broken screen.	Screen repairs cost \$249 from an authorised Apple repairer ^d or \$110–149 from an independent repairer ^e .	A refurbished secondhand iPhone 8 costs about \$400. ^f An upgrade to an iPhone 12 Pro, costs \$1699 (for the minimum storage option of 128GB). ^g	28–62 per cent 6–15 per cent
2010 Toyota Corolla sedan with a damaged front.	The cost of panel beating may be \$2000–5000 plus the cost of parts ^h .	The market value is about \$5400–7100. ⁱ	28–93 per cent
2020 Toyota Corolla sedan with a damaged front.	As above.	The new price for a base automatic model is about \$29 000. ^j	7–17 per cent

Sources: ^a Schneider (2020). ^b The Good Guys (2021). ^c Kmart (2021). ^d Apple (2021i). ^e Aussie Mobile Phone Repairs (2021). ^f Dick Smith (2021). ^g Apple (2021f). ^h ServiceSeeking (2019). ⁱ Automotive Data Services (2021). ^j Toyota Australia (2021).

Consumers vary in their sensitivity to the relative price of repair to replacement. As repair prices increase, some consumers may be willing to pay more for a replacement product (Gershoff and Pereira 2010, p. 804). In a contrasting example, Apple (2019d) noted that iPhone sales were lower than anticipated in 2019 partly due to ‘some customers taking advantage of significantly reduced pricing for iPhone battery replacements’. And the older the product is, the less consumers are willing to pay for repairs (van den Berge and Thysen 2020, p. 17; Sabbaghi and Behdad 2018, p. 1).

Of course, consumers may decide to replace a product with a newer version, rather than a like-for-like replacement. Newer products generally offer additional features, efficiency and improved aesthetics (EC 2018, p. 11; Islam, Dias and Huda 2021, p. 9). For example, a new washing machine will likely have better energy efficiency, lower water consumption and a broader range of settings compared with a ten-year-old washing machine. Therefore, even if repair is cheaper than replacement, consumers must weigh up the benefits from upgrading.

In some cases, the price of repair and replacement does not influence a consumer’s decision. Products that are insured, under warranty or covered by guarantees under the Australian Consumer Law may not incur the full costs for repair or replacement (chapter 3). In these instances, the insurer or manufacturer may elect whether to repair, refund or replace the product and consumers may not have the choice of repair (depending on the nature of the fault).

Some products are less likely to be repaired than others

Different products are more or less likely to be repaired based on their characteristics and functions, with ‘up-to-date’ products less likely to be repaired compared with ‘workhorse’ and ‘investment’ products (table 2.2).

Table 2.2 Categorisation of consumer products

<i>Product category</i>	<i>Description</i>	<i>Examples</i>
Workhorse	Purchased for functionality and reliability.	<ul style="list-style-type: none"> • Washing machines • Vacuum cleaners • Dishwashers
Up-to-date	The product has important technological and/or fashionable features.	<ul style="list-style-type: none"> • Smart phones • Clothing and footwear • Housing décor
Investment	Products that are expensive, high quality, and purchased with an ‘investment’ mindset. This may mean that consumers expect the product to appreciate over time or that they plan to keep it for a long time.	<ul style="list-style-type: none"> • Higher-price appliances such as air conditioning units • High-end electric guitars • High-end watches • Dining furniture

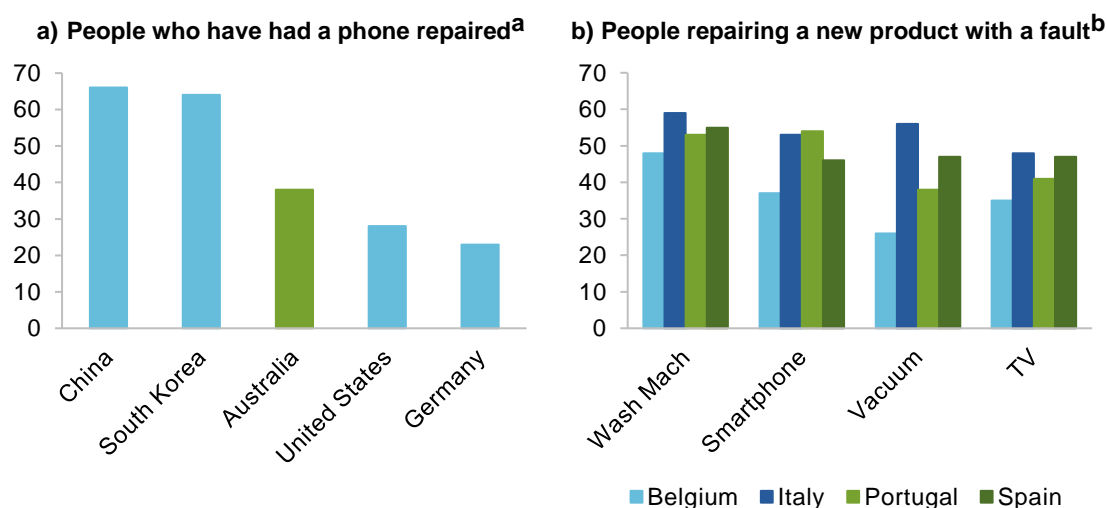
Source: Based on Brook Lyndhurst (2011, p. 4).

Up-to-date products (such as mobile phones and clothing) are more likely to be replaced before they break, because replacements are more technologically advanced or fashionable (Wieser and Troeger 2017, p. 4). When mobile phones break, however, the rate of repair varies. A study of Australian consumers found that about 38 per cent of participants had repaired a mobile phone, but this varies significantly across countries (figure 2.2, panel a). The rate of repair for mobile phones appears to be higher when the phone is new (figure 2.2, panel b). Younger Australians also appear more likely to use repair services for mobile phones compared with those aged over 65 (Mobile Muster 2020b, p. 15).

Some consumers may be open to repair for high-value workhorse products (such as washing machines and dishwashers) to extend the product's lifetime if it stopped working earlier than expected (Brook Lyndhurst 2011, p. 4). This is because it can be more cost-effective to repair, and due to the size of large appliances, calling out a repair technician may be more convenient. There are also installation costs for fixed products such as ovens, which adds to the cost of replacement. However, once workhorse products break down at the end of their expected useful life, many consumers will find replacement more economical (Brook Lyndhurst 2011, p. 72).

Investment products (such as air conditioning units) are more likely to be considered for repairs as they are often relatively expensive products to purchase, with long expected lifespans and expensive installation costs (Brook Lyndhurst 2011, p. 6). Some investment products, such as high-end watches, may even increase in value over time, making repair particularly appealing.

Figure 2.2 Rates of repair vary by country and product type
Per cent



^a Greenpeace survey of 1000 adults in each country. Data for Australia come from a Mobile Muster survey asking respondents: 'have you ever repaired a mobile phone?' ^b Survey asked respondents who acquired a new product and had a problem with it, whether they repaired it.

Sources: Greenpeace (2016, p. 2); Mobile Muster (2020b, p. 14); van den Berge and Thysen (2020, pp. 17–26).

Consumers can be deterred from repair if it is inconvenient or inaccessible

The accessibility and convenience of repair services can also influence the repair–replace decision (EC 2018, pp. 10–11; Perez-Belis et al. 2017, p. 268):

Consumers tend to be time poor and cost-sensitive — anything that takes a long time or costs more will result in less uptake of a repair option (over a disposal option). (Stein and Crosby, sub. 51, p. 3)

The effort required to arrange repairs can be a deterrent and some consumers may be unsure of how or where to get a product repaired (EC 2018, p. 11; Perez-Belis et al. 2017, p. 268). Consumers also incur time-related costs of repair. First, it may take time to get a product to and from the repairer (or post it, which incurs additional costs). Second, while a product is repaired, consumers often have to make do without it. This delay can be inconvenient if the product is used frequently (such as a washing machine or car) or relied upon for work (such as a laptop or mobile phone). In contrast, buying a new product may be more convenient.

Repair services can be limited or non-existent in regional areas. Smaller products, such as mobile phones, often need to be shipped to major cities, which increases the time and cost of repair. As larger products such as white goods cannot be easily shipped to a repairer at a low cost, the distance the repairer travels to reach a consumer may be reflected in the repair price. This means that people in remote areas can often expect to pay much higher prices for repairs. For example, Nous Group found that most repair and maintenance costs for public housing and appliances were 1.3–5.1 times higher in First Nations communities classified as ‘very remote’ compared with communities classified as ‘remote’ (2017, p. 22).

Consumer preferences for new products reduces their demand for repairs

Consumers can hold diverse preferences that influence whether they perceive repair to be worthwhile. Often, consumers have different thresholds to decide when an item needs repairing or replacing (van den Berge and Thysen 2020, pp. 7–8). Some consumers will continue to use a microwave with a broken light. Other consumers may update their mobile phone when they feel it is no longer fashionable — even if it still works. This might also be affected by the sentimental value or attachment that a consumer places on the product (EC 2018, p. 115). Consumers also face several biases in decision making that affect their consumption decisions (box 2.2).

In some instances, consumers decide to replace a broken product because they would prefer a new one. For example, a study of European consumers across several countries asked participants why they had chosen not to repair a product when it broke. For those who did not repair, a common reason was because they preferred a new product (20–47 per cent) or because they thought the old product was obsolete or unfashionable (20–30 per cent) (EC 2018, p. 86). These proportions were highest for up-to-date products such as clothing, mobile phones and televisions, and lower for workhorse products such as dishwashers and vacuum cleaners.

Further, some consumers replace products before they stop working. This tends to occur more for electronics (such as mobile phones, laptops and televisions), often because consumers are no longer satisfied with product features (such as performance or storage capacity) or they want a ‘better one’ (van den Berge and Thysen 2020, pp. 22–26; Islam, Dias and Huda 2021, p. 9). For example, a German study found that nearly one third of laptop and television owners discarded those products because they no longer liked them or were not satisfied with their features — this was substantially greater than owners of washing machines, kettles and hand mixers (Hennies and Stamminger 2016, p. 77). Indeed, rapid technological development of electronics over time has created significant benefits from replacing these products (section 2.2). Accordingly, the older products are, the less likely they are to be repaired (van den Berge and Thysen 2020, pp. 20, 23, 27; Prakash et al. 2020, p. 90).

When a consumer chooses to replace their product, the new product is often covered by a manufacturer’s warranty, which reduces a consumer’s perceived risk of the product breaking down. In contrast, consumers can be unsure how long a repaired item will last for, and some consumers might decide to replace a product if they lack confidence in the quality of repairs (Wieser and Troeger 2017, pp. 17–18).

Box 2.2 Behavioural biases can impact consumer decisions

When consumers decide whether to repair or replace a product, there are several potential biases that can affect this process.

- **Present bias:** consumers often prefer to receive a benefit now, discounting benefits received in the future. This can be rational if the benefits now outweigh the discounted future benefits (O’Donoghue and Rabin 1999, p. 103). However, present bias occurs when a consumer prefers a smaller benefit in the present than a larger discounted benefit in the future, to the detriment of their wellbeing in the future. For example, consumers may prefer to replace a product even if repair is more cost-effective in the long term.
- **Avoidable losses perceived as gains:** some consumers perceive repair as a loss because paying for repair only restores a product to its previous function. In contrast, the cost of repair may be avoided if consumers choose to replace the product. There is some evidence to suggest that the avoided repair price can be perceived as a gain, increasing willingness to pay for the replacement (Gershoff and Pereira 2010, pp. 804–805).
- **Framing biases:** the way that options are framed can impact consumer decisions. A study by Gershoff and Pereira (2010, pp. 804–805) found that when consumers were first asked whether they would repair a broken product, before being asked to select a replacement, they were willing to pay more for a replacement. In contrast, consumers who were given a range of repair and replacement options at the same time were willing to pay less for replacement, because it had been framed as one of many options rather than as a loss to be avoided.

There are circumstances in which consumer preferences favour repair. Consumers that have had a previous positive repair experience are more likely to consider repair again next time (Wieser and Troeger 2017, p. 18). There is also some evidence that consumers who have environmental concerns are more likely to repair a broken product or buy a secondhand product (EC 2018, p. 10). However, while many consumers suggest they are willing to make

environmentally-friendly choices such as repairing, buying secondhand or leasing products, in practice the fraction of consumers who have done this is often much lower (EC 2018, p. 10).

Not all products are repairable

Even when consumers prefer to repair a broken product, not all products are repairable, which makes replacement a necessary outcome. For example, van den Berge and Thysen found that, after price, one of the most common reasons for replacing products (such as washing machines, televisions, vacuum cleaners and mobile phones) was because repair was not possible or spare parts were unavailable (2020, pp. 17–26).

Some product types are more difficult to repair than others. Highly complex products — such as electronics, vehicles and machinery that use complex software — can be more difficult to repair (Sabbaghi et al. 2017, p. 146). Product complexity can also make it difficult to identify faults in the first place (Wieser and Troeger 2017, p. 18).

Lack of available repair inputs — such as tools, parts, software and manuals — can also make repair difficult. For example, Darebin Repair Café noted that:

Not all items brought to the Repair Café can be repaired on-site — generally this would be due to lack of a required part or equipment or expertise, sometimes due to product design. (sub. 69, p. 1)

The availability of spare parts (and their price) is a key factor that can affect whether repair is worthwhile, or even possible (Sabbaghi et al. 2017, pp. 138–139). Spare parts can be especially challenging for independent and DIY repairers to access (chapter 4). Indeed, analysis by the Repair Café International Foundation found that the most common reason for unsuccessful repair in repair cafés was due to a lack of spare parts (Postma, de Boer and van Zeeland 2020, p. 3). The availability of spare parts is largely driven by the cost to manufacturers to make and store spare parts, which can be high and becomes less cost-effective for less common parts (such as in older products) (Liu et al. 2014, p. 1170). This reflects the difficulties that some stakeholders have faced in sourcing spare parts for older products (WALGA, sub. 86, p. 2).

Product design can also make repair difficult (chapter 6). For example, products can be difficult to take apart or their design can prevent components from being separated out for repair. Some stakeholders have raised concerns that some products are held together with glue rather than screws or have components soldered together, which makes them difficult to disassemble. For example, iFixit noted that:

The overall trend in the smartphone industry is toward integrated batteries that are glued down and difficult to remove safely, thin designs that require complete disassembly in order to replace the screen, and thin components that are very challenging to remove without damage during disassembly. (sub. 107, p. 12)

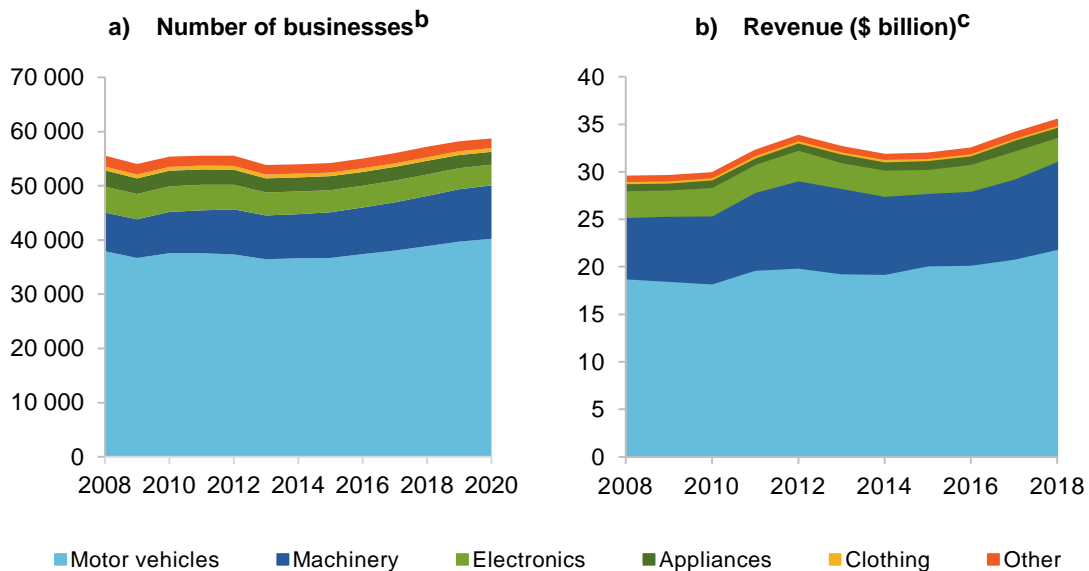
Organisations such as iFixit provide repairability scores and repair information and tools for some consumer products (chapter 6).

2.2 Snapshot of the Australian repair sector

The Australian repair sector has grown moderately over time

Australia's repair sector performs repair and maintenance for households and businesses across a range of industries, including motor vehicles, machinery, appliances and electronics.¹ In 2018, there were about 57 000 repair and maintenance businesses in Australia and over 203 000 workers (figure 2.3, panel a; ABS 2020b). This suggests that each business employs three to four workers on average.

Figure 2.3 Australia's repair sector has grown moderately^a



a Year end June. **b** Number of businesses operating at the end of the financial year. **c** Inflated to 2017-18 dollars using average CPI for financial years for the following groups in order: Maintenance and repair of motor vehicles; All Groups; Audio, visual and computing media and services; Major household appliances and Small electric household appliances; Cleaning, repair and hire of clothing and footwear; All Groups.

Sources: ABS (*Counts of Australian Businesses, including Entries and Exits*, 2011–2021, Cat. no. 8165.0; *Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata).

The repair sector made up just one per cent of total sales revenue across all business sectors in 2018 (ABS 2020c). It generated about \$35 billion in revenue in 2018 (figure 2.3, panel b), contributing about \$14 billion to Australia's gross domestic product (GDP) (once production costs are included) (ABS 2020c). By comparison, Australian manufacturing accounted for about 12 per cent of total sales revenue and contributed about \$106 billion to GDP (ABS 2020c).

¹ Data in this report generally uses the following ANZSIC codes for each industry: Motor vehicle – General repair and maintenance (Class 9419); Motor vehicle – Crash repair (9412); Motor vehicle – Electrical repair (9411); Machinery (9429); Appliances (9421); Electronics (9422); Clothing (9491); Other (9499).

The sector has also grown moderately over the past decade (figure 2.3). Sales revenue increased by about 1.9 per cent per year on average between 2008 and 2018. However, different industries face varying trends. The sector remains dominated by motor vehicle repair — which makes up 62 per cent of revenue and has grown by 1.5 per cent per year on average between 2008 and 2018. The fastest growing sectors are machinery and appliance repairs, for which revenue has grown about 3.7 per cent per year on average over the same period. Yet, revenue growth in these industries masks differing trends: the number of machinery repairers has grown over the past decade, whereas the number of appliance repairers has declined. In contrast to other industries, revenue in electronics repair has declined by about 1.2 per cent per year on average.

These trends broadly align with the factors influencing the repair–replace decision, particularly the importance of price and product type (section 2.1). For example, they show that most repair activity and growth comes from industries with more expensive products (such as motor vehicles and machinery) which tend to require ongoing maintenance and repair.

The rising price of repairs is a common challenge across all repair industries. The price of repair is affected by several factors, particularly labour (box 2.3) and the cost of spare parts:

... the general consensus is that for large home appliances, for instance, nearly half of the cost of the service of defective products goes to the repairman. The figures further show that for large appliances, such as fridges and washing machines, 37% of the average price for repair is the cost of spare parts; 16% goes to transport and 5% are listed as other costs. (CESA, sub. 25, p. 2)

This can make repair less appealing to consumers. As noted by Ai Group:

Repairs are often financially unattractive. Repair is labour-intensive compared to original manufacture, the productivity of repairers has not increased in line with the productivity of manufacturers, and Australia has high labour costs. (sub. 32, p. 2)

The remainder of this section provides a snapshot of the major repair industries and examines their underlying trends. It is important to note that the data used in this section have some limitations (box 2.4).

Box 2.3 Wages and skills shortage in the repair sector

Repair tends to be a labour-intensive process. Wages for repair and maintenance workers in Australia grew at about one per cent on average per year for the past decade, similar to the industry average (figure below). Rising wages increase the cost of repairs, reducing their appeal.

Many repairers need licenses to operate. For example, repairers typically need to be licensed to repair gas appliances. In some cases, repairers also need a specific repair licence, such as auto repairers in New South Wales and Western Australia (Australian Government 2015, pp. 2–11).

Some stakeholders have suggested that it is difficult to find appropriately skilled workers in repair industries (for example, CESA, sub. 25, p. 5; Ai Group, sub. 32, p. 6):

The appliance repair industry is suffering a skills shortage both locally and globally. Often in many regional centres of Australia there is very limited or no repair facility and manufacturers are forced to apply 'Non-repair' remedy for customers ... (LG Electronics, sub. 38, p. 12)

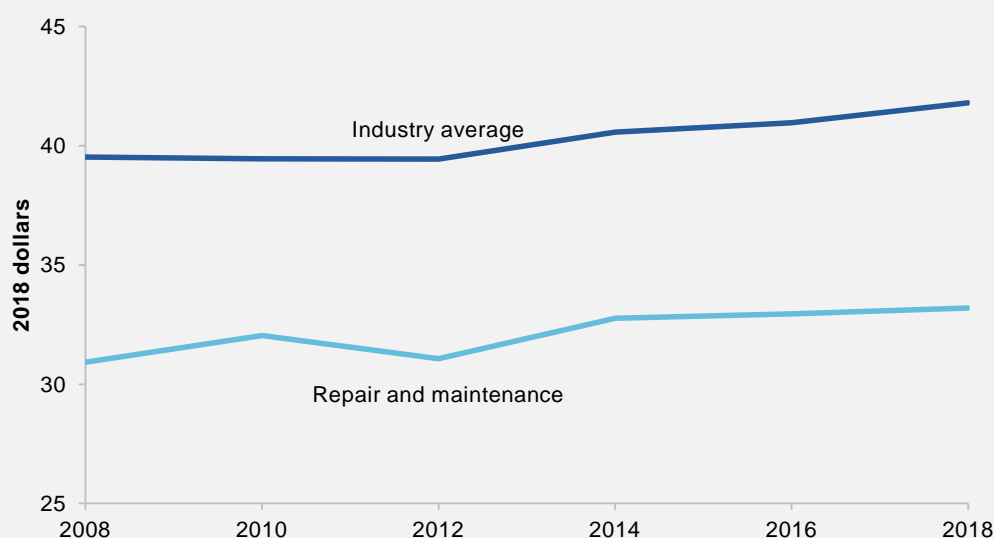
However, this likely reflects broader skills shortages and labour market issues faced by many trades in Australia. For example, there are national skill shortages for occupations such as electrical and mining engineering, automotive electricians, motor mechanics and general electricians (DESSFB 2019, pp. 1–3).

Some industries, such as electronics, also face declining demand for repairs which may reflect consumer preferences for replacement.

In our experience, most consumers will choose a new product instead of a repair. This will significantly reduce the volume of repair work for service technicians — the impacts of which would be devastating for a sector that is already struggling. (CESA, sub. 135, p. 2)

Some overseas repair sectors face similar challenges. For example, in the United States, the repair industry has difficulty attracting younger workers (McCollough 2010, p. 188) and high labour costs has subdued demand for repairs (Sabbaghi et al. 2017, p. 137).

Average hourly ordinary time cash earnings^a



^a Inflated to 2018 dollars using the wage price index for ordinary time hourly rates of pay excluding bonuses for: 'other services' for repair and maintenance; and 'all industries' for industry average.

Sources: ABS (*Employee Earnings and Hours, Australia, May 2018*, Cat. no. 6306.0; *Wage Price Index, Australia: All WPI Series: Original (Financial Year Index Numbers) February 2021*, Cat. no. 6345.0).

Box 2.4 **Data limitations**

The Commission's industry analysis used publicly available data (where possible) and the ABS Business Longitudinal Analysis Data Environment (BLADE) dataset, which contains individual business-level information (such as tax and other administrative data). While this produced a high-level overview of industry trends, it has some limitations. The data:

- do not identify if a business is an authorised or independent repairer
- include both repair and maintenance activities (maintenance is often required on products that have physical moveable parts, such as motor vehicles)
- likely exclude some repair activity undertaken by manufacturers or self-repair. This is because the Australian and New Zealand Standard Industrial Classification system separates repair from manufacturing or retailing activities, meaning that in some cases, in-house repair activity by manufacturers is captured under their primary industry (such as manufacturing). Therefore, the data are likely to focus on repair that is conducted by authorised and third-party repairers whose primary business is repair and maintenance
- for sales revenue exclude GST
- do not always exactly reflect similar ABS publications due to methodological differences. For example, some publications for employment numbers rely on survey data, whereas others rely on administrative data.

Motor vehicle repair is the largest repair industry in Australia

The motor vehicle repair industry makes up the largest share of repair and maintenance activity in Australia. The industry performs a range of work, including:

- general repair and maintenance (such as brake repair and routine servicing)
- crash repair (such as body, paint and interior repair)
- electrical repair (such as air conditioner and car radio repair).

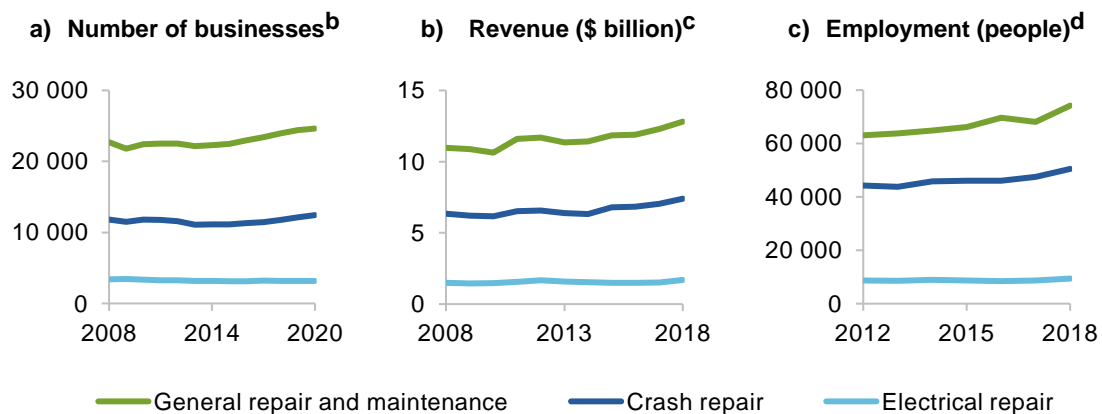
There were about 40 000 motor vehicle repair businesses in 2020 (figure 2.4, panel a), which represents the greatest share of all repair sector businesses (figure 2.3, panel a). Most businesses are small independent repairers — estimates suggest there are seven independent repairers for every dealership (AAAA 2016, p. 11). Mycar (formerly Kmart Tyre and Auto) is one of the larger motor vehicle repair chains, operating over 250 independent service centres across Australia that provide servicing, repairs and tyre services (IBISworld 2020g, p. 32; Mycar 2021). Independent repairers typically repair older vehicles for major out-of-warranty repairs (including smash repairs), whereas dealerships tend to repair and service newer vehicles including those under warranty (AAAA 2016, p. 11; Colmar Brunton 2017, p. 46). Dealerships typically have contractual arrangements with a vehicle manufacturer, which provides them with training, tools and parts (AADA, sub. 98, p. 8).

Motor vehicle repairs generated about \$22 billion in total revenue in 2018 (figure 2.4, panel b). General repair and maintenance contributed the most to this revenue

(\$12.8 billion), followed by crash repair (\$7.4 billion) and electrical repair (\$1.7 billion). The industry also employed over 134 000 people in 2018 (figure 2.4, panel c).

The motor vehicle repair industry has grown at a steady pace over time (figure 2.4). This likely reflects several factors. First, motor vehicles tend to be mechanical products that require ongoing maintenance and repair over time. Second, being more expensive products, it tends to be more cost-effective to repair rather than replace cars (section 2.1). Finally, Australia's new car fleet has grown steadily at about 1.6 per cent each year from 2007 to 2017 (ABS 2018), which leads to growing demand for repair and maintenance services. In the wake of the COVID-19 pandemic, prices for used cars have increased by over one third due to strong demand and production constraints for new cars (Gray 2021; Hope 2021), which may increase demand for motor vehicle repairs and maintenance.

Figure 2.4 Motor vehicle repair grew steadily^a



a Year end June. **b** Number of businesses operating at the end of the financial year. **c** Inflated to 2017-18 dollars using average CPI for financial years for Maintenance and repair of motor vehicles. **d** Includes employees and owner managers of enterprises (substantial quality improvement in industry information for the latter group in 2017-18 means comparison with previous years should be made with caution).

Sources: ABS (*Counts of Australian Businesses, including Entries and Exits*, 2011–2021, Cat. no. 8165.0; *Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata; *Jobs in Australia*, 2017-18, Cat. no. 6160.0).

The motor vehicle repair industry is also facing some challenges. Repair is becoming more complex as vehicles become increasingly computerised and differentiated (ACCC 2017b, pp. 39, 94). This often means that specialist diagnostic and repair tools are needed to conduct repairs, and this equipment can be costly (IBISworld 2020g, pp. 18, 31):

Empirical evidence indicates the automotive value chain is facing the most severe technology disruption of any sector in Australia's economy. A major issue is the rise in the number of new automotive technologies, the advancement and the acceleration e.g., digitisation, automation and electrification. (MTA Queensland, sub. 80, p. 3)

There is some concern that this may cause issues for independent repairers if they are unable to access the necessary repair inputs (chapter 4).

Despite moderate growth in the number of vehicle repairers, the Australian Competition and Consumer Commission noted that there has been some consolidation in the number of dealerships (2017b, p. 39). This mostly reflects the acquisition of dealerships by other, larger dealerships to increase economies of scale and profitability. This places pressure on smaller repairers to invest in equipment, information and training to service new vehicle models in order to compete. Similarly, there has been some consolidation in smash repair businesses, due to price competition from repair contracts with insurers (IBISworld 2020f, p. 12).

Capped-price servicing arrangements and extended warranties may also pose a challenge to independent repairers (IBISworld 2020g, p. 30). Capped-price servicing is offered by some dealerships to give new car owners a pre-arranged price for servicing at the authorised dealership (ACCC 2017b, p. 39). Extended warranties (either purchased or included in the purchase price of a new car) extend the duration of the manufacturer's warranty (ACCC 2012), such as the 10-year extended warranty offered by Mitsubishi (chapter 4). These arrangements can make it more difficult for independent repairers to compete for those customers. However, these arrangements can benefit vehicle owners through more certainty of ongoing repair and maintenance costs when they purchase a new car.

Machinery repair has experienced relatively strong growth

The machinery repair industry is the second largest industry in the repair sector (figure 2.3). This industry primarily conducts repair and maintenance on industrial products, including:

- agricultural machinery (such as tractors and harvesters)
- construction machinery (such as excavators and graders)
- mining machinery (such as drills and crushing equipment).

There were nearly 10 000 machinery repair and maintenance businesses in 2020 (figure 2.5, panel a). There are limited data on the split between third-party and authorised repairers in this industry, but it likely varies depending on the type of machinery. For example, some mining machinery repair and maintenance is performed on-site by a contracted team (Minprovis 2018; MMSA n.d.), whereas agricultural machinery repair is often performed by either an authorised dealership or independent repair business:

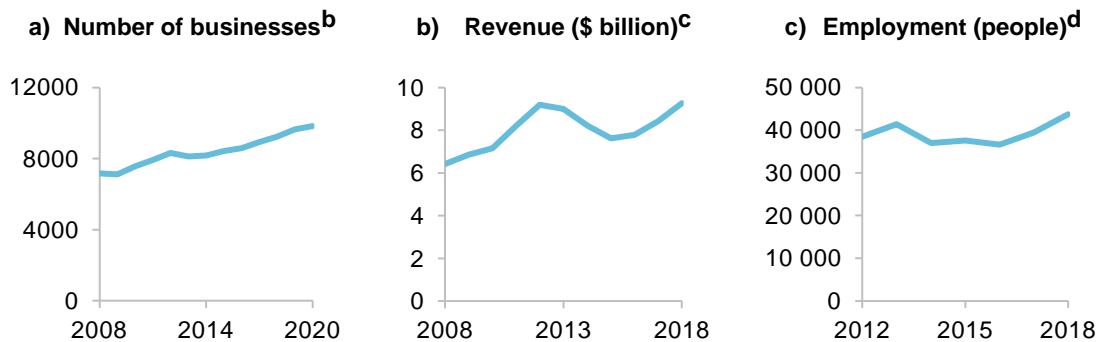
While machines are under warranty, the majority of servicing and most repairs are conducted by the dealer that sold the machinery. These functions tend to be performed more frequently by the owner of the machinery or an independent business once the warranty has run out, although survey results indicate that dealers continue to be heavily utilised (ACCC, sub. 106, p. 7).

One of the largest companies in the industry is Seven Group Holdings Limited, owner of WesTrac, which distributes Caterpillar machinery and provides repair and maintenance for construction and mining equipment (IBISworld 2020d, p. 32).

The machinery repair industry has grown over the past decade (figure 2.5). For example, revenue has grown at an average of 3.7 per cent per year over this period, to about

\$9.3 billion in 2018 (figure 2.5, panel b). And the number of workers in the industry has grown to about 44 000 people in 2018 (figure 2.5, panel c).

Figure 2.5 Machinery repair has grown faster than most other repair industries over the past decade^a



a Year end June. **b** Number of businesses operating at the end of the financial year. **c** Inflated to 2017-18 dollars using average CPI for financial years for All groups. **d** Includes employees and owner managers of enterprises (substantial quality improvement in industry information for the latter group in 2017-18 means comparison with previous years should be made with caution).

Sources: ABS (*Counts of Australian Businesses, including Entries and Exits*, 2011–2021, Cat. no. 8165.0; *Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata; *Jobs in Australia*, 2017-18, Cat. no. 6160.0).

The relatively strong growth in machinery repair is partly explained by growth in mining and construction activity. The industry is made up of roughly equal parts maintenance and repair (figure 2.6, panel a) and about half of the revenue in the industry is generated by mining and construction users (figure 2.6, panel b). Mining activity increased significantly between 2005 and 2012 and has remained strong (PC 2017b, p. 93). The construction industry has experienced strong growth, with an average revenue growth of five per cent each year over the past decade (ABS 2020c).

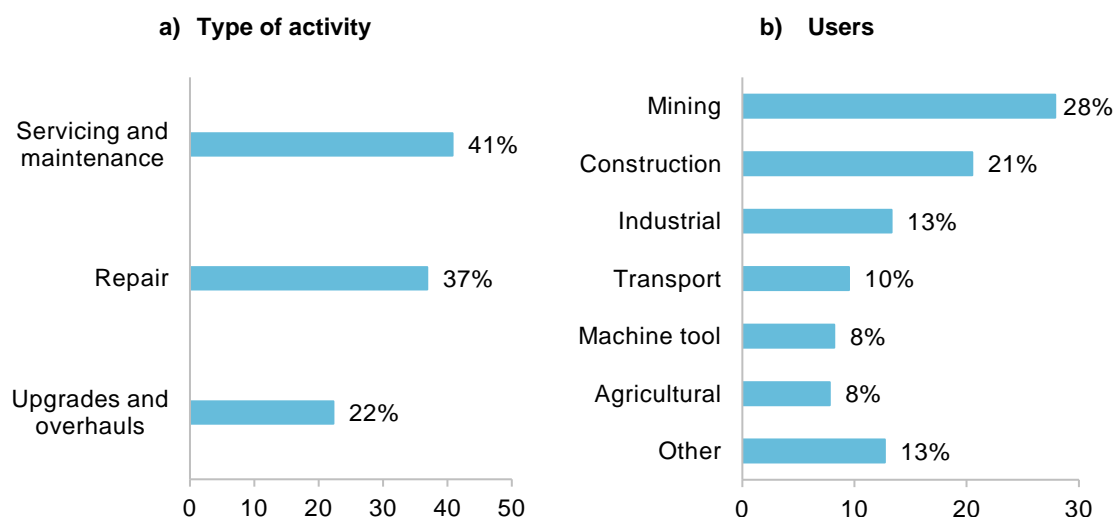
The agricultural sector has experienced increasing consolidation (PC 2016b, p. 478) and is transitioning towards more complex and expensive machinery that is increasingly automated (Wu et al. 2019, pp. 17–18). This also creates demand for routine maintenance and repair of valuable machinery.

The high replacement price of mining, construction and agricultural machinery means that, similar to motor vehicles, repair is often a small fraction of the cost of replacement (section 2.1). These products are often used for highly specialised purposes, making replacement relatively impractical and/or time-consuming.

While growth in machinery repair is strong relative to other repair industries, it faces a common challenge of finding workers with the appropriate skills to service machinery that is often highly sophisticated (IBISworld 2020d, p. 38). As the complexity of machinery increases over time, it is likely that this shortage will continue.

Figure 2.6 Machinery repair includes significant maintenance activity

Per cent^a



^a May not sum to 100 per cent due to rounding.

Source: IBISworld (2020d, pp. 19, 21).

Appliance repair is a small part of the repair sector

The appliance repair industry primarily conducts repair and maintenance on domestic appliances (for households and businesses), including:

- white goods (such as fridges and washing machines)
- appliances (such as toasters and microwave ovens)
- heating and cooling units (such as air conditioning and hot water units)
- entertainment products (such as televisions and stereos).

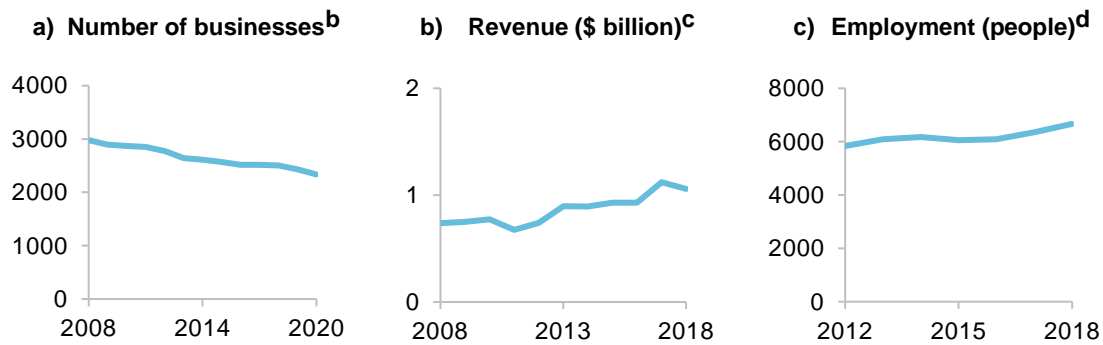
The appliance repair industry is primarily made up of small businesses (IBISworld 2020b, pp. 22–23). One larger independent appliance repair company is Woolley Appliance Services Pty Limited, which employs about 35 technicians across two sites in Melbourne (IBISworld 2020b, p. 32; Woolley Appliance Services 2021).

Appliance repair makes up a small proportion of all repair activity in Australia — about three per cent of total repair revenue in 2017-18 (figure 2.3). The industry has experienced stronger growth in the past ten years in terms of revenue and employment (relative to other repair industries), but there has been some consolidation in the number of businesses (figure 2.7).

Most appliance repair revenue comes from repairing household kitchen and laundry appliances (figure 2.8). These larger and more expensive appliances (such as fridges, ovens

and stoves) have mostly increased as a proportion of industry revenue over time (IBISworld 2020b, pp. 18–19), likely because the price of replacement is high compared with less expensive appliances, such as kettles and toasters (section 2.1).

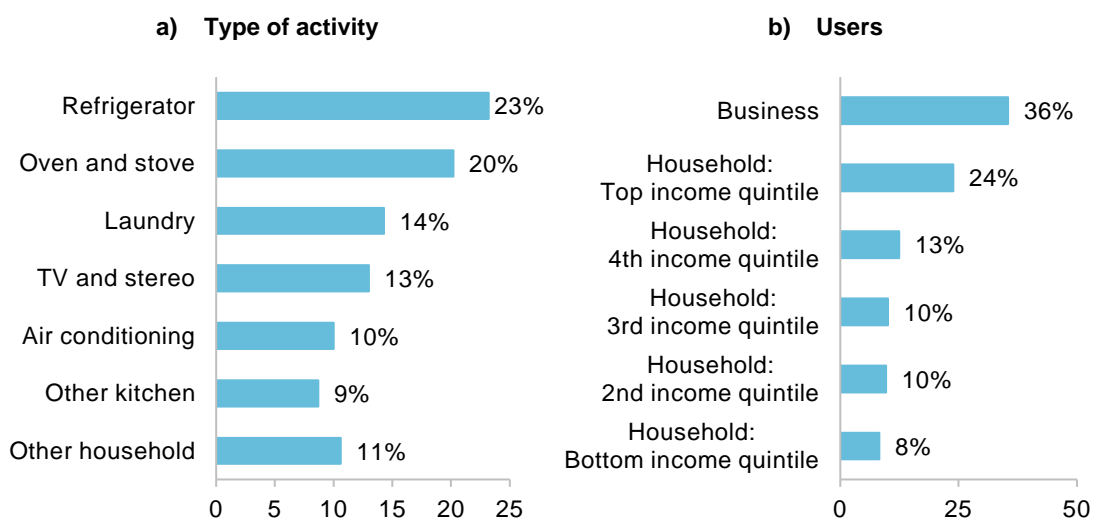
Figure 2.7 Appliance repair performance has been mixed^a



a Year end June. **b** Number of businesses operating at the end of the financial year. **c** Inflated to 2017-18 dollars using average CPI for financial years for Major household appliances and Small electric household appliances. **d** Includes employees and owner managers of enterprises (substantial quality improvement in industry information for the latter group in 2017-18 means comparison with previous years should be made with caution).

Sources: ABS (*Counts of Australian Businesses, including Entries and Exits*, 2011–2021, Cat. no. 8165.0; *Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata; *Jobs in Australia*, 2017-18, Cat. no. 6160.0).

Figure 2.8 Appliance repair is concentrated towards larger appliances
Per cent^a



^a May not sum to 100 per cent due to rounding.

Source: IBISworld (2020b, pp. 17, 20).

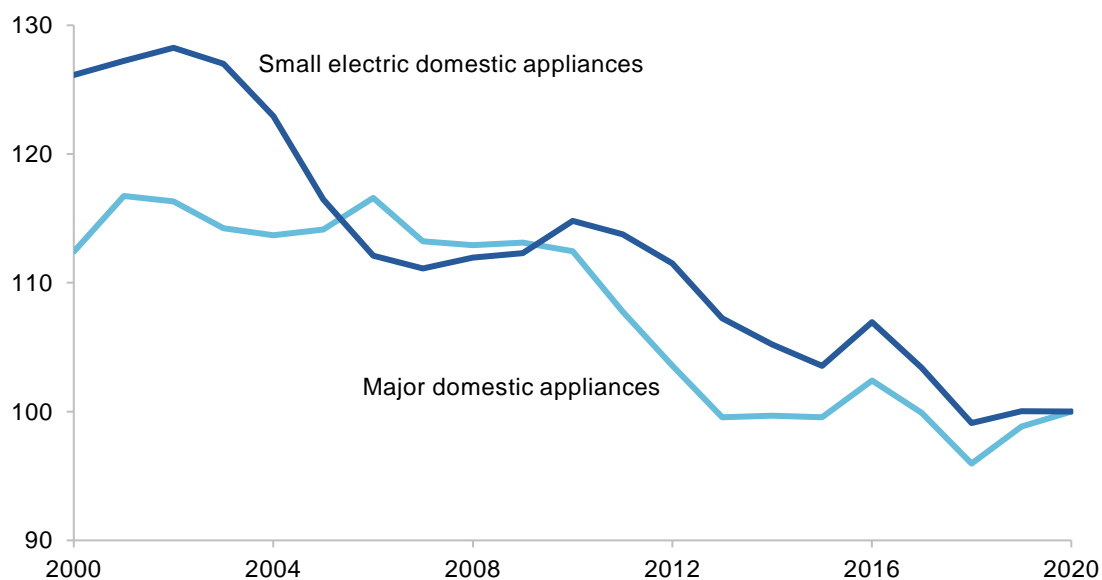
The appliance repair industry also faces several challenges. The price of new appliances has decreased significantly over time, which makes replacement more appealing (figure 2.9). In contrast, wages for repair technicians continue to grow (box 2.3), which contributes to the rising cost of repair. The effects of these trends are likely more acute for inexpensive appliances such as toasters and kettles:

... many small items such as kettles and toasters are thrown away because it is cheaper and easier to buy another one rather than repair it. (Repair Café Woolloongabba, sub. 42, p. 1)

This may reflect different labour costs between the production of new products overseas and the labour costs for Australian repair technicians:

[unlike] major appliance costs, technician costs have broadly kept up with inflation, changing the balance on when an appliance is not economical to repair. (Wilson, sub. 78, p. 3)

Figure 2.9 The price of new appliances has fallen
CPI^{a,b}



^a Index numbers use the following CPI expenditure classes: Major domestic appliances is CPI Major household appliances; Small electric domestic appliances is CPI Small electric household appliances.
^b Average CPI for financial years.

Source: ABS (*Consumer Price Index, Australia*, December 2020, Cat. no. 6401.0, Table 7).

Inquiry participants have also suggested that the industry faces challenges in finding employees with the appropriate skills to repair appliances:

In the 90's there were a whole industry of skilled technicians that repaired white goods which have all but disappeared. (comment 169)

I see thousands of home appliances from other manufacturers come in to our warehouses, many only a few years old being relegated to the scrap heap because they cannot be repaired due to a shortage of parts and service personnel making them uneconomical to repair. (Cole, sub. 9, p. 1)

The electronics repair industry is in decline

The electronics repair industry conducts repair and maintenance on a range of computer, electronic and precision equipment, including:

- consumer electronics (such as mobile phones, computers and gaming devices)
- medical and diagnostic equipment (such as ultrasound and x-ray machines)
- other professional electronics (such as laboratory and navigation equipment).

Electronics repair makes up a relatively small part of the Australian repair sector — accounting for seven per cent of total repair revenue in 2018 (figure 2.3).

One of the largest electronics repairers is Geeks2U Proprietary Limited which provides independent on-site repair and maintenance services (IBISworld 2020a, p. 34). Another company in this industry is Cabrini Health Limited, which provides medical equipment repair and maintenance (Cabrini Health Ltd 2020).

Many consumers appear to use independent repairers for their electronics. One study found that 63 per cent of Australians who purchased electronics in the past two years have used an independent repairer to repair their products (Wiseman, pers. comm., 2 February 2021). Another study found that in the case of mobile phones, 67 per cent of Australian consumers have used independent repairers compared with 29 per cent having used the manufacturer (Mobile Muster 2020b, p. 15).

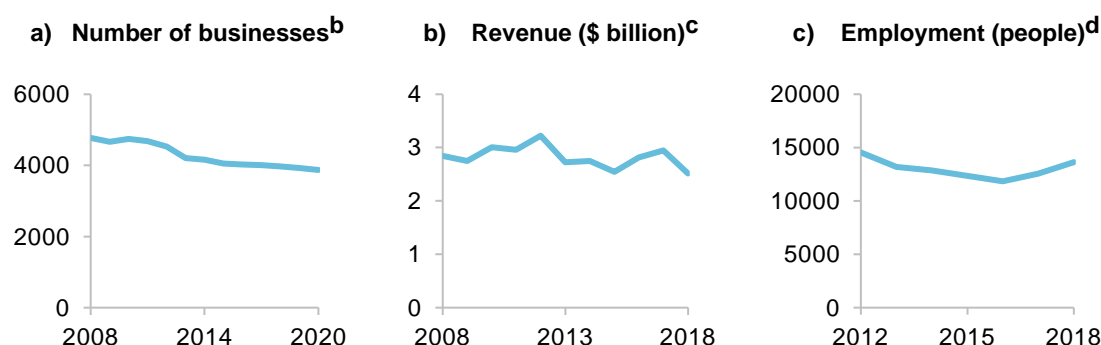
Despite steady demand growth for new electronic products in Australia (IBISworld 2020a, p. 14), the electronics repair industry has declined over the past decade in terms of revenue, the number of businesses and the number of workers (figure 2.10). This pattern is also common to the United States consumer electronics repair market:

Consumer electronics are turning into consumable devices nowadays, and consumers generally show little inclination to repair broken products due to the lack of repair infrastructures and relatively high repair costs. (Sabbaghi et al. 2017, p. 137)

The decline in the electronics repair industry is partly explained by the price of repair relative to replacement for many electronics products. The price of new electronics such as mobile phones and computers has fallen significantly over time, whereas the price of repair (including labour costs) has remained steady (figure 2.11, panel a), making replacement relatively more affordable.

Further, electronic products have experienced rapid technological development over the past decade (figure 2.11, panel b), providing additional features over time and replacing a variety of other products. For example, computers and smart phones have amalgamated telephones, diaries, cameras, calculators, notepads, radios, alarm clocks and many more products.

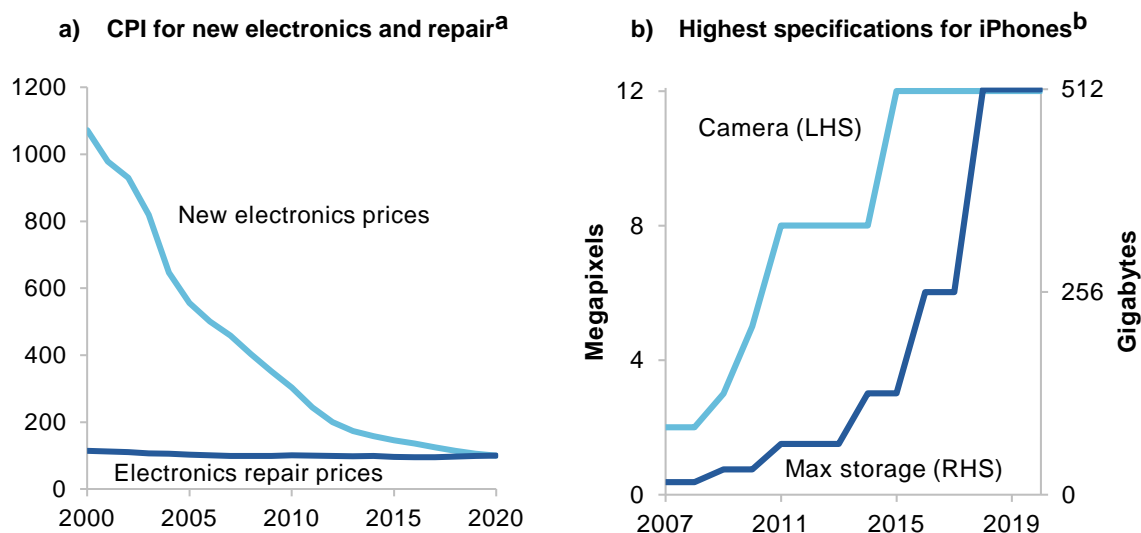
Figure 2.10 Electronics repair has been shrinking^a



a Year end June. **b** Number of businesses operating at the end of the financial year. **c** Inflated to 2017-18 dollars using average CPI for financial years for Audio, visual and computing media and services. **d** Includes employees and owner managers of enterprises (substantial quality improvement in industry information for the latter group in 2017-18 means comparison with previous years should be made with caution).

Sources: ABS (*Counts of Australian Businesses, including Entries and Exits*, 2011–2021, Cat. no. 8165.0; *Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata; *Jobs in Australia*, 2017-18, Cat. no. 6160.0).

Figure 2.11 Falling prices of new electronics, steady repair prices and rapid technological development makes replacement more appealing



a New electronics prices: CPI Audio, visual and computing equipment. Electronics repair prices: Audio, visual and computing media and services. Average CPI for financial years. **b** Using the highest specification for storage and camera megapixels for each year of iPhone releases since 2007.

Sources: ABS (*Consumer Price Index, Australia*, December 2020, Cat. no. 6401.0, Table 7); Apple (2008, 2009, 2014, 2015, 2019a, 2019b, 2019c, 2020a, 2020b, 2020c, 2021g, 2021j, 2021h); Eadicicco (2019); Hasnain (2021), Heisler (2015).

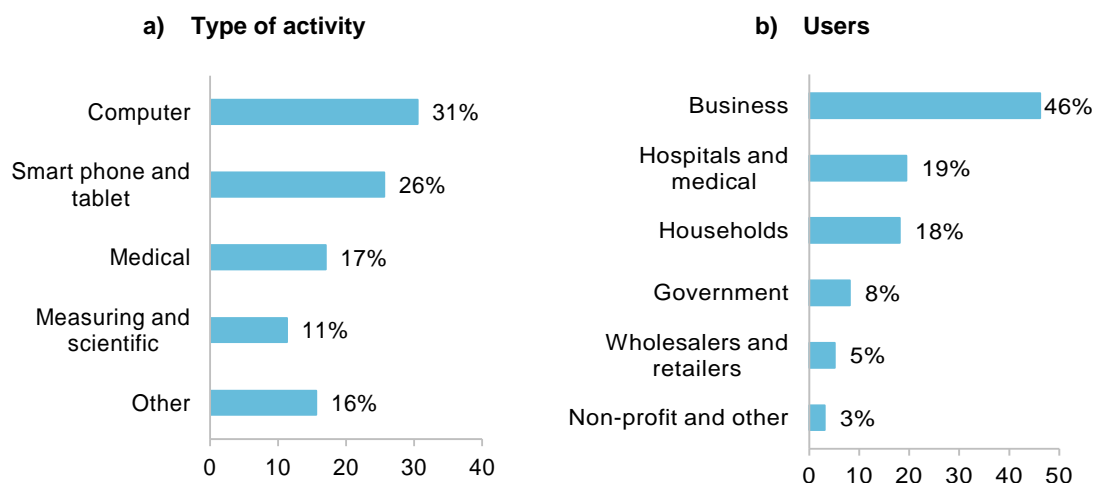
The decline in electronics repair may also be explained by business trends. Most industry revenue comes from repair and maintenance of computers, small electronic devices and medical equipment, and almost half of all users are commercial businesses (figure 2.12).

However, some businesses have adopted in-house repair services for their electronics, which has reduced demand for third-party repair services (IBISworld 2020a, p. 10). Other businesses have taken up leasing arrangements for electronic equipment, which often includes free product maintenance (IBISworld 2020a, p. 14).

Consistent with the wider repair sector, there also appears to be a shortage of electronics repairers (box 2.3). The Consumer Electronics Suppliers Association stated that in the consumer electronics sector it is difficult to identify and locate suitably qualified professional repairers (sub. 25, p. 5).

Figure 2.12 Most electronics repair activity comes from businesses

Per cent^a



^a May not sum to 100 per cent due to rounding.

Source: IBISworld (2020a, pp. 20, 23).

DRAFT FINDING 2.1 THE AUSTRALIAN REPAIR SECTOR

A consumer's decision to repair or replace a broken product is principally driven by price. Convenience, product reparability and consumer preferences for up-to-date products can also be important.

The repair sector accounts for about one per cent of all business revenue in Australia and has grown modestly over the past decade.

- Most repair activity (revenue, number of businesses and workers) comes from industries with more expensive products, such as motor vehicles and machinery, that require regular maintenance and where repair is often more cost-effective than replacement.
- There was less activity in repair industries for less expensive products, such as electronics and appliances, where replacement tends to be more attractive. This is likely due to the relatively low and falling prices of these products over time, rapid technological development, and consumer preferences for new and up-to-date products.

The repair sector faces several challenges

While the Australian repair sector has grown moderately, it faces several challenges.

Some challenges are common across all repair industries. The steadily rising cost of labour and spare parts is increasing the price of repairs relative to replacement. And the increasing computerisation of products, from cars to kettles, can make repair more difficult.

Other challenges are likely to affect some industries more than others. For example, rapidly falling real prices of new electronics, technological development and consumer preferences to update their devices, has likely contributed to the declining activity in the electronics repair industry.

While these challenges may act as barriers to repair, they are not necessarily problematic. For example, falling prices of new products benefits households, particularly lower-income earners, and reduces costs for businesses.

However, other barriers to repair may exist that are either unnecessary or lead to inefficient outcomes in which the cost of the barrier outweighs the benefits, or where there are significant negative impacts that are not accounted for in the price of the product. Subsequent chapters of this report examine these potential barriers and distortions in-depth.

- Chapter 3 examines whether there are limitations in Australian consumer protections that create barriers to repair, such as by limiting the ability for consumers to access repair or replacement under consumer guarantees.
- Chapter 4 assesses whether there are competition constraints in repair markets that create barriers to repair, such as by limiting the ability of independent repairers to compete, thereby increasing the price of repair services and reducing the choice of repairers.

-
- Chapter 5 considers whether the legal and technological measures that manufacturers use to protect their intellectual property impose barriers for repairers (including barriers affecting access to repair information and spare parts).
 - Chapter 6 examines product design and obsolescence and its impacts on consumers and the community.
 - Chapter 7 discusses the proliferation of e-waste, which can in part be a consequence of barriers to repair.

3 Repair rights in consumer law

Key points

- The Australian Consumer Law (ACL) provides consumers with considerable statutory rights to obtain a remedy (repair, replacement or refund) for defective products through consumer guarantees.
- The consumer guarantees are comprehensive and generally work well but participants have raised some concerns about their ability to exercise their rights when their product is faulty or breaks, including because:
 - there is a lack of clarity about what is considered a reasonable period of product durability, which can create uncertainty about whether guarantees apply
 - spare parts are not always available for consumers to repair their products, and there is a lack of clarity about how long parts and repair facilities should be made available
 - consumers can have difficulty exercising their rights when guarantees are not complied with, particularly for higher value products such as cars.
- Improvements to how guarantees are applied would help to address some of these concerns and enhance consumers' ability to obtain a repair, replacement or refund.
 - Greater clarity of product durability could be achieved by the Australian Competition and Consumer Commission developing and publishing estimates for how long products could reasonably be expected to last without fault. Such estimates should be a guide, developed in consultation with State and Territory ACL regulators and consumer and business groups.
 - State and Territory Governments should introduce alternative dispute resolution mechanisms to better resolve complaints about the consumer guarantees.
 - Australian Governments should enable designated consumer bodies to lodge 'super complaints' on systematic issues relating to consumer guarantees, with such complaints to be fast tracked and responded to by the Australian Competition and Consumer Commission.
- In addition, requiring manufacturers to provide software updates for a reasonable period could provide clarity for consumers that they are covered by the consumer guarantees and enhance their access to repair, replacement or refund.
 - The Commission seeks information on whether consumers are experiencing problems using their products due to a software fault or lack of updates, and on the likely benefits and costs of requiring manufacturers to provide updates for a reasonable time.

Consumers have rights to a number of remedies (including repair in some circumstances) under the consumer guarantees framework in the Australian Consumer Law (ACL). This framework provides protections against defective products, guarantees relating to the quality of products, and a requirement that spare parts and repair facilities are made available for repairs.

This chapter examines how effective the consumer guarantees framework is in facilitating access to repairs and whether it could be improved. Overall, the Commission has found that consumer guarantees are comprehensive and operating reasonably well, but there is scope to improve how they function in practice. The reforms proposed in this chapter would enhance consumers' ability to have their products repaired, in particular by providing greater certainty about when consumers are able to seek a remedy (repair, replacement or refund) when their product fails. Greater enforcement options for regulators would also improve the practical functioning of the consumer guarantees by providing consumers with increased access to remedies.

While the changes discussed in this chapter would benefit consumers by providing them with greater access to repair (as well as refund and replacement), they would not necessarily substantially increase the amount of repair activity, due to other factors that influence decisions to have products repaired, such as the cost of repair relative to replacement and people's preferences for new over repaired products (chapter 2). This reflects that a right to repair is not necessarily the same as an obligation to repair (chapter 1).

3.1 Australian consumer law and repair

Consumer policy in Australia is aimed at improving consumer wellbeing by fostering effective competition and enabling the confident participation of consumers in markets in which both consumers and suppliers trade fairly and in good faith. And while competition between firms leads to a more dynamic and efficient economy and promotes consumer wellbeing, in some circumstances, competition alone may be insufficient to deliver these benefits.

Consumers can face information gaps (or information overload) about products, which can lead to poor decision making, and there can be social costs associated with some consumer choices (PC 2008, p. 28). These can lead to potentially costly decisions for consumers (such as eating unsafe food or using unsafe products). Further, information asymmetries open opportunities for businesses to limit or distort information available to consumers — leading to the potential for further harm, such as higher prices and reduced product quality and choice (Bruce 2014, p. 14).

The ACL (box 3.1) attempts to address these problems with laws that: regulate suppliers' and manufacturers' behaviour (misleading or deceptive conduct, unconscionable conduct, unfair contract terms); require the provision of certain information (for safety); ensure product standards (health and safety standards); and support consumer purchases (consumer guarantees), among others.

This chapter focuses on consumer guarantees. Other policies are also relevant to support competition, consumer rights and wellbeing, including the competition policy provisions set out in the *Competition and Consumer Act 2010* (Cth). These are discussed in chapter 4.

Box 3.1 **Australian Consumer Law — provisions and regulators**

The Australian Consumer Law (ACL) is set out in a schedule of the *Competition and Consumer Act 2010* (Cth). It is a single generic consumer protection law, operating as a law of the Commonwealth and in each State and Territory.

The ACL provides a system of protections and remedies for consumers in relation to consumer guarantees, misleading or deceptive conduct and unconscionable conduct, unfair contract terms, product safety, and sales practices. Each State and Territory has additional consumer protections, including in relation to electrical product safety, the operations of motor vehicle dealers and the licensing of tradespeople (PC 2017a, p. 4).

In adopting the ACL, the Commonwealth, State and Territory Governments agreed to retain their own consumer regulators to administer and enforce it. Consequently, there is a ‘one-law, multiple-regulator’ model (PC 2017a, p. 3).²

At the Commonwealth level, the Australian Competition and Consumer Commission (ACCC) administers and enforces the ACL, with the Australian Securities and Investments Commission enforcing the parallel provisions for financial services. The ACCC generally focuses on systemic issues that have national implications and does not engage in individual dispute resolution, conciliation or mediation (PC 2017a, p. 6). The Australian Small Business and Family Enterprise Ombudsman provides assistance to small businesses in dispute with other businesses (ASBFEO 2021).

State and Territory ACL regulators, often referred to as Consumer Affairs or Fair Trading agencies, typically address problems specific to their jurisdictions, including undertaking conciliation and other actions to resolve particular consumer disputes (PC 2017a, p. 6). In some States and Territories, the Small Business Commissioner (where one exists) can play an active role in helping small business operators resolve disputes with other businesses, including consumer guarantees (VSBC 2016, p. 1).

Consumer guarantees

Consumer guarantees are the primary set of rights under the ACL that affect product repairs. Guarantees automatically provide consumers with a range of protections when they purchase a product (with some exceptions, discussed later). Among other things, they require manufacturers and suppliers to guarantee that the products they sell are of acceptable quality (s. 54) (including that they are reasonably durable) and meet any extra promises made in warranties about performance, condition and quality (box 3.2), such as lifetime guarantees, and money back offers (s. 59). Manufacturers are also required to have spare parts and repair facilities available for a reasonable period (s. 58) and suppliers are required to guarantee that the products they sell are fit for any disclosed purpose (s. 55).³

² There is also an array of consumer regulations specific to particular products, markets and industries, such as the Food Standards Code. A range of bodies administers and enforces these specialist regimes, however, State and Territory Governments can also have responsibility for enforcing some specialist regulation (PC 2017a, p. 28).

³ Suppliers are also required to guarantee that the consumer has full title and ownership of the product, and that the product does not carry any hidden debts or extra charges.

Box 3.2 Different types of warranties

An **express warranty** promises that a product will do something, for example, a chair can hold up to 100 kilograms (CAANZ 2016b, p. 30).

A **manufacturer's warranty** (warranties against defects) is a voluntary promise offered by the manufacturer about what it will do if something goes wrong with the product. It is a time-limited warranty against defects, and usually requires the supplier to repair or replace the product or provide compensation to consumers (ACCC 2021j). The claim period for a manufacturer's warranty varies but is usually based on a number of years. While warranties are offered voluntarily, they become a right that can be enforced under the consumer guarantees once the product is purchased (ACCC 2021j). A manufacturer's warranty must be expressed in reasonably plain language, clearly presented and include the mandatory text (ACCC 2021j).

A key difference between a manufacturer's warranty and an express warranty is that one states what the supplier or manufacturer will do if a problem occurs (manufacturer's warranty) while the other states what the product will do (express warranty).

An **extended warranty** is an optional product that consumers can purchase in which the warranty provider generally agrees to repair or replace, or cover the cost of repairing or replacing, the good, if a defect occurs within a specified time period (Treasury 2018b, p. 77).

Extended warranties are largely viewed as products extending repair assurances offered under manufacturer warranties, sometimes commencing at the expiry of a manufacturer's warranty (effectively a form of insurance). Consumer entitlements under extended warranties are separate to the rights available under the consumer guarantees and cannot be excluded. Further, consumer guarantees may still apply during the period of an extended warranty.

When guarantees are not met, consumers are entitled to a refund, replacement or repair by the supplier or manufacturer of the product. However, the option to choose repair rests with the supplier or manufacturer, not the consumer. If the product has a 'minor' failure, the *supplier* can choose between a replacement, refund, or repair.⁴ For a 'major' failure (s. 261), *consumers* can choose between a replacement or refund (s. 259).⁵ A repair is not a legal obligation in the event that a consumer elects to reject a product on the grounds of a 'major failure' to comply with one or more consumer guarantees. However, repair may in some circumstances be a cheaper option for a supplier or manufacturer, so a consumer who has a preference for repair may choose to accept that where offered.

CHOICE noted that the consumer guarantees generally provide 'strong protections for repair and other fair remedies for defective goods' (sub. 126, p. 14). They also noted that Australian

⁴ The ACL does not use the term 'minor'; it only makes reference to a failure that is 'major' and 'not major'. However, 'minor failure' is commonly used for simplicity in circumstances where a failure is not major (Commonwealth of Australia 2013, p. 2).

⁵ A product has a major failure (s. 260) when: a reasonable consumer would not have bought the product if they had known about the problem; it has multiple minor problems that, when taken as a whole, would have stopped someone from buying it if they had known about them; it is significantly different from the sample or description; it is substantially unfit for its common purpose and cannot easily be fixed within a reasonable time; it does not do what the consumer asked for and cannot be easily fixed within a reasonable time; or it is unsafe.

consumer protections are much ‘stronger’ in comparison to some other countries, such as the European Union (which only offers a minimum two-year guarantee).

The Commission has taken a neutral approach to considering how consumer guarantees affect consumers’ ability to obtain a repair. That is, the focus is on removing any unnecessary barriers or distortions to repair, rather than mandating a hierarchy that preferences repair over replacement or refund. While such a hierarchy may align with some groups’ objectives (such as environmental objectives of preventing the proliferation of e-waste through product repair and reuse) it does not always align with consumer preferences (and may remove consumer choice and risk consumers getting stuck in a cycle of repairs) (CHOICE, sub. 126, pp. 14-15). Such a hierarchy may also unnecessarily increase costs for manufacturers and suppliers, which may ultimately be passed onto consumers. Further, there may be more effective and efficient ways of addressing external costs associated with individual consumption choices, such as policies that manage the costs to the community from the waste generated by the disposal of consumer products (chapter 7).

The remainder of this chapter examines several issues related to consumer guarantees, which have been identified in the course of this inquiry, including whether:

- the definition of a consumer should be extended to cover purchases of agricultural machinery
- there is sufficient clarity regarding how long consumers can expect to exercise their rights under the consumer guarantees
- consumers lack reasonable access to spare parts and repair facilities under the consumer guarantees
- there is a need to strengthen access to redress options to help consumers access their rights under guarantees.

3.2 Consumer definition: a barrier to repair?

A broad definition of a consumer

The ACL defines a ‘consumer’ broadly, providing protection for individuals purchasing products for their personal or household consumption, as well as for some business transactions. A person is considered to have purchased a particular product as a consumer if:

- the purchase price is less than \$40 000 (increasing to \$100 000 from July 2021)⁶ or
- the product is purchased for personal, domestic or household use or
- the product is a vehicle or trailer purchased to transport products on public roads (s. 3(1)).

This definition means that consumer guarantees extend beyond a personal or household consumer to include a business as a consumer. In particular, a person is considered a

⁶ The monetary threshold has been increased to maintain its real value, as set in 1986 (Treasury 2018b, p. 27).

consumer for all purchases under the monetary threshold (\$40 000, rising to \$100 000)⁷, regardless of the nature of the product. This covers household items such as white goods, mobile phones and cars. It also covers products purchased for business use, such as agricultural machinery, so long as the purchase price is less than the threshold. Business purchases of vehicles and trailers are also covered, if they transport products on public roads.

The inclusion of business purchases was intended to broaden the group of consumers who are given protections, with a specific importance on protecting small businesses (Treasury 2018b, p. 14). Small businesses have a dual role in consumer policy: as well as being suppliers of goods and services, they are consumers in their own right. They are considered to have similar characteristics to individuals, particularly in relation to unequal bargaining power, and lack of resources to effectively negotiate an outcome in the event of a problem with a purchased product (PC 2008, p. 318). In 1977, a monetary threshold was introduced into the *Trade Practices Act 1974* (Cth) that extended a range of consumer protections to businesses — this had the effect of providing protections to small and large businesses that purchased products below that threshold (Treasury 2018b, p. 17). Large businesses are arguably not as affected as small businesses by unequal bargaining power. In 1986, further amendments were made to provide consumer protection to the purchase of commercial road vehicles on the basis that owner–drivers are not easily able to understand their rights without seeking legal advice (Treasury 2018a, p. 19).

Extending consumer protections to businesses was developed with small businesses in mind, but larger businesses also receive these protections. Australia is unique in explicitly including business purchases in its consumer guarantees framework. Other countries, such as New Zealand, the United Kingdom and France, only provide protections for individual or household products (CAANZ 2017, p. 10; Pinsent Masons 2014; Watson et al. 2015).

The categories not covered by the consumer guarantees include:

- businesses making purchases of business-related products above the monetary threshold
- individuals or households making purchases of products normally used in a business above the monetary threshold.

In the past few decades, there have been a number of significant junctions where the objective of protecting small businesses under consumer guarantees has come under review. In all cases, the threshold has been retained on the basis that small businesses have similar characteristics to individuals, particularly in relation to unequal bargaining power (box 3.3).

⁷ Businesses also have coverage for products that are ordinarily used for personal, domestic or household purposes. Courts have interpreted ‘ordinarily’ to mean ‘commonly’ not ‘predominately’. Therefore, products that have dual domestic and business purposes have consumer protection, even for those sales of products that are largely purchased for business use (such as industrial grade carpet as carpet is used for personal domestic or household purposes) (Bruce 2014, p. 239).

Box 3.3 Past reviews have accepted the objective of protecting small business

The Commission's 2008 review of the consumer policy framework considered the inclusion of small business as a consumer. It concluded that there are 'no clear principles that can be brought to bear in deciding the extent to which small business should be covered by generic consumer protections' (PC 2008, p. 320). The Commission noted that any significant scaling back of consumer protection for small business would change a longstanding tenet of the generic consumer policy framework in Australia, and would run counter to the trend towards increasing small business protections in other areas of consumer policy (PC 2008, p. 321).

When the Australian Consumer Law (ACL) was developed in 2010, removing the monetary threshold was considered, so that only personal, domestic or household products would be covered (Treasury 2018b, p. 17). This was rejected, with the legislation retaining the monetary threshold on the basis that small businesses should continue to be protected under the new regime (Hartsuyker 2010, p. 6472).

In its final report, the 2017 ACL review noted removing the threshold criteria would not only exclude business purchases, it would also exclude some purchases that were for personal use:

... removing the \$40 000 threshold would exclude business purchases from many current protections ... Also, removing the monetary threshold while leaving the definition of 'consumer' unchanged would remove current protections for individuals purchasing goods or services that are not ordinarily acquired for personal or domestic use, but are in fact purchased for personal use. (CAANZ 2016a, p. 26)

Furthermore, such a change would be inconsistent with recent government decisions to increase protections for small businesses, including in relation to unfair contract terms and access to dispute resolution (CAANZ 2016a, p. 26).

For the purposes of this inquiry, the Commission is interested in whether existing policies and regulations, including the ACL, are posing unnecessary barriers to repair. Removing coverage of consumer guarantees for businesses would erode access to repair for those businesses. That said, consideration of whether to adjust the definition of a consumer needs to take into account the relative costs and benefits of greater (or lesser) coverage of consumer guarantees.

Coverage of agricultural machinery in consumer guarantees

Some participants submitted that all agricultural machinery purchases should be covered in the definition of a consumer under the ACL, to provide agricultural businesses with corresponding rights to the consumer guarantees (GPA, sub. 27, p. 15; NFF, sub. 55, p. 5; VFF, sub. 60, p. 5; Wiseman and Kariyawasam, sub. 105, pp. 6–7).⁸ These participants noted that the purchase price of agricultural machinery is, on average, above the threshold. As such, these products are generally not covered by the consumer guarantees, even after the increase in the threshold in July 2021. The National Farmers' Federation stated:

The \$40 000 threshold for goods covered under the consumer guarantee in the ACL means that most agricultural machinery is not covered. With the average price of, for example, a combine

⁸ Coverage of agricultural machinery under consumer guarantees has also been raised in submissions to previous reviews and consultation processes (CAANZ 2017; Treasury 2018b).

harvester being approximately \$600 000, the new threshold of \$100 000 coming into effect on 1 July 2021 will leave most large machinery uncovered. (sub. 55, p. 5)

Some participants to this inquiry argued that farm businesses have unequal bargaining power compared with manufacturers and sellers of agricultural machinery. The Victorian Farmers Federation submitted:

Unlike many other industries that are highly mechanized such as mining, the majority of agricultural businesses are small family-owned businesses, resulting in limited bargaining power against dealers and multinational manufacturers. (sub. 60, p. 3)

The Australian Competition and Consumer Commission (ACCC) has also noted that farm businesses may be in a relatively weak position to negotiate with manufacturers and dealers (2020b, p. 6) (chapter 4).

Without protection from the consumer guarantees, manufacturer warranties (offered by manufacturers (box 3.2)) are the main avenue of recourse in the case of faults in farm machinery (ACCC 2020b, p. 11; NFF, sub. 55, p. 3; VFF, sub. 60, p. 3). This raises the importance of the terms and conditions of manufacturer warranties in the operation of the repair market and on purchasers' rights to repair (chapter 4).

Some participants suggested including an additional provision in the definition of a consumer to protect agricultural machinery purchases, similar to that currently covering vehicles or trailers purchased to transport products on public roads (for example, GPA, sub. 27, p. 15; VFF, sub. 60, p. 3). Any change to increase the coverage of consumer guarantees would not only provide access to remedies (of repair, replacement or refund at the cost to the manufacturer) but would allow consumers to potentially claim compensation for consequential loss from a supplier or manufacturer.

No change in the definition of consumer needed

Based on the evidence presented in submissions and consultations, there does not appear to be a strong case for all agricultural machinery to be covered by the consumer guarantees.

The extension of the consumer guarantees to include all agricultural machinery purchases would impose compliance costs on suppliers and manufacturers. In addition to training costs for suppliers, there would be costs to manufacturers from having to provide remedies (repair, refund or replacement) for products that they are not currently required to do so.

Another, potentially significant, cost is the possibility that suppliers and manufacturers may be liable for consequential losses because of the failure to comply with the guarantee if it was *reasonably* foreseeable (s. 259(4)). The National Farmers' Federation highlighted the importance of being able to seek damages for losses, including the loss of farm business revenue when machinery fails during a key stage in the production cycle (sub. 55, p. 5). One agricultural machinery manufacturer submitted that it would not object to extending consumer guarantees to business products over the threshold as long as that coverage was

limited to repair and/or replacement of goods (CNHI, sub. 116, p. 3). If this was not the case, they claimed exposure to liability for consequential losses would have to be factored into the purchase price of products.

Further, not all farm businesses face an imbalance of bargaining power in the purchase of farm machinery. Approximately 15 per cent of broadacre farms have annual income above \$1 million (CNHI, sub. 116, attach. 1, p. 10). And the farm business sector has been moving away from small family-run farms to larger farms, with more sophisticated operations, commodity diversification and adoption of technology (Wu et al. 2019, p. 12,16). Given this trend, extending consumer guarantees to the purchase of all agricultural machinery would, over time, increasingly afford protections to larger farm businesses.

In line with this, some participants take the view that farm businesses, particularly larger farm businesses, are equipped to negotiate with suppliers (CNHI, sub. 116, p. 1; Eglinton, sub. 5, p. 1; TMA, sub. 111, p. 1). For example, Eglinton submitted that:

... a farm machinery dealer is generally doing business with another business and so we are doing business to business transactions ... They are not consumers who lack understanding of the industry but should be aware of the various aspects of purchasing machinery. These customers do the research and understand what they are buying and what they want it to do along with understanding what the service back up would be. (sub. 5, p. 1)

Covering all agricultural machinery purchases under the consumer guarantees also raises consistency issues with other businesses whose purchases are not covered, many of which may also be small businesses (such as small brewing companies and building and construction companies that often purchase costly plant and equipment). Farm businesses, like other small businesses, are able to engage professional services and obtain advice to gain the necessary knowledge to negotiate a deal. Small businesses have a range of responsibilities in running their business, such as employment and tax obligations for which they may need to obtain professional advice. Seeking advice on the purchase of agricultural machinery over \$100 000 should not be viewed differently.

Another area of inconsistency with respect to the coverage of business purchases relates to vehicles and trailers purchased for the transport of goods on public roads. This additional coverage was granted based on an assessment of an imbalance of power almost 40 years ago. This provides an example of how once protection is granted it is not readily removed, even when the case for protection may have changed. The Commission is not aware of any re-assessment of this arrangement in recent decades. A review of the arrangement would be appropriate to determine whether coverage of vehicles and trailers for business purposes is still necessary and in the public interest.

In examining the issue of covering all agricultural machinery purchases under the consumer guarantees, a broader question arises as to whether adjusting the definition of a consumer (or the monetary threshold) would be the best way of addressing the main concerns being raised about repair and servicing of agricultural machinery. These primarily relate to the commercial viability of maintaining stocks of spare parts (discussed below) and barriers to

independent repairers obtaining access to the repair inputs they need to repair agricultural machinery (discussed in chapters 4 and 5).

3.3 Reasonable product durability needs clarification

The guarantee that a product will be of acceptable quality is at the heart of the consumer guarantees (s. 54) under the ACL. This includes, among other factors, that the product will be as durable as a *reasonable consumer* would regard as acceptable, and durable enough to perform its intended function for a *reasonable amount* of time in normal circumstances (Commonwealth of Australia 2019, p. 1).⁹

The principles-based approach to specifying ‘reasonable durability’ in the guarantee of acceptable quality provides suppliers and consumers with the flexibility to apply guarantees to a wide variety of products of different value and quality. Such flexibility can help to reduce compliance costs for manufacturers and suppliers, while at the same time protect consumers (Corones, Christensen and Howell 2016, p. 2). But with flexibility can also come uncertainty, particularly if there is lack of clarity, misunderstanding or different expectations between consumers and manufacturers/suppliers, about what a reasonable time period is for a particular product.

How is reasonable durability currently determined?

The reasonable consumer test attempts to overlay a subjective standard on durability. This depends on several factors including:

- the nature of the product, which can include the materials used or composition of the components and whether the product is a new product or a factory second
- the price of the product
- statements made about the product, either on the packaging or by the supplier or manufacturer (Commonwealth of Australia 2019, p. 1) (box 3.4).

⁹ Other factors in determining acceptable quality include being fit for all the purposes for which the products are commonly used for, acceptable in appearance and finish, free from defects, and safe (s. 54(2)). If any fault was drawn to the consumer’s attention before the purchase, the consumer cannot rely upon the acceptable quality guarantees for that particular fault (s. 54(4)).

Box 3.4 **Determining durability: factors taken into account**

The Australian Consumer Law (ACL) sets out a range of factors that influence how long a reasonable consumer would expect a particular product to perform its intended function. The ACL regulators have issued the following guidance for consumers, suppliers and manufacturers.

Nature of the product

Materials used

How long a product can be expected to last will depend upon the quality of the materials used in making the product. A product made of high-quality materials can generally be expected to last longer than an equivalent product made of lower quality materials.

Composition of the components

Some components in products, such as vacuum cleaner filters, must be regularly replaced for the product to continue to work. The requirement to regularly replace such components does not stop the product from being reasonably durable.

Product type and use

The type of product and how the product is used can also impact upon a product's durability. For example, products that are more portable or contain complex components would generally be reasonably expected to last a shorter time than products that are stationary and relatively simple. This is because a reasonable consumer would be likely to expect portable products to be subject to more wear and tear through normal use of the product.

A product is expected to be durable enough to perform its intended function in normal circumstances. This means using the product in the way it was intended or for the purpose that it was designed for. If a product is used in an abnormal manner, then it would be expected that it would be durable for a shorter period of time than if it had not been used in an abnormal way.

New, factory second or refurbished products

New, factory second or refurbished products are generally covered by the acceptable quality guarantee. However, a new product can generally be expected to be more durable than a factory second or refurbished good.

Where a factory second good has multiple components, it can be expected that the component with a minor fault will not last as long as the same component of an identical product that does not have the minor fault. Consumers should be informed of the fault and that it is the reason for the price reduction.

Where a refurbished good has multiple components, a reasonable consumer would expect that the secondhand components may not last as long as the same component of an identical good that is not secondhand.

(continued next page)

Box 3.4 (continued)

Price of product

The price of a product is generally related to the quality of the materials and the manufacturing techniques used to make it, and consequently durability. This means that often products purchased at a high price can be expected to last longer than products purchased at a lower price.

But factors other than durability also affect the price of a product. For example, scarce (such as limited-edition products) or highly attractive products may cost more to buy but not be more durable. Similarly, products containing the latest technology are more likely to have a higher purchase price than older models because of their features, but they are not necessarily more durable.

Statements made about the product

Statements about the durability of a product on its packaging or labelling, in advertising material or made orally by sales staff, known as ‘express warranties’, also affect how long a reasonable consumer would expect a product to last. This is particularly so if these statements include an estimate of how long the product should last.

Many products are sold with warranties against defects for a specified time period, known as manufacturer warranties. The length of the manufacturer’s warranty may be of some relevance to how long a reasonable consumer would expect a product to last, as they are inherently statements made by the manufacturer in relation to its durability.

Nevertheless, a reasonable consumer may expect a product to last longer than the supplier or manufacturer’s warranty period, depending on the circumstances.

Source: Commonwealth of Australia (2019).

For the purposes of the consumer guarantees, reasonable durability is a measure of reliability of a product. That is, it measures *how long* products should be expected to last without fault when used in normal circumstances, and if a fault develops within that time period the supplier or manufacturer is likely to be responsible for the repair (or providing another remedy).

There are other time-based measures of durability that relate to consumers’ ability to repair a product — that is, how long products are likely to last with maintenance and repairs. This measure is more aligned with expected lifespan of a product and takes into consideration the ability of a product to be repaired. Chapter 6 examines concerns that the lifespan of everyday products are becoming shorter and the merits of government action to reduce the impacts of short-lived products.

Uncertainty about what ‘reasonable durability’ means

While the flexibility of the principles-based legislation has advantages, some consumers and suppliers remain uncertain about what is considered a reasonable time period. There is no specific time periods in the legislation, or any ACL regulator guidance as to what reasonable durability is for particular product types. It is largely left up to consumers and suppliers or manufacturers to negotiate. When agreement cannot be reached between consumers and

businesses, it is generally the role of the court or tribunal to determine whether or not a product is reasonably durable.

Personal expectations may differ from that of a ‘reasonable’ consumer, as people form expectations based on their own values and influences, including their familiarity with a product. These expectations may not necessarily align with a reasonable life span for a modern product in the context of evolving technologies (Allens 2016, p. 12).¹⁰

Consumers and suppliers may also have different expectations about what they consider to be ‘reasonable’. This difference can lead to uncertainty over whether the consumer guarantees apply or to some consumers not seeking (or being offered) repairs under the consumer guarantees when they are entitled to them (Australian Democrats, sub. 100, part 1, p. 20; Downes, sub. 96, p. 3; Park, sub. 52, p. 2). A large Australian retailer commented that:

In determining whether a product has failed the test of ‘Acceptable Quality’, the concept of ‘durability’ in section 54 (which is obviously ‘time-based’) is also open to many different interpretations and the Act provides no guidance as to how long a product should last in order to pass this test. (pers. comm., 12 May 2021)

One area of uncertainty appears to be for higher value products that consumers have owned for some time. When a high value, significant household product fails after several years, the application of the consumer guarantees appears to become much more difficult for both consumers and businesses to navigate. CHOICE found that consumers who have purchased high-priced white goods that fail at the seven or eight year mark, for instance, are less able to confidently negotiate a remedy with the business due to the broadness of the law (CHOICE 2016, p. 12). The uncertainty for lower value products does not appear to be as great. The price of a product is typically related to the quality of materials and the manufacturing techniques used (and hence its durability). Lower priced products, therefore, can typically be expected to last for a shorter period than higher priced products (box 3.4). A shorter time period means that there is less scope for variation in what consumers and suppliers would consider reasonable (such as the reasonable durability for kettles and toasters).

In the event of a failure of a lower value product that is still covered by the consumer guarantees, some consumers may not seek a remedy, as they have a preference to replace the item with a newer model (chapter 2). Further, when consumers do seek remedies for low-value products, some suppliers may be inclined to replace or refund the product — even when there may not be an obligation to do so.

Consumers largely bear the cost of such uncertainty. Uncertainty about whether a guarantee applies can make it difficult for consumers to exercise their consumer right. Some consumers may decide that the inconvenience and cost of trying to get a repair (or refund) is not

¹⁰ Consumers may also be guessing at how long they have owned a product if they have no record of the purchase. Such guesses could be quite different to the actual length of ownership.

worthwhile (section 3.5) and will instead replace the item (at their own cost) or live without it. CHOICE submitted that:

Despite the high rate of problems with printers, only 11 per cent of people who purchased a printer in the last five years have contacted the brand for assistance. This could be for a range of reasons but we suspect product cost and access to support are contributing factors. (sub. 126, p. 11)

Others may not seek a repair because they do not know they are entitled to one. And some consumers purchase extended warranties because they expect the claims process for getting repairs under a warranty will be more straightforward, even though they may be entitled to the same remedy under a guarantee (section 3.5).

Some participants have stated that more clarity is needed about how long products can be expected to be covered under the consumer guarantees (Ai Group, sub. 32, p. 4; Australian Democrats, sub. 100, part 1, p. 21; CNHI, sub. 116, p. 2; LGNSW, sub. 97, p. 6). For example, LGNSW noted that:

... it is viewed that consumers are not sufficiently aware of the remedies available to them. This lack of awareness and knowledge could be remedied by communication campaigns and information at point of purchase. ... One approach to address this lack of awareness is to make it mandatory for distributors to inform consumers of the ACL's consumer guarantees and the product's 'reasonable' life span at the point of purchase and on the product and/or packaging. (sub. 97, p. 2)

Greater clarity on how long consumers and suppliers could expect products to be covered by the consumer guarantee would not only improve access to repair remedies but would also improve access to refund and replacement remedies. Two approaches for providing clearer guidance are outlined below.

Options to deliver greater guidance on reasonable product durability

ACL regulators could provide guidance on product durability timeframes

The Australian Consumer Law Review, completed in 2017, recommended that regulators should work with stakeholders (including tribunals) to provide more specific guidance on 'reasonable durability'. The report suggested that this guidance:

... could include clarifying the relevant factors to consider and examples of how the 'reasonable consumer' test would apply to common types of products, drawing on court and tribunal decisions and other relevant information. There is also merit in exploring the feasibility of specific guidance that estimates the reasonable timeframes for common electrical and white goods and, potentially, within specific price ranges. (CAANZ 2017, p. 22)

In 2019, the Australian Government released guidance, developed by the ACL regulators (comprising the ACCC and State and Territory consumer protection agencies, as well as ASIC), on how long a product could reasonably be expected to last after purchase without fault (Commonwealth of Australia 2019). While extensive, and providing a number of

examples for each factor, it does not provide specific guidance that estimates the reasonable timeframes for common electrical and white goods.

To reduce the uncertainty that remains, there could be merit in the ACL regulators extending their current guidance to provide specific time periods on reasonable durability for particular product classes. Given the large number of different products available, and new products continually coming onto the market, the guidance could be developed for a select number of common household products, within specific price ranges. The time period estimates could also be a minimum and, given variability of performance of any particular product in practice, the time period guidance for acceptable quality could be a range. For example, a fridge could be estimated to last for a minimum of 5 to 7 years without fault with the upper and lower bounds of the range reflecting lower and higher value fridges. Given technological development, these estimates should be reviewed regularly.

Some estimates of product durability have already been developed by consumer groups in Australia and internationally, indicating that it is possible to develop specific guidance, at least within ranges (box 3.5). These estimates could be drawn on, or adapted, as relevant and appropriate in the development of guidance by ACL regulators. It would also be desirable for the guidance to be developed in consultation with other stakeholders, including consumer and industry groups and manufacturers, who have technical knowledge about the reliability of their products. However, consideration would need to be given to how input from consumers and manufacturers' would be balanced, including because the estimates from each of these groups may be based on different methodologies.

Box 3.5 Estimating the durability of products

There are several approaches to estimating the durability of products. Many estimates calculate the average lifespan of a product, but lifespan can be defined in different ways. For example:

- the length of time from when the product is purchased to when it is replaced
- the length of time for which a product is actively used (this ends when the product is replaced or placed in storage. It might include use after repair)
- the length of time for which a product is held (this ends at the product's disposal and might include periods of storage)
- the technical lifespan of the product (this ends when the product has a fault).

CHOICE and Consumer NZ calculate durability ratings for household products such as fridges and vacuum cleaners. CHOICE calculates durability based on consumer surveys and manufacturer feedback (CHOICE 2018), and provides estimates for budget, mid-range and high-end price brackets for products. Consumer NZ also uses consumer and manufacturer information to estimate durability, but calculates life expectancy based on mid-range products (Smith 2020).

There would be costs and some practical challenges associated with developing specific estimates due to the various factors that influence product durability (box 3.4). Durability estimates would need to be based on assumptions about how the product is typically used and maintained, which would also depend on the type and quality of the product. As such, there is a risk that any estimates could over- or under-state the reasonable durability of products (with a potential consequence that this affects manufacturers' product offerings). However, if the estimates are too caveated they may fail to provide certainty to consumers and businesses. The risk of incorrect estimates were acknowledged in the ACL review. One way of overcoming this risk is to develop minimum estimates and ranges (as suggested above).

There may also be a possibility that, even as guidance, the estimates could take on heightened importance in how they are used, and become *de facto* standards. To ameliorate this risk, consumers and suppliers should be clearly informed by the ACCC that any estimates represent a guide only and that the course of action in any particular case will depend on specific circumstances, such as how and when the product is used. It should be made clear to consumers and businesses that the aim of the guidance is to assist them in negotiating a resolution in the event that a product develops a fault.

Manufacturers to provide guidance on product durability

An alternative approach could be to rely on information on product durability developed and published by manufacturers (CHOICE, sub. 126, p. 4; LGNSW, sub. 97, p. 6). CHOICE has long argued for greater certainty about the acceptable quality guarantee by placing the onus on the manufacturer to specify the time period for durability.

Consumers should also be provided with some certainty around how long they can expect their purchases to last — the expected longevity of a product is an important factor that consumers weigh up when choosing to buy one product over another, and they should be able to rely on representations from the manufacturer or retailer when making this decision. (CHOICE 2016, p. 8)

The specification of a time period for which a product should operate without need of repair could become a point of competition between manufacturers, with consumers benefiting from greater information about how long consumer guarantees may last and possibly, over the longer-term, providing incentives for manufacturers to increase this time period through innovation. There is some evidence that manufacturers are already using durability to compete by offering a longer time for manufacturer warranties. For example, Miele offered a promotional 10-year warranty for some high-quality household appliances (Miele 2020).

However, manufacturer warranties may not always align with what a reasonable consumer would expect in terms of product durability. For example, mobile phone warranties are typically provided for two years, whereas CHOICE estimated their expected durability to be between three and six years (CHOICE 2018).¹¹ Another example of the divergence between the length

¹¹ CHOICE durability estimates measure how long a product should last, given reasonable use and some maintenance and minor repairs. This differs from measures of durability relating to how long a product should last without fault.

of manufacturer warranties and expectations of reasonable durability relates to farm machinery, which are often only provided for one year. McIntosh and Sons submitted that:

Most agricultural and construction machinery has a 12 month warranty and only a very minor portion of the market has a warranty beyond 24 months. The warranty period typically represents less than 10 per cent of the effective commercial life of most agricultural and construction machinery. (sub. 24, p. 2)

This approach could require manufacturers to include durability information on their products (at least for certain classes of products). Specifically, this could require labelling that stated a minimum period or a range for how long the product could be expected to last without fault. However, the labelling estimate would not provide an automatic obligation for suppliers and manufacturers to provide a remedy under the consumer guarantees if a product developed a fault in this time period, as other factors such as product usage would affect whether the claim was reasonable. Understanding reliability of products could also help manufacturers plan for spare parts (section 3.4) (NI 2019).

A benefit of manufacturers providing durability information via labelling is that they are best placed to assess and identify the durability of their own product, given they have the technical knowledge of the product's design and quality of materials used. However, there would also be costs associated with durability product labelling. There would be business compliance costs of researching and estimating the time period of durability, as well as the cost of changing packaging to specify an estimate, including alterations over time for changes in durability. As outlined in chapter 6, labelling schemes can take resources to design and be subject to refinement, which add to compliance costs.

For these reasons, the Commission's preferred approach is for ACL regulators to develop and publish guidance on reasonable durability, in consultation with relevant stakeholders, including product manufacturers. Over time, there may be value in transitioning to a manufacturer product labelling scheme — indeed, several participants highlighted developments internationally, including the European Union's desire to introduce mandatory labelling to provide information to consumers on the estimated lifetime and repairability of a product at the time of purchase. However, this durability labelling is broader than what the Commission is proposing in draft recommendation 3.1, and importantly, it is motivated by different factors (such as environmental concerns and consumer information to guide product choice). Chapter 6 discusses the merits of a labelling scheme for product durability and repairability and seeks further information on the costs and benefits of a product labelling approach.

DRAFT RECOMMENDATION 3.1 GUIDANCE ON REASONABLE DURABILITY OF PRODUCTS

The Australian Competition and Consumer Commission (ACCC) should develop and publish estimates of the minimum expected durability for products within major categories of common household products.

The estimates would be a guide only to support application of the acceptable quality consumer guarantee in section 54 of the Australian Consumer Law. It could use ranges to take into account lower and higher value products in each category.

The ACCC guidance should be developed in consultation with State and Territory consumer law regulators, consumer groups and business groups representing product suppliers and manufacturers, and should be updated over time.

3.4 Access to spare parts and repair facilities

Consumers need access to repair information, spare parts, tools and facilities in order to fix their products. The consumer guarantees provide that the manufacturer will take *reasonable action* to ensure that facilities for repair, and parts for the product, are *reasonably available* for a *reasonable period*, after the product is supplied (s. 58). The legislation does not specify what manufacturers are required to do to fulfil the obligation to provide ‘facilities for repair’. As such, it is unclear if it is sufficient for manufacturers to provide spare parts and repair information or whether they are required to ensure repairers are available to undertake repairs.

The test of reasonability for access to spare parts and repair facilities takes into consideration the nature of the product supplied. For example, it would be reasonable to expect that tyres for a new car will be available for many years after its purchase. But it may not be reasonable to expect the availability of spare parts for an inexpensive children’s toy (Emerson 2010, pp. 190–191). There is no obligation on manufacturers to support a product for a minimum period or require manufacturers to inform consumers about the support period (ACCC, sub. 106, p. 5).

Manufacturers are able to opt-out of the requirement to ensure repair facilities and spare parts are reasonably available if they inform consumers (with written notice) at or before the time of purchase (s. 58(2)). However, the Commission has not been presented with evidence of widespread use of the opt-out clause. In particular, the ACCC submitted that in their experience ‘few manufacturers provide such notice’ (sub. 106, p. 2).

Submissions and consultations identified two areas of uncertainty with respect to access to spare parts and repair facilities under consumer guarantees: how long physical spare parts need to be held for and whether software is considered a spare part for the purposes of the consumer guarantees.

Experience in accessing spare parts and repair facilities

Access to spare parts may be limited for a variety of reasons, including commercial decisions of manufacturers (chapter 2), intellectual property considerations (chapter 5) and original equipment manufacturers restricting supply of spare parts to independent repairers (chapter 4). The focus in this chapter is whether manufacturers are not fulfilling their obligations relating to spare parts in the consumer guarantees, as described above.

Some participants to this inquiry stated that they experience difficulties accessing spare parts, but they did not specify for which particular products this was an issue (Australian Democrats, sub. 100, part 1, p. 22; Brisbane Tool Library, sub. 73, p. 2; Jandey, sub. 37, p. 1; SA Repair Café Coordinators, sub. 46, p. 8; World's Biggest Garage Sale, sub. 45, p. 1; ZWV, sub. 90, p. 3). However, the Victorian Farmers Federation outlined the difficulty accessing spare parts for agricultural machinery:

Dealers and manufacturers have moved to a 'just in time' [approach] for much of their inventory. While some shortages are to be expected during peak periods, it has increasingly become commonplace for growers to be forced to pay for individual parts (even in current models) to be air freighted from overseas, rather than being imported in bulk by the dealers and manufacturers at a much cheaper rate. (sub. 60, p. 3)

In contrast, other participants stated that access to spare parts under the consumer guarantees was not a problem, and some provided evidence and their experience.

- The ACCC noted that they received almost 100 000 contacts relating to the ACL generally in 2019-20, with only a few hundred relating specifically to access to repairs or spare parts (sub. 106, p. 2).
- Legal Aid Queensland stated that they had not seen any clients attempting to rely on the guarantee of available repair facilities and spare parts (sub. 68, p. 6).

The ACCC also submitted that the low cost of repair relative to providing a refund or replacement provided a strong incentive for manufacturers to maintain some form of repair facility available to Australian consumers (sub. 106, p. 2). In this context, Toyota Australia noted that:

Toyota has a very extensive dealer network that is comprised of 198 dealers and 279 dealership sites across Australia, making access to repair services and parts widely accessible. Toyota prides itself on working within the 'just in time' principles that ensures parts are appropriately stocked and available as required. (sub. 118, p. 3)

Similarly, the Australian Automotive Dealer Association noted the need to keep parts for safety recalls, even for 'vehicles which are 20 years old or more' (sub. 98, p. 6).

It is likely to be more cost-effective to repair, rather than replace, high cost and longer lasting products, such as vehicles, but is unlikely to be the case for many lower valued small household

appliances (such as toasters and kettles) (chapter 2). A large Australian retailer noted that in the event that they could not provide parts, they would offer a replacement or refund.

We note that in the event that a customer has a prima facie right to a repair remedy under the ACL (or a warranty) and the product cannot be repaired, then the customer will usually be offered a refund or replacement ... in the vast majority of cases, consumers with faulty goods much prefer refunds or exchanges as opposed to repairs. (pers. comm., 12 May 2021)

Are software updates covered by the consumer guarantees?

Of the few submissions that raised ‘software’ (often in the sense of firmware or operating systems), there were two main issues concerning consumer guarantees.

- The embedded software can have a fault that stops the overall product from working or limits the product’s function. This fault may be present at the time of purchase or be a result of an update. One submitter questioned whether faulty software was covered by the acceptable durability guarantee (McGrath, sub. 15, p. 5).
- Manufacturers may stop providing software updates before consumers have stopped using a product (Electronic Frontiers Australia, sub. 65, p. 3; Witherby, sub. 134, p. 4). Without these updates, products (such as smart phones) may become vulnerable to cyber-attacks, leaving consumers with a product that is no longer fit for purpose. Other participants noted that without software updates the product becomes obsolete. Claims about product obsolescence are considered in chapter 6.

Case law indicates that faulty software, including faulty software updates, are covered by the consumer guarantees. For example, following a software update, some Apple customers experienced a software fault (‘error 53’), which disabled their phones. While Apple declined to provide some consumers with a fix because their device had been repaired by a third-party repairer, the Federal Court found that the fault was covered by consumer guarantees (chapter 4).

With regard to how long manufacturers should provide software updates, there would seem to be a *reasonable* expectation that updates would be provided for a *reasonable period* after the purchase (much like spare parts). However, the ACL does not explicitly specify obligations relating to software fixes or updates. McGrath submitted:

ACL provides consumer guarantees around availability of ‘spare parts’ however it is uncertain (to me) how that applies when reproducing a firmware composed of embedded software components.

- Is software considered a ‘spare part’?
- Does the guarantee apply to new version of software?
- How does licensing of Intellectual Property interact with this law?
- Should the spare part be delivered as an individual software component, or as part of the original collection of software components that compose a complete firmware?
- How would the software component be verified as a genuine ‘spare part’ if the manufacturer provides no way examine the firmware? (sub. 15, p. 5)

The ACCC also submitted that there are practices that are not currently caught by ‘consumer protection and fair trading laws’, including businesses not providing security updates for smart products for a reasonable amount of time, thereby putting sensitive consumer information at risk (sub. 106, p. 5).

Some manufacturers claim that they provide regular software updates as this support is valued by consumers, even if it is not explicit in the law (AIIA, sub. 127, p. 20; IGEA, sub. 103, p. 5). Industry commentators report that iPhones released since 2011 have received updates for at least five years (Haslam 2020; Muhammad 2020). Further, Apple claim that 86 per cent of iPhone devices introduced in the past four years and 80 per cent of all iPhones in use have the latest operating system (Apple 2021a).

There may be value in clarifying consumer guarantees so as to clearly require manufacturers to provide software updates for a reasonable period of time (along the lines of the requirement to provide repair facilities and spare parts). To further inform the Commission’s thinking in this area, this draft report seeks feedback from participants on whether consumers are experiencing problems using their products due to a software fault or lack of software updates. Feedback is also sought on the costs and benefits of expressly defining that software updates be provided by manufacturers for a reasonable period of time after the product has been purchased (information request 3.1).

Specify time periods for spare part availability

While there is limited evidence from submissions indicating that manufacturers are not fulfilling their obligations regarding access to physical spare parts in the consumer guarantees, some participants noted that greater clarity about what is ‘reasonable’ for spare parts and facilities would be useful to both consumers and businesses (Ai Group, sub. 32, p. 4; Brisbane Tool Library, sub. 73, p. 2; CNHI, sub. 116, p. 2; Law Council of Australia, sub. 114, p. 6; Queensland Consumers Association, sub. 122, p. 2).

A number of submissions suggested mandating specified time periods for the availability of parts (Bower Reuse and Repair Centre, sub. 48, p. 1; CHOICE, sub. 126, pp. 5–6; IT Professionals Australia, sub. 26, p. 9; LGNSW, sub. 97, p. 10; Norris, sub. 89, p. 1; Queensland Consumer Association, sub. 122, p. 2; Transition Town Sunshine Coast, sub. 28, p. 1; WMRR, sub. 85, p. 4; WALGA, sub. 86, p. 4). Some countries have specified in legislation that spare parts, among other requirements, need to be kept for certain time periods.

- In the European Union, manufacturers, importers or authorised representatives are required to make specified spare parts available to repairers for a minimum period (depending on the product) after placing the last unit of the model on the market (EC 2019c). This includes software and firmware. These laws commenced in March 2021 (EC 2021a).
- In Canada, some provinces require spare parts for farm machinery to be available for 10 years after the purchase (Garvey 2015). The Victorian Farmers Federation proposed that Australia adopt these requirements for spare parts (sub. 60, p. 4).

-
- In France, manufacturers are required to indicate to consumers, for each product sold, the period during which the manufacturer or importer commits to provide the spare parts needed for its repair.¹²

In its submission to this inquiry, the ACCC raised the idea of introducing an express obligation on manufacturers to disclose a minimum time that products, including products embedded with software that connects to the internet, will be supported (sub. 106, p. 5).

Setting specified time periods that physical spare parts need to be available imposes costs on manufacturers and suppliers and may require them to hold spare parts when it is not commercially viable (Ai Group, sub. 32, p. 4; AIIA, sub. 127, pp. 5–6; Caravan Industry Association, sub. 76, p. 2). These costs include warehouse costs associated with storing parts and possible transport costs connected with the purchase of less frequently used parts that need to be delivered quickly. Spare parts may also degrade while in storage, adding to the cost of storing parts. The AIIA submitted that:

Making parts available for extended periods for a product that has been withdrawn from market will present ageing shelf-life issues. For example, specialised batteries stored for long periods as spare parts will self-discharge and degrade over time and may not be able to be recharged or the efficiency is reduced so they cannot perform as well as a newly-manufactured part, and they cannot be remanufactured without retooling and major additional expenses. This is an expense to the original equipment manufacturer. (sub. 127, p. 6)

There may also be potential loss of the cost of parts if they are surplus to requirements and disposed of following the minimum time period. These costs are likely to be passed on to consumers as higher prices for products. Technologies such as 3D printers may assist in ameliorating these costs in the future.

CNHI emphasised the need to balance the cost of holding parts for older generation products in sectors, such as agricultural machinery, that tends to adopt technology quickly:

Ultimately, the requirement to retain access to parts needs to be balanced against the costs of doing so, by reference to the number of customers still benefitting from the older version of products. Most farmers who take up technology are quick to adopt new and updated products. (sub. 116, p. 3)

‘Thin markets’ (where the repair market is too small to support the provision of services, particularly in rural and regional locations for certain products) can also make it difficult to provide consumers with access to repair facilities, including physical spare parts. Assistive Technology Suppliers Australia, a national organisation of industry participants of products used by individuals to perform tasks that might otherwise be difficult, stated that:

The difficulty in the AT [assistive technology] market is the geographic size of Australia and the specialisation of some AT devices can create repair access difficulties due to in part the ‘thin market’ environment. However, the AT industry works hard to overcome these barriers to assist

¹² Article L111-4 of the consumer code and article 16 of law number 2020-105.

the AT user to gain access to repair support wherever they live. This is generally coordinated by the seller of the AT device so that, in turn, the guarantee is supported. (sub. 23, p. 9)

Specifying periods for a particular product also does not allow for the flexibility within a product class. It could be reasonable to expect to have parts available for a longer time period for more expensive products, given they are generally expected to have a longer lifespan.

Further, if there is greater clarity provided by the ACCC on product durability timeframes for certain products (as proposed above in draft recommendation 3.1), these estimates could provide a guide to consumers and businesses as to the minimum period for which physical spare parts and facilities should be available under the ACL. For example, if a fridge is expected to last for a minimum of 5 to 7 years without fault, then it would be reasonable to expect that spare parts would be kept for at least this time period, if not longer.

Given the limited evidence from submissions indicating that manufacturers are not fulfilling their obligations regarding access to physical spare parts in the consumer guarantees the case for additional government measures, including specifying time periods, is limited. To further inform this view, the Commission is seeking feedback on the extent to which consumers are experiencing issues associated with not being able to access to spare parts under consumer guarantees.

INFORMATION REQUEST 3.1 REPAIR FACILITIES, SPARE PARTS AND SOFTWARE UPDATES

To better understand whether consumers have reasonable access to repair facilities, spare parts and software updates, the Commission is seeking further information on:

- whether consumers have faced difficulties accessing spare parts or repair facilities under guarantees when their product breaks or develops a fault, including specific examples of the type and age of the product, and the costs incurred by the consumer*
 - costs and benefits of businesses being required to hold physical spare parts or operate repair facilities for fixed periods of time*
 - whether consumers are experiencing problems using their products due to a software fault or lack of software updates, including specific examples where manufacturers have not addressed the problem because of claims that it is not covered by consumer guarantees*
 - the costs and benefits of requiring that software updates be provided by manufacturers for a reasonable period of time after the product has been purchased.*
-

3.5 Consumer guarantee enforcement issues

A well-functioning consumer redress system is essential for the effective operation of the consumer guarantees. It underpins consumer confidence and sends a signal to businesses about the need to comply with consumer laws. Although the consumer guarantees framework is broadly working well, there is evidence that consumers can have difficulty

accessing guarantees in some cases, for a range of reasons. In particular, consumers and suppliers may not always be able to reach agreement on a suitable remedy, and ACL regulators have limited powers to enforce guarantees.

Consumers and suppliers may not agree on a suitable remedy

When a fault does occur, some consumers can have difficulty accessing remedies with the supplier or manufacturer, particularly for higher value products such as cars, mobile phones and white goods (ACCC 2020a, pp. 127–128; CALC, sub. 119, p. 6; LAQ, sub. 68, p. 5).

- In 2019-20, the ACCC reported over 37 600 complaints about consumer guarantees and warranties, with the automotive industry (27 per cent) and electronics and consumer white goods (26 per cent) accounting for over half of these complaints (ACCC 2020a, pp. 127–128). In its 2017 market study, the ACCC found that there were ‘a number of systemic problems in the new car industry preventing consumers from obtaining the remedies to which they are entitled when their car experiences a problem’ (ACCC 2017b, p. 2).
- Data from State and Territory regulators indicate that complaints regarding the sale of new and used motor vehicles is the top complaint (table 3.1), accounting for 10 to 26 per cent of complaints (data supplied).
- Of the 444 consumer guarantee legal advice sessions provided by the Consumer Action Law Centre in the 11 months to November 2020, about 30 per cent related to vehicles, and 12 per cent related to electronics (CALC, pers. comm., 23 November 2020).

Table 3.1 Top 3 consumer guarantee complaints received^a, 2019-20
by State and Territory regulator

<i>Vic</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>ACT</i>	<i>NT</i>
Motor vehicles sales	Motor vehicles sales	Motor vehicles sales	Motor vehicles sales & parts	Motor vehicles sales	Motor vehicles sales
Furniture	Motor vehicles maintenance & repairs	Furniture	Maintenance of machinery & equipment	Household appliances, including mobile phones	Motor vehicles maintenance & parts
Clothing and footwear	Furniture	Motor vehicles repairs & parts	Furniture	Furniture	Electrical appliances & white goods

^a As State and Territory regulators generally do not classify complaints as ‘consumer guarantees’, data provided are based on categories which closely align to consumer guarantee issues. These include categories such as defective goods, warranties, minor and major faults. Therefore, the population base for each State and Territory will be different. Similarly the product categories also vary. For the purpose of illustration, the Commission has standardised product categories. Only physical product categories are included. Data were not available from Tasmania, and New South Wales did not provide data at sufficient disaggregation.

Source: Commission estimates based on data supplied by State and Territory ACL regulators.

One reason why consumers may face difficulties obtaining a remedy from the supplier is due to a lack of clarity about whether guarantees apply at all — in particular, when consumers and suppliers have different views on ‘reasonable’ durability of a product. Where this is the case, then draft recommendation 3.1 (guidance on reasonable durability timeframes) may assist.

Some recent changes to what constitutes a ‘major’ or ‘minor’ failure under consumer guarantees may also improve access to consumer remedies relating to motor vehicles, particularly where consumers get stuck in a continual cycle of repairs (box 3.6), although it is too early to tell how effective these changes have been. While the change to the definition of a major failure may assist in clarifying that an appropriate remedy applies in a particular situation, it does not address other problems that relate to difficulties and costs associated with obtaining a remedy, including the limited powers of regulators in dispute resolution and consumer access to tribunals (discussed below).

Box 3.6 Legislation change for multiple minor failures

While some consumers may have difficulty accessing any remedy under the Australian Consumer Law (ACL), in selected cases continual access to repair becomes a problem. In these cases, products can be repaired on multiple occasions without resolution. This is particularly pronounced in the new car market. In these circumstances, consumers had sufficient access to ‘repair’ under the ACL. Instead they would like greater access to other remedies, such as refund or replacement, having become frustrated and fatigued with the repair cycle or they have lost faith in the supplier to reach a solution that they deem satisfactory.

In December 2020, the ACL was amended to clarify that if a product has two or more minor failures, it is considered a major failure (ACCC 2021g). This has the effect of switching the choice of remedy from the supplier to the consumer. If consumers would prefer a refund or replacement over repair, this becomes an option they can choose.

Difficulties accessing consumer guarantees may also be leading to some consumers resorting to buying extended warranties as they believe it provides greater certainty that, if they experience a problem with their product, the claims process will be more straightforward than relying on consumer guarantees (CAANZ 2017, p. 23; Treasury 2018b, p. 81). However, consumers can have difficulty assessing the value of extended warranties over and above the consumer guarantees, and the claims process under warranties may not be as straightforward as expected (box 3.7). If consumers are purchasing extended warranties due to difficulty accessing remedies under the consumer guarantees, then addressing this issue, and any uncertainties regarding when the consumer guarantees apply, may reduce the need for consumers to purchase extended warranties (and thus address concerns that consumers are not getting value for money). Other reforms to improve consumers’ ability to assess the value of extended warranties are also underway (box 3.7).

Box 3.7 **Extended warranties and consumer guarantees**

Some consumers may be buying extended warranties as they believe it provides greater certainty that, if they experience a problem with their product, their claim will be accepted and the claims process will be more straightforward than relying on their rights under the consumer guarantees. CHOICE found, in a 2020 survey, that about one in five Australians have purchased extended warranties in the past two years, mostly for electronics and appliances, with the main reason given being ‘peace of mind’ (CHOICE 2020).

However, some consumers who have purchased extended warranties have found that the claims process is not always straightforward, as the warranty may not cover their problem. For example, extended warranties on some cars can have caps on claims as low as \$500 (ASIC 2019, p. 52).

A lack of clear and accessible information, behavioural biases and time constraints can also make it difficult for consumers to make informed decisions about whether to purchase an extended warranty. Consumers are not always aware of their rights under the consumer guarantees and can experience difficulty comparing the protections offered under an extended warranty with these existing rights. This can make it difficult for consumers to determine if an extended warranty provides value for money and the additional protection they seek (Treasury 2018b, p. 83).

Further, there is no obligation upon suppliers to provide information comparing rights under an extended warranty with the consumer guarantees. There is also no strong market incentive for provision of this information by suppliers because they are unlikely to obtain any additional benefit from providing consumers with comparison information, unless the extended warranty offers superior protections compared with a consumer’s existing rights (Treasury 2018b, p. 89).

Reflecting these concerns, changes have been proposed to ensure consumers have sufficient information and safeguards to make informed decisions about purchasing extended warranties (Treasury 2018b, p. 78). Under the proposed changes, suppliers would be required to provide:

- a cooling-off period of ten business days from the time the consumer receives the written agreement — this period gives consumers time to distinguish the purchase of the warranty from that of the primary product and assess the purchase of the extended warranty on its own merits, away from the pressure of a sales negotiation
- oral disclosure about a consumer’s cancellation rights before entering into the contract, as well as a written agreement that includes a comparison of the key features and benefits of the relevant consumer guarantees, and the protections provided by the agreement, among other details.

ACL regulators have limited powers in dispute resolution

When consumers have difficulty accessing a suitable remedy through negotiation with the manufacturer or supplier, they may seek help from their State and Territory ACL regulator.¹³ However, most of these regulators have limited powers in dispute resolution as they are unable to compel businesses to participate in a conciliation process or make determinations, with the exception of South Australia and New South Wales, which have put in place such processes (discussed below).

¹³ Although, the Australian Consumer Survey found that only 44 per cent of consumers were aware of the dispute resolution services provided by the ACL regulators (EY Sweeney 2016, p. 36).

The 2016 Australian consumer survey indicated that only 58 per cent of respondents agree that the government provides adequate access to services that help to resolve disputes between consumers and businesses (EY Sweeney 2016, p. 26).

Consumers may also be uncertain about which regulator to approach, given there are some sector-specific regulators, as well as ACL regulators. For example, CALC highlighted that the course of action in the case of a problem with a phone or mobile device differs depending on whether the fault relates to the product itself or the associated service.

Is it an issue of repair of the phone itself? Or is it an issue of the linked service not working? The answer to these questions often funnels the purchaser into a specific dispute resolution scheme, with different access points, rights and potential outcomes (the Telecommunications Industry Ombudsman, the relevant state or territory administrative tribunal, and in some circumstances, the state consumer affairs regulator). (sub. 119, p. 5)

The ACCC is another agency for consumers to seek assistance from. The ACCC can provide information about consumer rights (box 3.8) or refer consumers to a more appropriate agency, but it is unable to take legal action to penalise suppliers that refuse to provide consumers with a remedy under the consumer guarantees. The ACCC may be able to use other provisions of the ACL to penalise such conduct, for example where it relates to misleading conduct (although such action does not address the core issue of suppliers and manufacturers not providing a remedy when consumers are entitled to one) (sub. 106, p. 2). One example of this relates to action that the ACCC took against Apple for misleading or deceptive representations about consumers' rights under the ACL (referred to as the 'error 53 case' — discussed above and chapter 4).

Box 3.8 Would more information about guarantees assist consumers?

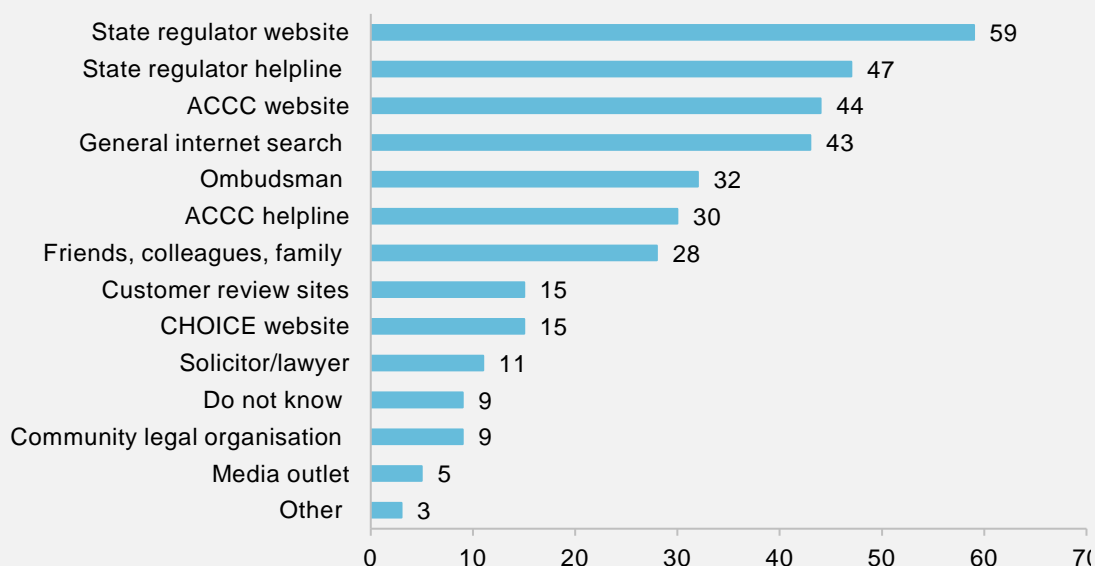
Some participants supported more information for consumers to learn about their rights (for example, Law Council of Australia, sub. 114, p. 7; LG Electronics, sub. 38, p. 10; LGNSW, sub. 97, p. 6; NSROC, sub. 117, p. 14; ZWV, sub. 90, p. 3). Others either questioned the value of more information (LAQ, sub. 68, p. 6; Wiseman and Kariyawasam, sub. 105, p. 8) or highlighted that it is only one component of the solution to consumers accessing remedies under the consumer guarantees (Downes, sub. 96, p. 4; IGEA, sub. 103, p. 13; McGrath, sub. 15, p. 6; Repair Café Woolloongabba, sub. 42, p. 2).

Consumers benefit from being able to easily access and understand information regarding their consumer rights when a fault occurs. Many consumers are already motivated, with the Australian Consumer Survey suggesting that one third of consumers would always seek information and advice if they had a fault with a product (EY Sweeney 2016, p. 30). A further 62 per cent of consumers indicated they may seek advice on the problem but it would depend on the circumstances, in particular the cost of the product. Consumers are also relatively well informed of their sources of information and advice on consumer issues (figure below). Of those who have enquired about advice, over 90 per cent found Australian consumer law regulators' websites and phone lines helpful (EY Sweeney 2016, p. 48).

There does not appear to be any major gaps in the general information available to consumers regarding their rights under the consumer guarantees. However, Australian consumer law regulators should continue to improve and refine the quality of information available to consumers. Governments need to ensure regulators have sufficient resourcing to perform this role.

Sources of information for consumer issues

Per cent of consumers willing to seek information or advice



Source: EY Sweeney (2016, p. 31).

Tribunals and Courts can be costly and claims can be difficult to prove

The next step for consumers in accessing a remedy is courts and tribunals. These institutions are able to make legally binding and enforceable decisions. But this process is costly, time consuming and complex for the consumer, deterring many from seeking redress this way.

Seeking redress through courts or tribunals requires the consumer to pay relevant fees and to obtain legal advice and technical reports. The process can also take significant time and can be inconvenient for consumers if they are required to go without their product for long periods of time. The Consumer Action Law Centre submitted that:

... we hear from our clients that the process of enforcing their rights through state administrative tribunals is confusing, prohibitively expensive and can result in extensive further financial and non-financial loss when they are without the good during a protracted dispute resolution process (for example, when they are without the family car). This tends to be felt most acutely by people experiencing financial disadvantage and vulnerability. (sub. 119, p. 1)

Filing fees to access tribunals and courts can be several hundreds of dollars in some jurisdictions. For example, in Queensland for claims over \$10 000, the fees are over \$350 and in Victoria for claims up to \$100 000, filing fees are close to \$500 (table 3.2).

Table 3.2 Tribunals and courts — fees, jurisdictional limits
as at May 2021

<i>Tribunal or court</i>		<i>Filing fee</i>	<i>Jurisdictional limit</i>
		\$	\$
NSW	NSW Civil and Administrative Tribunal	52 – 277 ^a	40 000
Vic	Victorian Civil and Administrative Tribunal	65 – 487 ^b	No limit
Qld	Queensland Civil and Administrative Tribunal	27 – 352	25 000/100 000 ^c
SA	South Australian Magistrate Court	156	100 000
WA	Western Australia Magistrate Court	156 – 630	75 000
Tas	Magistrate Court of Tasmania	121 – 235	50 000
ACT	ACT Civil and Administrative Tribunal	77 – 584	25 000
NT	NT Civil and Administrative Tribunal	105 – 421	25 000

^a New South Wales provides reduced or concession fees for eligible pensioners or individuals receiving legal aid or assistance from a community legal centre. ^b For claims up to \$100 000. For claims over \$5 million, the filing fee is \$1669. ^c Motor vehicle dispute have the higher limit of \$100 000.

Sources: ACAT (2020b, 2020a); Courts Administration Authority of South Australia (2020b, 2020a); Magistrates Court of Tasmania (2020, 2021); Magistrates Court of Western Australia (2018, 2020); NCAT (2021b, 2021a); NTCAT (2021a, 2021b); QCAT (2020a, 2020b); VCAT (2021b, 2021a).

Technical reports, often costing over \$1000 for motor vehicle claims, are usually required to support a claim, as without sufficient independent evidence to prove there was failure, courts and tribunals are not in a position to make decisions in favour of the consumer (CALC 2016, p. 27; Corones, Christensen and Howell 2016, p. 7). However, it can be difficult to obtain

technical evidence. Legal Aid Queensland said that it can be difficult to find a mechanic or expert who is willing to attend and give evidence at a hearing (sub. 68, p. 5).

Jurisdictional limits for some tribunals and courts can also mean that consumers need to limit their claim or escalate the claim to a higher court if they wish to seek redress (table 3.2). For example, claims for motor vehicles and caravans could be limited (depending on their value) in the Northern Territory, the Australian Capital Territory, and to a lesser extent, New South Wales. Legal Aid Queensland submitted that jurisdictional limits for motor vehicles should be expanded (sub. 68, p. 10).

Collectively, these costs and inconvenience mean that courts and tribunals are not an effective form of redress for many consumers. As noted by the ACCC, in many cases, the cost and effort involved in commencing legal action in either a court or tribunal will be greater than the value of the product in question (sub. 106, p. 2).

DRAFT FINDING 3.1 SCOPE TO IMPROVE THE APPLICATION OF CONSUMER GUARANTEES

The Australian Consumer Law provides consumers with considerable legislative rights to obtain a remedy (repair, replacement or refund) for defective products through consumer guarantees.

The consumer guarantees are comprehensive and operate reasonably well but there is scope to enhance consumers' ability to exercise their rights when their product breaks or is faulty — by providing guidance on the expected length of product durability and better processes for resolving claims.

Options to improve consumer access to guarantees

Several submissions advocated for greater regulator enforcement powers (Australian Democrats, sub. 100, part 1, p. 39; CALC, sub. 119, p. 6; CHOICE, sub. 126, p. 16; Queensland Consumer Association, sub. 122, p. 2). For example, the Consumer Action Law Centre proposed that all State and Territory regulators be empowered to give directions on ACL disputes to provide better access to remedies for faulty products (CALC, sub. 119, p. 6). Similarly, CHOICE called for more effective enforcement, such as penalties and direct regulatory action (sub. 126, p. 16).

The need for greater enforcement powers is also recognised by governments across Australia, with a policy process underway considering options to improve enforcement of the consumer guarantees in the ACL (ACCC, sub. 106, pp. 2–3). Although the exact scope of this process is to be finalised through consultations, potential reforms may include providing ACL regulators with the power to take direct court action against suppliers and manufacturers who fail to provide a remedy to consumers when legally obliged to do so under the consumer guarantees. A public consultation process will occur in 2021 (ACCC, sub. 106, pp. 2–3).

The provision of enforcement powers for State and Territory ACL regulators could provide a clear and simple pathway for dispute resolution for people with consumer guarantee problems and send a strong signal to businesses of the need to comply with consumer guarantee obligations. For these reasons, the Commission has considered options relating to additional enforcement powers for ACL regulators as well as consumer bodies being able to raise super-complaints to ACL regulators on behalf of consumers.

Compulsory conciliation and determination powers for regulators

To help resolve complaints efficiently and effectively, as an alternative to what can be costly and lengthy court and tribunal processes, one Australian jurisdiction (New South Wales) has granted additional powers to its ACL regulator to make determinations, and another (South Australia) has introduced powers to compel businesses to participate in conciliation processes.

South Australia introduced compulsory conciliation in 2013. When a consumer and business cannot come to an agreement privately, the regulator, Consumer and Business Services, can arrange a compulsory conference, acting as a neutral third party, prior to the consumer taking legal action. The consumer and the business must attend the meeting, with fines of up to \$10 000 for businesses that do not attend without a reasonable excuse. Outcomes from conciliation must be agreed to by both parties¹⁴, and may proceed to court if agreement cannot be found. In 2018, the main industries subject to compulsory conciliation conferences were solar panels (35 per cent), building (22 per cent) and mobile phones (7.5 per cent) (SA CBS 2018).

In its first two years of operation (2013 and 2014), South Australia's conciliation process resolved 86 per cent of the 403 cases that had been escalated to compulsory conciliation (Gago 2015). In 2018, the process resolved 90 per cent of cases (169 cases) (SA CBS 2018). The Australian Consumer Survey reported that 75 per cent of people who had participated in third-party conciliation in 2015 found it either very or extremely helpful (EY Sweeney 2016, p. 51).

Another option is to give ACL regulators the ability to make an enforceable direction for a business to comply with the consumer guarantees. For example, in New South Wales, the Commissioner for Fair Trading can issue a consumer guarantee direction that may require the business to repair, replace or refund certain products (up to the value of \$3000 within six months of the date of purchase), after reviewing submissions from both parties. If the business does not comply with the direction, the consumer will need to register the direction with the Local Court and apply to have it enforced (NSW Fair Trading 2018).

While expanding these alternative dispute resolution powers to other jurisdictions may have some merit, no analysis appears to have been done to show they deliver net benefits to the community in New South Wales or South Australia. In particular, the Commission

¹⁴ If one party fails to carry out their obligations under the agreement, the other party (or the Consumer and Business Services Commissioner) can apply to the South Australian Magistrates Court to enforce it (under s. 8A(7) of the *Fair Trading Act 1987* (SA)).

has not been able to locate any data on the number and successful outcomes from New South Wales’ consumer guarantee directions, nor any information on the resourcing costs associated with administering the mechanisms in either jurisdiction. Expanding State and Territory regulator powers would add costs to their operations, in an environment where funding is often already constrained.

Further analysis before introducing compulsory conciliation or direction powers to other State and Territory jurisdictions would also align with previous Commission conclusions. In 2008, the *Consumer Policy Framework* inquiry noted that ‘there may be value in developing a more coherent set of generally applicable consumer ADR [alternative dispute resolution] arrangements’ between states and territories, but these require appropriate resourcing and their exact design is ‘best resolved through specific cost-benefit analysis of detailed alternative policy proposals’ (PC 2008, p. 201). Similarly, the 2017 *Consumer Law Enforcement and Administration* report (PC 2017a, pp. 204–211) recommended an independent review of alternative dispute resolution functions to consider some of the same issues (including an assessment of South Australia’s conciliation process).

DRAFT RECOMMENDATION 3.2 POWERS FOR REGULATORS TO ENFORCE GUARANTEES

State and Territory Governments should introduce alternative dispute resolution mechanisms to better resolve complaints about the consumer guarantees, such as compulsory conciliation or direction powers (as are used in South Australia and New South Wales).

To inform the most effective design and use of any alternative dispute resolution mechanism, appropriate cost-benefit analysis and sufficient regulator resourcing would be required prior to implementation.

Enabling a super complaints mechanism for consumer guarantees

Another reform, that would be complementary to additional powers for ACL regulators, is to introduce a ‘super complaints’ mechanism, whereby designated consumer organisations are able to lodge complaints on consumer issues. Super complaints are not about highlighting the practice of one business — they focus on structural issues (Moorey 2018). Consumer groups have previously advocated for the introduction of such a complaint mechanism (PC 2017a, p. 220).

Once a complaint is lodged by a designated consumer group, it would be fast tracked by the regulator, with the regulator required to provide a response within a certain period (such as 90 days). The response would state how the regulator proposes to deal with the complaint and whether any action will be taken — this could include enforcement action, launching a market study, or referral to a specific regulator. A super complaint mechanism has operated in the United Kingdom for almost two decades (box 3.9) and one was trialled in New South Wales between 2011–2013 (PC 2017a, p. 221). Ultimately the NSW trial did not lead to a super complaints regime in the State. It is our understanding that this was not due to its

failure, but rather that such a scheme best resides with a national regulator, given the nationally significant issues super complaints focus on (discussed below).

Box 3.9 Super complaints — United Kingdom

In the United Kingdom, a super complaint is designed to bring to the attention of the regulator market features that appear to be significantly harming the interests of consumers. A market feature may relate to the structure of the market, the conduct of a person who supplies goods or services in the market, or the conduct of their customers (CMA 2015).

Only designated consumer bodies can make a super complaint. It is expected that the designated consumer bodies would be informed organisations that are in a strong position to represent the interests of groups of consumers and able to provide strong analysis and evidence in support of any super complaint made (UK OFT 2003, pp. 5, 16). Evidence that might be expected as part of the super complaint includes:

- details of the market to which the complaint relates
- how consumers' interests are harmed and the scale of detriment
- whether vulnerable or disadvantaged consumers are impacted
- details of means of redress available to consumers and their effectiveness.

While a 'super complainant' is not expected to provide the level of evidence necessary for the regulator to decide that immediate action is appropriate, they should present a reasoned case for further investigation. Once a super-complaint is made, the regulator receiving it has 90 days to publish a response setting out what action, if any, it proposes to take and its reasons (UK OFT 2003, pp. 7–8). A super-complaint could lead to enforcement action, a market study or a full competition investigation, for example.

A wide variety of UK regulators can receive super complaints, including the Competition and Markets Authority, Financial Conduct Authority, Payment Systems Regulator, Office of Road and Rail, and regulator for the communications services (Ofcom) (Moorey 2018). Super complaints have been raised on a range of issues including concerns about long-term customers paying more for products and services than new customers, misleading pricing practices in the grocery sector, and the tying of beer purchases to a sole company.

A key benefit of a super complaints process is that it provides regulators with an additional source of intelligence and ensures that major consumer issues are responded to by the regulator (due to the time-limited and public nature of the process). On this point, CHOICE claims that the super complaints lodged with NSW Fair Trading were escalated to wider, national processes, resulting in outcomes that they do not believe would have been achieved outside of the super complaints mechanism (CHOICE 2017, pp. 10–11). CHOICE lodged two super complaints with NSW Fair Trading as part of its pilot: a complaint regarding misleading free-range egg labelling and a complaint on electricity switching websites.

Another benefit is that a super complaints process can compel regulators to respond to well-known issues. In the United Kingdom, for example, in 2008, a super complaint was made against British Telecommunication over the high charges it makes for prisoners' phone calls, with calls costing up to seven times the amount payable from a public pay phone. The

problem had been the subject of repeated criticism from the prisons ombudsman and from independent monitoring boards (Travis 2008). The super complaint resulted in relevant regulator taking action which led to a reduction in call costs (Prison Reform Trust 2009).

One potential issue with a super complaint process is that it may divert regulator resources away from alternative, higher-priority activities, given the ‘fast-track’ requirements. However, the Consumer Action Law Centre contends that ‘well-established’ consumer advocacy organisations in Australia would use a super complaints process appropriately and not derail pre-established regulatory priorities with unnecessary complaints (2017, p. 28). Further, gathering the necessary evidence and lodging a complaint could be a costly exercise for a consumer group both in terms of resources and in reputation and influence should such a complaint be founded on scant evidence. As noted by a former campaign director of a designated body who prepared super complaints in the United Kingdom:

... no one wants to be in a position where, after 90 days, the regulator says that the complaint is ‘unfounded’ or requires no action ... This means that consumer groups spend a lot of time testing their arguments in advance of submitting a super complaint. Their sharpest policy minds will have been over it with a fine toothcomb. (Moorey 2018)

On balance of the costs and benefits, the Commission sees value in implementing a super complaints process. The Commission’s 2017 *Consumer Law Enforcement and Administration* study came to a similar conclusion (2017a, p. 224). The UK super complaint process has operated for almost two decades (and extended into other regulatory areas), indicating that it is functioning well, and is a possible model for Australia to use.

A super complaints process in Australia would need to be supported by operational guidance and principles, to ensure that the process is effective and efficient. This should include requirements for designating (and removing) consumer bodies, evidentiary requirements to support a claim (including the potential consumer harm), and the process by which a regulator should respond to the complaint (such as the specified time period for a response). The guidance and principles should be developed by the Australian Government in consultation with ACL regulators and consumer groups, drawing on lessons from the New South Wales trial and the UK experience.

As super complaints are typically focused on systemic and nationally relevant issues, they would be best directed to the ACCC. However, there may also be merit in Australian Governments considering whether State and Territory ACL regulators could also receive super complaints, or potentially lodge super complaints with the ACCC, given their direct experience in handling issues associated with consumer guarantees.

DRAFT RECOMMENDATION 3.3 ENABLING A SUPER COMPLAINTS PROCESS

The Australian Government should enable designated consumer groups to lodge ‘super complaints’ on systemic issues associated with access to consumer guarantees, with the complaints to be fast tracked and responded to by the Australian Competition and Consumer Commission (ACCC).

The Australian Government should design the super complaints system in consultation with the ACCC, relevant State and Territory regulators and consumer groups. The system should be underpinned by sound operational principles — including criteria for the assignment (or removal) of designated consumer bodies, evidentiary requirements to support a complaint, and the process and time period by which the ACCC should respond.

4 Competition in repair markets

Key points

- Community concerns about the dominant role of many original equipment manufacturers (OEMs) and lack of competition in repair markets are widespread.
 - Lack of competition in repair markets can harm consumers or broader society where it results in higher repair prices, or reduced access, choice and convenience of repair. However, effective competition in the primary market for products can limit consumer harm through offsetting lower prices for the original product.
 - Although limited, existing evidence does not suggest a systematic competition problem in repair markets. However, there is anecdotal evidence that some OEMs are limiting independent repairs in some markets by restricting access to repair supplies (such as information, tools and parts), and using warranty terms that discourage independent repair.
 - There may be valid reasons why OEMs seek to manage how their products are repaired, and who repairs them — including to protect public safety, cyber security, brand reputation and environmental standards. However, some of these risks appear to be overstated, and in some instances, OEM restrictions on repair could increase risks from independent repair.
- There are several products for which market characteristics — such as high consumer lock-in, a large repair market and limited product competition — may mean that competition in these repair markets is restricted. The Commission is seeking additional information on the nature and extent of any consumer harm in different product markets, particularly in the markets for agricultural machinery, and mobile phones and tablets.
- There are existing remedies under the *Competition and Consumer Act 2010* (Cth) to address anti-competitive behaviours in repair markets, such as provisions to prevent the misuse of market power, exclusive dealing and anti-competitive agreements.
- A further option may be to introduce a ‘positive obligation’ that requires OEMs to make repair supplies (such as information, tools and parts) available to third-parties at a reasonable price. However, this is a significant and potentially costly regulatory step. The Commission is seeking to establish whether its benefits would outweigh its costs.
 - One type of positive obligation currently being implemented in Australia aims to expand access to repair information for motor vehicles. This may be an effective remedy for addressing concerns about access to repair information in this market, but the efficacy of the scheme should be evaluated after implementation.
- To facilitate independent repair (and address consumer misunderstanding), text in manufacturer warranties should be required to prominently state that guarantees under the Australian Consumer Law do not require the use of authorised repairs or spare parts.
 - The Commission is also seeking feedback on the costs and benefits of prohibiting manufacturer warranties from containing terms that void warranties if consumers do not use manufacturer authorised repairs or parts.

Competition is important to achieve better economic outcomes for the community. At its best, it can drive people to new heights, encouraging them to excel and rewarding their success. Typically, businesses attempting to obtain or keep market share in a competitive market will provide customers with higher-quality goods or services for lower prices, while vying among each other to offer the best customer experience, creating a cycle of constant improvement (Fletcher 2016, pp. 12–13; PC 2018, p. 68).

In repair and maintenance (hereinafter repair) markets, the structure of the market and the strength of competition between different repairers can be a vital mechanism to ensure that consumers have access to affordable repair options. This includes competition between the different types of repairers — in-house repair services provided by the original equipment manufacturer (OEM); repairers that are ‘authorised’ for repairs by the OEM; those that are ‘independent’ of any OEM; and consumers undertaking their own repair (‘DIY repair’ or ‘self-repair’). Beyond the cost of repair, competition in repair markets can also promote innovation in products and repair solutions, enhance the quality, convenience and variety of repair services on offer, and improve the overall efficiency of the sector.

However, limited competition in repair markets does not necessarily harm consumers or society. A lack of competition could be reflective of a more durable product with less requirement for maintenance or repair, reflected in higher prices at purchase. Moreover, an enduring battle for customers in the market for the original product (the primary market) may be able to offset (fully or in part) any higher prices in the repair market.

This chapter investigates various dimensions of competition and examines the concerns posed in the terms of reference for this inquiry, which states that there is ‘lack of competition in repair markets’ and that ‘consumers and third parties are being prevented from being able to repair products due to lack of access to the necessary information, tools, parts or diagnostic software’. The chapter is structured as follows.

- Section 4.1 presents the Commission’s framework for assessing competition issues in repair markets.
- Section 4.2 examines the evidence for whether there are impediments to competition in repair markets for particular products.
- Section 4.3 examines some of the justifications for restricting repair, including safety, security and quality concerns, among others.
- Section 4.4 considers the overall state of competition in specific product markets, taking into account their structure and broader context.
- Section 4.5 looks at the effectiveness of current competition provisions in the *Competition and Consumer Act 2010* (Cth) (CCA).
- Section 4.6 concludes with a discussion of possible alternate policy remedies.

4.1 Weighing competition concerns

Concerns about the state of competition in repair markets are widespread, and featured prominently among inquiry participants, with a particular focus on the dominant role that many OEMs (or their networks of authorised repairers and dealers) have in the repair markets for their products (box 4.1). Much of this dominance derives from the inherent advantages in being an OEM. As the product's manufacturer, the OEM knows the product best (including its technical specifications, the materials used to make it, and how to repair it) and is typically the major (or in some cases, the only) supplier of spare parts and repair tools for that product.

Box 4.1 The dominant role of OEMs in repair markets

Concerns about the dominant position of OEMs in repair markets featured prominently in submissions, with many stakeholders noting that this dominance has grown over time:

Globally, we note a trend in the technology and mechanical industries since the 2000s towards a "walled garden" style ecosystem in which companies attempt to maximise sales by locking in consumers to their own suite of software and hardware products while also restricting self- or third party repairs through regulatory, legal and technical measures. (Pirate Party Australia, sub. 74, p. 3)

The increasing 'computerisation' of everyday products has provided OEMs with a new set of tools that can prevent access to product aftermarkets (ACS, sub. 66, p. 2; Australian Democrats, sub. 100, part 1, p. 28). As noted by iFixit:

Over the last two decades, we've gone from a world where software is rarely seen outside of a general-purpose computer, to a world where billions of microprocessors are embedded in virtually every type of device. As a result, software has become central to the repair of devices. Manufacturers are, unfortunately, taking this opportunity to prevent users from repairing or modifying the devices they have bought, from tractors to printers to coffee makers. (sub. 107, p. 10)

Concerns varied between product markets. For example, many participants were concerned about the influence of OEMs and dealers in agricultural machinery:

Currently dealerships have a monopoly on repairs, with farmers being burdened with higher costs and limited choice of repairers. I believe service to farmers would be greatly improved and costs reduced if they had a choice of repairer they can engage for servicing and repair of their machinery. (Fusinato, sub. 6, p. 1)

Others were concerned about the control that some watchmakers have:

[Swiss watchmakers] like to use the term "vertical integration". In other words, control over manufacturing, control over who sells their product (often limited to the factory's own retail outlets) and control over who repairs their product. I would think a more fitting word would be "monopoly". (Peters, sub. 19, p. 2)

Similar issues were raised in other product markets, including motor vehicles, medical devices, domestic household appliances (ovens, coffee machines), consumer electronics (mobile phones, laptops), and electrical equipment (Abbas, sub. 34, p. 16; Australian Democrats, sub. 100, part 1, pp. 5–6; Brisbane Tool Library, sub. 73, pp. 1, 4; Johnson, sub. 49, pp. 1–3; Pirate Party Australia, sub. 74, pp. 4, 7).

A framework to consider aftermarket competition issues

The Commission's approach to assessing competition in repair markets focuses on determining whether there is evidence that aftermarket competition is being restricted, and if so, whether this is harming consumers (figure 4.1, adapted from Tirole (2005, p. 5)). More detail about this framework and the basis for it can be found in appendix B.

Figure 4.1 **A framework to consider aftermarket competition issues**

A. Is there evidence that competition in repair markets is restricted?
<input type="checkbox"/> High-level measures indicate a lack of competition (concentration, barriers to entry, profit margins)
<input type="checkbox"/> Specific cases of manufacturers restricting competition (limits on third-party access to repair supplies)
B. Is there harm to consumers?
<input type="checkbox"/> Consumers are 'locked-in' to the repair market (high switching costs)
<input type="checkbox"/> Consumers face difficulties estimating repair costs (lack of information, complexity)
<input type="checkbox"/> The repair market is large (relative to the primary market)
<input type="checkbox"/> Manufacturers have financial ties to the repair market (in-house repair, contracts)
<input type="checkbox"/> Consumers are not compensated by lower prices in the primary market
<input type="checkbox"/> Adverse non-price outcomes for consumers (reduced choice, inconvenience)
<input type="checkbox"/> Risk from third-party repair (to safety, security, quality or innovation) are limited

The first step is to identify evidence of whether competition in repair markets is being restricted (section 4.2). This includes considering:

- **Do high-level measures indicate a lack of competition** — such as high market concentration, low rates of firm entry or exit, and high (and increasing) profit margins.
- **Are there specific cases of OEMs restricting competition** — such as limits on third-party (both independent repair businesses and consumers undertaking 'DIY repair') access to repair supplies or warranty terms that discourage independent repair.

Market power is not necessarily a problem, in and of itself. The issue is whether a lack of competition in repair markets is harming consumers or broader society, through higher prices or reduced choice and access. This question requires considering:

- **Do market characteristics encourage higher prices in repair markets** — there are several characteristics that can indicate when an OEM may be more likely to restrict competition in repair markets and set higher prices.
 - *Consumers are 'locked-in' to using authorised repair and parts* — the greater the cost of switching to a competing product to avoid high repair prices, the less existing customers are likely to switch (Coppi 2007, p. 55; OECD 2017, p. 8). High switching costs are more likely to arise for high-cost durable goods (such as tractors or cars) or appreciating investment goods, for which skilled repair is required (such as high-end watches). It can also include factors beyond price, such as a loss of content when

changing brands, costs of learning to use a different product, and contract exit costs (Schulz 2015, p. 124).

- *Consumers face difficulties estimating repair costs* — inadequate or poor quality information on repair costs, and the complexity of making long-run calculations on these and other ‘lifecycle costs’ of a good, can mean that consumers are not able to observe and consider higher repair prices in their purchase decisions (BIAC 2017, p. 10; OECD 2017, p. 9). This is more likely for goods that do not require regular maintenance (such as mobile phones), or that are purchased primarily by households.
- *The repair market is large* — the larger the value of the repair market (relative to the primary market) and the greater the certainty of ongoing returns in aftermarket (such as through regular maintenance), the more gains there are to OEMs from raising repair prices (BIAC 2017, pp. 10–11; Coppi 2007, p. 70; OECD 2017, p. 42).
- *OEMs have financial ties to the repair market* — it is only profitable to restrict third-party repairs if there is a mechanism for OEMs to extract gains from higher repair prices. These mechanisms can include direct profits from in-house repairs, or returns from contracts with authorised repairers (such as franchising fees or requirements to use OEM-branded parts).
- **Are consumers compensated by lower prices in the primary market** — where there are highly-competitive markets for the original product (the primary market), firms may ‘compete away’ any profits they earned in the repair market for that product, creating a ‘waterbed effect’¹⁵ (Coppi 2007, p. 59; OECD 2017, p. 8; Shapiro 1995, p. 485).
 - The Commission sought to empirically assess whether this effect exists for motor vehicles — a market with a high degree of primary market competition — using a natural experiment created by a policy change in the United States that mandated the sharing of repair information and tools to owners and independent repairers. The analysis found some evidence that the price of new cars increased as a result of the policy change, however there are a number of caveats to this analysis (appendix B).
- **Are there adverse non-price outcomes for consumers** — there may be non-price impacts on consumers, such as reduced access to and choice of repairers, and more inconvenience from fewer independent repairers, including increased time and travel costs for repairs (particularly for people living in regional and remote areas). Higher repair prices from restrictions (and lower primary product prices due to the waterbed effect) can also tilt consumer decisions towards replacement rather than repair, leading to product disposal (which can have harmful environmental impacts if not well managed — chapter 7).
- **Are there valid reasons for restricting third-party repair** — such as to maintain the safety, security, quality and environmental standards of products (section 4.3), or to promote innovation and protect a firm’s intellectual property (IP) (chapter 5).

¹⁵ A pattern of low primary market profits and high secondary market profits (and prices) has typically been referred to as a ‘waterbed effect’ because the nature of primary and secondary product complementarity means that reducing one price tends to make another price go up (appendix B).

The above criteria help to identify whether there might be a lack of competition in repair markets that is leading to consumer or societal harm. However, applying this framework to justify government intervention requires an in-depth analysis of each factor, on a product-by-product basis, to establish the magnitude of harm to consumers and society, and the efficacy and cost-effectiveness of potential policy responses. Undertaking such a detailed assessment was beyond the scope of this inquiry, including because it requires access to (and potentially collection of new) data that is not currently publicly available. Instead, the Commission has taken a qualitative approach, supported with data where possible, to arrive at a judgment about whether there appear to be competition issues in select repair markets, and where further investigation may be warranted.

4.2 Evidence for restricted competition in repair markets

The Commission conducted several broad ‘health checks’ to provide an indication of the state of competition across the ‘repair and maintenance’ sub-industries¹⁶. These cover appliances, electronics, machinery, clothing and footwear, and different types of motor vehicle repairs. The analysis did not indicate a systemic competition problem across the repair industries analysed.

- Low market concentration ratios (suggesting numerous providers without significant market dominance) and entry and exit rates were comparable to the rest of the economy (indicating healthy movement of businesses in and out of the market).
- Profit margins do not appear to have changed substantially over the past decade, suggesting that any increasing barriers to competition have not resulted in higher profits in repair markets, as would otherwise be expected (appendix B).

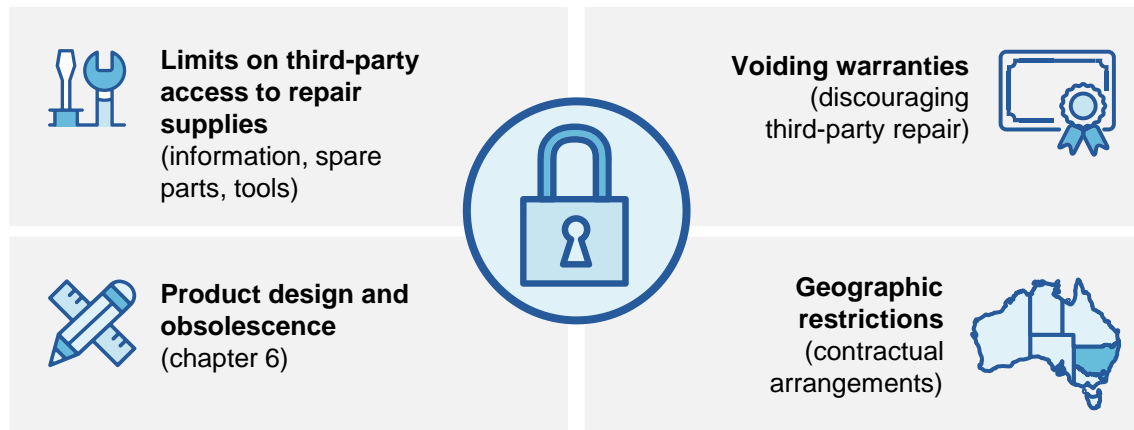
However, there are some caveats to this analysis that limit its authority as evidence of the competitiveness (or otherwise) of repair markets. First, industry-level trends may mask significant variations between specific product markets (for which consistent data is not available) — for example, the machinery sub-industry (‘other machinery and equipment repair and maintenance’) covers agricultural, mining, construction, forestry, refrigeration, and most other kinds of heavy machinery, making it difficult to discern issues in each of these product markets. Second, the data does not differentiate between OEM-affiliated and independent repair providers, such that it was not possible to comment on whether the concentration of OEM-affiliated repairers was increasing and independent repairers decreasing. Finally, the effects of restricting competition may not be evident in the data — for example, greater barriers to the repair of newer ‘computerised’ products may not have affected the viability of independent repairers yet, as they are still able to repair older products in circulation.

The second area of investigation focused on assessing the strength of the evidence base for concerns raised about the specific actions and behaviours of OEMs in particular product

¹⁶ Defined by the Australian and New Zealand Standard Industrial Classification (ANZSIC).

repair markets that could be restricting competition. The Commission has categorised these concerns into four types (figure 4.2).

Figure 4.2 **Methods of restricting repair**



Limits on third-party access to repair supplies

Repairers need access to specific inputs and information to effectively conduct repairs, including:

- spare parts
- tools and equipment (such as specialised hardware, or diagnostic/calibration software)
- repair information (such as repair manuals, technical specifications or circuit diagrams).

Several inquiry participants raised concerns that OEMs are using their dominant market position to restrict third-party access to many of these supplies. Of the concerns raised in submissions, about 80 per cent related to a ‘refusal to deal’, where OEMs refuse to provide supplies to any party outside their authorised repair network. For example, a medical equipment supplier said that it ‘has made many attempts to purchase parts, components and equipment from OEMs and these have been flatly rejected’ (MD Solutions, sub. 41, p. 4). Similarly, the National Farmers Federation said that agricultural machinery OEMs refuse to supply technical information, diagnostic tools and parts to anyone outside their authorised network (sub. 55, p. 2).

Other inquiry participants noted that some OEMs will notionally sell repair supplies to any purchaser, but may set their prices prohibitively high (‘margin/price squeezing’) or only sell the necessary repair supplies with other repair services or products (‘tying’ or ‘bundling’), making third-party repair uncompetitive. For example, one participant claimed that Samsung sets its prices for replacement mobile phone parts at the same level as the cost of parts *and*

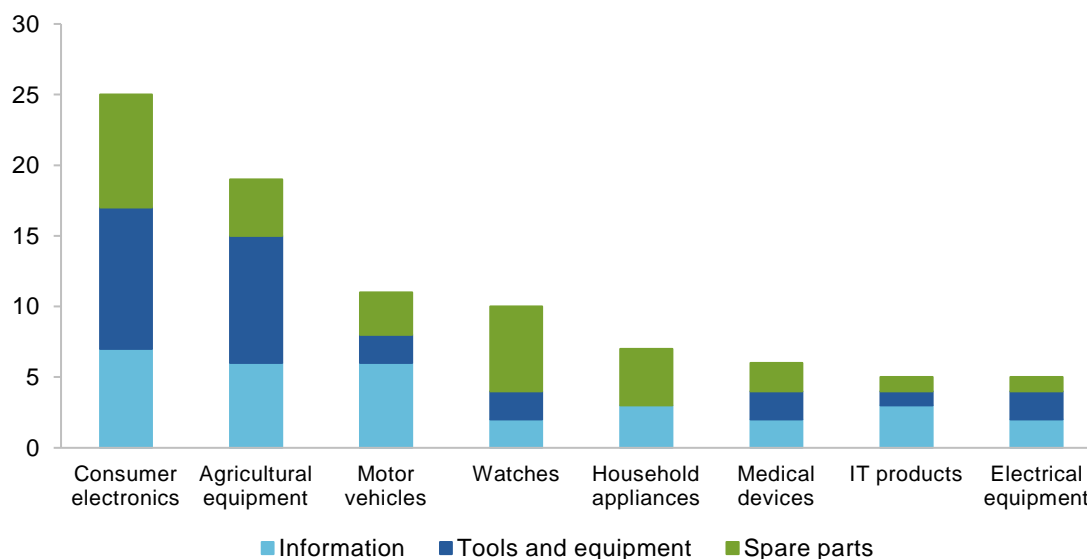
services in its authorised repair network, making independent repairs uncompetitive (The Phone Spot, sub. 50, p. 2).

Based on submissions to this inquiry, such impediments appear to be particularly prevalent for consumer electronics, agricultural equipment, motor vehicles and high-end watches (figure 4.3). Concerns about limited access to repair supplies were roughly evenly split across the different types of supplies (spare parts, tools and equipment, and information).

- *Spare parts* — concerns mostly related to accessing OEM-branded spare parts. For watches, issues accessing spare parts comprised more than half of all complaints. The Watch and Clockmakers of Australia said that ‘the watch repair industry around the world has been subjected to the effects of a policy by many major watch brands of not supplying spare parts to independent watchmakers’ (sub. 83, p. 1). Another participant noted that some manufacturers of electronic devices often refuse to distribute parts that are essential to repair and maintenance (Free Software Melbourne, sub. 43, p. 3).
- *Tools and equipment* — concerns were mainly about accessing tools and equipment to repair agricultural machinery and consumer electronics. For agricultural machinery, access to diagnostic software tools was the primary barrier, whereas for consumer electronics, access to calibration tools (to fine-tune or reinitialise products after new parts are installed) was the main issue. iFixit suggested that agricultural machinery OEMs do not make diagnostic software available to anyone except their authorised technicians, making it impossible for farmers to debug their own equipment (sub. 107, p. 7), although this was denied by John Deere (sub. 84, attach. 1, p. 2). Another participant noted that printer manufacturers restrict access to calibration software needed to use refilled (or non-OEM) ink cartridges (Osborne, sub. 7, p. 1).
- *Repair information* — issues accessing repair information were more of a barrier to repair for cars and household appliances. For cars, access to data (diagnostic/product use/consumer data) was the primary barrier, whereas for household appliances, access to product schematics was the primary issue. The Australian Automotive Aftermarket Association suggested that most car manufacturers in Australia are not fully sharing technical data (including diagnostic and product-use data) (sub. 81, p. 3).

Such restrictions on repair supplies have a long and well-known history — for example, Ford Motors was first reported to have restricted third party access to specialised repair tools in the 1920s — but the ‘electrification and computerization’ of products may have ‘dramatically expanded’ OEMs’ capacity to implement restrictions (Hanley, Kelloway and Vaheesan 2020, pp. 6, 8). In particular, the spread of complex software to ever more products can enable IP rights to be used as a mechanism to prevent access (Grinvald and Tur-Sinai 2019, p. 74), particularly through the use of copyright, patents, trademarks and digital software locks (chapter 5).

Figure 4.3 Repair barriers, by industry, raised in submissions^a



^a Consumer electronics includes mobile phones, printers and laptops. Agricultural equipment includes heavy equipment and tractors. Motor vehicles includes cars and caravans. Household appliances include ovens, dishwashers, coffee machines and blenders. Information technology products include software, operating systems, telemetry and data analytics services.

Restrictions on access to repair supplies do not prevent all third-party repairs, however. Where supplies are restricted, independent and DIY repairers can often turn to other suppliers of non-OEM-branded parts and diagnostic tools, or salvage parts from used or secondhand equipment (Hanley, Kelloway and Vaheesan 2020, p. 10). Despite such workarounds, these efforts are not always possible, nor costless, in many product markets. For example, alternate suppliers may not be available in many repair markets, particularly where the necessary supplies are highly specialised or protected from replication by IP laws. Some workarounds (such as circumventing diagnostic software on agricultural machinery — chapter 5) can also involve significant time and money costs — for both repairers and consumers — and may, in some instances, involve repairers engaging in potentially unlawful behaviour to get around restricted supplies.¹⁷ In the event that such efforts are not successful, independent repairers are at risk of being excluded from the market entirely. Moreover, where independent repairers are able to find a workaround, such solutions may be incomplete or offer no security of ongoing supply (ACCC 2017b, p. 10).

Similar issues may also arise if OEMs are unwilling to provide repair training to independent repair providers. For complex repair work, specialised training can substantially reduce the time and other costs imposed on independent repairers — who are often forced to reverse engineer products and learn from a system of trial and error (ATSA, sub. 23, p. 10; Stuart,

¹⁷ For example, in response to repair restrictions and the need for timely repair during periods of harvest, some US farmers have started ‘hacking’ their tractors with illegally torrented firmware (Koebler 2017b).

sub. 29, p. 1) — with implications for product safety and security (section 4.3). The provision of OEM-specific repair training (whether free or paid for by the independent repairer) appears to be limited (or non-existent) across several product markets, including cars, and medical devices (ACCC 2017b, p. 125, MD Solutions, sub. 41, p. 5).

However, as a general rule, suppliers have the right to choose who they wish to deal with, and there are many reasons why a manufacturer may refuse to supply goods or services. For example, an OEM may find it too costly or inconvenient to sell to everyone who asks, particularly for independent repairers ordering under a minimum threshold (appendix B). The OEM may also find that producing and then warehousing spare parts for long periods of time increases costs to a prohibitive level (chapter 3). Concerns about safety, security, quality and environmental protections are other reasons that OEMs may restrict access to repair supplies, although these may sometimes be an excuse rather than a genuine problem (section 4.3). Nonetheless, limits on third-party access to repair supplies may be unlawful under some provisions of the CCA, especially if it substantially lessens competition (section 4.5).

Warranty terms that discourage independent repair

Nearly all consumer products come with a manufacturer’s warranty (also known as a ‘warranty against defects’) that typically provides consumers with a voluntary, time-limited promise that, if the goods (or part of them) are defective, the manufacturer will either repair or replace the goods (chapter 3). These warranties are separate to, and cannot displace, the consumer guarantees (discussed below).

Many manufacturer warranties contain conditions that limit the OEM’s liability for coverage in the event that the product is damaged due to non-authorised repairs, maintenance or modification. While such clauses can be a reasonable mechanism to limit OEM liability, some OEMs go further by including warranty terms that permit the OEM to void the warranty should *any* non-authorised repairs, maintenance or modification occur, even where those repairs are unrelated to a subsequent fault covered by the warranty. A prominent version of these clauses involve warranty seals, such as ‘warranty void if removed/broken’ stickers found on some products (US PIRG 2018, p. 3). Commission analysis of over 30 warranties suggests that such warranty voiding clauses exist across a wide range of products (including mobile phones, video game consoles, washing machines and high-end watches), but only for a minority of brands (box 4.2).

Even where the warranty does not contain these voiding clauses, evidence from the United States suggests that customer service representatives often (in 28 of 31 home appliance manufacturers tested) tell consumers their warranty is void anyway (US PIRG 2018, pp. 12–13). Similar concerns about misrepresentations from customer service staff in Australia were raised as part of this inquiry (AAAA, sub. 81, pp. 4–5; GiveGet, sub. 35, p. 4), as well as in the ACCC’s market study on new car retailing (ACCC 2017b, pp. 55–57).

Box 4.2 **Examples of void warranties from independent repair**

During the course of the inquiry, the Commission heard about or discovered several examples of warranty terms that automatically void the warranty on unauthorised repair, as well as several ‘warranty void if removed/broken’ stickers.

In the United States, one experiment found that 45 out of 50 home appliance manufacturers either had voiding terms in their warranties, or customer service representatives were stating that warranties would be void (US PIRG 2018, pp. 2–3). To partially replicate this analysis, the Commission reviewed Australian warranties across a range of products — tractors, gaming consoles, mobile phones, washing machines, microwaves and watches — and found that, of 33 warranties examined, five clearly stated a void warranty term for non-authorised repair, while two had similar (but ambiguous) wording. The remaining 26 warranties had clauses that appear to exclude any damages from non-authorised repair, though often with unclear or dense language.

Examples of the use of these voiding clauses in warranties were observed or suggested across a range of products during this inquiry. For example:

- for some game consoles — the warranty for Nintendo’s Switch console states that the ‘warranty does not cover ... the Product if it has been opened, modified or repaired by you or any other person not authorised by Nintendo’ (Nintendo 2020). Warranties of other consoles, such as Sony’s PlayStation 4, only state they do not apply to damage caused by unauthorised repair (Sony 2021), yet still have a sticker stating that ‘warranty void if seal removed/damaged’ on the back, placed over top of a screw that is needed to open the device up.
- in the agricultural machinery sector — for example, the National Farmers Federation observed that some OEMs are ‘voiding the machine’s warranty if purchasers conduct repairs themselves or use an independent repairer’ (sub. 55, p. 2). Similarly, the Australian Small Business and Family Enterprise Ombudsman noted that ‘farmers are usually capable of repairing equipment themselves, but are unable due to warranty conditions that stipulate equipment be repaired by an authorised repairer’ (sub. 59, p. 2).
- In the medical device industry — for example, MD Solutions, a medical device supplier, suggested that some OEMs routinely inform customers that any repairs undertaken by third party service agents will void their warranty. MD Solutions’ understanding is ‘that, if third party repairs are found by certain OEMs (no matter how minor), a complete rebuild will be quoted ... This is usually more than the residual value ... resulting in a new purchase’ (sub. 41, p. 3).

However, some manufacturers said that their warranties do *not* contain any such restrictive clauses. For example, John Deere noted that it ‘does not void the warranty in the event a customer uses non-John Deere parts or utilises a service provider other than an authorised John Deere dealer’ (sub. 84, attach. 1, p. 2). And the gaming industry association said that warranties on Microsoft Xbox consoles only exclude damage caused by unauthorised repairs, but do not automatically void the warranty (IGEA, sub. 103, p. 16).

Many warranties also use language that can be dense and difficult to understand (Repair Café Woolloongabba, sub. 42, p. 2), leading consumers to wrongly believe that their warranty would be void if they sought independent repair services (AAAA, sub. 81, pp. 4–5; Abbas, sub. 34, p. 10; Wiseman and Kariyawasam, sub. 105, pp. 7–8). For example, manufacturer warranties on motor vehicles generally do not contain voiding clauses (Kollmorgen 2020), but a survey conducted for the ACCC found that 30 per cent of people cited worries about voiding the warranty as a reason for getting vehicle repairs at dealerships,

while 28 per cent stated it was mandatory under the warranty. Respective figures for choosing dealerships for maintenance and servicing were 22 per cent and 23 per cent (Colmar Brunton 2017, pp. 49, 63). These results led the ACCC to conclude that the use of authorised dealers for repairs and servicing by a majority of consumers ‘appears to be, in part, the result of a mistaken belief that the manufacturer’s warranty requires them to only use an authorised dealer’ (ACCC 2017b, p. 57).

As part of this inquiry, participants and commentators raised concerns that the existence of warranty voiding clauses (or the widespread belief that they exist) can discourage consumers from seeking independent repair during the warranty period and restrict competition within the repair market (Buckingham, sub. 22, p. 2; GiveGet, sub. 35, p. 4; Hanley, Kelloway and Vaheesan 2020, p. 21; IT Professionals Australia, sub. 26, p. 6; Janday, sub. 37, p. 1; Proctor, sub. 92, pp. 1-2; SA Repair Cafe, sub. 46, p. 11).

For many product defects, such voiding terms will not be problematic — few cost-minimising consumers would seek repairs from an unauthorised repairer for a defect that is covered by a warranty, as these repairs are typically provided free of charge by the OEM.

However, there are circumstances where consumers may want to access independent repair services during a warranty period. For example, warranties do not cover all product faults, with few warranties covering accidental damage or ‘normal wear and tear’, making independent repair a potentially cost-effective alternative to paying for authorised repair. And even where the defect or fault is covered by the warranty and would be provided by the manufacturer for free, some consumers may still prefer an independent or DIY repair, particularly if the inconvenience (or shipping costs, if these are not covered) of a warranty claim is greater than the cost of an independent solution (Adelaide Appliance Repairs, sub. 102, p. 1; US PIRG 2018, p. 6).

Moreover, voiding clauses in warranties can conflict with the consumer guarantees provided under the Australian Consumer Law (ACL) for most consumer products (or business products up to \$100 000 value from July 2021 — chapter 3). Guarantees typically cover a similar range of failures or defects for a period that may last longer than the warranty, and generally offer the same remedies — repair, replacement or refund (ACCC 2021j, 2021d).¹⁸ Recent court cases — particularly relating to Apple products (box 4.3) — have also clarified that the consumer guarantees do not cease to apply simply because of independent repair or the use of third-party parts, regardless of the terms of the manufacturer’s warranty.

Yet, given numerous other difficulties that consumers have with understanding their rights (chapter 3), it is not clear that consumers are broadly aware that voiding warranty terms and ‘warranty void if removed’ stickers do not prevent them from obtaining a remedy for a fault under the consumer guarantees. As the Australian Automotive Aftermarket Association (sub. 81, p. 6) noted ‘if the consumer is unaware of their rights, or misled about their statutory rights, it is highly unlikely they will be able to take action to enforce these rights’.

¹⁸ The party who chooses the remedy depends on the nature of the defect — for minor failures, the supplier or manufacturer chooses the remedy, but for major failures it is the consumers’ choice.

Box 4.3 **Apple software fault (error 53)**

In 2015, Australian Apple customers experienced a software fault called ‘error 53’. The error disabled some iPhones and iPads after an update to Apple’s operating system. The issue particularly affected consumers who had repair — primarily installation of a new ‘home button’ — carried out by a non-Apple technician.

Responding to at least 275 Australian customers over the period 2015-16, Apple declined to provide consumers with a fix. Apple claimed that consumers were not eligible for a remedy if their device had been repaired by a third-party repairer.

The Federal Court found that the fault was covered by consumer guarantees and that ‘the mere fact that an iPhone or iPad had been repaired by someone other than Apple did not, and could not, result in the consumer guarantees ceasing to apply’ (ACCC 2018c). The Federal Court ordered Apple Inc to pay \$9 million in penalties for making false or misleading representations to customers about their rights under the Australian Consumer Law.

Sources: ACCC (2018c); *Australian Competition and Consumer Commission v Apple Pty Ltd (No 4)* [2018] FCA 953.

Nevertheless, many manufacturers have legitimate concerns about being held liable for poor-quality repair work by unauthorised parties, or of safety issues for authorised staff conducting subsequent repairs (section 4.3).¹⁹ As the National Farmers Federation noted:

... there are legitimate reasons for a manufacturer to limit the applicability of warranties. Foremost among these is the desire of manufacturers to limit their financial liability to sub-standard repairs undertaken by a third-party. It may be fair and reasonable for a manufacturer to choose not to carry the risk arising from a third party over whose actions the manufacturer has no control. (sub. 55, p. 2)

But as the National Farmers Federation went on to note, a concern about shared liability ‘does not justify the inapplicability of that warranty to mechanical issues unrelated to the third-party repair’ (sub. 55, p. 2).

Some of these terms can resemble tying and bundling arrangements, with both the ACCC and state and territory consumer protection agencies noting that this may breach anti-competitive conduct provisions (such as exclusive dealing — section 4.5), particularly in the motor vehicle sector (ACCC 2014, p. 1; CAANZ 2018, p. 20). The ACL also contains provisions against both unfair contract terms (s. 23) and false and misleading representations (s. 29), which may be contravened by voiding terms in manufacturer warranties or incorrect statements from customer service representatives about warranty coverage (respectively), although neither application appears to have been tested in court. And despite OEM concerns, these warranty voiding clauses and the use of ‘warranty void if removed’ stickers

¹⁹ Other OEMs, such as video game console makers, claim that their warranty terms help to protect their IP rights (IGEA, sub. 103, p. 18), although it is not apparent how time-limited warranty terms or a ‘warranty void if removed’ sticker would pose a serious obstacle to IP infringement. For agricultural machinery, McIntosh & Sons also observed that warranty periods are normally quite short, so do not lessen competition over a machine’s entire commercial lifetime (sub. 24, p. 2).

are typically unlawful in the United States already, with the introduction of similar provisions in Australia available as a possible policy solution (section 4.6).

DRAFT FINDING 4.1 VOIDING WARRANTIES FROM INDEPENDENT REPAIR

Terms within manufacturer warranties that automatically void such warranties if non-authorised repairs are undertaken (including ‘warranty void if removed’ stickers) can deter consumers from using third-party repair during the warranty period. The Commission found examples of such terms in warranties for mobile phones, gaming consoles, washing machines and high-end watches.

Even where these terms do not exist, many consumers appear to be under the mistaken belief that their warranties will be void if they undertake third-party repair. They may also not be aware that consumer guarantees (that they are entitled to under the Australian Consumer Law) cannot be displaced by terms in warranties and are not extinguished due to independent repairs.

Extended warranty voiding clauses and service requirements

Although less prominent during this inquiry, concerns about similar voiding clauses in extended warranties (an optional product extending warranty coverage, often purchased separately — chapter 3) have also been raised by the Consumer Action Law Centre (sub. 119, pp. 5, 10) and the Australian Securities and Investment Commission (ASIC). In particular, ASIC found that some extended warranty products in the motor vehicle industry have onerous vehicle servicing requirements, such as:

- requirements to service vehicles more frequently than specified under the manufacturer’s warranty (which is typically annually) after the manufacturer’s warranty has expired
- tied-servicing arrangements where consumers are required to service their vehicle at the selling dealer both during the period of the manufacturer’s warranty and after it has expired, or the extended warranty will be void (ASIC 2019, p. 55).

As part of a broader package of reforms on extended warranties, ASIC concluded that these requirements are causing detriment to consumers, and has proposed regulatory changes to prohibit tied-servicing requirements and voiding clauses in extended warranties for motor vehicles, unless these are provided to consumers for no cost (ASIC 2019, pp. 56, 58). More broadly, the Australian Government has also proposed a number of changes (such as cooling-off periods and mandatory information disclosure) to ensure consumers have sufficient information to make informed decisions about purchasing extended warranties (Treasury 2018b, pp. 101–102) (chapter 3).

In light of the proposed regulations on extended warranties, the Commission is of the view that voiding terms within *manufacturer* warranties are now a more pressing issue than similar terms in *extended* warranties, particularly as manufacturer warranties are typically provided with the purchase of goods, without any choice or negotiation by consumers.

Authorised repairer contracts — geographic restrictions

As a key part of the repair market, the nature of the contractual arrangements between OEMs and third-party authorised repairers can also influence the state of competition. Several inquiry participants were concerned that such agreements may reduce competition by creating geographic restrictions on repairs by an authorised dealer, preventing customers from one region from seeking repairs from a dealer in another region. These claims were particularly common for agricultural machinery (GPA, sub. 27, p. 14; NFF, sub. 55, p. 3) where, for example, the Victorian Farmer’s Federation (VFF) stated that:

... geographical restrictions can effectively render purchasers of agricultural machinery a captive market when buying certain brands, inhibiting their ability to shop around for better prices or service. Indeed, many farmers have provided the VFF with examples where they were directly told by dealers that they were unable to purchase outside their area, or have struggled to get agricultural machinery fixed by a dealer if it wasn’t purchased locally. (sub. 60, p. 5)

Where they exist, such restrictions could severely constrain competition in repair services, by effectively providing dealers with a local monopoly over repair and maintenance. As noted by the ACCC:

The effect of these restrictions may be that dealers are able to charge higher prices or provide lower quality after-market goods and services than would be possible in the absence of these restrictions. (2020b, p. 14)

However, it is not clear that such geographic restrictions exist or are causing problems. Some OEMs denied that such clauses exist in their dealership agreements (CNHI, sub. 116, attach. 1, p. 12; JDL, sub. 84, attach. 1, p. 4). Other participants noted that it is common — particularly in motor vehicle and agricultural machinery markets (ACCC 2017b, p. 32, 2021b, pp. 13–14) — for authorised dealer agreements to assign a geographic ‘area of responsibility’. However, OEMs and industry groups argue that these are typically for sole marketing rights, regional performance measurement, or allocating a primary (but not exclusive) seller of the manufacturer’s products and authorised servicing and repairs, which is often necessary to ensure dealerships have adequate business to remain viable (Ai Group, sub. 32, p. 7; Eglinton, sub. 5, p. 2; FCAI, sub. 115, p. 6; JDL, sub. 84, attach. 1, p. 4; Toyota Australia, sub. 118, p. 4).

These areas of responsibility do not appear to be preventing competition between authorised dealers for repair services — the Federal Chamber of Automotive Industries noted that dealers ‘are able to sell vehicles and genuine parts, provide associated financial and insurance agency services as well as service customers regardless of where they may reside’ (sub. 115, p. 6). Consistent with this view, a recent ACCC market study found that arrangements to designate an area of responsibility in agricultural machinery markets are ‘not absolute’, and in some circumstances, may enable services to be supplied to purchasers at a lower cost (2021b, p. 14).

4.3 What are the reasons for restricting repair?

Manufacturer restrictions on access to independent repairs are often justified 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 (chapter 5).

Public safety and liability for defects

The nature of some products — and the manner in which they are commonly used — can result in some classes of goods generating risks to public safety. For example, defective motor vehicles or improperly functioning medical devices — such as ventilators, cardiac pumps or defibrillators — can lead to serious harm or death (BITRE 2011, p. 6; MD Solutions, sub. 41, p. 8; MITA 2019, p. 3).²⁰

The safety risks inherent in some products — and the possibility that a poor-quality repair may exacerbate them — is a prominent OEM justification for restrictions on third-party repair. In particular, OEMs express concerns that independent repairers:

- *lack qualifications and specialised training* — some OEMs (or their authorised networks) invest significant time and money hiring skilled technicians and providing specialised on-the-job training (Ai Group, sub. 32, pp. 6, 9; Dux Manufacturing, sub. 21, p. 2; Eglinton, sub. 5, p. 1; IGEA, sub. 103, p. 18; Rinnai, sub. 71, p. 2)
- *use low-quality parts* — it is sometimes claimed that independent providers are more likely to use non-OEM branded or second-hand aftermarket parts that are of lower quality or are not subject to the same level of safety testing and certification as OEM-branded parts (Ai Group, sub. 32, p. 6; AIIA, sub. 127, p. 12; ATSA, sub. 23, p. 12)
- *may not adhere to safety standards* — for example, the Federal Chamber of Automotive Industries and the Equipment Dealers Association contend that unregulated modifications and safety system disablement are more likely with independent repair (EDA 2019, p. 1; FCAI 2017, p. 27).

However, the Commission has not been provided with or been able to find any substantive evidence that independent repairs result in systemic safety issues, or are less safe (on average) than authorised repairs. Indeed, the Commission heard several arguments to the contrary.

- Repairs of some high-risk goods are already governed by mandatory occupational licensing requirements — for example, an electrical licence is typically needed to repair fixed electrical appliances, and a gasfitting and/or plumbing licence is needed for repairing products that are connected to gas or water, such as gas ovens and water heaters (Adelaide Appliance Repairs, sub. 102, p. 1; AWHF, sub. 94, p. 1; Rheem, sub. 53, p. 1).

²⁰ Vehicle defects, including defective parts, cause or contribute to about 5–12 per cent of all crashes in Australia (BITRE 2011, p. 6; Michael Paine 2000, p. 1). In 2017, the Therapeutics Goods Administration received 5370 ‘adverse event reports’ relating to medical devices (2018, p. 5), many of which appeared to be related to mechanical failure or other product defects (2021).

Similarly, medical devices are required to meet standards testing and regulatory compliance with the Therapeutic Goods Administration (ATSA, sub. 23, p. 4).

- For specific products, some independent repair technicians may have gone through the same training and certification processes that OEMs require of their own technicians, particularly as it is ‘not uncommon for independent repair shops to have former technicians from big manufacturers on staff’ (iFixit, sub. 107, pp. 18–19).
- Many common repairs — for example, replacements of smartphone screens or batteries — do not require extensive expertise and pose few safety risks and can be learnt on the job at either an independent or authorised repairer (iFixit, sub. 107, pp. 18–19).
- Non-OEM branded parts are often sourced from the same suppliers that the manufacturers use. For example, one participant claimed that mobile phone parts makers like Foxconn sell otherwise identical unbranded parts, separate from their supplies to OEMs (iFixit, sub. 107, p. 18). Further, in some instances non-OEM parts may be of higher quality, such as for motor vehicle and medical equipment parts (AAAA, sub. 81, p. 5; MD Solutions, sub. 41, p. 9).
- Independent repair businesses have a similar brand reputation to uphold for high quality and safe repair services (iFixit, sub. 107, p. 18). Workplace health and safety requirements also apply to independent repairers.

Moreover, by withholding critical repair supplies, like repair manuals, tools, spare parts or training, independent repairs may be more unsafe than they otherwise would be (Australian Democrats, sub. 100, part 1, pp. 24–25; Hanley, Kelloway and Vaheesan 2020; Thorpe, sub. 8, p. 3). For example, there were reports that during the early stages of the COVID-19 crisis, constrained access to repair information and parts for ventilators obstructed some repairs, leaving some devices non-functional during the peak of the crisis (Koebler 2020; Proctor, sub. 92, p. 2; US PIRG 2020, pp. 9–10). Limiting independent repair may also reduce the accessibility and affordability of maintenance or repair (Proctor, sub. 92, p. 2), encouraging consumers to persist in using malfunctioning equipment or reducing the frequency that products have pre-emptive repairs or maintenance.

In some instances, safety concerns regarding independent repair appear to be overstated. For example, safety concerns are often raised about consumer electronics or small household appliances, due to the potential for electrocution or malfunctioning batteries that create fire hazards (IGEA, sub. 103, p. 17; Mend It Australia, sub. 101, pp. 7, 9). Yet the Commission has seen no substantive evidence that independent repairs add to these risks — for instance, most of the risk of house fires due to lithium-ion batteries is inherent in the design of products or occur due to misuse or damage (Fogelman 2020; Jacques 2020; WADMIRS and WADFES 2020). And while there are risks from electrical shocks — with nearly 400 individuals hospitalised each year due to exposure to an electric current from cords, switches or domestic appliances (AIHW 2018, p. vi) — there is no evidence to suggest independent

repairs are at fault.²¹ Even for products that pose a higher risk to public safety when incorrectly repaired, like medical devices, some basic repairs require little expertise and pose no significant safety risk (such as simple mechanical repairs for wheelchairs).

One reason that some OEMs may be overly cautious about safety risks is due to concerns that they may be held legally liable for any issues that arise due to independent repair (IGEA, sub. 103, p. 18; LG Electronics, sub. 38, p. 3). The ACL contains provisions against unsafe or defective goods, with manufacturers liable for compensation for any loss or damage to people, goods or property (ss. 138–141). However, these provisions also allow for an OEM to defend themselves against liability if the safety defect ‘did not exist ... at the time when the goods were supplied by their actual manufacturer’ (s. 142). In practice, OEM liabilities should be limited if subsequent repairs or modifications cause any safety issues, but OEMs may still incur substantial legal costs to demonstrate their lack of liability.²² A related consideration is whether OEMs may suffer from damaged brand reputation due to safety-related incidents caused by third-party repairers — especially if there is substantial media coverage — although such instances are likely to be rare (brand reputation and shared liability is discussed below).

Finally, independent repairers, just like authorised repairers, vary in their competence and experience. Vigorous competition between repairers — authorised and independent — is one of the best remedies to poor-quality or unsafe repairs, as customers share their experiences by word of mouth or on social media.

Security and privacy

Many OEMs also argue that restrictions on access to repair supplies are necessary to prevent data and software security risks, as well as to protect consumer privacy. In particular, OEMs argue that unauthorised repair or replacement of device components can disable key hardware or software security features, or impede firmware updates for device security or system integrity (Microsoft 2019, p. 8). Such conduct can create ‘backdoors’ into internet-connected devices, as well as risk the user’s personal details, private conversations, financial information, and data on physical movements (Communications Alliance, sub. 131, p. 2; Paget 2018; Stumpf 2020). Examples of some product specific security and privacy risks are presented in box 4.4.

²¹ In its submission to this inquiry, Mend It Australia (sub. 101, pp. 7–9) included data obtained from the Monash University Accident Research Centre (MUARC) on injuries relating to home repairs of electrical items. According to its correspondence, MUARC found only 40 cases over the five years between 2015 and 2020 in Victoria, with most injuries to the wrist and hand (56 per cent), 28 per cent going to hospital, and none who died or were electrocuted.

²² Some OEMs appear to insure against product liability to mitigate such risks (Boyle 2018).

Box 4.4 **Examples of product specific security concerns**

Although security and privacy risks are applicable to most internet-connected devices, some devices may have elevated risks.

- Medical devices — modern medical devices can be reliant on the harmonized interaction of hardware and software components, and are often connected to other medical devices, databases and hospital networks. Security breaches may provide hackers with access to the sensitive health records of the user or others (Miller 2020a; Williams and Woodward 2015, p. 307), as well as create risks to health — for example research shows that pacemakers are vulnerable to hacking (Groeneveld et al. 2019, pp. 1–3; Smith 2018).
- Gaming consoles — in addition to risks to personal information, some inquiry participants claimed that independent repairs to gaming consoles may allow third-parties to install counterfeit software, modify the operating system for intellectual property infringement, or defraud the manufacturer by gaining free credits or games (IGEA, sub. 103, p. 18).
- Motor vehicles — in response to a 2020 ballot initiative in Massachusetts, expanding the right to repair legislation to cover telematic data (chapter 1), manufacturers contended that access to such information could potentially expose call data, GPS coordinates and other personal information to hackers (Stumpf 2020).

However, much like for safety concerns, it is also possible that restrictions on repair could *increase* security and privacy risks.

- If a vulnerability exists, restrictions that limit access to embedded software and firmware could prevent researchers from more easily finding it and raising concerns, before the vulnerability is exploited (Camejo 2020). For similar reasons, numerous industry experts have suggested that open source software and security systems are typically less vulnerable to attack than closed source or proprietary software (Gain 2021; Rymon 2015; SecuRepairs 2020), which ‘rely on obfuscation for security’ (GEOTAB Australia Pty, sub. 61, p. 4).
- Most OEMs eventually stop providing operating system or security software updates for products still in circulation, yet restrictions can still prevent independent operators from producing and sharing their own software updates to address such risks (EFA, sub. 65, pp. 3–4; ACS, sub. 66, p. 3).
- Where there is a security or privacy vulnerability, it is crucial that the software is updated with a fix as soon as possible. While some fixes can be pushed out remotely (like for smartphones), others need access to the physical product and the right tools (like for many agricultural machinery software updates or aviation navigation updates). Restrictions on repairs that limit the availability of such tools can create significant delays to these updates, prolonging vulnerabilities (Camejo 2020; SecuRepairs 2020).

Moreover, there are numerous established methods to address cybersecurity and privacy threats from internet-connected devices (Jang-Jaccard and Nepal 2014, p. 979), not many of which *require* restriction on access to repair (Thorpe, sub. 8, pp. 1–2). For areas where there are genuine residual security concerns, security and background checks of independent repairers may also assist, without resulting in restrictions on access to repair.

Quality control and shared liability

Another common rationale for restricting third-party repair is to ensure that all repair services are of sufficient quality. Even when there are no safety issues, OEMs may be concerned about being held liable for product malfunctions after low-quality independent repair, leading to financial costs through remedies under warranties or consumer guarantees (Borenstein, Mackie-Mason and Netz 2000, p. 185; IGEA, sub. 103, p. 18; TMA, sub. 111 attach. 1, pp. 6-7).²³

Determining the cause of a malfunction can be complex and costly — particularly where product design intertwines different components, or for products with embedded software or firmware (IGEA, sub. 103, p. 18). On the other hand, software can sometimes allow for a more precise and immediate determination of the cause of failure. This complexity can create opportunities for competing claims on liability, with both the OEM and the independent repairer apportioning fault to each other, leaving consumers without a clear remedy and in some cases requiring legal action to determine liability (which can be difficult and costly, as discussed in chapter 3). Additionally, OEM brands could be damaged by consumer perceptions (or media coverage) that misattribute product failures to the product, rather than poor repair work. For example, in 2011, reports of a defective iPhone 4 that caught fire mid-flight on an aeroplane in Australia initially blamed the battery (Jones 2011), but later investigation uncovered a loose screw that was left in by a third-party repairer (Chirgwin 2012).

However, such instances are relatively rare, and blanket restrictions on repair to eliminate these risks are unlikely to be a proportionate response. In particular, any defects with the underlying product would also be found among products that had *not* been repaired by a third-party. Most OEMs also know their products in intimate detail and have strict quality control and continual improvement processes in place (Mitra 2016, pp. 3–14), making many faults caused by third-party repair relatively easy to identify.

Moreover, despite several inquiry participants and other commentators claiming that independent repair businesses typically offer lower quality services, others suggested that some independent repairers are of better quality (box 4.5). Overall, there is limited evidence of quality differences between authorised and independent repairers on average and, as noted above, the added competition from independent repairers can act to lift standards for both authorised and independent repairers.

Many of the most acute concerns about repair quality relate to work conducted by consumers (DIY or self-repair) on their own product (CESA, sub. 25, p. 5; LG Electronics, sub. 38, p. 2). While it could be argued that DIY repair is, on average, likely to be of lower quality

²³ On this basis, Cabral (2014, p. 60) claimed that ‘where there is a risk of shared liability ... aftermarket power may be a “necessary evil”’.

than independent repair work conducted by a professional business (authorised or not), the Commission has not seen any evidence that this is necessarily the case.²⁴

Box 4.5 Quality concerns relating to independent repair

Several inquiry participants (typically those representing OEMs) claimed that independent repair businesses offer lower quality services.

There is a distinct quality difference between repairs by a supplier trained repair provider and an open market/independent repairer ... Unfortunately, it is not uncommon for an independent repairer to learn as trial by error, which is of great concern to the industry. (ATAA, sub. 23, p. 10)

Technicians (such as gasfitters, plumbers, electricians, refrigeration mechanics) even if authorised in their jurisdiction to perform such work may not have the necessary skills and knowledge for appliances from particular manufacturers without specialist training and accreditation from such manufacturers. (CESA, sub. 25, p. 3)

However, other participants and commentators suggested that independent repairers offer superior quality services.

Whilst there is no evident difference in quality between Independent Repair Shops and manufacturers our experience suggests that Independent Repair delivers higher quality repairs at lower prices compared with OEM's, provided they have access to the right tools. (Australian Democrats, sub. 100, part 1, p. 24)

People who used independent repair shops were more satisfied with the repairs than those who used factory service, which is consistent with what we've found previously. (Consumer Reports 2014)

Most independent repair shops are no different than your friendly, local auto mechanic whom you recommend to your friends and family any chance you get. And many of them are fully capable of performing the same repairs that manufacturers do — plus some repairs the manufacturers won't do. (iFixit, sub. 107, p. 17)

Safeguarding environmental standards

Some OEMs have argued that restrictions on independent repairs are necessary to safeguard environmental standards. In particular, OEMs contend that unrestricted repairs would enable third-parties to modify engine systems or disable software that ensures compliance with emissions standards, particularly for cars and agricultural machinery (Ai Group, sub. 32, pp. 1–2; CNHI, sub. 116, p. 2; Honey Bee Manufacturing, sub. 2, attach. 2, p. 10; JDL, sub. 84, attach. 1, p. 2; TMA, sub. 111, attach. 1, p. 6). There is some evidence from overseas to support such concerns — a survey of 770 equipment dealers in the United States found that 116 (15 per cent) had seen modified equipment with removed, impaired or disabled emissions controls in their dealership over the previous 24 months (EDA 2019, p. 1).

Environmental and emissions standards on products exist for a reason — circumvention of these safeguards can create worse outcomes for society, through the release of substances

²⁴ Although DIY repairers do not have a reputation to uphold and there may be more variability in their skill level, they would incur greater costs from a botched repair that makes their product unusable, creating strong disincentives for work beyond their skillset. Some DIY repair work may also be exploratory in nature, investigating whether a fault can be easily fixed, before seeking professional repairs.

that may be harmful to human health (such as particulate matter) or the environment (such as nitrogen oxide) (DIT 2010). Indeed, some of these safeguards appear to require manufacturers to install active measures against circumvention — for example, Australia’s emissions standards for both light and heavy vehicles (including agricultural machinery and other special purpose vehicles) require that ‘any vehicle with an emission control computer shall include features to deter modification, except as authorised by the manufacturer’.²⁵

However, these restrictions seldom require all independent repairs or modifications to be precluded, nor are they incompatible with broader access to repair supplies and facilitation of independent repair. In fact, the light vehicle emissions standards specifically go on to state that the ‘manufacturer shall authorise modifications if these modifications are necessary for the diagnosis, servicing, inspection, retrofitting or repair of the vehicle’ (Australian Design Rule 79/04 — Emission Control for Light Vehicles, para. 5.1.5.1).

Moreover, even where a minority of users misuse access to repair supplies to undermine environmental standards (and other standards, like those for safety and security, discussed above), these modifications are often unlawful or regulated themselves, without a need for OEM enforcement. For example, New South Wales requires all significant light vehicle modifications to have a compliance certificate issued by an accredited certifier, including any modifications to engines, exhausts or fuel systems that impact applicable emissions levels (NSW RMS 2013, pp. 1, 4, 15). Similarly, Queensland requires all modifications of heavy vehicles that affect compliance with applicable emission standards to be approved by the National Heavy Vehicle Regulator, with fines of up to \$10 000 for unauthorised tampering (ss. 87–91, *Heavy Vehicle National Law Act 2012 (Qld)*). Instead, the methods used by OEMs to prevent such modifications (section 4.2) also prevent many legitimate repairs or other lawful modifications, restricting competition in repair markets.

Summing up

Manufacturers often justify restrictions on third-party repair as a means of reducing risks to public safety, cyber security, brand reputation and environmental standards. On balance, however, it is unlikely that independent repair systematically increases these risks. Similarly, the Federal Trade Commission recently concluded that ‘there is scant evidence to support manufacturers’ justifications for repair restrictions’ (2021, p. 6).

In some cases, manufacturer restrictions on independent repair could heighten risks by limiting access to high-quality repair supplies or reducing opportunities to identify cyber security vulnerabilities. Further, for many products, manufacturer concerns about risks to public safety (particularly for consumer electronics) and environmental standards (for motor vehicles and agricultural machinery) appear to be overstated. More broadly, manufacturers are also seldom liable for safety defects or circumvention of environmental standards due to

²⁵ Vehicle standards (Australian Design Rule 79/04 — Emission Control for Light Vehicles, Volume 2, para. 5.1.5.1; and Australian Design Rule 80/03 — Emission Control for Heavy Vehicles, Volume 3, para. 6.1.10.1), based on the Euro 5 and Euro V emission standards (DITRDC 2018).

repairs or modifications beyond their control, although they may suffer reputational risk and transaction costs to discover the underlying cause of any issues.

Where these risks are used to justify restrictions on independent repair, manufacturers should be able to demonstrate genuine concerns about third-party repairs and show that they cannot be mitigated through other (more proportionate) means.

4.4 Are consumers harmed by repair restrictions?

The Commission has applied its framework and the evidence above to particular product repair markets to consider whether it is likely that competition is being restricted and consumers (or broader society) are being harmed by higher repair prices, or reduced choice of repairer. This involved assessing product and market characteristics (section 4.1), the nature and effect of repair restrictions (section 4.2), and the reasons why restrictions might be in place (section 4.3).

As noted earlier, given data limitations and the range of product markets in scope for this inquiry, the Commission has taken a largely qualitative approach, supported by quantitative analysis where possible. Much of this analysis has focused on product markets that were raised in submissions and elsewhere, but where possible the Commission has also examined other product markets with unique characteristics (such as construction machinery).

Overall, this preliminary assessment finds some products (agricultural machinery, mobile phones and tablets) for which market characteristics — such as high consumer lock-in, a large repair market (relative to the primary market) and limited competition in the sale of original equipment²⁶ — indicate that consumers may be harmed from limits on third-party access to repair supplies (table 4.1). The Commission is seeking additional information on the extent of consumer harm in these and other repair markets and whether its assessments here are valid.

²⁶ The Commission's preliminary analysis of primary market competition has relied on high-level indicators such as market concentration and product substitutability. More in-depth assessment of market competition typically requires consideration of structural indicators (such as entry/exit rates), the conduct of participants, market outcomes and (for some products) the relevant geographic level (ACCC 2021b, p. 8).

Table 4.1 A preliminary assessment of competition and harm

<i>Product market</i>	<i>Factors indicating competition is restricted or consumers are harmed</i>	<i>Protective factors</i>	<i>Preliminary assessment</i>
Agricultural machinery	<ul style="list-style-type: none"> • Large repair market • High profit margins from repair • High product lock-in (expensive, durable and low inter-brand operability/data portability) • Primary market competition unlikely to compensate consumers • Large impact from reduced access or choice (regional customers) • High financial costs from repair delays 	<ul style="list-style-type: none"> • Typically purchased by businesses who are likely to consider the cost of repairs when making purchases (although there is a significant number of small farmers) 	Consumer harm is likely (from higher prices and reduced access and choice)
Mobile phones and tablets	<ul style="list-style-type: none"> • Some high lock-in factors (learning costs, brand ecosystems, content loss) but modest price lock-in (rapid product turnover) • Primary market competition unlikely to compensate consumers • Low safety risks from third-party repair 	<ul style="list-style-type: none"> • Industry improving access to repair supplies for independent repairers 	Harm likely small per consumer, but could add up to be significant across the economy
Motor vehicles	<ul style="list-style-type: none"> • Large repair market • High profit margins from repair • High product lock-in (expensive and durable) • Large impact from reduced access or choice (ubiquitous consumer product) 	<ul style="list-style-type: none"> • Primary market competition likely to partly compensate consumers • Repair info sharing scheme introduced to Parliament 	Potential for consumer harm (from reduced access and choice)
Construction machinery	<ul style="list-style-type: none"> • Large repair market • High product lock-in (expensive and durable) • Primary market competition may not compensate owners • High financial costs from repair delays 	<ul style="list-style-type: none"> • Typically purchased by businesses, with small operators more likely to lease 	Harm unlikely, due to limited evidence of repair being restricted
High-end watches	<ul style="list-style-type: none"> • High product lock-in (investment good) • Primary market competition unlikely to compensate consumers 	<ul style="list-style-type: none"> • Small repair market • Small impact on consumers from reduced access or choice 	Harm unlikely to be material across economy
Medical equipment	<ul style="list-style-type: none"> • High product lock-in for some products (expensive and durable) • Primary market competition may not compensate owners 	<ul style="list-style-type: none"> • Modest repair market size • Safety risks can be high • Some products already regulated by the Therapeutic Goods Administration 	Harm possible, but elevated safety risks

Agricultural machinery

One market that featured prominently among inquiry participants (section 4.2) was agricultural machinery (such as tractors, combine harvesters and planters). Several characteristics indicate that competition in the repair market for these products may be limited and consumers may be harmed.

- The repair and maintenance market is reasonably large, giving OEMs who operate in these repair markets an incentive to increase repair prices. Revenue from repair and maintenance is estimated to be about \$720 million in 2018 (Commission estimates),²⁷ or about 9–32 per cent of the value of new machinery sold in 2018 (\$2.3–7.9 billion) (ACCC 2021b, p. 4; Hunkin 2017; IBISworld 2020c, p. 8,14; Statista 2021a).
- Profit margins for repair and maintenance appear high — some estimates suggest that spare parts and repair services are three to six times more profitable than sales of original equipment (US PIRG 2021, p. 17; Waldman and Mulvany 2020).
- Consumers tend to be locked into a particular brand’s repair market because agricultural machinery is often expensive to replace with separate proprietary attachments and accessories, making it difficult to switch between brands — for example, a new combine harvester can cost upwards of \$400 000 (GPA, sub. 27, p. 4). Inter-brand data portability and operability can also be low (ACCC 2021b, p. 54).
- Competition to reduce prices for new products may not be strong enough to offset high repair prices. The market for the sale of new agricultural machinery appears relatively concentrated. A few prominent players (who are all active in the repair market) account for more than half the market (ACCC 2021b, pp. 11, 47; NFF, sub. 55, p. 2).²⁸ Concentration is likely much higher in some regions and for specific products. There is also a high degree of product differentiation across brands, limiting substitutability (ACCC 2021b, p. 11).
- Owners of agricultural machinery can be exposed to large financial risks if they are unable to access timely repair, especially during harvest periods (GPA, sub. 27, p. 11; Honey Bee Manufacturing, sub. 2, attach. 1, p. 3; VFF, sub. 60, p. 3; Wiseman and Kariyawasam, sub. 105, p. 5). Further, agricultural machinery has a uniquely regional customer base, meaning that reduced access to repair can lead to greater travel costs (ACCC 2021b, p. 47).²⁹

²⁷ There are limited disaggregated data available on the value of individual repair markets. As such, the Commission has estimated repair market size in this section using total revenue for ANZSIC repair and maintenance industry classes (ABS 2020d), multiplied by IBISworld estimates of the proportion attributable to relevant product markets within those classes (IBISworld 2020d, p. 21, 2020a, p. 20).

²⁸ Key players in the market for agricultural machinery include John Deere, AGCO Corporation, CNHI, and Kubota Corporation (ACCC 2021b, p. 11; Mordor Intelligence 2021).

²⁹ However, one agricultural machinery OEM suggested that independent retailers do not appear to be more accessible to remote and regional customers than OEM dealers (CNHI, sub. 116, attach. 1, p. 20).

However, one factor that may protect against harm is that most purchasers of agricultural machinery are businesses (ACCC 2021b, pp. 47–48), which are more likely to consider the cost of repairs when making purchases, or to obtain professional advice to help them to do so. As noted by one OEM:

The majority of these purchases are made by savvy business owners in support of their complex and sophisticated operations. These individuals are in the main very capable of negotiating transactions and understanding their legal rights. (CNHI, sub. 116, p. 1)

Yet there also remains a substantial (though shrinking) number of small farmers in Australia — about 50 per cent of broadacre farms have less than \$260 000 in annual turnover (ABARES 2021) — who often blur consumer and business capabilities together.

This preliminary assessment indicates that competition in agricultural machinery repair may be limited and that consumers may be harmed as a result. The ACCC reached a similar conclusion in its recent market study, which found that weak competition in agricultural machinery repair markets:

... reduces purchaser access to genuine choice, and may result in higher prices charged by authorised repairers, lower levels of customer service, and unnecessary delays in accessing repairs and servicing. (2021b, p. 46)

Based on this assessment, the ACCC (2021b, p. viii) recommended that third-party access to repair supplies be expanded (section 4.6). However, the Commission is seeking further evidence to examine the *extent* of harm from higher prices or reduced access and choice, to assess the need for additional policy responses.

Mobile phones and tablets

Consumer electronics were the most commonly cited products of concern during the inquiry. Particular concerns were raised about the difficulties faced by third-party repairers in obtaining supplies and information needed to repair mobile phones and tablets (section 4.2). Revenue from mobile phone and tablet repairs in Australia was about \$640 million in 2018 (Commission estimates), equivalent to about 6 per cent of the size of the market for sales of new devices (about \$10.3 billion in 2018) (IBISworld 2020e, p. 14).

Available evidence indicates that, if the repair market were restricted, competition in the market for new mobile phones and tablets may not be strong enough to compensate consumers through lower product prices. For mobile phones, Apple’s market share was over 50 per cent from 2011 to 2020, well above the next highest competitor (Samsung) with a market share of about 25 per cent (Global Stats 2021a; Statista 2020b). For tablets, market

concentration is even higher — Apple’s market share was 83 per cent in October 2020 (Global Stats 2021b; Statista 2020a).³⁰

Further, there is some degree of consumer lock-in because other products are often not easily compatible with brand-specific ecosystems (ACCC, sub. 106, p. 4), such as for interconnected Apple devices (Montgomerie and Roscoe 2013, pp. 292–293). Consumers may also face learning costs or the potential loss of content (such as calendar events, notes, and paid applications) when switching to alternative brands (Yan 2019). On the other hand, the degree of lock-in can be limited as mobile phones and tablets are generally less expensive (compared with higher cost durable goods, such as agricultural machinery) and product turnover can be high (Lu 2017).

However, there is evidence that major OEMs are improving access to repair supplies. For example, Apple (2021e) recently expanded its Independent Repair Provider program to more than 200 countries (including Australia) giving independent repairers access to Apple-branded parts, tools, repair manuals, and diagnostics, as well as free training. It is too early to tell whether this program will significantly benefit consumers and independent repairers in Australia. It has also received some criticism overseas for containing onerous and restrictive contract terms (Stone 2020; iFixit, sub. 107, p. 20).

While OEMs are often concerned by the quality of independent repairers (section 4.3), the safety risks associated with third-party repair are likely to be low, particularly for common repairs, such as screen and battery replacement.

Overall, the Commission’s view is that while any harm may be small per consumer, the ubiquitous nature of mobile phones and tablets could mean this adds up to significant harm across the economy.

Motor vehicles

Some inquiry participants expressed concerns about competition in the market for the repair and maintenance of motor vehicles (AAAA, sub. 81, p. 2; ACCC, sub. 106, p. 6; ICA, sub. 120, attach. 1, p. 1).

The motor vehicle repair and maintenance market has several characteristics that increase the likelihood that OEMs may restrict competition and that consumers may be harmed as a result. Motor vehicles have the largest repair market in Australia, at about \$22 billion in revenue in 2018 (chapter 2). This is about one third of the size of the market for the sale of new cars — about \$64 billion in 2016-17 (ACCC 2017b, p. 1) — giving OEMs a substantial incentive to increase repair prices. Dealers also tend to earn higher margins from aftermarket

³⁰ Data on profit margins for mobile phone repairs and maintenance were not available. However, global profits for some mobile phone OEMs appear high — in the six months to March 2021, Apple recorded a gross margin (not accounting for administrative expenses or research and development) of over 40 per cent, with a 70 per cent margin on services (covering Apple Music, iTunes, Apple Pay, licensing and repair services) (Apple 2021c, p. 1; Gartenberg 2019).

services than from new car sales — parts, repairs and servicing was estimated to account for 15 per cent of revenue, but 49 per cent of gross profit, in 2017 (ACCC 2017b, p. 45). Consumer lock-in is high for motor vehicles, as cars are durable and can be one of the most necessary and largest expenses for a household.³¹ Many consumers are also unlikely to estimate repair costs at the time of purchase (ACCC 2017b, p. 141), although maintenance costs may be more predictable as some manufacturers and dealers offer long-term fixed-price maintenance contracts (such as ‘capped price servicing’).

One factor that may protect consumers from harm is competition in the market for new cars. The ACCC (2017b, pp. 4, 26, 35) considered that the market for new cars in Australia is generally competitive, with 67 brands vying for business. However, there is a higher concentration of manufacturers — the top five car manufacturers (Toyota, Mazda, Hyundai, Holden and Ford) accounted for about 50 per cent of all new cars sold in 2016. Further, the ACCC stated:

Consumer switching in the new car market is unlikely to provide strong competitive discipline on manufacturers and dealers in aftermarkets, and any benefit of competition in the sale of new cars to consumers does not offset the impact of less competitive aftermarkets. (2017b, p. 11)

The ACCC concluded that repair restrictions were ‘causing detriment to consumers’ through higher costs, greater inconvenience and delays, and reduced choice (2017b, p. 11).

Given the characteristics of the motor vehicle repair market could lead to some consumer harm, the ACCC (2017b, p. 12) recommended the introduction of a mandatory repair information sharing scheme to improve competition. Legislation for such a scheme was recently introduced into the Australian Parliament, and should be reviewed once it has been in operation for three years, to ensure it is continuing to generate net benefits for the community (section 4.6).

Other product markets

Construction machinery

While no submissions expressed concerns about competition in construction machinery repairs and maintenance (such as for excavators, bulldozers and compactors), these products share many of the same characteristics as agricultural machinery. The repair market is large — about \$1.9 billion in revenue in 2018 (Commission estimates) — and 17–23 per cent of the size of the market for new construction machinery (\$8.4–11.3 billion in 2018) (IBISworld 2020c, pp. 8, 14; Market Reports World 2019). The equipment is costly — for example, a large bulldozer can cost upwards of \$1 000 000 (Taylor 2019) — durable, and increasingly reliant on data (Komatsu 2020, pp. 7–11). And the breakdown of a single piece

³¹ However, the cost of switching to alternative cars may be lower if consumers are able sell their car in the used car market, reducing lock-in. In 2015, for example, there were an estimated three million used cars sold in Australia (Manheim 2015, p. 85), compared with about one million new cars (Chesterton 2021).

of construction machinery can bring production to a standstill until it is repaired or replaced (H.O. Penn 2021).

Competition in the primary market for the sale of new construction equipment may not be strong enough to compensate consumers for higher repair prices. The global market is somewhat concentrated around a handful of OEMs (Grand View Research 2020). Although Caterpillar, Komatsu, AB Volvo, JCB and Liebherr collectively accounted for only about 40 per cent of the global construction equipment market in 2019 (Fortune Business Insights 2021), concentration can be much higher in some regions and for some highly-specialised equipment.³²

However, there may be fewer issues in accessing repairs, less delays and lower transport costs compared with agricultural machinery repair because a smaller proportion of activity is likely to occur in regional areas. Construction equipment is also typically purchased by businesses that are likely to consider the cost of repairs when making an initial purchase. It is also common for (particularly small) construction equipment users to lease their equipment from large asset managers (Inter Capital 2020), who are more likely to consider product lifecycle costs.

Overall, this indicates that any restrictions to the repair of construction equipment are less likely to result in harm compared to restrictions to repair of agricultural machinery. Further, there is a lack of evidence that OEMs are restricting third-party repairs — as noted above, the Commission did not receive any submissions raising concerns about access to repairs for construction machinery — suggesting that any potential harm is limited.

High-end watches

High-end watches were also a product of concern for some participants, primarily independent watch repairers, due to limited access to spare parts (CS Watch Repairs, sub. 88, p. 1; Peters, sub. 19, p. 1; Vintage Time Australia, sub. 13, p. 1; WCA, sub. 83, p. 1).

Consumer lock-in can be significant for expensive watches, particularly for mechanical watches, as some watches appreciate in value over time and are not easily substitutable, due to consumer preferences and limited supply of certain brands (Altieri 2020). Competition in the primary market for the sale of new watches is also unlikely to be strong enough to compensate consumers for high watch repair prices — the top three OEMs (Swatch, Rolex and Richemont) hold over 70 per cent market share (Muller 2021; Statista 2020c). Although some specialist independent repairers claim to provide higher-quality repairs than OEMs (Peters, sub. 19, p. 1; Vintage Time Australia, sub. 13, p. 3), it is difficult to determine whether the quality of independent repairs is systematically higher *or* lower.

³² For example, construction machinery resale data indicate that between 2012 and 2014, Komatsu and Caterpillar collectively controlled about 83 per cent of the market for large (90 metric tonne or over) crawler-mounted excavators (Ritchie 2020).

Nevertheless, the size of the watch repair industry is relatively small — the Commission was unable to disaggregate it in the data from an unclassified group of repairs (which includes bicycle and furniture repair). While restrictions to repair supplies may impede the ability of independent repairers to effectively undertake repairs, the possible consequential impacts on consumers — in terms of higher repair prices, reduced choice, delays or inconvenience — is unlikely to be substantial enough to justify the potential costs of additional (industry-specific) policy responses.³³

Medical equipment

Several inquiry participants claimed that OEMs of medical devices are restricting access to repair information, tools and spare parts (MD Solutions, sub. 41, p. 3; Abbas, sub. 34, p. 16). The definition of medical devices can be broad and includes ‘instruments, apparatus, appliances, software, implants, reagents, materials or other articles intended for human therapeutic use’ (Department of Health, sub. 121, p. 3). The devices can range from relatively simple equipment such as wheelchairs or walking aids, to more complex devices such as endoscopes, pacemakers and magnetic resonance imaging (MRI) scanners.

The medical equipment repair market is sizeable — generating about \$430 million in revenue in 2018 (Commission estimates) — but was only about 7 per cent of the size of the market for the sale of new equipment — about \$6.1 billion in 2018 (Statista 2021b). Lock-in is likely to be high for expensive and durable medical equipment (such as MRI scanners, defibrillators, endoscopes and ventilators). And competition in the primary market may not be strong enough to compensate consumers for high repair prices — consumers will often take the recommendation of their health practitioner, while markets for specialised medical equipment can be highly concentrated. For example, MD Solutions (sub. 41, p. 3) claimed that Olympus controls about 95 per cent of the market for flexible endoscopes in Australia.

However, medical equipment is often purchased or used by businesses delivering health services, such as hospitals and medical clinics (Department of Health, sub. 121, p. 6), which are more likely to consider repair and maintenance costs at the time of purchase. Moreover, safety risks from poor-quality repair are likely to be higher for medical equipment than for other products, making some repair safeguards necessary (section 4.3). Yet, not all repairs pose significant safety risks, especially those by professional independent repairers (FDA 2018, p. i; ATSA, sub. 23, p. 6). The industry is also closely regulated by the Therapeutic Goods Administration (Department of Health, sub. 121, p. 3).

As a result, although restrictions on repairs of medical equipment may generate some harm (particularly for any vulnerable or disadvantaged equipment users), this may not be sufficient to justify any policy response, due to elevated safety risks for some types of repair.

³³ Independent repairers can also seek remedies through existing CCA provisions (section 4.5).

DRAFT FINDING 4.2 LIMITS ON THIRD-PARTY ACCESS TO REPAIR SUPPLIES

Available evidence does not point to a systemic competition problem in repair markets. However, for some products, anecdotal evidence suggests that manufacturers are limiting third-party access to repair supplies (such as spare parts, repair information and tools). While manufacturers often justify these limits as a way to safeguard against risks from poor-quality repair (such as to safety and security), these risks can be overstated. The Commission's preliminary assessment indicates that limits to repair supplies could be leading to consumer harm in some repair markets.

- Agricultural machinery — manufacturers have an incentive to limit third-party access to repair supplies to increase repair prices because these markets are large relative to the market for new machinery. Competition in the market for new machinery may be insufficient to compensate consumers through lower product prices. Further, consumers can be exposed to large financial risks if they are unable to access timely repair and face a high cost of switching to alternative products.
- Mobile phones and tablets — there is a high concentration of manufacturers in these markets, suggesting competition in the market for new devices may not be strong enough to compensate consumers through lower product prices. Some consumers may also be locked-in to using authorised repairers as they cannot easily switch to alternative brands (for example, due to low product compatibility or the loss of content). While any harm may be small per consumer, it could add up to significant harm across the economy.

INFORMATION REQUEST 4.1 CONSUMER HARM FROM LIMITS ON ACCESS TO REPAIR SUPPLIES

The Commission is seeking feedback and evidence on its preliminary assessment of consumer harm (chapter 4) in repair markets for agricultural machinery, mobile phones and tablets. In particular:

- *is there any evidence of systematic differences in quality, safety or security between authorised and third-party repairers? If so, what is the cost to manufacturers (for example, damaged brand reputation, determining the cause of a fault, or other liability issues)?*
- *what is the size of the repair market compared to the primary market? What proportion of repairs are conducted by authorised repairers?*
- *how difficult is it for consumers to estimate the lifecycle costs of these products at the time of purchase?*
- *to what extent are consumers locked in to using authorised repairers (for example, can consumers easily switch to other products or non-manufacturer repair supplies)?*
- *is competition in the primary market sufficient to compensate consumers for any harm in the repair market (as indicated by low concentration and/or barriers to entry)?*
- *to what extent are consumers harmed by less choice, high transportation or travel costs, delays, and inconvenience, particularly in regional and remote locations?*

(continued next page)

The Commission is also interested in evidence of where there is substantial consumer harm in other repair markets, including but not limited to medical equipment and high-end watches (which were raised as areas of concern by participants to this inquiry) as well as construction machinery.

4.5 How effective is current competition policy?

In instances where OEMs seek to control repair markets and this substantially reduces competition, there are existing remedies available under Part IV of the CCA to prevent anti-competitive outcomes. As the ACCC noted:

Part IV of the CCA includes prohibitions relating to ... exclusive dealing and misuse of market power. Some of these prohibitions could apply to aftermarket repair markets if businesses were to leverage their market power or engage in conduct such as exclusive dealing that has the purpose, effect or likely effect of substantially lessening competition. (sub. 106, p. 6)

Anti-competitive agreements (s. 45)

While agreements and contracts between business entities are essential to support economic activity, s. 45 of the CCA prohibits any contracts, arrangements, understandings or concerted practices that have anti-competitive impacts (including verbal arrangements, inferred agreements, or evidence of a ‘meeting of minds’) (ACCC 2021c).³⁴

To be considered anti-competitive, such arrangements must be shown to have the ‘purpose, effect or likely effect of substantially lessening competition’. Although there is no legislative definition of what this test — referred to as the ‘SLC test’ — means in practice, there is a considerable amount of case law outlining how it has been applied by the courts (box 4.6). The SLC test is common to a number of CCA provisions (including the misuse of market power and exclusive dealing provisions, both discussed below).

From September 2019, the application of s. 45 has been expanded, following the recommendation of the 2015 Competition Policy Review (also known as the Harper Review).³⁵ The review recommended repeal of s. 51(3), which provided an exemption for contraventions of the restrictive trade practices provisions (other than ss. 46, 46A and 48) where the contravention is related to IP protections, including the imposition of certain licence conditions (Harper et al. 2015, pp. 105–110, 113). Further interactions between IP protections and repair market competition are discussed in chapter 5.

³⁴ Unlike some other CCA provisions, legal proceedings under s. 45 do not require that parties be competitors, and thus can capture both vertical and horizontal agreements (Clarke 2019).

³⁵ Implemented by *Treasury Laws Amendment (2018 Measures No. 5) Act 2019* (Cth).

Box 4.6 **The substantial lessening of competition test**

Courts have provided guidance on how to interpret each of the terms within the ‘purpose, effect or likely effect of substantially lessening competition’ test — the SLC test:

- ‘*purpose*’ refers to a firm’s intention to achieve a particular result
- ‘*effect or likely effect*’ refers to the consequences (or likely consequences) of a firm’s conduct
- ‘*substantially*’ means an impact that is relatively meaningful or non-negligible, but is specific to the context (such as the size of the market)
- ‘*lessening competition*’ means that the process of rivalry is diminished, hindered or reduced, or the competitive process is compromised or impacted, such as through raising barriers to competition or to entry into a market (ACCC 2018a, pp. 7–8, 2020g).

When examining conduct under the SLC test, courts will typically consider counterfactual scenarios as part of their analysis — either the outcome that would have occurred in the present (the ‘but for’ test), or future states ‘with and without’ the proposed conduct (Clarke 2016). In both instances, it is generally necessary to define a ‘market’ for the purpose of this analysis (mechanisms for doing so are discussed below). Although each case is considered on its merits and in context, the ACCC regards some types of conduct as having a greater potential to breach the SLC test — for example, refusals to deal or tying and bundling arrangements (ACCC 2018a, p. 8).

Although the Commission has not been able to find any court cases involving the application of s. 45 provisions to contracts related to competition in repair markets, some of the behaviours that have generated community concern involve agreements or contracts between different businesses (such as claims of geographic restrictions on authorised repairs — section 4.2). Any evidence that such restrictions exist and are having an anti-competitive impact on repair markets could potentially be pursued under s. 45, as could similarly anti-competitive agreements between OEMs and authorised repair networks.

Misuse of market power (s. 46)

Although it is not unlawful to have, or to seek to obtain, market power by offering the best products and services, misusing that power through anti-competitive conduct is prohibited under s. 46 of the CCA. To determine whether there has been a misuse of market power, the courts will generally consider the following questions.

1. What is the relevant ‘market’ that the business operates in?
2. Does the business have a ‘substantial degree of power’ in that market?
3. Has the business misused that power by engaging in anti-competitive conduct?

For repair markets, the latter two questions are complex, but no more so than in most other markets.

- A ‘substantial degree of power’ in a market is considered on a case-by-case basis, but indicators can include: the market share and financial strength of the business; the ability of the business to consistently restrict competition; how difficult it is for competitors to

enter the market; and the business's ability to behave with little regard to what its competitors, suppliers or customers do (ACCC 2020g).

- From November 2017, the SLC test (box 4.6 above, also referred to as the 'effects test') has also been used to determine whether anti-competitive conduct has occurred under s. 46, following changes recommended by the Harper Review (Harper et al. 2015, p. 348).³⁶ To date, the new effects test has only been considered by the courts in a few cases, all relating to ports (Carver, Clark and Kemmery 2019). In the ACCC's first proceedings (*ACCC v Tasmanian Ports Corporation Pty Ltd*) the Federal Court declared by consent that Tasmanian Ports Corporation Pty Ltd engaged in conduct that had the likely effect of substantially lessening competition in the markets for towage and pilotage services in northern Tasmania (ACCC 2021h).

However, the nature of repair markets makes the first question — determining the relevant 'market' — complex, due to the relationship between the primary markets and repair markets (discussed in section 4.1 and appendix B). In particular, it can be difficult to determine whether there is a separate secondary market for brand- or product-specific parts and repairs, or if there is only one relevant market for the supply of all primary products, together with parts and ancillary services. When defining markets, courts typically consider a number of factors — many of which are the same as those discussed in section 4.1 and appendix B — such as whether there is effective competition in the primary market, low switching costs and sufficient information on product lifecycle costs (Clapperton and Corones 2006, p. 695).

The most prominent example of the market definition question being applied to a repair market in Australia is that of *Regent's Pty Ltd v Subaru (Aust) Pty Ltd* [1998] FCA 730, which involved Subaru refusing to supply branded spare parts to a distributor (box 4.7). In this instance, the Federal Court found that the spare parts aftermarket was merely a subset of the broader market, and that competitive pressures in the primary market constrained Subaru's ability to exploit consumers in the market for spare parts. Since then, several other cases have examined whether the behaviour of firms operating at one functional level of a market (such as in a repair market) has a substantial constraining effect on the behaviour of firms at another functional level (such as in the primary market), with the courts generally rejecting attempts to define a 'market' in terms of a single trademarked product or copyright (Clapperton and Corones 2006, p. 694; Miller 2020b, pp. 109–111).

Internationally, in some prominent cases, courts have found that aftermarkets constitute a *separate* market, such as in *Eastman Kodak Co. v. Image Technical Services, Inc.*, 504 US. 451 (1992) in the United States — where the Supreme Court found that Kodak's small share of the primary market did not prevent anti-competitive behaviour in the repair market — or *Hugin Kassaregister AB v. Commission of the European* [1979] ECR 1869 — where the European Court of Justice found that a Swedish cash-register maker was restricting

³⁶ Prior to the introduction of the effects test, only conduct related to a specific purpose was prohibited for firms with substantial market power. The prohibited purposes included: eliminating or substantially damaging a competitor; preventing entry of a person into that or any other market; or deterring or preventing a person from engaging in competitive conduct (Clarke 2017b).

access to repairs despite substitutability with other brands (Clapperton and Corones 2006, pp. 695–696; OECD 2017, p. 23). However, most other international cases, particularly in recent years, have not followed these precedents and have instead made a ruling consistent with the approach taken by Australian courts, finding that primary and secondary markets constitute a single ‘systems’ or ‘cluster’ market (OECD 2017, p. 40)

Box 4.7 Sub-markets and Subaru markets

The case of *Regent's Pty Ltd v Subaru (Aust) Pty Ltd* [1998] FCA 730 related to an allegation that Subaru had misused its market power by terminating its relationship with a distributorship (Regent's), and then refused to supply Regent's with genuine Subaru spare parts or to authorise it to resell such parts and service Subaru vehicles.

The court's conclusion was that the aftermarket (secondary market for spare parts and ancillary services) was only a subset of a broader market for motor vehicles, spare parts and ancillary services, based on:

- evidence of cross-elasticity of demand and supply at the wholesale and retail levels — that is, a price rise of Subaru parts would lead to buyers switching to other brands of cars or parts (including the use of non-genuine parts for common, substitutable parts)
- a close interrelationship between the cars and the parts markets, and ‘vigorous competition’ in the supply of new motor vehicles (Clapperton and Corones 2006, p. 694).

Consequently, the court found that, even where the parts of other car manufacturers were not physically substitutable for Subaru parts (for many of the less-common parts), Subaru had regard to the prices of parts for other vehicles when pricing its own parts, to ensure that consumers did not reject Subaru vehicles because its parts were too expensive. As such, Subaru was found to *not* have market power in this broader market for motor vehicles, spare parts and ancillary services, so the case was dismissed.

Exclusive dealing (s. 47)

Broadly speaking, exclusive dealing (also referred to as ‘vertical restrictions’) occurs when one person trading with another imposes restrictions on the other's freedom to choose with whom, in what, or where they deal. More specifically, under the CCA (s. 47), exclusive dealing includes circumstances where a business only supplies or acquires products on the condition that the other party agrees to only acquire products from that business (or a related business), or to not supply goods to a competitor. Like anti-competitive agreements (s. 45) and the misuse of market power (s. 46), exclusive dealing is only prohibited when the conduct meets the SLC test. The ACCC noted that ‘as a general guide, the more exclusive the product and the more powerful the supplier, the more likely it is that the competition will be affected’ (ACCC 2020e). The Commission has not been able to find any exclusive dealing cases pursued in relation to repair markets in the past two decades.

Notification and authorisation

One possible explanation for a lack of recent exclusive dealing cases is that firms can provide ‘notification’ to the ACCC of prospective actions that may be considered exclusive dealing. Once the notification is submitted, the entity cannot be held to be in breach of s. 47 (helping firms to manage their legal risks) unless the ACCC objects (also referred to as a type of ‘exemption’). Under s. 93 of the CCA, the ACCC can only object to a notification on the basis that the conduct is both likely to breach the SLC test and has no net public benefit.³⁷

One example of a recent exclusive dealing notification for conduct related to repair markets is Mitsubishi’s recent application for its offer of a 10-year or 200 000 km (whichever occurs first) extended warranty to purchasers of new Mitsubishi vehicles, on condition that the purchaser exclusively acquires aftermarket servicing from a Mitsubishi affiliated dealer or service centre (box 4.8). Although the ACCC did not object to Mitsubishi’s notification, it noted that it is able to revoke the notification, and that it would consider ‘the ongoing viability of independent mechanics’ and ‘the extent to which other vehicle manufacturers seek to engage in similar conduct’ in any revocation decision (ACCC 2020h, p. 21).

Box 4.8 Mitsubishi 10-year warranty

In September 2020, Mitsubishi Motors Australia Limited (MMAL) lodged an exclusive dealing notification with the ACCC. The notification involves MMAL offering a 10-year or 200 000 km (whichever occurs first) warranty to purchasers of new Mitsubishi vehicles on condition that the purchaser exclusively acquires servicing (but not repairs) from an MMAL dealer or service centre. This conditional extended warranty is in addition to MMAL’s existing five-year warranty, under which purchasers of new Mitsubishi vehicles can choose to use independent service centres without affecting their warranty (provided the vehicle is serviced in accordance with Mitsubishi’s specifications).

In December, the ACCC decided not to object to the notification, as it was ‘not satisfied ... that the Notified Conduct has the purpose, effect or likely effect of substantially lessening competition in any market’. However, the ACCC noted that:

If appropriate evidence should come to light that the notified conduct is adversely affecting the ability of independent mechanics to compete on their merits to a substantial degree, and at that time, the ACCC does not consider the public benefits of the Notified Conduct outweigh the public detriments, including from a lessening of competition, the ACCC is able to move to revoke the notification. (2020h, p. 2)

Sources: ACCC (2020f, 2020h).

Another form of exemption is an ‘authorisation’ (under s. 88 of the CCA), where an entity can seek permission from the ACCC to engage in anti-competitive conduct, if they can provide evidence that the conduct is likely to result in a net public benefit (or if the ACCC determines it would not be anti-competitive conduct anyway). For example, the ACCC recently granted an authorisation for the Battery Stewardship Council to collect a levy on all

³⁷ According to the ACCC, common public benefits that may offset the detriment from anti-competitive conduct include: more efficient business operations (for example, through economies of scale), improved product quality and whether the conduct addresses an externality (ACCC 2017a, pp. 5–6, 2019, pp. 43–49).

battery imports (chapter 7), as the environmental and other benefits of the associated product stewardship scheme outweigh the competitive detriments caused by the obligation on members of the scheme to only deal with other members (ACCC 2020d, p. 1).

Unlike notifications, authorisations are available for a wide range of conduct, including not only exclusive dealing, but also anti-competitive agreements and misuse of market power (ACCC 2019). However, the burden of proof for an authorisation is on the applying entity (not the ACCC), so notifications tend to be more frequently used for exclusive dealing conduct (Clarke 2017a).

Concerns about the application of the CCA provisions

Participants to this inquiry raised concerns that the CCA provisions have not been effective in addressing competition issues in repair markets (Australian Democrats, sub. 100, part 1, p. 28; Repair Café Hobart Inc, sub. 14, p. 2; SA Repair Café, sub. 46, p. 12). For example, the ACT Minister for Consumer Affairs noted that ‘despite [the CCA] restrictions and protections, premature product obsolescence and a lack of competition in repair markets remain’ (Rattenbury, sub. 133, attach. A, p. 2).

The evidentiary bar for pursuing a successful court case against a single company acting in an allegedly anti-competitive manner can be high. Generally, the applicant in each case bears the onus of proof to demonstrate that the conduct in question breaches the SLC test for that market and, where relevant, that a firm has substantial market power across both the primary and repair markets (Duke 2019, p. 997). This threshold can be difficult to clear — for example, more than half of cases have historically failed to establish substantial market power under s. 46 (Merrett 2015).

Civil legal proceedings can also be very costly and time consuming to pursue (Duke 2019, p. 51; Harper et al. 2015, p. 407; PC 2014, pp. 113–128). This can be particularly true for small businesses trying to pursue competition cases — the Harper Review received numerous submissions confirming that ‘small businesses either lack the time and financial resources to take action themselves or are concerned about the impact this might have on their ongoing business relationships’ (Harper et al. 2015, p. 84). Similarly, the Australian Small Business and Family Enterprise Ombudsman recently noted that small businesses have:

... immense difficulty ... in resolving their disputes. Both disputes and commercial relationships are often abandoned due to the cost and stress of trying to fix them. Commercial disputes are very common and devastating when not handled correctly. (2020, p. 3)

Yet enforcement is a vital part of competition policy. As noted by one inquiry participant:

Laws can only change behaviour if they are enforced, the loopholes and significant barriers to bring legal action over breaches of CCA make the provisions irrelevant to any embedded software repair markets. (McGrath, sub. 15, p. 9)

The two recent changes to the CCA (discussed above) may help to reduce the threshold for a successful court case, but will require more time to be reflected in common law. Although neither change has yet been fully tested in court, the introduction of the SLC test to s. 46 now allows for a misuse of market power to be pursued if it has the (likely) consequence of reducing competition (no longer requiring proof of intent). And certain types of IP-related conduct are no longer exempt from the restrictive trade practices provisions.

A number of alternative avenues are also available to provide access to remedies for small businesses, including several small business ombudsmen and commissioners at the federal, state and territory level (ASBFEO 2020, pp. 16–17; PC 2014, pp. 283–344). Moreover, the ACCC is empowered to investigate anti-competitive conduct and institute proceedings in the Federal Court on behalf of consumers and small businesses, improving access to justice and helping to clarify the law. Although the ACCC does not have the resources to pursue every allegation of anti-competitive conduct, credible evidence of egregious anti-competitive conduct in repair markets is likely to meet its prioritisation factors, which include:

- conduct that is of significant public interest or concern
- conduct that results in substantial consumer or small business detriment
- national conduct by large traders, given the potential for greater consumer detriment and the likelihood that conduct of large traders can influence other market participants
- conduct involving a significant new or emerging market issue or where action is likely to have an educative or deterrent effect (ACCC 2020c).

More broadly, competition policy has come under recent global criticism for defining its objective too narrowly, and failing to account for environmental or social outcomes.³⁸ However, issues in repair markets, such as those that contribute to environmental problems (such as the disposal of broken or unwanted products as ‘e-waste’) are typically addressed more efficiently through more targeted policy solutions designed to achieve the desired outcome (chapter 7). As the Chair of the ACCC argued in a recent speech:

Competition law is enforced by an independent authority, not by elected officials, so the objectives must be clear. Competition law and policy should be first and foremost about protecting and promoting competition for the welfare of consumers ... if you have two targets you want to achieve in public policy, you generally need two instruments. Competition, income inequality, media diversity and environmental protection are all legitimate public policy objectives, but they each require their own particular policy instrument (environmental laws, for example). It is bad public policy to attempt to achieve these goals with the single instrument of competition or consumer policy. (Sims 2018)

Overall, the Commission has not seen any evidence to suggest that the existing CCA provisions are systematically unfit to address anti-competitive conduct in repair markets.

³⁸ The ‘hipster antitrust’ movement typically argues that the consequences of market concentration are felt much more broadly than through reduced product quality and higher prices, and that competition policy should account for these other consequences, such as environmental degradation, income inequality, unemployment and concentrations of political power (Daly 2017; Meyer 2018; Sims 2018; Wood 2019).

Indeed, several inquiry participants (mostly representing OEMs) noted that the current CCA provisions are sufficient to prevent anti-competitive conduct (AADA, sub. 98, p. 9; ATSA, sub. 23, p. 11; FCAI, sub. 115, p. 8; LG Electronics, sub. 38, p. 4; Toyota Australia, sub. 118, p. 5). The Law Council of Australia also observed that:

A policy underpinning the competition law is that there should be a strong preference for general rules applicable to all sectors and activities of the economy rather than more specific, industry or activity-specific rules. There would need to be strong evidence of a need to depart from this approach before amendments to these provisions could be contemplated. (sub. 114, p. 8)

Further, the restrictive trade practices provisions (under Part IV) are only one set of tools enabled by the CCA, with a range of other policy options available to address issues in repair markets, such as through changes to consumer guarantees in the ACL (chapter 3) or the introduction of codes of conduct for specific product markets (LCA, sub. 114, p. 8), where it is a cost-effective solution to identifiable competition problems. Indeed, the ACCC noted as part of this inquiry that:

... in many instances an individual business' conduct will not substantially lessen competition, meaning Part IV would not apply to their conduct. Nonetheless, a market as a whole may suffer from poor competition because of the individual actions of multiple businesses. In these circumstances the government should consider the potential for these behaviours to harm competition and consider whether specific regulation to facilitate stronger competition is warranted. (sub. 106, p. 6)

Some of these alternative policy solutions for addressing competition issues in repair markets are discussed in section 4.6.

DRAFT FINDING 4.3 COMPETITION PROVISIONS ARE AVAILABLE TO ADDRESS REPAIR ISSUES

Although infrequently relied upon, there are existing remedies available under Part IV of the *Competition and Consumer Act 2010* to address anti-competitive behaviours in repair markets, such as provisions to prevent the misuse of market power, exclusive dealing or anti-competitive agreements.

Based on the evidence presented to this inquiry, the Commission does not see a strong case for changes to these provisions to address specific issues in repair markets (such as refusals to deal or tied servicing arrangements), particularly as the remedies have had recent changes that are yet to be fully tested in court.

4.6 Are alternative policy remedies needed?

Tailored policy interventions may be beneficial where competition issues in repair markets are generating some degree of consumer and societal harm, but where existing competition provisions are unlikely to address the problem. However, this also requires weighing up the costs and limitations of intervention, against the prospective benefits to the community.

A number of other countries are grappling with similar issues and have implemented a range of policy responses under a ‘right to repair’ banner (chapter 1). For its part, the Commission has considered a wide range of policy responses to the specific issues raised during this inquiry. The merits of two such policy changes are discussed below — requiring OEMs to provide access to repair supplies (a ‘positive obligation’) and warranty regulations — while other chapters discuss alternative reforms, where relevant.

A ‘positive obligation’ on OEMs to provide access to repair supplies?

A positive obligation is one possible policy remedy to address OEM restrictions on third-party access to repair supplies. A positive obligation would require manufacturers to make repair supplies (such as information, tools, equipment and parts) available to third parties (independent repairers and potentially consumers) at a reasonable price. Several participants to this inquiry supported a positive obligation (box 4.9).

Box 4.9 Participant views of a positive obligation

Several participants recommended versions of a positive obligation on manufacturers to provide access to repair supplies (Adelaide Appliance Repairs, sub. 102, p. 1; GEOTAB Australia Pty, sub. 61, p. 1; Marriott, sub. 16, p. 1; Abbas, sub. 34, p. 3). For example:

A meaningful ‘right to repair’ should remove barriers to repair for both consumers and independent repair providers. This can be achieved by imposing ... requirements on manufacturers. (iFixit, sub. 107, p. 2)

OEMs must be required to make accessible relevant repair and/or maintenance software information to independent repairers (and/or consumers, depending on the type of product in question). (Stein and Crosby, sub. 51, p. 2)

The [Small Business Development Corporation] strongly supports the introduction of a mandatory scheme for the sharing of information in the motor vehicle service industry as we believe this will better assist small business repairers and provide increased options for consumers choosing who services and repairs their vehicles. (Small Business Development Corporation, sub. 99, pp. 1–2)

Introduce mandatory schemes for manufacturers of new products to provide spare parts and repair manuals for a mandated period of time, such as has been legislated in France and is being introduced across Europe. (Transition Town Sunshine Coast, sub. 28, p. 1)

Making spare parts and service information available to anyone, including independent service providers and community-led repair centres. (WA Local Government Association, sub. 86, p. 2)

In principle, a positive obligation could improve access to repair supplies for independent repairers and consumers. The benefits might be expected to flow through to consumers as a greater choice of repairer and improved convenience, as well as lower priced repairs, although this may be offset (entirely or in part) by higher new product prices (appendix B).

However, a positive obligation could impose significant regulatory costs, such as:

- *unintended consequences* — there is a risk that imposing an obligation to provide access to repair supplies could conflict with OEM reasons for limiting access (section 4.3). For example, an independent repairer that can access the information needed to repair a

specialised item of medical equipment may not have the necessary skills to ensure safety standards remain uncompromised

- *compliance costs* — providing broader access to repair supplies could generate significant compliance costs for OEMs. While disseminating existing repair information (such as manuals and schematics) may not create many additional costs (apart from some initial fixed costs), providing access to physical tools and equipment would likely generate ongoing production, storage and distribution costs. These costs also vary depending on the type of product — for example, the cost of storing individual spare parts will likely be higher for motor vehicles (which require more storage space) than for mobile phones. Further, OEMs may face the cost of assessing the suitability (in terms of skills and relevant qualifications) of the repairers accessing repair supplies. Although compliance costs may be recouped from the third parties accessing the repair supplies, they are likely to be passed onto consumers to some extent.

Given these costs and the uncertainty about the materiality of existing barriers to competition (section 4.2), it is not clear that a broad economy-wide positive obligation (requiring *all* OEMs to provide *all* repair supplies to independent repairers) would result in net benefits to the community. However, a positive obligation could instead target particular product markets — such as motor vehicles (as is currently being implemented), agricultural machinery or mobile phones — where there is evidence of consumer harm from restrictions (section 4.4) and the benefits of reform are likely to be largest. Further, a positive obligation could target specific repair supplies (such as repair information), where the costs are likely to be low. Depending on which product market and repair supplies are included, a positive obligation could to some extent reduce the need to amend copyright law to allow repairers to copy information such as manuals (chapter 5).

There are different ways that a positive obligation could be implemented to balance the costs and benefits, including the following options.

- Legislative amendments (such as to the CCA) to establish a positive obligation for a specific product market (and type of repair supply). An example of this is Australia's proposed mandatory scheme for sharing of motor vehicle information (discussed below), as well as similar schemes in the United States and the European Union (chapter 1).
- A general provision to establish a positive obligation for any product market and repair supply that is specified in regulations. This would permit new products and supplies to be added (or removed) over time by the Treasurer or a nominated regulator, subject to specific criteria being met (such as evidence and analysis of consumer harm from restrictions to repair supplies). The provision could be an extension of, or modelled on, existing mandatory industry codes of conduct prescribed under Part IVB of the CCA. It could also be designed to include an authorisation process to exempt OEMs from complying with the positive obligation if they can provide evidence that the benefits of restricting repair supplies outweigh the costs (this could also apply to other forms of positive obligation).

-
- Extension of the consumer guarantees under the ACL, such as the provision that currently requires OEMs to have spare parts and repair facilities available for a reasonable period (s. 58). This could include extending the guarantees to cover software updates (chapter 3), or other repair supplies (such as repair manuals), as well as requiring all repair supplies to be made available to professional third-party repairers. In 2021, the European Union implemented product design standards that require sharing of spare parts and repair information to professional repairers for a range of appliances, such as fridges (chapter 6).

The Commission is seeking further information on the costs and benefits of implementing a positive obligation, including details on specific product markets or repair supplies to focus on, and how such a positive obligation could best be implemented.

INFORMATION REQUEST 4.2 A POSITIVE OBLIGATION TO PROVIDE ACCESS TO REPAIR SUPPLIES

The Commission is seeking feedback and evidence on the costs and benefits of different approaches to designing and implementing a positive obligation on original equipment manufacturers to provide access to repair supplies to third-party repairers. In particular:

- *evidence on the effectiveness of positive obligation schemes overseas (such as motor vehicle repair information schemes in the United States and Europe, and spare parts requirements in Europe)*
 - *should a positive obligation be applied across all product markets or targeted towards particular product markets? If so, which product markets, and why?*
 - *should a positive obligation mandate access to all repair supplies or a subset of repair supplies (such as repair information, spare parts, or diagnostic tools)?*
 - *how should a positive obligation be implemented and enforced in practice?*
-

Mandatory sharing of motor vehicle repair information

A positive obligation is currently being implemented in Australia, which aims to expand access to repair information for motor vehicles. In 2021, the Australian Government introduced legislation into Parliament to establish a *Motor Vehicle Service and Repair Information Sharing Scheme* (MV scheme) to help improve competition in motor vehicle repairs (box 4.10). The scheme will require OEMs to share vehicle diagnostic, service and repair information on fair and reasonable commercial terms.

It is difficult to predict how effective the MV scheme will be. A formal cost–benefit analysis or regulation impact statement was not conducted prior to introduction of the scheme legislation. The ACCC market study noted that the form of regulation ‘will require careful consideration of the costs and benefits of alternative approaches and is beyond the scope of this study’ (2017b, p. 132). Treasury certified the ACCC’s market study into new car retailing as ‘equivalent to a Regulation Impact Statement’ (Sukkar 2021, pp. 3–4).

Box 4.10 **Motor Vehicle Information Sharing Scheme**

In 2017, the Australian Competition and Consumer Commission conducted a market study into new car retailing. It found that car manufacturers have an incentive to limit access to repair information for independent repairers, limiting their ability to compete and causing increased costs, inconvenience and delays to consumers (2017b, p. 11). It concluded that the 2014 voluntary *Agreement on Access to Service and Repair Information for Motor Vehicles* had not effectively facilitated access to repair information and recommended a mandatory scheme be introduced for car manufacturers to share technical information on commercially fair and reasonable terms to improve competition in car repairs.

In response, in March 2021, the Australian Government introduced legislation into Parliament to establish a *Motor Vehicle Service and Repair Information Sharing Scheme* (Sukkar 2021). The scheme requires manufacturers (and other ‘data providers’) to share vehicle diagnostic, service and repair information on fair and reasonable commercial terms with independent repairers and Registered Training Organisations, to promote competition in the motor vehicle repair market and provide consumers with greater choice. The scheme is expected to commence on 1 July 2022 and applies to all passenger and light goods vehicles manufactured from 2002. Organisations that fail to comply with the scheme face a maximum penalty of \$10 million for a body corporate or \$500 000 for an individual.

There is also some uncertainty about how the scheme will operate in practice and overcome some challenges.

- The scheme excludes some types of information, such as trade secrets, GPS data and most automated driving systems (Sukkar 2021, pp. 9–10). Other ‘safety and security’ information — including information on hydrogen, electric and hybrid engines — can only be provided to people determined to be ‘fit and proper’. While this may provide scope for large amounts of information to be restricted, the scheme includes a ‘scheme adviser’ to help mediate any disputes.
- The scheme excludes access to spare parts, which the ACCC suggested may make it ‘less effective if the parts required to complete repairs or servicing are not made available’ (2017b, p. 139). It is also not yet clear whether all types of diagnostic and calibration tools are covered by the MV scheme, although diagnostic tools are covered by both the US and EU motor vehicle repair information sharing schemes (chapter 1).
- The scheme requires that data providers (including data aggregators and dealerships) share copyright information, even if doing so would infringe on Australian copyright law, as long as the information is required by the scheme and the data provider compensates the copyright holder (Sukkar 2021, pp. 7–9). It is unclear how this requirement will work in practice, or interact with international copyright law.
- There will be some compliance costs to the scheme. Treasury estimated that the annual regulatory burden on OEMs would be about \$1.5 million (Sukkar 2021, p. 3). However, the Federal Chamber of Automotive Industries (sub. 115, attach. 1, p. 6) estimated the costs could be significantly higher (\$43 million to establish and \$29 million per year thereafter). Most of these costs are likely to be passed onto independent repairers or consumers, either through fees to access repair information or through higher prices on

motor vehicles, spare parts or other OEM goods and services. To reduce some of this cost, the Australian Government announced it will provide a \$250 000 grant to an industry-led organisation to help establish a voluntary online portal to facilitate access to, and supply of, information, as well as verify that those accessing safety and security information meet the required criteria (2021a, p. 2).

It will be important for the Australian Government to undertake a post-implementation evaluation of the scheme to ensure that it is meeting its objectives, that the benefits outweigh the costs, and to determine whether any potential changes are required. This is particularly important given the MV scheme was partially motivated by similar regulations in the United States and Europe, but there is limited evidence of their effects on competition or the benefits provided to consumers in terms of lower repair prices or greater choice of repairer. One study estimated that the Massachusetts scheme increased the market share of small auto repair shops by 2.35–3.33 percentage points on average (Kahane 2021, p. 1), and an evaluation of the European regulation found that it allowed for more effective competition (EC 2016b, p. 5).

The MV scheme has also been designed so that it can be extended to include other types of vehicles (such as motorcycles, heavy vehicles and buses), subject to consultation and regulatory impact assessments (Sukkar 2021, pp. 12–13). However, any extension of the scheme to include other types of repair supplies or additional repair information would require further amendments. One suggested change was that vehicle telemetry information (data that is automatically generated and transmitted to the OEM, such as diagnostics) should be included in the scheme to enable access by third-party repairers (Wiseman and Kariyawasam, sub. 105, pp. 4–5).³⁹

Depending on the success of the scheme, it may be possible to extend it further or use it as a framework to impose a positive obligation for other product markets, but this will require a case-by-case analysis of the net benefits for each additional product market. Based on the Commission’s analysis (section 4.4), such a regulatory response is unlikely to provide net benefits for most other product markets, although one possible candidate could be agricultural machinery. In May 2021, the ACCC recommended that ‘agricultural machinery be considered for inclusion in the motor vehicle service and repair information sharing scheme’ (2021b, p. viii), though further investigation is needed to determine whether expanding the MV scheme to cover agricultural machinery would provide net benefits to the community.⁴⁰

However, many of the reforms proposed in this draft report are likely to facilitate greater competition for independent repair, without the uncertainty and costs associated with more

³⁹ The Centre of State Policy Analysis (2020, p. 2) in the United States claimed that telematics are unlikely to have a major impact on repairs in the short term, as they do not yet contain a lot of repair data. Nevertheless, Massachusetts voters approved amendments to their motor vehicle right to repair legislation to include telematics in November 2020 (chapter 1).

⁴⁰ Agricultural machinery OEMs may also import their voluntary ‘statement of principles’ from the United States to provide access to repair information, although the effectiveness of this voluntary approach has been criticised (Proctor, sub. 128, p. 1) and a similar voluntary scheme for motor vehicles in Australia was largely ineffective (ACCC 2017b, p. 10).

significant regulatory interventions. There would be merit in further assessment of the policy landscape in the coming years, supported by an evaluation of the costs and benefits of the motor vehicle scheme after it has been in operation for at least three years.

DRAFT RECOMMENDATION 4.1 EVALUATE MOTOR VEHICLE INFORMATION SHARING SCHEME

The Australian Government should evaluate the Motor Vehicle Service and Repair Information Sharing Scheme that is designed to improve access to repair information, once it has been in operation for three years.

The evaluation should focus on compliance with the scheme, the costs imposed on manufacturers, the benefits to independent repairers and consumers, and any implementation issues that require changes to the scheme, including consideration of whether the scheme should continue.

Prohibiting voiding warranty terms?

In response to concerns about the use of clauses that void a warranty due to independent repair (section 4.2), a number of inquiry participants have suggested that such clauses should be prohibited (GEOTAB Australia Pty, sub. 61, pp. 9–10; IT Professionals Australia, sub. 26, p. 9; LGNSW, sub. 97, p. 4; SA Repair Café, sub. 46, p. 9; WWF Australia, sub. 54, p. 4). This kind of prohibition (including on ‘warranty void if removed’ stickers) already exists across most products in the United States under the Magnuson-Moss Warranty Act, and for motor vehicles in the European Union (box 4.11).

In principle, a prohibition similar to the Magnuson-Moss Warranty Act could be introduced in Australia, preventing manufacturer warranties from containing ‘warranty void’ terms (including warranty seals) that require consumers to use authorised repair services or parts from a particular company to keep their warranty coverage. By making such terms (or any statements from customer service representatives that such terms exist) unlawful, a prohibition could help to simplify and clarify some of the ambiguous warranty language, reducing misconceptions and improving access to independent repair for consumers seeking alternative repair solutions during the warranty period.

Box 4.11 **An absence of the void — prohibitions on warranty terms**

Magnuson-Moss Warranty Act

In the United States, the Magnuson-Moss Warranty Act is the federal law that governs consumer product warranties. Enacted by Congress in 1975 and enforced by the Federal Trade Commission (FTC), the Act prohibits ‘provisions that state or imply that a consumer must buy or use an item or service from a particular company to keep their warranty coverage’, unless the item or service to consumers is provided for free, or the FTC provides an exemption. The FTC also notes that ‘it is permissible to disclaim warranty coverage for defects or damage caused by the use of parts or services you didn’t provide’ (US FTC 2018a).

In 2018, the FTC sent warning letters to six companies (Sony, Microsoft, Nintendo, Hyundai, HTC, and ASUS), alerting them that their use of warranty voiding provisions (including warranty seals such as ‘warranty void if removed’ stickers) was unlawful under the Act, and giving them 30 days to change their policies (Gault 2020; US FTC 2018b).

European Commission vertical agreement guidelines

In 2010, the European Union introduced new sector-specific guidelines on the application of competition law to vertical agreements in the motor vehicle sector (EU Regulation No 461/2010). Alongside these regulations, the European Commission (EC) published supplementary guidelines (OJ C 138, 28.5.2010, pp. 16–27) that clarified the EC’s ‘determination to preserve competition both between the members of authorised repair networks and between those members and independent repairers’ (p. 24). To this end, the EC noted several types of conduct that it would consider contrary to that goal, including the misuse of warranties that ‘explicitly or implicitly reserve repairs on certain categories of motor vehicles to the members of the authorised network’, with exceptions for any claims that are ‘causally linked’ to poor-quality repairs or spare parts (p. 26). The practical impact of this guideline was to act as:

... clarification by the European Commission that vehicle manufacturers may not make the warranties conditional on the repair and servicing of a vehicle within their network, or on the use of their own branded spare parts. According to the new set of rules, consumers have the right to use any repair shop for non-warranty work, during both the statutory warranty period (2 years in most EU member states) and any extended warranty period. Of course ... anyone who damages a vehicle as a result of negligent work or use of defective parts is responsible for it. (R2RC 2010, p. 10)

Similar to the United States, any prohibition could still permit warranty terms that only aim to limit OEM liability for defects or failures created by poor-quality independent repairs (such as warranty terms that state something similar to ‘this warranty does not apply to any damage caused by non-authorised repairs’). This means that the OEMs who stated their warranties lack any voiding clauses during the course of this inquiry — John Deere, Microsoft (for its Xbox products) (section 4.2) — are unlikely to be affected by a prohibition.

However, a prohibition may also increase burdens for OEMs, by requiring them to determine the underlying cause of all defects or failures. These additional costs could be passed on to consumers (through price changes) or result in less generous warranty terms — although the generosity of a warranty does not affect the availability of remedies under the consumer

guarantees. For example, despite their products being covered by the consumer guarantees, the video game console makers noted that:

Unfortunately, an unintended but entirely counter-productive consequence of imposing restrictions on the ability of manufacturers to set conditions around their own voluntary warranties is that many will decide to simply stop providing them or to scale them back to avoid further commercial and legal risks. Clearly, this would only lead to an inferior outcome for consumers and one that governments, industries and consumers would all be keen to avoid. (IGEA, sub. 103, p. 19)

As a result, the Commission is seeking additional information on the costs and benefits of such a prohibition, to inform its view for the final report.

Additional warranty text on the consumer guarantees

As a complementary policy option, the Australian Government could also aim to improve consumer awareness about the consumer guarantees, particularly that the guarantees do not cease to apply simply because of independent repair or the use of third party parts, and cannot be extinguished or altered by the terms of a manufacturer's warranty.

One mechanism to achieve this would be through changes to existing regulations that require all manufacturer warranties to contain text about the ACL and consumer guarantees. In particular, the ACL allows for regulations that 'prescribe requirements relating to the form and content of warranties against defects' (s. 102). This provision has already been used (r. 90 of the Competition and Consumer Regulations 2010) to set out the basic requirements of a manufacturer warranty, as well as obliging warranties to include specific text about guarantees under the ACL.⁴¹ As the 2017 review of the ACL noted:

The mandatory text alerts consumers to the ACL and acts as a reminder to local and international traders (and frontline staff handling warranty claims) of their obligations to not mislead consumers in warranty documents and that they cannot 'contract out' of the consumer guarantees. (CAANZ 2017, p. 26)

This warranty text could be supplemented by additional words, stating that entitlements to consumer guarantees under the ACL do not require consumers to use an authorised repair service or authorised spare parts. The warranty text should be placed in a prominent position on the warranty, to improve awareness for consumers. Public communications from the ACCC could also help to ensure that consumers are aware of and understand the changes. Although changing the required warranty text would create some implementation costs for manufacturers — as the text of their warranties would need to be updated and their customer service support staff trained on the new text and its meaning — ongoing costs should be minimal.

⁴¹ For goods, the required text is 'Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure'.

DRAFT RECOMMENDATION 4.2 ADDITIONAL MANDATORY WARRANTY TEXT

The Australian Government should amend r. 90 of the Competition and Consumer Regulations 2010, to require manufacturer warranties ('warranties against defect') on goods to include text (located in a prominent position in the warranty) stating that entitlements to consumer guarantees under the Australian Consumer Law do not require consumers to use authorised repair services or spare parts.

INFORMATION REQUEST 4.3 A PROHIBITION ON WARRANTY VOID TERMS

The Commission is considering recommending provisions similar to the Magnuson-Moss Warranty Act in the United States, which prohibit manufacturer warranties from containing terms that require consumers to use authorised repair services or parts to keep their warranty coverage. We are seeking feedback and evidence on the costs and benefits of this approach. In particular:

- would manufacturers respond by increasing product prices or making their warranties less generous? Would this latter change have any practical impact on consumers given they are also covered for defects under consumer guarantees?*
- how could such a prohibition be designed and communicated to ensure that consumers are aware that voiding terms are now prohibited?*
- how could the prohibition be designed to limit manufacturer liability for damage beyond their control? For example, the Magnuson-Moss Warranty Act permits warranty terms that limit manufacturer liability for damage caused by unauthorised repairs or parts, if they can demonstrate third-party fault.*

In a similar vein, should terms within end-user license agreements that purport to restrict repair related activities (discouraging third-party repair) also be prohibited? Is a disclosure as proposed under draft recommendation 4.2 sufficient or is a legislative prohibition required?

5 Intellectual property protections and repair

Key points

- When product owners seek to repair items themselves or through a third-party repairer, they can encounter barriers due to manufacturers using intellectual property (IP) protections over the product. These barriers include IP protections that:
 - restrict third-party access to inputs needed for repair, such as spare parts, tools, and information (for example, the copyright holder of a repair manual may prevent others from reproducing and sharing it)
 - limit the scope of repairs that third parties may undertake (for example, end-user licences may stipulate that product disassembly can result in licence termination, which may render the product unusable).
- Such IP protections can adversely affect the cost and availability of repair services by preventing third-party repairers from competing with authorised repairers. But, within limits, they can also have wider community benefits (such as encouraging innovation). Hence, reducing IP protections to facilitate repair can involve trade-offs.
- In Australia, evidence on the extent to which IP protections restrict repair is patchy and largely anecdotal. Nonetheless, the most significant IP-related barriers to repair appear to relate to the inability of third-party repairers to access repair information under copyright law.
- Options for addressing these barriers include amending copyright laws so that product owners or repairers can:
 - reproduce and share repair information (such as manuals) without the copyright holder's permission
 - access repair information (such as diagnostics) hidden behind technological protection measures (TPMs) such as digital locks.
- The case for such reforms is not clear cut. In addition to uncertainty about the materiality of the underlying barriers to repair, other considerations include:
 - potential unintended impacts from attenuating copyright protections (such as heightened product safety and security risks)
 - implementation challenges associated with adherence to international copyright obligations.
- On balance, amending the Copyright Act to introduce an exception (fair use or fair dealing) to allow for the reproduction and sharing of repair information, and to allow repairers to legally procure tools required to access repair information protected by TPMs, could help promote competitive repair services.
 - The Commission is seeking further information on the likely benefits, costs, risks and implementation issues associated with these (and any other) IP reform options.

In media coverage of the ‘right to repair’ movement, it is common to hear about the experiences of farmers who attempt to fix their tractor only to be thwarted by the need for specific computer software or code to access diagnostic information and undertake repair activities (Burt 2018; Koebler 2017b). Then there are cases of self-repair hobbyists who are unable to access the repair manuals for their laptops (The Tech Journal 2012) or unable to obtain spare parts needed to fix a mobile phone (Van der Velden 2020). Both of these are examples of how intellectual property (IP) protections, used by manufacturers, can affect people’s ability to undertake repairs.

This chapter examines the various ways IP can act as a barrier to product repair (section 5.1). It then considers the evidence on the extent of IP-related barriers to repair in Australia (section 5.2), and what the government could do to address such barriers (section 5.3). It finds that the most significant IP-related barriers to repair appear to relate to the inability of third-party repairers to access repair information under copyright law. Two potential copyright reforms are identified that warrant closer consideration following further stakeholder input.

5.1 How IP protections can act as a barrier to repair

IP protections describe the range of legal and technological measures used by manufacturers (or other people) to protect their creations of the mind (inventions), literary and artistic works, designs, symbols, names and images used in commerce (WIPO nd).

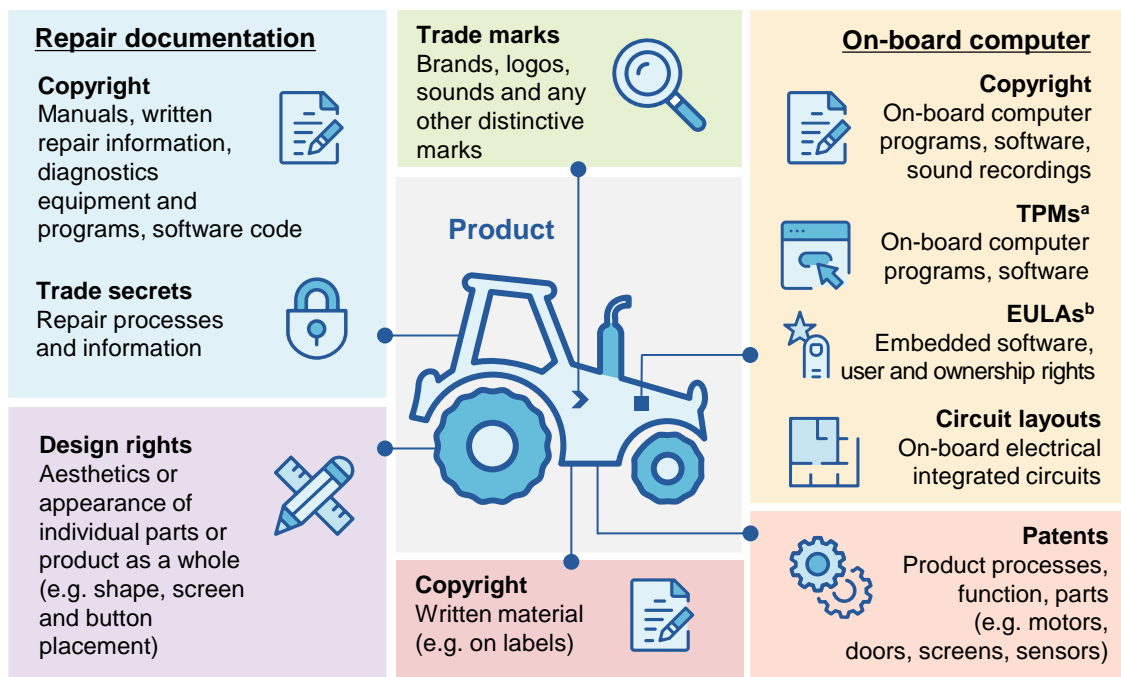
IP rights (such as copyright, patents, designs, trademarks) are one of the main forms of IP protection that manufacturers use. IP rights provide legally enforceable, exclusive rights to creators over the use of their creations, for a certain period of time (IP Australia 2020; WTO 2020).⁴² Different IP rights provide different forms of protection and manufacturers may use multiple IP rights to protect a single product. For example, a registered design right may protect the distinctive shape of a product, a trademark may protect the brand name and logo, copyright may protect the underlying computer software, and a patent right may provide exclusive rights over parts (figure 5.1).

In addition, manufacturers may use technological protection measures (TPMs) and contractual arrangements to protect their creations. TPMs — such as password protection, file permissions, encryption and copy controls — enable manufacturers to control who can access and reproduce their copyrighted material (such as software) (House of Representatives Standing Committee on Legal and Constitutional Affairs 2006, p. 8). Contractual arrangements can take a variety of forms. End-user licensing agreements (EULAs) are contractual agreements that enable manufacturers to stipulate the terms and

⁴² The legal foundation for Australia’s IP regime is set out in the Australian Constitution, with section 51 conferring an exclusive power to the Commonwealth to make laws with respect to various forms of IP. As a result, specific IP protections and rights are set out across a range of pieces of Commonwealth legislation (for example, the *Copyright Act 1968* (Cth), *Patents Act 1900* (Cth) and *Designs Act 2003* (Cth)) and non-statutory (common law) principles developed by the courts (for example, contract law and confidential information/trade secrets).

conditions by which users can access products (particularly software) and may impose post-sale usage, repair and modification restrictions on consumers (Hanley, Kelloway and Vaheesan 2020, p. 14).⁴³ Manufacturers may also have contractual or licensing arrangements with other businesses (such as authorised repairers) that may include provisions such as non-disclosure of confidential repair information to third parties.

Figure 5.1 A single product may be covered by multiple IP protections



^a Technological protection measures. ^b End-user licence agreements.

When product owners seek to repair items themselves or through a third-party (independent) repairer, they may encounter barriers resulting from manufacturers' use of IP protections over the product. There are three broad types of barriers (figure 5.2).

- **Restrictions on accessing inputs required for repair** — examples of such inputs and associated IP-related barriers include:
 - *Reduced access to physical spare parts* (such as screens, wiring and other product components). For example, design and patent laws prohibit unauthorised manufacture and sale of protected parts, and a manufacturer may refuse to license their IP to third parties to make parts.
 - *Inability to access tools and equipment* necessary to open up products, diagnose issues and replace components (such as screwdrivers, diagnostic machines, and tools

⁴³ EULAs can take the form of 'click wrap' licences whereby users agree to conditions by clicking a digital click box, or 'shrink wrap' licences whereby users agree to conditions by taking off product packaging (Lindsay 2002, pp. 70–75).

used to unlock manufacturer TPMs). For example, design and patent laws prohibit unauthorised manufacture and sale of protected tools, and a manufacturer may refuse to license their IP to third parties to make tools.

- *Inability to access and share repair information* (such as diagnostics, product data, and repair manuals and schematics). For example, manufacturers may use digital locks to block access to diagnostic information, or rely on copyright law protections to prevent third-party repairers from reproducing and sharing repair manuals with each other without authorisation.
- **Restrictions limiting the scope of repairs that third-party repairers or consumers may undertake** — for example, end-user licence agreements (which are used to define the terms and conditions for the granting of licences to use embedded software) may stipulate that if the product is disassembled, this could result in termination of the licence.
- **Restrictions on marketing of repair services** — manufacturers may refuse to allow third-party repairers to use their trademark-protected brand names and logos when advertising their repair services to the public (such as at the point of service).





Such restrictions can adversely affect the cost and availability of repair services, by reducing the ability of independent repairers to compete with authorised repairers and discourage self-repair by consumers. However, they can often have wider community benefits beyond the repair market. For example, within limits, time-limited exclusive IP rights are a means by which government can incentivise businesses to invest in and bring to the market socially beneficial innovations and creative outputs. Without such rights, innovators may be unable to recoup sufficient returns on their investments because they are unable to prevent others from offering the same innovation at lower prices (competitors would not have incurred any research and development costs). Consumers may also benefit from some IP-related restrictions (such as trademarks restrictions) where it enables them to clearly identify and distinguish brands that have established a reputation (including for safety and quality).

5.2 Key IP-related barriers to repair in Australia

In response to the issues paper for this inquiry, several participants highlighted concerns about IP-related barriers to repair. Most examples cited related to limits on accessing inputs required to undertake repair (such as spare parts, tools and equipment, and information). The examples mentioned tended to focus on products such as consumer electronics, agricultural equipment, and motor vehicles.

The rest of this section examines specific types of IP-related barriers in more detail and the evidence on the extent that they are a material barrier in Australia.

Figure 5.2 How IP protections may act as a barrier to repair

Access to inputs required to undertake repair	
Tools and equipment	Information
<ul style="list-style-type: none"> • Inability to access tools used to unlock/bypass manufacturers' digital locks <ul style="list-style-type: none"> • Copyright law prohibits their dissemination • Inability to access tools for issue diagnosis, disassembly and repair <ul style="list-style-type: none"> • Design and patent laws prohibit unauthorised manufacture and sale • Copyright law prohibits unauthorised copying and dissemination of software tools 	<ul style="list-style-type: none"> • Inability to access repair manuals <ul style="list-style-type: none"> • Copyright law prevents unauthorised copying and dissemination • Inability to access diagnostic and calibration information, and product data <ul style="list-style-type: none"> • Such information is often held behind digital locks, with copyright law restricting access tools (see 'tools and equipment') 
Spare parts	
<ul style="list-style-type: none"> • Reduced access to original manufacturer parts <ul style="list-style-type: none"> • Design and patent laws allow for control of exploitation and use • Reduced access to generic parts <ul style="list-style-type: none"> • Design and patent laws prohibit unauthorised manufacture and sale by third parties • Uncertainty about legal protections for third parties making and using generic spare parts • Reduced availability of refurbished parts <ul style="list-style-type: none"> • Trademark law prohibits unauthorised importation and sale of parts bearing registered trade marks 	
Scope of repairs	
<ul style="list-style-type: none"> • Reduced scope to disassemble <ul style="list-style-type: none"> • May void warranty or product licence under end-user licence agreements • Reduced scope to repair embedded software <ul style="list-style-type: none"> • Copyright law permits the use of digital locks to prevent repairers accessing the software • Copyright law prohibits unauthorised reproduction of software • Reduced scope to alter product <ul style="list-style-type: none"> • Patent law prohibits remanufacture and reconstruction 	

Sources: FTC (2021); Grinvald and Tur-Sinai (2019); Svensson et al. (2018); inquiry submissions, for example: iFixit, sub. 107; Law Council of Australia, sub. 114; MD Solutions Australasia, sub. 41; Wiseman and Kariyawasam, sub. 105.

Preventing access to inputs required for repair

The increasingly complex nature (including the computerisation and miniaturisation) of everyday products can make repairs more difficult. Repairers are often unable to simply drop down to their local hardware store to get the spare parts or tools they need. A regular-head screwdriver or wrench may no longer do, nor might a standard connector or ring seal, and it

is now much harder to work out how to repair a product merely by looking at it or pulling it apart. A rise in tech-enabled products also means that much of the information required to diagnose a fault is digital, embedded into the product itself and held behind ‘digital locks’ (TPMs) that require passwords or special ‘circumvention’ tools to bypass (diagnostic information can simplify the task of determining the cause of a fault and how to fix it).

Access to spare parts

International studies suggest a variety of IP rights may limit access to physical spare parts required to complete product repairs (FTC 2021, p. 22; Grinvald and Tur-Sinai 2019, pp. 112–119; Svensson et al. 2018, pp. 5–6). For example, design and patent law protections provide manufacturers with the exclusive rights to use and exploit their creations, and prohibit their unauthorised manufacture and sale. As such, a manufacturer who owns the patent or registered design for a particular product part can refuse to license the IP rights to manufacture and sell generic parts, and pursue parties who have manufactured or sold generic parts without authorisation. Manufacturers may also refuse to supply their spare parts, however such conduct may in some cases fall foul of competition laws (chapter 4), and may occur regardless of whether or not an IP right over the spare part is actually held. There are also instances internationally where a manufacturer (in particular, Apple) has used trademark law to prevent the importation of spare parts bearing its logos (box 5.1).

Box 5.1 **Apple’s use of trademark law protections to prevent the importation of spare parts**

There have been two recent, relatively high-profile overseas cases involving Apple preventing imports of aftermarket iPhone screens by independent repairers on the basis that the screens infringed Apple’s exclusive trademark rights.

In these cases, replacement iPhone screens imported from China and Hong Kong by independent repairers were seized by Norwegian and United States customs authorities — in one case, Apple was earlier granted an injunction requiring customs to ‘seek to disclose and keep from release all articles [regardless of importer] with trademarks or figure marks belonging to Apple Inc’ (*Henrik Huseby v Apple Inc*, HR-2020-1142-A, case no. 19-141420SIV-HRET, [5]) — on suspicion that they were counterfeits bearing unauthorised Apple trademarks that therefore infringed Apple’s trademark rights (Koebler 2018b; Montello 2020, pp. 172–174; Van der Velden 2020). The parts in question were argued to be aftermarket parts comprised of a mix of original manufacturer, refurbished and aftermarket components, with some original internal componentry bearing microscopic Apple logos invisible to consumers.

Although many submissions to this inquiry expressed concerns about manufacturers restricting access to spare parts — approximately 37 per cent of submissions raised a lack of access to spare parts as barrier to repair — the vast majority of these did not specify exactly *how* manufacturers are denying access to spare parts (box 5.2). No submissions explicitly stated that manufacturers are using IP law protections to restrict access to spare parts — such as by refusing to license third parties to produce generic spare parts or taking legal action to prevent the unauthorised

importation of IP-protected parts under IP laws. This may suggest that IP protections are not the limiting factor. Rather, the main issue could be that manufacturers simply refuse to provide the parts (whether or not the parts are protected by specific IP rights).

Box 5.2 Third-party repairers have reported experiencing manufacturer refusals to supply spare parts

Some inquiry participants cited issues obtaining spare parts from original manufacturers when attempting to undertake repairs. These comments related to products such as consumer electronics, household appliances, medical equipment and watches.

Most of those submissions reported that original manufacturers simply refuse to supply spare parts to third-party repairers without any explanation (Bersten, sub. 138, p. 1; Free Software Melbourne, sub. 43, p. 3; MD Solutions Australasia, sub. 41, p. 4; Peters, sub. 19, p. 1; Pleszczynski, sub. 63, p. 1; Thorpe, sub. 8, p. 1; Witherby, sub. 134, p. 3). For example:

MDS has made many attempts to purchase parts, components and equipment from OEMs [original equipment manufacturers] and these have been flatly rejected. (MD Solutions Australasia, sub. 41, p. 4)

One participant suggested that refusal to supply spare parts for some watches was due to company policy (Watch and Clockmakers of Australia Inc., sub. 83, p. 1). In some cases, refusal to supply was a result of the product line (and associated parts) being discontinued (Deighton, sub. 72, p. 6; Horan, sub. 11, p. 1). For example:

My daughter dropped an electronic tablet onto my open oven door and smashed the internal layer of glass in the oven door ... I phoned the oven company and they told me parts were no longer being manufactured for that model. (Deighton, sub. 72, p. 6)

One possible reason why IP protections (particularly design, patent and trademark laws) are less likely to be a limiting factor in accessing spare parts is because Australian IP laws provide some defences for the manufacture of IP protected spare parts for the purposes of repair. In particular, the ‘spare parts defence’ in the *Designs Act 2003* (Cth) (‘Designs Act’) enables the manufacture of design-protected spare parts for the purpose of repairing ‘complex’ products (box 5.3). New technologies such as 3D printing (and other forms of ‘additive manufacturing’, whereby objects are created by adding layers of material, rather than by removing material (General Electric 2021)), may also increase the accessibility of spare parts, by enabling repairers to fabricate their own replacement parts and be less dependent on conventional manufacturers (Abbas, sub. 34, p. 13). In Australia, the use of 3D printing to create spare parts is unlikely to infringe manufacturers’ IP rights if: the 3D printed spare part is not substantially similar in overall impression to the original part (or the ‘spare parts defence’ under the Designs Act applies), there has been no copying of the part’s original (copyrighted) design schematics in the creation of the print (the part is reverse engineered), and no manufacturer trademarks are printed on to the part.

It is also unclear whether manufacturers could use trademark law protections to prevent the importation of spare parts into Australia, as has occurred in other countries. In particular, the use of microscopic marks on non-visible product components may not satisfy legislative

criteria set out in the *Trade Marks Act 1995* (Cth) as to ‘use’ of a mark that gives rise to exclusive trademark rights — the consumer is unable to use the sign to distinguish the goods.⁴⁴

Box 5.3 The ‘spare parts defence’

Generally, a person infringes a registered design if they make, import, sell, or use in trade or business (among other things) a product (without the authority of the registered owner) that embodies or is substantially similar to the registered design (s 71, *Designs Act 2003* (Cth)).

However, section 72 of the *Designs Act* provides a complete defence to infringement of a registered design for certain repairs if the product to which the registered design is embodied is a component part of a complex product (products containing two or more replaceable parts) and its use is for the purpose of repairing the complex product so as to restore its overall appearance (though not to repair function or enhance a product). The provision defines ‘repair’ to include:

- restoring or replacing a decayed or damaged component part of the complex product to a good or sound condition
- replacing incidental items when restoring or replacing a decayed or damaged component part of the complex product
- carrying out maintenance on the complex product.

While introduced in 2003, the defence was not tested in court until the Federal Court clarified the operation of the defence in *GM Global Technology Operations LLC v S.S.S. Auto Parts Pty Ltd* [2019] FCA 97. It was held that ‘spare parts can be acquired for both repair and enhancement, and that the defence should be available in such cases’ (Wiseman and Kariyawasam 2020b, p. 140).

Access to repair information

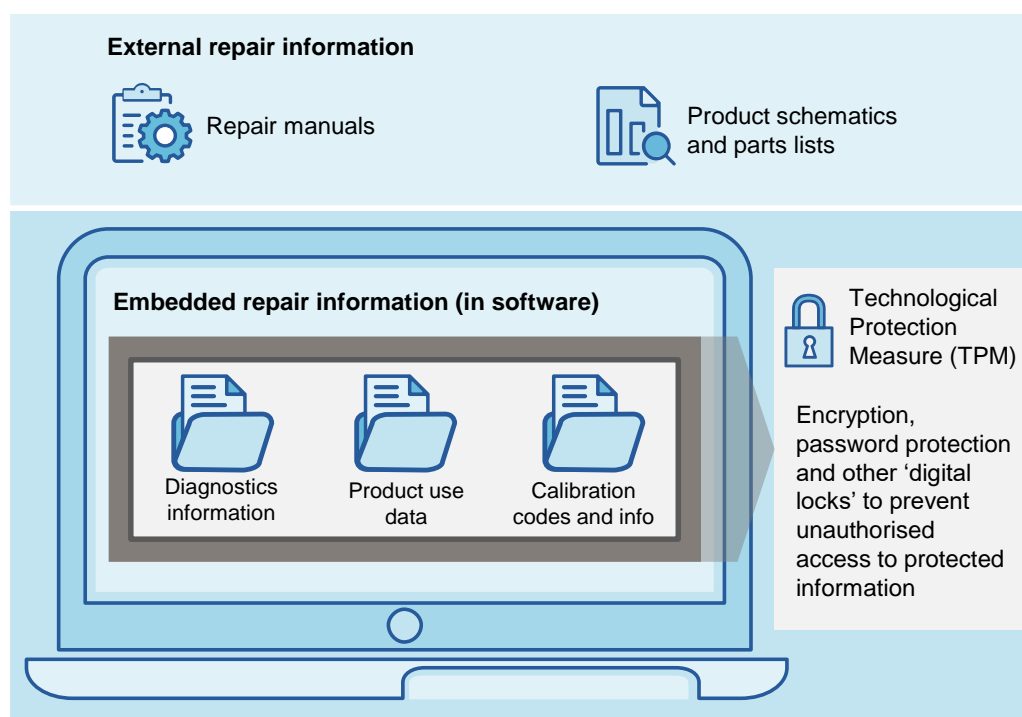
When a product is not operating as intended, repairers require:

- information to diagnose the problem — for example, diagnostics and product data (information automatically recorded by the product about functions executed and outputs generated) housed in embedded computer programs
- information to rectify the problem — for example, repair manuals, schematics (such as parts lists and product assembly diagrams), and calibration codes and information (figure 5.3).

Manufacturers’ use of IP protections can limit access to such repair information.

⁴⁴ In addition, it was stated in the High Court case *Pioneer Kabushiki Kaisha v Registrar of Trade Marks* (1977) 137 CLR 670, [34] that: ‘Indeed to place a word or device mark on some small part of an elaborate piece of equipment where it would not be seen in the course of ordinary use may well not amount to a use of the mark at all, as in the case of a mark too small to be seen’.

Figure 5.3 Many types of information are required to conduct repairs



Restrictions on reproducing and sharing repair information such as manuals

Some forms of repair information such as repair manuals and technical diagrams or schematics are generally copyrightable in that they often contain text, flowcharts, and other graphics that satisfy copyright's creativity requirements (Hanley, Kelloway and Vaheesan 2020, p. 13). As such, manufacturers can use copyright law to prevent third parties reproducing and disseminating (sharing) manufacturer repair manuals for their products (such as by uploading them to a hobbyist website). In Australia, there are no general defences or exceptions for unauthorised uses of copyright material (such as reproduction or dissemination) for the purpose of repair.⁴⁵

A number of participants to this inquiry raised concerns about IP-related barriers to accessing repair information, including repair manuals and other 'how to' repair information such as service information, schematics and parts lists. As with spare parts, the majority of submissions that raised concerns about access to repair manuals did not explicitly identify how manufacturers were restricting access to this information. However, there has been a high-profile instance in Australia of a multinational laptop manufacturer, Toshiba, exerting its rights under copyright to prevent unauthorised reproduction and dissemination of

⁴⁵ Section 47E of the Copyright Act permits the reproduction or adaptation of computer programs to correct errors in limited circumstances. In order to rely on the exception, an error-free copy must not be available within a 'reasonable time at an ordinary commercial price' (that is, a replacement program is not otherwise available).

copyrighted repair manuals for its products (box 5.4). (The Toshiba case also demonstrates how manufacturers can use contractual arrangements (such as confidentiality agreements) in conjunction with their rights under copyright law to control access to repair information and prevent unauthorised reproduction and dissemination.)

Box 5.4 The case of the Toshiba laptop manuals

The legal interactions between multinational laptop manufacturer Toshiba and an Australian hobbyist repairer in 2012 are one well-known example where a manufacturer firmly enforced their exclusive intellectual property rights with respect to repair information.

Toshiba does not make its laptop service documentation publicly available (a fairly common practice amongst many laptop manufacturers) (Wiens 2013). A hobbyist repairer hosts a popular website containing a range of laptop service manuals, including over 300 Toshiba manuals, that can be freely accessed and downloaded (Wiens 2012). Toshiba sent a cease and desist letter to the repairer demanding he remove their copyrighted manuals from his site and destroy all copies held on the grounds that he was not an authorised service provider to whom manuals were provided, and his distribution without permission infringed their copyright:

The Manuals are only available to Toshiba authorised service providers under strict confidentiality agreements. You are not a Toshiba authorised service provider and therefore you have no rights to have any of the Manuals ...

The Manuals are copyright and, as stated, contain Toshiba proprietary information. The copyright statement prohibits the copying and distribution in any format without the prior written authority of Toshiba. You have not made any written requests of Toshiba for permission to access, hold, copy and distribute Toshiba's proprietary Manuals nor has Toshiba granted any rights to you ...

You are required to immediately disable the links to the Manuals that are contained and published on and distributed from your website and to destroy all copies of the Manuals that you hold in whatsoever format ... within seven ... days of this letter. (Toshiba Australia 2012, p. 1)

Because Toshiba does not make this repair documentation publicly available, the removal of these manuals makes repairing Toshiba laptops by third-party repairers considerably more difficult and potentially impossible if such information cannot be found elsewhere.

Overseas, a number of similar instances have been reported, including with respect to Apple MacBook Pro manuals (Cook 2006), and more recently, hospital ventilator manuals (Frank's Hospital Workshop nd; Linder 2020). For example, iFixit reported similar actions in the United States with respect to copyrighted Apple schematics:

iFixit received a US DMCA [Digital Millennium Copyright Act] takedown notice from Apple on December 8, 2015, demanding the removal of a circuit schematic uploaded by a community member for a MacBook Pro logic board. (sub. 107, p. 3)

In some cases repairers may be able to develop workarounds that enable them to share repair guides and information without the risk of infringing copyright.⁴⁶ For example, organisations

⁴⁶ Where a repairer is in possession of a manufacturer manual, they can use the information contained in the copyrighted manual to create (and disseminate) their own non-infringing repair guides, so long as the 'expression' of the new guide (for example, appearance, layout, wording etc.) is not substantially similar

such as iFixit have undertaken ‘teardowns’ (whereby products are disassembled to identify its component parts, method of assembly and functionality) of a wide variety of products to find out how they work (iFixit nd), and re-assembled them to create their own non-infringing ‘how-to’ repair guides (having a different look and feel, and potentially different repair methods) (iFixit nd). These guides are readily accessible to consumers and third-party repairers online. However, these endeavours are resource-intensive and may not cover all products that consumers and independent repairers seek to repair. They may also not always identify the most efficient means of repairing the products.

The costs associated with restrictions on sharing copyright repair manuals will also vary depending on how easily repairers can access manuals from manufacturers. Several submissions noted that some manufacturers make repair and service information available to third-party repairers. For example, a farm machinery dealer stated that (at least in the agricultural machinery sector), technical repair manuals can be purchased by independent repairers or customers (Eglinton, sub. 5, p. 10). Also in the context of agricultural equipment, John Deere stated that manuals for their equipment are made ‘available to the public online and through the John Deere dealer network for maintenance and repair of John Deere equipment’ (sub. 84, p. 1). In some cases, it has been submitted that service information is made available (sometimes free of charge) to equipment owners, who must input product serial numbers for access (AIIA, sub. 127, p. 15). The Brunswick Tool Library noted that this is the case for some household appliances, with companies such as Bosch sharing repair documentation for their appliances so long as a full model number or model name of the appliance is available (sub. 77, p. 5).

A further issue when assessing the costs associated with restrictions on reproducing and sharing copyright repair manuals is the extent to which copyright holders enforce their rights. Measuring enforcement is inherently challenging because there is no central record of actions, such as the issuing of ‘cease and desist’ or ‘takedown’ notices, that might be a sufficient deterrent. Similarly, it is also difficult to measure the extent to which some repairers may be sharing repair manuals, but such behaviour goes undetected or ignored.

Manufacturers often justify restricting access to repair manuals (and associated technical diagrams and methods) on the basis that providing non-expert repairers access to such information poses safety risks (Dux Manufacturing Limited, sub. 21, p. 3; GAMAA, sub. 58, p. 3; RA & AREMA, sub. 62, p. 6; Toshiba Australia 2012, p. 1). For example, Toshiba’s takedown notice stated that: ‘by providing the Manuals to unqualified person[s] you may be endangering their wellbeing’ (2012, p. 1). Other claimed reasons include to protect competition, commercial interests and ensuring that repair information is used genuinely for repairs (LG Electronics Australia, sub. 38, p. 5; IGEA, sub. 103, pp. 24–26). Chapter 4 considers these manufacturer rationales in further detail.

to the copyrighted manual. As noted by Davies Collison Cave Pty Ltd: ‘[c]opyright protects only the expression in a work in which it subsists; it does not protect an idea or information communicated through such expression’ (sub. 141, p. 2).

Barriers to accessing embedded (digital) repair information such as diagnostics

Several inquiry participants, as well as Australian legal academics (Austin 2020, p. 121; Wiseman and Kariyawasam 2020a, pp. 95–96), have raised concern about manufacturers’ use of technologies (such as TPMs) to restrict access to embedded repair information. For example, iFixit stated that:

Manufacturers are unfortunately using new technology to prevent users from accessing their data and repairing or modifying the devices they have bought, from tractors to printers to coffee makers. (sub. 107, p. 8)

An electrician specialising in the service and repair of power supply and generator equipment noted various TPM-like mechanisms used by manufacturers to restrict access to information, including service codes (special codes required to access equipment service settings) and ‘dynamic’ service codes (codes that change ‘month to month’ or that are ‘generated based on the equipment serial number and date of the visit’) (Marriott, sub. 16, p. 3).

Under Australian copyright law, it is lawful for a manufacturer to use TPMs to protect copyright subject matter such as software and computer code (including code relating to product and parts calibration) from unauthorised access. Moreover, copyright law generally prohibits the circumvention (or bypassing) of TPMs unless there is an explicit legislative exception.

There is an exception in Australian copyright law that seemingly permits the circumvention of TPMs to access protected copyright information for the purposes of repair, in limited circumstances.⁴⁷ However, the intent and scope of this exception is ambiguous — in fact, submitters to the Australian Competition and Consumer Commission (ACCC) Agricultural machinery market study were of the opinion that no such exception exists (2021b, p. 43). For example:

Regulation 40 of the Copyright Regulations 2017 sets out exemptions to this ban, which include a number of permitted uses by disability groups and educational and cultural institutions, as well as the making of interoperable products. However, it does not currently include circumvention for the purpose of repair. (Australian Digital Alliance 2020, p. 2)

One area of ambiguity in the exception is the extent that the TPM must itself be ‘malfunctioning’ (‘interfering with or damaging’ a product) before circumvention is permitted to access protected repair information needed to repair the product (the ‘host product’ in which the TPM resides) (box 5.5). If the exception is interpreted as only applying when the TPM ‘malfunctions’, this would narrow the scope of potential repairs that may be undertaken by relying on the exception — because products may require repair even when the TPM protecting the repair information is not ‘malfunctioning’ (where the TPM is doing its job by preventing access to embedded repair information, but in doing so ‘interferes with’ the product by preventing product repair).

⁴⁷ Regulation 40(2)(d)(ii) Copyright Regulations 2017 via section 116AN(9) *Copyright Act 1968* (Cth).

Box 5.5 **Lack of clarity in the intent and scope of the ‘repair’ TPM circumvention exception under copyright law**

Australian copyright law generally prohibits the circumvention (or bypassing) of technological protection measures (TPMs). However, there is an exception that seemingly allows for repairers to circumvent TPMs to access protected information to undertake repairs in limited circumstances. The exception allows:

... the gaining of access by a person to copyright material that is protected by a technological protection measure that interferes with or damages a product in which it is installed (the host product) or another product used in conjunction with the host product ... to repair the host product or another product (if circumvention of the technological protection measure is necessary to enable the repair to be carried out) ... (Copyright Regulations 2017, reg 40(2)(d)(ii) via *Copyright Act 1968* (Cth) s 116AN(9))

The intent and scope of this exception is somewhat ambiguous. One area of ambiguity is whether the exception would extend to repairers seeking to circumvent a TPM for the defined purpose (to repair the host product), but where the TPM is not necessarily ‘malfunctioning’ (that is, ‘damaging’ or ‘interfering with’ the host product in a conventional sense).

On face value, a TPM that ‘interferes with or ‘damages’ the host product appears to be a threshold requirement. This interpretation is supported by the fact that the exception was initially introduced to the Copyright Regulations 1969 (now superseded by the Copyright Regulations 2017) under the heading ‘Malfunctioning technological protection measures’. In addition, the original exception was introduced following a recommendation of the 2006 review of TPM exceptions (House of Representatives Standing Committee on Legal and Constitutional Affairs 2006), which was made after considering a number of submissions raising issues about TPMs that had become obsolete, or where passcodes to bypass TPMs were lost over time, thus rendering the protected material inaccessible (AVCC 2005, pp. 17–18; DEST 2005, pp. 34–35; House of Representatives Standing Committee on Legal and Constitutional Affairs 2006, p. 123; NSW Department of Education and Training 2005, pp. 15–16; Weatherall 2005, pp. 25–26).

However, a range of secondary sources associated with and discussing the exception appear to indicate that TPM ‘malfunction’ is not required. For example, the original recommendation that led to the introduction of the exception stated:

The Committee recommends that the proposed exceptions to liability for TPM circumvention for ... Access where a TPM interferes with or causes damage or a malfunction to a product, or where circumvention is necessary to repair a product. [emphasis added] (House of Representatives Standing Committee on Legal and Constitutional Affairs 2006, p. xxiii)

The explanatory statement accompanying the introduction of the exception stated:

New paragraph 6.2 of table item 6 [equivalent to current regulation 40(2)(d)(ii)] prescribes the activity of accessing copyright material protected by a TPM to prevent damage to a product or to repair a product on which the TPM is installed. New paragraph 6.2 of table item 6 allows the circumvention of an access control TPM in these circumstances. [emphasis added] (Commonwealth of Australia 2006b, p. 15)

The government has made similar references to the exception since its introduction (such as part of a 2017 copyright regulations consultation paper and a 2012 review of TPM exceptions):

... access where a TPM damages a product, or where circumvention is necessary to repair a product. [emphasis added] (Department of Communications and the Arts 2017, p. 15)

In addition, the government removed the heading reference to ‘malfunctioning’ TPMs when the current Copyright Regulations 2017 were created, which may allow for a broader interpretation of the phrase ‘interferes with or damages’.

A lack of case law dealing with this particular exception adds to the interpretive uncertainty.

With respect to equivalent TPM circumvention prohibitions in the United States, the Librarian of Congress in 2018 issued a temporary three-year exemption permitting circumvention for a range of purposes, some of which involve repair.⁴⁸ As a result of such copyright law exceptions, the Federal Trade Commission considers that manufacturers' assertions of IP rights 'do not appear to present an insurmountable obstacle to repair' in the United States (2021, p. 26). Nevertheless, various repair advocates (including iFixit and the Electronic Frontier Foundation) have been pushing for a permanent exception 'to repair all software-enabled devices' protected by TPMs (Purdy 2021).

As discussed below, even if repairers are able to rely on the 'repair exception' to circumvent TPMs to some degree, their ability to do so may be limited by copyright law provisions that prevent the communication, distribution or provision of devices used to circumvent TPMs (section 116AO *Copyright Act 1968* (Cth)).

Manufacturers often justify controls over access to embedded data through TPMs on the basis that they are necessary to protect their financial investments in IP, such as by preventing the pirating of software (IGEA, sub. 103, p. 24). Public safety and security grounds are also cited as a reason (such as cybersecurity risks) (LG Electronics Australia, sub. 38, p. 5). For example, the Interactive Games and Entertainment Association highlighted the important role of TPMs with respect to developer IP:

TPMs underpin the entire video game ecosystem and the willingness of developers to invest the tens or hundreds of millions of dollars that it can take to innovate their products and to develop new games. With a secure hardware system in which to create and publish new games, developers, who are often small-to-medium-sized creative businesses, are more willing to make the financial investments necessary to support the development of new games. This in turn benefits the consumer who has a wider array of games and interactive experiences to enjoy. TPMs have allowed the games industry to move beyond packaged goods and to embrace new digital technologies and distribution models. (sub. 103, p. 23)

Efforts to implement a right to repair policy will, whether intended or not, also better arm these malicious actors and erode the ability of manufacturers to protect their products, the IP of game developers, and players themselves. (sub. 103, p. 11).

Some participants noted that the risks associated with providing greater access to embedded repair information are particularly pronounced for more complex products such as cars (Toyota Australia, sub. 118, p. 7).

⁴⁸ Exemptions included permitting circumvention to access computer programs contained in and controlling the function of 'motorised land vehicles' (such as personal and commercial vehicles and mechanised agricultural vehicles), smartphones or home appliance systems (such as refrigerators, thermostats, heating and air conditioning systems and electrical systems). Circumvention must: be necessary to allow for the diagnosis, maintenance or repair of the specified products, and not be for the purpose of gaining access to other copyrighted works (U.S. Copyright Office, Library of Congress 2018, pp. 54029–54030).

Access to repair tools and equipment

Modern (particularly tech-enabled) products now require repairers to have access to a diverse range of tools and equipment in order to conduct repairs. These can include:

- unique physical tools used to open up and replace or repair parts that are held together by similarly unique fastenings (for example, special screw heads or wrench heads)
- physical equipment used for issue diagnosis
- standalone software tools (such as programs and code) that are used to diagnose and repair issues (including software needed to recalibrate products and installed parts)
- equipment used to legally circumvent TPMs (known as circumvention devices), which may be in the form of insertable physical devices housing code, or standalone software that can be loaded onto a device.

These tools may be patent and design-protected, which would give rights holders the exclusive right to use, sell and otherwise exploit them. For example, a manufacturer who owns the patent or registered design for a particular repair tool can refuse to license the IP rights to manufacture and sell the tool, and pursue those who manufacture and sell generic tools without authorisation. As discussed above, manufacturers can also refuse to supply necessary tools to consumers and third-party repairers, though these refusals may occur regardless of whether the tools are IP-protected.

Manufacturers can also rely on copyright law provisions that prohibit the dissemination of tools used to unlock or bypass ‘digital locks’ (TPMs) to protect copyrighted embedded software and computer code. In this regard, there is a close link between repairers’ ability to access repair *information* and their ability to access repair *equipment*, namely:

- repairers may be unable to access repair information because they cannot bypass or circumvent TPMs (even where doing so is otherwise permitted under copyright law)
- copyright laws prevent persons (including repairers) from buying, selling or otherwise distributing devices used to circumvent TPMs (Copyright Act, section 116AO).

A large number of inquiry participants have raised concerns about manufacturers limiting supply of repair tools and equipment in Australia. These concerns most often relate to difficulties accessing diagnostic tools and software tools such as circumvention devices (for example, Canegrowers Herbert River, sub. 12, p. 1; Fusinato, sub. 6, p. 1; GPA, sub. 27, p. 6; May, sub. 129, p. 3; National Farmers Federation, sub. 55, p. 2), as well as software tools necessary to calibrate products and parts after repair or installation (for example, iFixit, sub. 107, p. 6; Marriott, sub. 16, p. 2; Osborne, sub. 7, p. 1; The Phone Spot, sub. 50, p. 1). Difficulties were also experienced in accessing specialised physical tools (for example, Vintage Time Australia, sub. 13, p. 1).

In the case of access to diagnostic and other software tools, copyright laws that prohibit repairers procuring TPM circumvention devices from other parties appear to be a potentially material barrier to repair. For example, one independent repairer of agricultural and

earthmoving equipment submitted that a lack of access to diagnostic equipment prevented him from providing a full range of repairs:

I am unable to provide farmers the full service they require because I cannot access the diagnostic equipment at a reasonable cost, so machinery with software errors needs to be repaired by authorised dealers. The only way I can repair a machine with electronic error codes is to use manual diagnostic processes which can be very time consuming and increases the costs to farmers for repairs. (Fusinato, sub. 6, p. 1)

In addition, iFixit submitted that an inability for independent repairers to access Apple diagnostic software means that Touch ID sensors on iPhones are not repairable by anyone outside Apple's retail stores (sub. 107, p. 12).

The inability of repairers to procure TPM circumvention devices may mean their only other option is develop a circumvention tool themselves from scratch. However, many repairers may not do this because they lack the technical computing knowledge and resources to develop circumvention devices. (A positive obligation on manufacturers to provide access to embedded repair information (chapter 4) would reduce the need for TPM circumvention devices in the product markets in which the obligation applies). However, such an obligation only currently applies in Australia with respect to motor vehicles, and excludes some types of information, such as computer program source codes, telemetry, and manufacturer trade secrets (Treasury 2020, p. 7).

In the case of accessing physical tools such as disassembly and assembly tools, there are arguably more workarounds to overcome IP-related barriers to repair. In contrast to intangible tools such as software or circumvention tools — which third-party repairers might not have access to even look at let alone recreate⁴⁹ — physical tools can often be reverse engineered (for example, repairers may be able to deduce the shape and form of tools required to unscrew or prise open a particular part by looking at the product). Some organisations such as iFixit develop and sell their own range of non-infringing tools (created via reverse engineering) to allow self- and third-party repairers to open and fix otherwise un-openable electronic products (Wiens 2018a).

Notably, some participants raised concerns about manufacturers using patented and design-protected parts that are hard to open or fix — for example, the use of adhesives, un-screwable screws and heat welding (Helstroom, sub. 30, p. 1; Zyllberberg and McDonnell, sub. 44, p. 1). These overlap with concerns about premature product obsolescence and might be better viewed through the lens of government measures to combat such behaviour, to the extent it is occurring (chapter 6).

Limitations on the scope to repair

Consumers and third-party repairers may be reluctant to undertake repairs where doing so could expose them to liability for any future product faults or for breaches of IP law.

⁴⁹ For example, Apple and Samsung diagnostic and service toolkits (Purdy 2019).

Examples where this might occur are terms and conditions in EULAs that prohibit repair-related activities, and where repair involves directly altering a product that is protected by certain IP rights (namely, patents and copyright).

End-user licence agreement terms and conditions

EULAs are contracts that set out the terms and conditions under which manufacturers provide users with access to their products, most often software (including software embedded in physical products). For example, smartphone buyers typically have to agree to the software developer's conditions for using the operating system before they can use the phone — although purchasers may own the physical phone, they are only accessing the software under licence. If a person fails to comply with EULA conditions, the licensor (usually the manufacturer) may terminate the licence and access to embedded software. Where the licensed software is an integral part of the product (for example, it controls the operating system), this may significantly reduce the physical product's functionality and may even render it useless — a phone is not able to function as a phone without the software that runs on it, and thus are 'bricked'.

Some inquiry participants have argued that manufacturers use EULAs to limit the scope of repairs that third-party repairers may undertake, by imposing restrictions on circumventing TPMs, disassembly and other post-sale usage, repair and modification restrictions on consumers. For example, one hobbyist noted that typical conditions in EULAs forbid software components being re-distributed or reverse engineered, which restricts consumers' ability to reuse and reverse engineer critical firmware components such as device drivers (McGrath, sub. 15, pp. 4, 10). Others stakeholders highlighted concerns that EULAs were used in certain industries to prohibit repairs by independent repairers:

It was recognised that within agriculture the sophisticated agricultural machinery comes with equally sophisticated and complex software contracts that not only restrict farmers' rights to repair their tractors but also forces them to use only authorised repairers. (Wiseman and Kariyawasam, sub. 105, p. 14)

Although it is possible to find examples of Australian EULAs that contain conditions similar to those described by participants (box 5.6), it is much more difficult to gauge how often manufacturers actually enforce these contract conditions and how this enforcement is impacting upon the costs and availability of repairs. For example, no repairer explicitly stated that they decided to not undertake repairs due to concerns about termination of licence.

Manufacturers justify EULA terms prohibiting product repair largely on competition and commercial grounds. For example, LG Electronics Australia argued that protecting commercially valuable company property through EULAs was a way to 'ensure competitiveness in the market' (sub. 38, p. 5). They further argued that such terms do not pose a significant barrier to repair in the home appliance and home electronics sector (sub. 38, p. 5). The Australian Information Industry Association noted that licence conditions 'prevent misuse, such as reverse engineering and manufacturing cloned or competing copies of the product', and are required to

protect the company's profitability, in the same way that movie and music theft is well-recognised as being similarly detrimental (sub. 127, p. 14).

Box 5.6 EULA terms often prohibit repair-related activities

Many end-user licence agreements (EULAs) for embedded software products include terms that may directly restrict users' ability to repair their products, such as prohibitions on disassembly, reverse engineering, and bypassing digital locks and encryption. This can occur *even where such actions may be permitted under law* (that is, these acts are not those over which copyright holders are granted exclusive rights, or there is an exception under the Copyright Act that applies). For example, the EULA for an electrical utility communication product states that:

Licensee may not cause, permit or suffer the Software to be reverse engineered, disassembled or decompiled ... (SystemCORP Energy Pty Ltd nd, p. 1)

Some EULAs explicitly acknowledge that there are some cases where uses of the copyright material are permitted by law (for example, via specific copyright law exceptions). For example, the EULA for an energy monitoring and distribution product states that:

You agree not to, and you will not permit others to: ... modify, make derivative works of, disassemble, reverse compile or reverse engineer any part of the Product Software (except to the extent applicable laws specifically prohibit such restriction for interoperability purposes ...) (carbonTRACK nd)

Licence termination is a common outcome for non-compliance with licence terms. For example:

carbonTRACK may terminate this EULA at any time if you breach any term(s) of this EULA. ... Upon termination of this EULA, the license granted hereunder will terminate and you must stop all use of the Product Software ... (carbonTRACK nd)

Overall, the extent to which EULAs limit repairers' willingness to undertake repairs is uncertain. In this context, the Commission is seeking further feedback on whether EULA terms are unnecessarily discouraging third-party repairs — in a similar vein to which manufacturer warranties may be discouraging independent repair through use of warranty 'void' clauses (chapter 4, information request 4.3).

Where concerns about EULAs relate to their complex, confusing or misleading nature (as suggested, for example, by Wiseman and Kariyawasam, sub. 105, pp. 13–15), the issue (and regulatory response(s)) are better thought of as a consumer law issue (for example, misleading and deceptive conduct) rather than an IP issue.

Copyright and patent law limitations on altering protected products

In some cases, repairing a product may involve more than just replacing a small cable or a battery, and instead requires replacing a large number of parts, or significant product parts such as a chassis. In other cases, repairs may require modifying, re-coding or completely replacing the faulty programs or code embedded in physical products.

Some legal experts noted that undertaking these types of repairs could breach IP rights and thus expose repairers to potentially significant penalties. In particular:

- if a repairer was to undertake wholesale repair of a product they could run the risk of infringing a manufacturer’s exclusive patent rights as to the manufacture (making) of their inventions (Grinvald and Tur-Sinai 2019, pp. 100–101; Svensson et al. 2018, p. 5). For example, repair of a particularly badly broken mobile phone may require more than just a screen replacement; it may also require replacing the battery, cabling, the camera unit and perhaps the frame of the phone itself, which, given the number and substantiality of parts, may constitute a ‘making’ of a new phone
- if a repairer was to perform modifications to faulty code in the course of repair they may infringe on the manufacturer’s copyright over the embedded computer programs (protected as ‘literary works’) — modifying faulty code is likely to be considered an unlawful copying of the program under copyright law (Law Council of Australia, sub. 114, p. 14).

If a repairer is found to have infringed IP rights in the course of repairing a product, the courts may impose an injunction, and require either damages or an account of profits be paid to the rights holder.⁵⁰ Uncertainty about what constitutes a breach of these IP rights and the associated penalties (along with the cost of litigating) could discourage self- and small independent repairers from undertaking repairs.

However, the potential limits that patent laws place on alteration of products does not appear to be a major concern for repairers in Australia. No inquiry participants specifically identified such laws as an impediment to repairs. Moreover, the recent High Court decision *Calidad v Seiko Epson Corporation*⁵¹ (box 5.7) clarifies to some extent the line between (permissible) repair and (impermissible) remanufacture (as well as dealing with the concept of patent exhaustion (box 5.10)), something noted by some inquiry participants as ‘recognis[ing] and facilitat[ing] the right to repair patented goods’ (Wiseman and Kariyawasam, sub. 105, p. 11). However, the effect of the *Calidad* decision on general repairability is still somewhat uncertain — future cases will serve to test the High Court’s reasoning and clarify the scope of the doctrine, particularly as it applies to different acts of repair.

Issues relating to an inability to undertake particular types of repair of copyright-protected products (including software) under the copyright regime appear to be, in theory, a material barrier to product repairs. The Law Council of Australia raised two main concerns.

- A lack of defences in the Copyright Act for the modification of copyrighted computer programs for repair — in particular, while a defence exists that permits the reproduction or adaptation of computer programs to correct errors, its operation is limited to ‘where a working copy is not available “within a reasonable time at an ordinary commercial price”’ (sub. 114, p. 14). Consequently, even where software repair is straightforward

⁵⁰ *Copyright Act 1968* (Cth), section 115; *Designs Act 2003* (Cth), section 75; *Patents Act 1900* (Cth), section 122; *Trade Marks Act 1995* (Cth), section 126.

⁵¹ [2020] HCA 41 (‘*Calidad*’).

(and possible) without the need for replacement, repairers must still first attempt replacement. This may be costlier than modifying (repairing) software code, and restricts consumer choice.

- The circumvention of TPMs for the purpose of repair is limited to repairing ‘machines or devices’ and does not allow for the circumvention of TPMs ‘in the context of repair of electronic files or software’ (sub. 114, p. 13).

Box 5.7 The ‘Calidad case’ clarifies issues around repair of patented products

Until the High Court of Australia’s 2020 decision in *Calidad v Seiko Epson* (‘*Calidad*’), there was little Australian jurisprudence as to what constitutes a permissible ‘repair’ of a patented product (as compared with an impermissible ‘remaking’ or ‘manufacture’). As such, the decision provides ‘much-needed certainty and clarity’ about Australian patent law and its relationship to rights of repair (Williams and Farago-Diener 2020, p. 147).

The dispute

Calidad operates in the aftermarket for printer consumables, and had imported and sold in Australia used, original printer cartridges first sold by Seiko Epson. These used cartridges had been restored to working condition by a third party (including through emptying and cleaning the cartridges, injecting new ink through a port drilled into the cartridge, reprogramming memory chips, and sometimes installing new memory chips and modifying circuit boards). Seiko Epson owned two Australian patents over the cartridges, and alleged that Calidad’s importation and sale of its used printer cartridges constituted patent infringement. The High Court was required to determine whether refilling and restoring the used Epson cartridges to working condition was a permissible repair or an impermissible making of a new patented article.

The decision

The High Court (in a 4-3 majority) found that once the modifications had been carried out, what remained were the original cartridges with some alterations that had enabled their reuse, and there was no replication of parts and features of the invention as claimed in the patents. Ultimately, the modifications were consistent with ‘the exercise of the rights of an owner to alter an article to improve its usefulness and enable its re-use’ (*Calidad Pty Ltd v Seiko Epson Corporation* [2020] HCA 41, [70]).

As a result, consumers can do what they like with patented products that have been purchased from the patentee, so long as a new product is not made in such a way as to infringe the patentee’s exclusive manufacturing rights. Some uncertainty remains as to where exactly the boundary lies, particularly in different factual circumstances (such as the dismantling for repair of a simple (non-complex) product. Future cases on the issue will serve to further clarify the *Calidad* decision.

Sources: *Calidad Pty Ltd v Seiko Epson Corporation* [2020] HCA 41; Williams and Farago-Diener (2020).

However, no submissions were received from repairers indicating that the above copyright laws specifically acted as a barrier to completing software repairs. It was noted by the Victorian Automotive Chamber of Commerce that for some products with embedded software (such as ‘low cost consumer goods’), ‘software updates are automatically performed over an internet connection (mobile phones, computers) or by downloading a

software patch directly from the manufacturer’s website (TV’s, printers) – installing it to the device, usually at no cost to the consumer’ (sub. 136, p. 8). This may reduce the need for repairers to repair some types of software faults themselves.

In addition, as noted above, manufacturers often argue that current protections provided by copyright law and TPMs are justified and appropriate. In relation to modifying embedded software in particular, John Deere submitted that:

Deere supports our customers’ right to maintain and repair their equipment, but not the right to modify embedded code in equipment, which raises safety, emissions and intellectual property infringement and misuse concerns. (sub. 84, attach. 1, p. 2)

Overall, the extent to which IP rights (particularly with respect to patent and copyright) discourage repairers or limit the scope of repairs that are undertaken in practice is uncertain.

DRAFT FINDING 5.1 INTELLECTUAL PROPERTY-RELATED BARRIERS TO REPAIR

In Australia, evidence on the extent to which intellectual property protections restrict repair is patchy and largely anecdotal. Notwithstanding this, copyright laws that prevent third-party repairers from accessing repair information (such as repair manuals and diagnostic data) appear to be one of the more significant intellectual property-related barriers to repair.

5.3 Is there a case for amending IP laws to facilitate repair?

As noted in section 5.2, copyright laws that prevent third-party repairers from accessing repair information appear to be one of the more significant IP-related barriers to repair. Amending these laws could improve access to repair information and help increase competition and consumer choice in repair markets. However, a range of other factors will influence whether such changes are likely to have net benefits to the community. Amending laws governing IP protections may have unintended impacts, such as increasing product safety risks associated with making sensitive information more readily available to the public. Any changes to Australian IP laws would also need to be consistent with Australia’s obligations relating to minimum standards of IP protection under international agreements.

The following section presents the Commission’s initial analysis of two broad options for reforming copyright laws to facilitate access to repair information. Based on current evidence, it is not possible to be certain whether these reforms will have net benefits. However, the options offer sufficient potential that they at least warrant further consideration, with the benefit of further stakeholder input.

If implemented, changes to copyright laws outlined in this section would not be a complete solution for addressing barriers to repair information. They would not necessarily provide third-party repairers with access to all the types of repair information they might need. Other information, such as program source codes, may be required in addition to diagnostic information and repair manuals and schematics. Further, they would not prevent manufacturers from using measures such as TPMs to protect digital repair information in the first place, and would not address instances where manufacturers are in sole possession of the desired information and refuse to release it.

A positive obligation on manufacturers to provide repair information and other inputs (as outlined in chapter 4) could potentially overcome some of the IP-related barriers to repair outlined in this chapter. For example, if a manufacturer is obliged to provide repairers with access to diagnostic information, there would be limited need to bypass TPMs to access this information. However, a positive obligation could involve substantial compliance costs on industry such that, if the government were to apply one, it might elect to target it to specific areas where there is the evidence of a competition problem. Hence, the Commission will consider the relative merits of the copyright reforms as part of broader package of measures, once it gathers further evidence for its final report.

Options for amending copyright law to increase access to repair information

There are two broad ways the government could amend copyright laws to help third-party repairers access repair information.

- Amend the Copyright Act so that repairers can legally access repair information hidden behind TPMs, such as digital locks.
- Amend the Copyright Act to allow repairers to reproduce and share copyright repair information (such as repair manuals and schematics) without the need to seek permission from the copyright holder under certain circumstances.

In considering whether or not to recommend these options, the Commission will weigh their benefits and costs, including against the option of making no amendments to copyright laws. The rest of this section considers the benefits, costs, risks and implementation issues associated with these options.

Amending copyright laws to allow repairers to legally access information hidden behind TPMs

One way that the government could increase third-party repairers' ability to access digital repair information (such as diagnostics and product data) would be to amend the Copyright Act to make it legal for repairers to distribute (and thus obtain from others) TPM circumvention devices. By being able to communicate, distribute or provide TPM circumvention devices to other repairers, repairers who lack the skills or resources to develop

their own circumvention devices would no longer be precluded from accessing important information necessary for repair (where circumvention is permitted by law).

As noted in section 5.2, the Copyright Act provision (section 116AO) that prohibits repairers from obtaining TPM circumvention devices appears inconsistent with the fact there is an exception⁵² under copyright law that seemingly permits repairers to circumvent TPMs to repair a ‘host product.’ However, as discussed above, there are ambiguities as to the intent and scope of this exception. Therefore, for any reforms to have their intended effect (to facilitate circumvention to access TPM-protected information for repair), it may also be necessary to clarify the intent and scope of the circumvention exception itself, to make clear that it applies to instances where repairers are circumventing TPMs to repair the host product. Permitting repairers to obtain TPM circumvention devices from others will have little effect if repairers cannot rely on the TPM circumvention exception to undertake the act of circumvention.

A potential risk of increasing the ease with which people can obtain circumvention tools is that it may increase the scope for people to use such devices for illegal activities. These could include unauthorised use and copying of protected software, including ‘hacking’ activities and misuse of the protected information (such as publishing sensitive commercial and personal information or using it for non-repair purposes). In assessing such risks, one issue is whether restrictions on the distribution of circumvention devices are a major barrier to malicious actors. For example, many sophisticated hackers may already have such circumvention devices or have the skills to develop them. In this case, relaxing the law might have limited risks. Conversely, removing the restrictions could increase the risks posed from less sophisticated or less well-resourced hackers, who were previously prevented from engaging in such activities but are now more easily able to source and access the required devices. However, the substantial penalties for unauthorised use of copyright material, circumventing TPMs, or communicating, distributing or otherwise providing TPM circumvention tools would provide some deterrent. Currently, standard penalties for such acts can be as high as a \$122 100 fine, five years imprisonment, or both (with the unauthorised conversion of a work from hard copy to digital form attracting a harsher fine of up to \$188 700, five years imprisonment, or both) (*Copyright Act 1968* (Cth); Commonwealth of Australia (2020)).

A further consideration is Australia’s international obligations with respect to copyright law. In particular, the existing provisions in the Copyright Act that restrict the communication, distribution and provision of TPM circumvention devices were enacted to reflect, and make legally binding, Australia’s obligations under article 17.4.7 of the Australia-United States Free Trade Agreement (AUSFTA) (Commonwealth of Australia 2006a). To the extent that any changes to Australian TPM circumvention tool provisions to achieve the above objectives could not comply with Australia’s international obligations (particularly under the AUSFTA), amending the AUSFTA would be required. Amending the AUSFTA is possible but requires written agreement by both parties (AUSFTA, article 23.3). Negotiating an amendment to article 17.4.7 may be costly (including time and resource costs), and may not be successful. Although the United States has recently enacted temporary amendments

⁵² Section 116AN(9) Copyright Act in conjunction with regulation 40(2)(d)(ii) Copyright Regulations 2017.

to its domestic TPM provisions to allow for repair-related circumvention (discussed above), it has retained the prohibition on communicating, distributing or providing TPM circumvention tools, consistent with the AUSFTA (U.S. Copyright Office, Library of Congress 2018, p. 54011).

Amending copyright laws to allow repairers to reproduce and share repair information

Amending the Copyright Act to allow repairers to share copyrighted repair information with other repairers (without needing to seek permission from the copyright holder) would improve access to this information. This may in turn increase repairers' ability to safely and efficiently perform product repairs, thereby reducing any costs associated with third-party repair (such as product teardowns, reverse engineering, search costs, and repair delays).

As noted above, the benefits of these reforms largely rely on the information existing generally in the public domain in the first place or manufacturers being willing to provide the information to some unconditionally. If manufacturers are in sole possession of the information and refuse to release it to anyone in the first place, this reform will likely have limited effect.

Two options to permit the reproduction and sharing of repair information

The Australian Government could amend copyright laws (through the introduction of an exception) to allow the reproduction and sharing of repair manuals — acts that would otherwise breach copyright holders' exclusive rights — to be non-infringing under certain circumstances (including where use is considered 'fair').

There are two broad ways in which the government could do this, with different advantages and disadvantages:

- introducing a **general copyright exception** that may cover the reproduction and sharing information for the purpose of repair (a broad fair use exception in the Copyright Act)
- introducing a **specific copyright exception** for the reproduction and sharing of information for the purpose of repair (a new fair dealing exception in Copyright Act).

Fair use versus fair dealing

A **general** 'fair use' exception under Australian copyright law has been raised as a potential means by which repair-related uses of copyright material could be permitted (Law Council of Australia, sub. 114, p. 14; Rimmer 2019, p. 12). The Commission has also previously recommended that Australia introduce a fair use exception into the Copyright Act (2016a, p. 33, recommendation 6.1). The proposed model included four 'fairness factors' drawn

from a proposal from the Australian Law Reform Commission (which was based on United States fair use factors), where ‘fair’ depends on:

- the purpose and character of the use
- the nature of the copyright material
- the effect of the use upon the potential market for, or value of, the copyright material
- the amount and substantiality of the part used (PC 2016a, pp. 186–187).

The broad nature of these ‘fairness factors’ reflects the intent of a broad ‘use’ exception — the exception is meant to be ‘flexible and technology-neutral’, applicable to any potential use of copyright material, including with respect to currently non-existent or unforeseen uses and contexts (ALRC 2013, p. 95).

A **specific** ‘fair dealing’ copyright exception for repair-related uses of copyright material would also act to make otherwise infringing uses of copyright material (such as the reproduction and sharing of repair manuals without permission from the copyright owner) non-infringing. The Australian copyright regime currently provides for a range of specific exceptions — ‘fair dealing exceptions’ — which allow for the use of copyright material without permission from the copyright owner, so long as the use falls within one of the defined categories (for example: research or study; criticism or review; parody or satire; and reporting news) and is considered ‘fair’ (applying criteria set out in the legislation).

The option of creating a new fair dealing category (and thus exception) to cover repair-related uses has been raised in other recent contexts, namely by stakeholders to the Treasury’s Motor vehicle service and repair information sharing scheme (Rimmer 2019, p. 12). This new category could be complemented by specific ‘fairness factors’ to be considered only in the context of the repair category, to the extent that the existing guiding ‘fairness factors’ established through case law and set out in some fair dealing categories are inadequate in accounting for the unique characteristics of repair information.⁵³ For example, in comparison to copyright material used for purposes such as research and study:

- an entire repair manual is often necessary to undertake repairs (in contrast to the 10 per cent or single chapter taken to be a permitted fair dealing for materials such as books for research and study (Copyright Act, s. 40(5))⁵⁴
- the use of repair-related information is more likely to be commercial in nature (such as in the course of third-party repairs), or at least not for sole personal use (such as for use at repair cafes and to teach repair techniques)

⁵³ The ‘fairness factors’ set out in the legislation (as part of the fair dealing exceptions for the purposes of research and study, and access by persons with a disability) are an inclusive set of principles to assist in determining whether in the circumstances, the use of copyright material is ‘fair’, derived from case law (and not limited to a specific purpose) (ALRC 2013, p. 126). As such, while only some fair dealing exceptions explicitly set out the ‘fairness factors’ to be applied, the principles are in practice applied by the courts across the fair dealing categories, and would be equally applied to a new fair dealing exception for repair.

⁵⁴ While section 40(5) deems 10 per cent or a single chapter of a work to be fair dealing for the purpose of research or study, this does not preclude the court finding an amount greater than this to be fair dealing.

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- the repair information *itself* may have limited commercial value for manufacturers, but in the right hands, it has the potential to unlock product repair markets, which are of significant commercial value for manufacturers (in contrast to books, that are *themselves* the commercially significant product for authors).

A potential drawback of a ‘broad’ general exception for the purpose of providing repairers with greater access to repair information is some degree of uncertainty about what types of repair-related ‘uses’ of copyright information would fall under the broad definition of ‘fair’ (if any). The broad nature of the ‘fairness factors’, coupled with limited international jurisprudence on the application of fair use to repair contexts (box 5.8), means that there would be a high degree of discretion in how Australian courts interpreted whether repair-related uses of copyright material are considered ‘fair’, and would vary depending on the facts of individual cases. Such uncertainty as to Australia’s position regarding fair use and repair may result in repairers avoiding undertaking repair activities that risk infringing manufacturers’ copyright.

In contrast to fair use, a new fair dealing exception category specifically for repair would provide greater scope for government to clarify the particular circumstances under which third parties may (or may not) use and share copyright information without the permission of the copyright owner, and any specific considerations to be taken into account when considering ‘fairness’. In particular, the fair dealing exception for repair could reduce the risk of repair-related uses of copyright material not falling within existing ‘fairness factors’ provided by law, by better accommodating repair-specific product and market characteristics, and thresholds of ‘fairness’.

The trade-off of limiting the scope of an exception to only repair-related uses is that the law’s ability to adapt and evolve over time is restricted — an issue that does not arise with a broad principles-based fair use exception. This can mean that the law may not extend to uses that government may not have anticipated at the time of drafting, but nevertheless have an overall social benefit, including as a result of technological development and change. More broadly, it would also add to the complexity and accessibility of copyright legislation.

One potential barrier to realising the benefits of copyright exceptions generally is if manufacturers can use other means (such as contractual agreements including confidentiality agreements or EULAs) to prevent access to repair information in the first place, particularly where such mechanisms are not easily regulated by governments. Where the risks of such behaviour are high (and could be used to defeat the clear intent of such a provision), it may be beneficial to include in the exception (or Copyright Act generally) a prohibition on the use of contractual agreements to ‘override’ exceptions. Such a ‘contracting out’ provision — that deems to have no effect on any agreement, or provision of an agreement, that excludes or limits (or has the effect of excluding or limiting) the operation of certain copyright law provisions — is already available in the Copyright Act (s. 47H), albeit only with respect to certain exceptions relating to computer programs.

Box 5.8 Fair use and repair information in the United States

There have been a small number of repair-related fair use cases brought to the courts in the United States. The United States has a fair use exception, which permits the ‘unlicensed use of copyright-protected works in certain circumstances’ set out in the legislation (U.S. Copyright Office 2020). The outcome of each case was decided in its unique factual circumstances, applying the relevant legislative ‘fairness’ criteria, and as such, no overarching principle about fair use and repair can be deduced from analysing these cases. However, these cases do provide useful context as to what uses of repair information may or may not be likely to be considered fair use, and may provide some guidance in future Australian contexts.

The use of aircraft maintenance manuals (provided by customers who legally obtained them from the manufacturer) by a company to provide aircraft maintenance tracking services was held, on balance, to be ‘fair’ in *Gulfstream Aerospace v Camp Systems International*. The use of the manuals was found to be ‘non-transformative’ (used in the way originally intended, with no new additions or further uses (U.S. Copyright Office 2020)), commercial (subscription fees were charged for services that utilised the manuals), part of the company’s core business, and involved a significant amount of the manuals. However, the manuals were used only to benefit the customer who provided the manual (and not distributed to other manual purchasers such as repair shops), and the manufacturer specifically licensed the manual purchaser to use it for the purpose of maintenance and repair. In addition, the use of the manuals did not affect the manufacturer’s market for the creation or sale of the manuals itself — the fact that it could affect the market for the manufacturer’s own maintenance tracking service was held to be irrelevant.

The use of a copyright automobile emission manual to produce a similar (but not identical) chart was also found to be fair use (*Sinai v Bureau of Automotive Repair*). Factors that leaned towards fair use included that: the information was used for a public purpose (dissemination to Bureau offices to assist in compliance checks); was primarily factual in nature; the replica chart was not ‘substantially similar’ to the original; and there was only a slight effect on the market for manuals (free-of-charge distribution, to a limited set of recipients).

However, an individual’s copying for sale of a copyright video instructing viewers how to modify and enhance the performance of cars was found not to be fair use (*Calibrated Success Inc v Charters*) — there was an intention for financial gain (illegally downloading the video from a torrent website and selling copies for up to \$50 each); the use was not ‘transformative’; the entirety of the work was used; and the market for the manual would be ‘obliterated’ if others could engage in the same conduct (manuals would be able to be purchased for a fraction of the original price).

Sources: Calibrated Success, Inc. v Charters 72 F.Supp.3d 763 (E.D. Mich. 2014); *Gulfstream Aerospace v Camp Systems International, Inc.* 428 F.Supp.2d 1369 (S.D. Ga. 2006); *Sinai v Bureau of Automotive Repair* 25 U.S.P.Q.2d 1809.

Under either a fair use or fair dealing approach, there would be some implementation risk relating to Australia’s international IP obligations and trade agreements. In particular, any reforms seeking to make exception to copyright holders’ exclusive rights (such as rights to reproduce, disseminate, and communicate their works) — including fair use and fair dealing — would need to comply with a ‘three-step test’ under international law (box 5.9). If the reforms were seen to be inconsistent with the three-step test, other countries or entities could choose to formally oppose them, thus opening up dispute resolution processes under the respective agreements, that may require any non-complying reforms be removed or nullified. Other penalties (such as financial penalties) may also be imposed.

Box 5.9 **The ‘three-step test’**

Any exceptions to copyright owners’ exclusive rights proposed by the Australian Government must satisfy the ‘three-step test’ under international law. The test is considered to be the ‘international standard for assessing the permissibility of copyright exceptions generally’, originating as Article 9(2) of the Berne Convention in its 1967 revision. It was later incorporated into the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the World Intellectual Property Organization (WIPO) Copyright Treaty (WCT). The Australia-United States Free Trade Agreement (AUSFTA) also requires Australia to comply with the test for exceptions to all exclusive rights of the copyright owner.

The test consists of three cumulative steps (or conditions) — any limitations or exceptions to exclusive copyright rights must be confined to:

- (a) certain special cases
- (b) which do not conflict with a normal exploitation of the copyright material
- (c) do not unreasonably prejudice the legitimate interests of the rights holder.

Source: ALRC (2013, pp. 116–117).

The Australian Law Reform Commission (ALRC 2013, p. 117) has previously noted that the precise meaning of each step of the three-step test lacks certainty. As such, it is difficult to determine whether any of the potential reform options discussed above would likely to satisfy the test if challenged — any finding would be highly dependent on the framing and precise wording of any legislative amendments. That said, it is arguable that countries that already have copyright exceptions in place (such as fair use in the United States) would be unlikely to challenge similar reforms in Australia insofar as they would be undermining the validity of their own arrangements (in terms of compliance with the three-step test).

The Law Council of Australia raised concerns about potential problems that may arise if new copyright exceptions are enacted for the purpose of repair (such as fair use or fair dealing) before there is greater clarity about whether a doctrine of exhaustion (discussed below) applies to copyright, noting that such exceptions are ‘likely to create overlapping or conflicting rights’ (sub. 114, p. 12).

On balance, both of the above amendments to Australian copyright laws could help promote competitive repair services by increasing third-party repairers’ access to information required to undertake repairs, and warrant closer consideration. The Commission is therefore seeking further information on the likely benefits, costs, risks and implementation issues associated with these (and any other) IP reform options before making a decision for the final report.

DRAFT FINDING 5.2 OPTIONS TO IMPROVE ACCESS TO REPAIR INFORMATION

There are two main options to amend intellectual property protections to improve access to repair information.

- Amend the *Copyright Act 1968* to allow for the reproduction and sharing of repair information, through the introduction of a *fair use* exception or a repair-specific *fair dealing* exception.
- Amend the *Copyright Act 1968* to allow repairers to legally procure tools required to access repair information protected by technological protection measures (TPMs), such as digital locks. This may also require the Australian Government to clarify the scope and intent of the existing (related) exception for circumventing TPMs for the purpose of repair.

To reduce the risk of manufacturers using contractual arrangements (such as confidentiality agreements) to ‘override’ the operation of any such reforms, it may also be beneficial to amend the *Copyright Act 1968* to prohibit the use of contract terms that restrict repair-related activities otherwise permitted under copyright law.

INFORMATION REQUEST 5.1 IMPROVING ACCESS TO REPAIR INFORMATION

The Commission is considering recommending amendments to intellectual property laws to improve access to repair information through the options outlined in draft finding 5.2. It is seeking views on each option, in particular:

- *whether the proposed reform options will assist repairers in accessing repair information, and therefore facilitate third-party repair*
- *what types of contractual arrangements that could override such reforms are most likely to be of concern*
- *the costs, benefits and risks of pursuing each option.*

Expanding the exhaustion doctrine to copyright

One suggested alternative to the above options is the adoption of the ‘exhaustion doctrine’ to copyright law. In its submission, the Law Council of Australia (sub. 114, pp. 11–12) noted that the doctrine of exhaustion was held by the High Court of Australia (in the recent *Calidad* case) to apply to patentees’ rights in Australia (box 5.10), and argued that the court’s reasoning ‘may also support the application of the doctrine in the context of other forms of IP’ including copyrighted works in order to ‘facilitate repair in the context of copyright protection’ and bring Australia in line with US and EU jurisprudence (box 5.11).

Box 5.10 The exhaustion doctrine

Originating in patent law, the exhaustion doctrine states that the patentee's exclusive rights cease upon first sale of a product embodying the invention (except the right to prevent others from 'making' such products), unless the patentee expressly imposes contractual conditions to the contrary (Pereira and Cooper 2020). As a result, purchasers can do what they like with their purchased product, so long as a new product is not *made* in such a way that infringes the patentee's exclusive rights (Williams and Farago-Diener 2020, p. 159).

Broadly, the doctrine is founded upon a need to balance intellectual property owners' exclusive rights with the public interest in allowing the free movement of goods. Patent law seeks to encourage innovation by granting a limited monopoly to inventors to allow them to obtain a 'reward' (the ability to exploit (sell) their inventions at monopoly prices) for bringing the product to the market. Patentees should only be able to obtain the 'reward' once for each product sold, and so once the product is sold by the patentee (at the monopoly price), they have reaped the 'reward' promised to them, and 'the exhaustion doctrine leaves no patent rights to be enforced' (*Calidad Pty Ltd v Seiko Epson Corporation* [2020] HCA 41, [73] ('*Calidad*')). Patentees' rights to make and sell another product embodying the patented invention remain.

In late 2020, the High Court in *Calidad* held that the exhaustion doctrine applied in Australia with respect to patented products, displacing the longstanding 'implied licence' doctrine. The exhaustion doctrine was preferred due to its logic, simplicity and coherence with legal principle, consistency with fundamental property rights, and consistency with US and EU jurisprudence (where exhaustion is well-established).

Box 5.11 Copyright exhaustion already exists overseas

The principle that exclusive intellectual property rights are exhausted at the sale of a product is not confined to patent law. In some jurisdictions, exhaustion also applies to copyright. The so-called 'first sale' doctrine in copyright law was first applied by US courts over 100 years ago, to limit copyright holders' right to control downstream (retail) distribution and sale of books (Prutzman and Stenshoel 2013, p. 9). The doctrine has since been codified into US copyright law.

The doctrine allows a person who knowingly purchases (and now owns) a copy of a copyrighted work from the copyright holder to sell, display, lend or give away the particular copy, without the permission of the copyright holder (Reis 2015, p. 173; The United States Department of Justice Archives 2020). As such, the copyright holder's exclusive rights under copyright law to distribute the work ends once the particular copy is sold. Copyright owners' exclusive rights to reproduce and communicate their works are not restricted as a result of the first sale doctrine.

In theory, an exhaustion doctrine in copyright law may allow for consumers or repairers who purchase repair information such as manuals from manufacturers to share them with other repairers (and as such would be an alternative to introducing a copyright exception for repair to some degree). However, it has several drawbacks relative to an exception as described above.

First, it may not allow for as much freedom to share repair information as an exception. For example, a number of stakeholders in the course of consultations noted that given that the doctrine relies on the legal sale of a product from the copyright owner (where property rights are transferred, as opposed to the sale of a licence to use a product), the exhaustion doctrine is unlikely to apply to embedded software and other repair inputs that are supplied on a *licence* basis — contractual agreements (such as EULAs) often specify restrictions on use and transfers of ownership. In addition, under the Copyright Act, the exclusive rights of copyright owners include rights to the reproduction, distribution and communication of copyright works. The exhaustion doctrine (particularly as it applies in the United States) only allows for unauthorised distribution of copyright materials after purchase (Prutzman and Stenshoel 2013, pp. 2–3) and does not affect copyright holders’ reproduction and communication rights, which may limit the effectiveness of the doctrine in improving access to repair information — repairers may be able to share repair manuals that they have purchased from manufacturers, but they would not be permitted to make copies of the manuals to share.

Second, it is unclear if and when the doctrine would be found to apply in Australia. The exhaustion doctrine is a common law (non-statutory) doctrine, and as such is law made by the courts and not government through legislation. For such a doctrine to be adopted into Australian law, the courts must endorse it through cases brought before them (as was the case with patent exhaustion in *Calidad*). If the government adopted a wait and see approach, there is no guarantee that such a case would ever be brought, or that the courts would even adopt the exhaustion principle via those cases. To get around such concerns, the government could pre-emptively legislate the doctrine into copyright law. However, the Commission is unaware of any precedents of such an approach and hence the potential legal issues and other implementation costs that might arise.

Given the various limitations and risks, pursuing a doctrine of exhaustion in copyright law at this time is not a preferred option. An explicit legislated copyright exception (either fair use or fair dealing) (discussed above) is more likely to effectively address issues regarding access to repair information.

6 Product design and obsolescence

Key points

- There is growing concern in Australia and overseas that the lifespans of everyday products are becoming unnecessarily short (premature obsolescence) with detrimental impacts on consumers and the environment.
 - Some groups claim that manufacturers are intentionally shortening the lifespan of products, such as consumer electronics and white goods, to force consumers to purchase new products (planned obsolescence).
- Various arguments have been made for governments and regulators to step in and prevent premature obsolescence, including through product standards, labelling and expanded consumer protection laws. These include to:
 - protect consumers from unfair or misleading conduct
 - overcome information asymmetries regarding product qualities, such as durability and repairability, that prevent consumers from making informed purchase decisions
 - reduce the external environmental impacts associated with short-lived products.
- Evidence on whether premature obsolescence is a significant problem in Australia is mixed.
 - It is not possible to rule out that some manufacturers engage in strategies to intentionally reduce product lifespans, but there is no evidence that such practices are widespread. Further, Australian consumer and competition laws contain provisions that provide some protection against such behaviour (such as prohibitions on misleading conduct).
 - Although there is evidence that the lifespans of some products are becoming shorter, this is often driven by consumers choosing to replace their products with newer ones rather than the products breaking. There is also evidence that some products are becoming more reliable or durable.
 - In many cases, consumers' decisions to 'prematurely' dispose of their products, or to opt for shorter-lived or less repairable products, reflect personal preferences, rather than information gaps on product durability or repairability at the time of purchase. And for some types of products, such as smart phones, there is publicly-available information on product qualities such as durability or repairability if consumers are sufficiently motivated to seek it out.
 - Studies used to support policies that reduce environmental impacts by extending product lifespans (such as mandatory durability standards) often omit or do not fully consider other important impacts that matter to the community (such as the effect of new policy measures on business costs and product prices).
- On balance, additional policies to prevent premature product obsolescence (in the form of product standards or expanded consumer protection laws to address planned obsolescence) would be unlikely to have net benefits to the community. Information request 6.1 seeks further evidence to help clarify the potential net benefits of a product labelling scheme in Australia.

There is growing concern in Australia and overseas that the lifespans of everyday products are becoming unnecessarily short (premature obsolescence). Some groups claim that manufacturers are intentionally shortening the lifespan for products, such as consumer electronics and white goods, to encourage consumers to purchase new products (planned obsolescence).

This chapter considers whether premature product obsolescence (either intentional or unintentional) is a significant problem in Australia and what, if anything, the government should do about it.

6.1 Obsolescence: key definitions and concepts

Obsolescence describes the process of something becoming obsolete and no longer used. For example, businesses have gradually abandoned dot matrix printers because they are noisy, and their staff and clients expect higher quality printed work. Technological developments have made this possible. Obsolescence encompasses instances where consumers no longer use a product because it is broken beyond repair (such as an old kettle that has become dangerous to use) as well as instances where consumers decide to replace a product that still functions (such as an old pair of jeans).

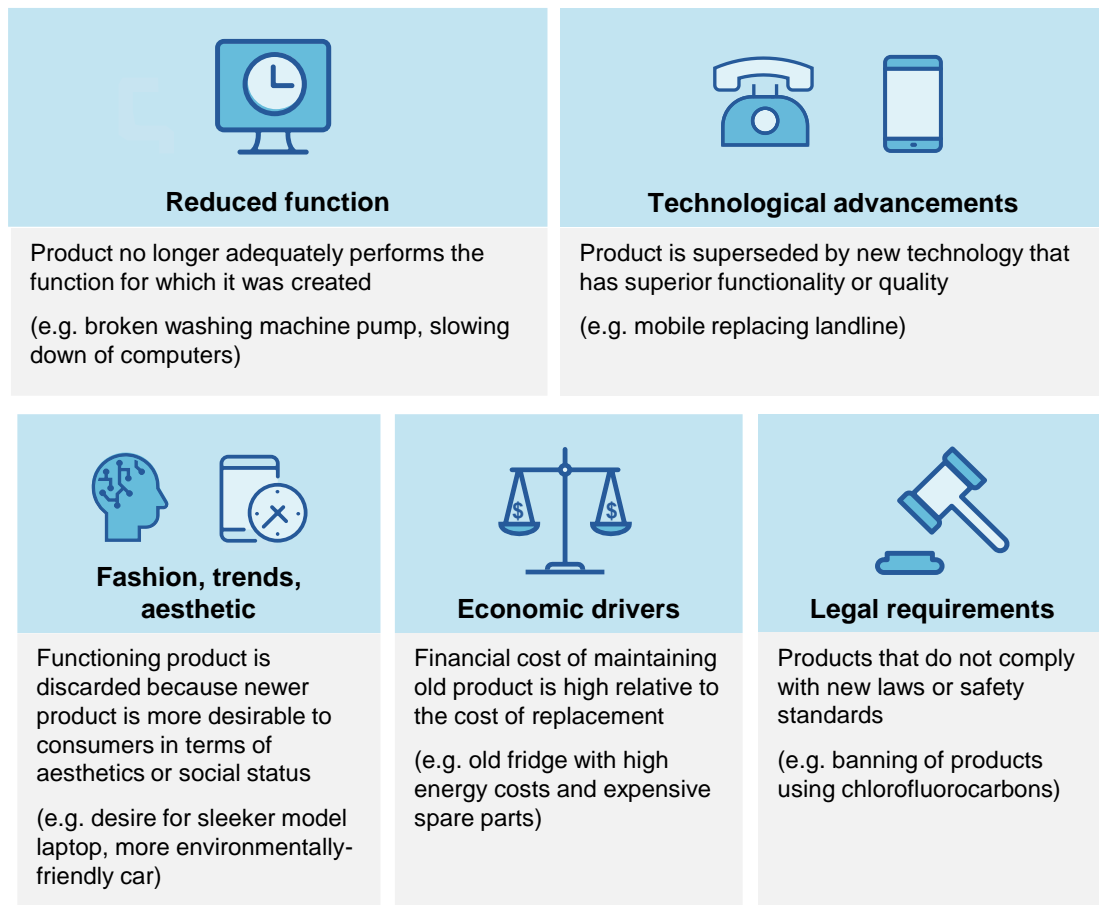
A variety of factors may contribute to product obsolescence. These include the changes in product function, technology, fashion, regulatory standards, and the relative cost of maintenance and repair (figure 6.1). Often a user's decision to replace a product will be due to a combination of factors. For example, a consumer might replace their smart phone because of a weak battery or a broken screen, especially if a newer version is available.

Planned obsolescence

The term planned obsolescence dates back at least 90 years, when American real estate agent Bernard London proposed ending the Great Depression through policies such as offering tax rebates to consumers for turning in obsolete merchandise (London 1932, pp. 2–3). In 1954, American industrial designer Brooks Stevens famously defined planned obsolescence as 'instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary' (Stevens, quoted in Valant 2016, p. 3).

Today, planned obsolescence has taken on negative connotations. Prakash et al. observed that popular media often use planned obsolescence to refer to the intentional shortening of product life by manufacturers, with the aim of forcing consumers to purchase new products (2020, p. 61). This view of planned obsolescence is based on the premise that the product as a whole had not reached the end of its technical lifespan, and that consumers would have preferred to continue using their product for longer.

Figure 6.1 **Mind, matter, money: factors contributing to obsolescence**



Prakash et al. (2020, pp. 273–274) and others (for example, Ai Group, sub. 32, p. 10) have noted that the pejorative use of ‘planned obsolescence’ is problematic given designing products that are tailored to consumers’ needs is also ‘planned’. Further, obsolescence is not as one-dimensional as some of the media portrayal of manufacturers as ‘perpetrators’ who manipulate the design of their products and consumers as defenceless ‘victims’ of a conspiracy (Prakash et al. 2020, p. 273). Product obsolescence can indicate that consumers are replacing older ‘obsolete’ products with products that better meet their needs.

Although an agreed definition of planned obsolescence remains elusive, claimed planned obsolescence strategies commonly include:

- designing products with structural weak points so they fail after limited use (for example, designing fans with poor quality metal components (Hamilton, sub. 57, p. 3))
- designing products in a way that prevents repair or upgrade (for example, using glue instead of screws, or soldering components together to construct a device, can make it more difficult to disassemble for repair (iFixit, sub. 107, p. 9))

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- limiting access to spare parts or repair services (chapter 4 examines concerns about manufacturers restricting access to spare parts and potential responses in detail)
 - limiting compatibility across products (such as changing charger ports on successive models of a product (Mama Minimalist 2019))
 - restricting the refurbishment and resale of secondhand devices (for example, forcing recyclers to shred old phones rather than refurbish them (Koebler 2017a))⁵⁵
 - software that reduces a product's performance (for example, software updates that slow down older model smart phones (Australian Democrats, sub. 100, part 1, p. 18))
 - marketing strategies that encourage consumers to replace functioning products with new models to remain fashionable (Valant 2016, p. 1) (figure 6.2).

Notably, these strategies include actions put in place before a product is released (for example, during the design phase) and after (for example, limiting access to spare parts or updating the software embedded within a product).

Premature obsolescence

While claims of 'planned obsolescence' often grab the media's attention, many experts on the topic often emphasise the need to address all forms of 'premature obsolescence'. They generally use 'premature' to connote that a product's lifespan is shorter than necessary, reasonable, or optimal (either due to an intentional strategy by the manufacturer, as in the case of planned obsolescence, or for some other reason). Some definitions of premature obsolescence focus on the consumer side, while others focus on the producer side. For example, van den Berge and Thysen defined premature obsolescence as the disposal of a product that is 'physically still functioning, or in need of (minor) repair' (2020, p. 5). In contrast, Malinauskaite and Erdem suggested premature obsolescence also occurs where a product has 'a shorter physical life than the industry is capable of producing under existing technological and cost conditions' (2021, p. 6).

Governments in several other countries, particularly in Europe, have adopted policies aimed at addressing premature obsolescence. In several cases they have commissioned reports that show the potential benefits to consumers and the environment from longer-lived products.

To better understand whether premature obsolescence is a problem in Australia and what, if anything, the government should do about it, the following sections consider the issue from a community-wide perspective, using economic principles. Section 6.2 examines the common market failure arguments for government intervention. Section 6.3 considers evidence on whether premature obsolescence is a problem in Australia. Section 6.4 assesses suggested reforms to prevent premature obsolescence, such as product standards, labelling and legal penalties.

⁵⁵ Chapter 7 discusses barriers to reuse of electronic and electrical products and changes to product stewardship schemes to promote reuse.

Figure 6.2 Examples of claimed planned obsolescence



Sources: Albergotti (2020); Australian Democrats, sub. 100, part 1, pp. 7, 12, 18, 35-36; Brunswick Tool Library, sub. 77, p. 2; Free Software Melbourne, sub. 43, p. 3; Hamilton, sub. 57, pp. 2–3; iFixit, sub. 107, p. 9; Janday, sub. 37, p. 1; Koebler (2017a, 2018a); Leighton, sub. 82, p. 2; Lewis-Fitzgerald, sub. 75, p. 3; Osborne, sub. 7, p. 1; Porter (2015); Stein and Crosby, sub. 51, pp. 3–4; Storer, sub. 140, p. 1.

6.2 Arguments for government intervention to address premature product obsolescence

Various ‘market failure’ arguments have been made for governments and regulators to step in and prevent premature obsolescence, including through product standards, labelling and expanded consumer protection laws. These fall into the broad themes of consumer protection and environmental protection.

Consumer protection

It can be frustrating for consumers when their product breaks or malfunctions sooner than expected. Replacing or having to repair an essential item, or simply getting a refund, can involve personal financial costs, time, and inconvenience. Submissions to this inquiry and previous studies have suggested these issues can be brought about by market failures relating to manufacturers engaging in unfair or misleading conduct (as part of planned obsolescence strategies), and information asymmetries between manufacturers and consumers.

Unfair or misleading conduct by manufacturers

A common argument made for government intervention to address planned obsolescence is that such strategies often constitute unfair or misleading conduct. There are two notable international precedents in this regard.

- Under the European Union Unfair Commercial Practices Directive (UCPD) and associated guidelines, planned obsolescence is defined as a commercial policy involving deliberately planning or designing a product with a limited useful life so that it will become obsolete or non-functional after a certain period of time. From the UCPD point of view, planned obsolescence is not unfair per se. However, under Article 7, a trader who fails to inform consumers that a product has been designed with a limited lifetime might, according to the specific circumstances of the individual case, be considered to have omitted to provide material information (EC 2016a, p. 81).
- In France, the government has made planned obsolescence a criminal offence, defined as ‘as a group of techniques through which a manufacturer or a marketer seeks to deliberately reduce the lifecycle of a product in order to increase its replacement rate’. Planned obsolescence is punishable with a two-year imprisonment sentence and a €300 000 fine (HOP 2021). However, it can be difficult to prove that a company has intentionally reduced the life of a product (section 6.3).

There is a clear role for government in prohibiting planned obsolescence strategies that involve misleading consumers about important aspects of product durability, repairability or support. Misleading conduct can cause significant consumer harm. With respect to software updates, for example, the Australian Competition and Consumer Commission (ACCC) noted ‘if manufacturers do not disclose their anticipated lifespan of a product, consumers cannot

meaningfully assess the value of two competing products prior to purchase’ (sub. 106, p. 5). It can also weaken competition by making it easier for bad or poorly performing businesses to survive, and make consumers less willing to deal with unfamiliar suppliers (PC 2008, p. 12). In practice, however, there are likely to be some grey areas with respect to whether a manufacturer failing to disclose certain product information is in fact misleading and causing consumer harm. For example, the court may need to determine what would have been reasonable based on the specific circumstances of the case.

The ACCC also argued that there may be a case for government to protect consumers from planned obsolescence strategies where customers are unable to switch to another competitor (sub. 106, pp. 4–5). For example, they noted some consumers may be locked into a manufacturer’s technology ‘ecosystem’ such that they are vulnerable to strategies that reduce the life of products, access to repairs, or support services. This is consistent with economic literature that suggests manufacturers of durable products *may* have a financial incentive to reduce product life when they have considerable market power — as customers will return to them for a replacement product (Bulow 1986, p. 747; Orbach 2004, pp. 94, 112–113) (box 6.1). In contrast, manufacturers are far less likely to engage in such strategies when there is healthy competition, as customers will simply buy a competing product that better meets their needs (Malinauskaite and Erdem 2021, p. 17).

Box 6.1 Incentives to engage in planned obsolescence depend on the level of competition

Economists examining planned obsolescence often highlight the importance of the intensity of competition in affecting incentives to engage in planned obsolescence. In particular, several papers have shown how a monopolist, and in some cases oligopolists (generally through collusion), of durable products may have an incentive to engage in planned obsolescence to overcome what is known as the ‘Duopolist Puzzle’ (Bulow 1986, p. 730; Malinauskaite and Erdem 2021, p. 17; Orbach 2004, p. 113).

The Duopolist Puzzle describes when producers of durable products are unable to engage in monopoly pricing due to their inability to commit to keep prices low in future periods. This is because after selling the durable good at the monopoly price to high-value customers, the market will become exhausted (because the goods are long-lasting). Therefore, the monopolist has an incentive to lower the price of the good to attract lower-value customers into the market (Orbach 2004, p. 72). Consumers will anticipate this pricing strategy, and will hold off their purchases until prices are close to the competitive level (Orbach 2004, pp. 72–73).

Orbach (2004, pp. 74–75, 90–111) noted that strategies to overcome the Duopolist Puzzle may include designing products with lower durability, introducing annual style changes that convince consumers to replace their old product, tying arrangements, and ‘crippling’ secondhand and aftermarkets.

In contrast, under competitive market conditions, employing planned obsolescence would harm businesses (Malinauskaite and Erdem 2021, p. 17). For example, deliberately reducing a product’s durability and quality in a competitive environment would result in a loss of customers to competitors and lower long-term profits.

Unlike other jurisdictions, Australia’s consumer and competition laws do not have a general prohibition for unfair conduct⁵⁶ or planned obsolescence⁵⁷. However, they do contain provisions that provide some protection against planned obsolescence, namely:

- prohibitions against unconscionable conduct (which may include consideration of the extent to which the parties acted in good faith) (ACCC 2021i)
- false or misleading representations (including statements likely to create a false impression) (ACCC 2021e)
- refusal to supply products or services when the supplier is acting unconscionably (ACCC 2021f)
- the consumer guarantee (manufacturers, importers and sellers of goods must guarantee, among other things, that those goods are of acceptable quality and have spare parts and repair facilities available for a reasonable period of time, unless the consumer is advised otherwise) (ACCC 2021d) (chapter 3).

Gaps in information about product durability and repairability

Concerns about product obsolescence are not confined to instances of manufacturers deliberately shortening product lives or intentionally misleading consumers. For example, Prakash et al. argued that shorter product lives may reflect the information asymmetries between manufacturers and consumers, in regard to product qualities that prevent consumers from making buying decisions that align with their needs.

... planning pertaining to the product life-time is dependent upon the objectives and target groups as well as future market and technology development scenarios. The requirements are, therefore, different for different products — an aspect which is generally communicated within the sales prices. The requirements are also influenced by other factors, such as service-delivery, availability of spare parts, additional functions, design, updates, repairability, mechanical and electrical robustness etc. What lies behind the decisions of companies, however, is not something consumers are privy to. The lack of transparency leaves consumers unable to make the best buying decisions as regards their own needs (asymmetrical information). (Prakash et al. 2020, p. 30)

⁵⁶ The EU Unfair Practices Directive takes a three-tiered approach which consists of a first tier general prohibition of unfair commercial practices, second tier prohibitions against misleading and aggressive practices, and a third tier for specific practices that are prohibited in all circumstances (Brody and Temple 2016, p. 164). Planned obsolescence is not on the third tier but may be considered a misleading practice (EC 2016a, p. 81).

⁵⁷ In the United States, there is no specific federal or state law prohibiting planned obsolescence. However, other protections such as mandated warranties and prohibitions on unfair business practices may apply (Cissé et al. 2020).

Similarly, representatives from the environmental ministries or attached agencies in Austria, Belgium, France, Germany and Italy have argued:

The lack of information concerning durable and repairable products causes an asymmetry in the market balance and leaves consumers unable to make the best buying decisions regarding their own needs. (Ober et al. 2017, p. 318)

Similar observations have been made in other contexts, such as households failing to adopt energy efficiency improvements that are cost effective for them (PC 2005, p. 103).

There may be a role for government intervention where information asymmetries are insurmountable for most consumers at any reasonable cost.⁵⁸ This may involve providing such information directly or requiring sellers to provide it (through labelling, for example), to reduce the search costs of obtaining information (PC 2005, p. 54).

While France has recently passed laws mandating the provision of information on product repairability to consumers through labelling (and other EU countries are pursuing similar measures), there are no equivalent measures in Australia. However, Australia has a range of regulations and government-funded programs that seek to address potential information asymmetries pertaining to other product qualities (for example, product safety, energy and water efficiency labelling) (Australian Government 2020, 2021b; DISER 2021). There are also private providers of information on product quality (such as CHOICE) and repairability (iFixit) (section 6.3). Brand reputation and price can also provide a source of information about product quality (EC 2018, p. 116).

‘Bounded rationality’ — limits on people’s ability to process all relevant information

Another argument for government intervention in premature obsolescence is to correct for cognitive limitations that cause consumers to underinvest in products or product features that would benefit them in the long term.⁵⁹ For example, consumers may use rules-of-thumb (or heuristics) when making purchases that involve complex information or uncertainties. Rather than considering all of the information needed to determine the product that provides the best value for money, consumers may choose to focus on fewer criteria when comparing products, such as price. This may result in consumers making purchase decisions that they eventually regret. Similar arguments have been used to support compulsory superannuation.

As discussed previously by the Commission in its inquiry into *The Private Cost Effectiveness of Improving Energy Efficiency*, arguments for government intervention based on cognitive limitations (or bounded rationality) are contentious.

... while individuals might not make ideal choices from the perspective of an outside observer, they may well be optimising something else that is just as important to them — such as the value of their time — which might be better spent on core projects or leisure activities ... In other words, concepts

⁵⁸ The public good characteristics of information also means manufacturers may underprovide it.

⁵⁹ This is not to be confused with arguments that limits on people’s ability to process all relevant information make them vulnerable to deception. Measures to protect consumers from misrepresentation are discussed above.

of bounded rationality help explain how firms and individuals achieve entirely appropriate, if somewhat constrained, approximations of economically-efficient outcomes. They might not be ideal outcomes, but given the limits on cognitive abilities, and the transaction costs involved in seeking out the ideal solution (which may include the opportunity cost of management time), they are as economically efficient as it is practical to contemplate achieving. (2005, pp. 56–57)

The Commission concluded that limits on people’s ability to process all relevant information is an insufficient ground for justifying measures such as minimum energy efficiency standards, as it ‘relies on notions of omniscient regulators who are capable of making decisions that are in the best interests of energy users’ (2005, p. 57). However, the Commission suggested that bounded rationality is on stronger grounds in its application to labelling systems that help consumers to ‘cut through the information haze without curtailing choice’. Even then, an argument for labelling ‘can be mounted more strongly from the grounds of information asymmetries’ (2005, p. 57).

Environmental protection

Community concerns about the environmental impacts associated with the production, consumption and disposal of products have been a major driver behind both the right to repair movement and calls for the Government to prevent premature obsolescence (and planned obsolescence in particular) (City of Melbourne, sub. 20, p. 3; DIA, sub. 108, p. 1; East Waste, sub. 18, p. 3; NSW Circular, sub. 93, p. 3; Rattenbury, sub. 133, p. 8; WWF, sub. 54, p. 1). This is particularly evident in Europe, where several governments have enacted policies to promote the circular economy (including by promoting product repairability, upgradability, durability, and recyclability) (box 6.2). In Australia, there has also been a shift towards policies relating to the circular economy, including the Modern Manufacturing Strategy (which promotes recycling and clean energy as a priority (WMRR, sub. 85, p. 3)), and waste export bans and product stewardship initiatives supported by the new *Recycling and Waste Reduction Act 2020* (Cth) (chapter 7). Further, State Governments — such as in Victoria, the ACT and New South Wales — have implemented policies that draw on circular economy principles, such as improving recycling and waste management practices (ACT Government 2021; DELWP 2021; NSW Government 2019, pp. 2,4).

Submissions to this inquiry and previous studies have argued for policies to address premature product obsolescence (and promote the circular economy) on the basis they reduce market failures relating to environmental externalities.

Box 6.2**The circular economy and its growing influence on government policies**

A 'circular economy' is an economic system designed to minimise waste, emissions, and resource use through long-lasting product design, and the sharing, maintenance, repair, reuse, remanufacturing, refurbishing and recycling of products (Ellen MacArthur Foundation 2021; Geissdoerfer et al. 2017, p. 763). The circular economy movement has gained momentum in recent years (particularly in the European Union (EU)), influencing government policy at the local, regional, national and international level (Geissdoerfer et al. 2017, p. 763). For example:

- Germany passed a law on the circular economy in 1996, which aimed to reduce landfill through initiatives such as closed-loop recycling (recycling old products into new products) (Ogunmakinde 2019, p. 6)
- Japan implemented a 'Basic Law for Establishing a Recycling-Based Society' in 2000. This included clarifying the basic principles for establishing recycling policies, and outlining the responsibilities of the state, local government, businesses and public (MEJ 2000, p. 2)
- China released a 'Circular economy promotion law' in 2009, which aimed to improve the efficiency of resource use in areas such as product design, production, consumption and waste management (Ogunmakinde 2019, p. 4)
- France adopted a legal measure in 2015 to make planned product obsolescence a crime (HOP 2021)
- Australia implemented a National Waste Policy in 2018, which aims to shift Australia towards a circular economy by avoiding waste and improving resource recovery and recycling (discussed in chapter 7). State and Territory Governments such as in Victoria, the ACT and New South Wales have also implemented policies that draw on circular economy principles such as improving recycling and waste management practices (ACT Government 2021; DELWP 2021; NSW Government 2019, p. 1).

EU circular economy action plan and the right to repair

The 2015 EU circular economy action plan included an initiative to extend the scope of the Ecodesign requirements — an EU-wide initiative that sets out the minimum mandatory requirements for the energy efficiency of certain products (EC 2021b) — to also include repairability, upgradability, durability, and recyclability aspects for products (European Parliament 2021). To date, Ecodesign requirements to increase the repairability and durability of washing machines, dishwashers, fridges and electronic displays (including televisions) have been implemented (for instance, one of the Ecodesign requirements is to extend the length of time spare parts are available for repair after purchase) (EC 2019c; Mikolajczak 2021).

The new 2020 EU circular economy action plan seeks to expand the Ecodesign standards to more products and also work towards establishing a 'right to repair' for information and communications technology products (that is, improving the availability of spare parts or access to repairs, and a right to update obsolete software) (EC 2020, pp. 5,7). The European Commission will also consider strengthening consumer protection against premature obsolescence by setting minimum requirements for sustainability labels and information tools (EC 2020a, p. 5).

Environmental externalities

Externalities are the unintended costs and benefits of an activity (such as the production, consumption or disposal of goods) that are experienced by people other than those directly involved in that activity (PC 2006, p. 419). For example, a waste processing or recycling facility may have adverse effects on the amenity of neighbours (a negative externality). The existence of negative externalities means that people may undertake too much of an activity from a community-wide perspective because they do not consider the costs of the activity on others. The magnitude of environmental externalities can depend on where they occur. For example, the damage done to human health by pollution is generally lower if the pollution is emitted in remote areas rather than metropolitan areas (PC 2006, p. 419).

On the other hand, there are also positive externalities where the individual buying the product causes benefits to the community at large and these are likely to be under-provided. A classic example is immunisation, such as the COVID-19 vaccines, where each additional person receiving the vaccine provides added benefits to the community at large.

Policies that cause firms to bear the costs and benefits of their activities on third parties (that is, internalising the costs) can help promote a level of activity that better balances the costs and benefits to the community. Such policies may include requiring a firm to adopt practices to avoid environmental damage, to repair any damage caused, or to pay compensation to the community for causing the damage (PC 2006, p. 419). That said, policies themselves create costs and these need to be weighed against the benefits from a community-wide perspective.

Several stakeholders argued that environmental externalities associated with the production, consumption and disposal of various products mean product lives are too short from a societal perspective (Bower Reuse and Repair Centre, sub. 48, p. 1; DIA, sub. 108, p. 1; SA Repair Café Coordinators, sub. 46, pp. 3–4; TOC Development, sub. 137, p. 2; WMRR, sub. 85, p. 3; WWF, sub. 54, p. 1). The European consumer group BEUC have similarly argued that:

Negative impacts on the environment may not always be clear to consumers as prices for products do not communicate externalities to consumers such as the negative impact on the climate as well as local communities and the environment in producing countries. If such externalities are taken into account, the costs of repair would not seem to be that high. (2015, p. 5)

While there is a role for government in reducing the external environmental impacts associated with the production, consumption and disposal of goods, a critical issue is whether measures targeting premature product obsolescence through product design are likely to be the most effective and efficient way to do so, and how it might fit within Australia's broader environmental policies. For example, Australia's *Product Emissions Standards Act 2017* (Cth) establishes a national framework that allows the Australian Government to address the adverse impacts of air pollution from certain products on human and environmental health (DAWE 2021e). The Product Emissions Standards Act allows the Australian Government to prescribe products as an emissions controlled product and make rules relating to those products — penalties apply to the controlled products if they are not meeting the standards

under the Act (DAWE 2021e). For example, outdoor power equipment such as lawn mowers are covered under the Product Emissions Standards Act, and other products can be added subject to a cost–benefit analysis (DAWE 2021e).⁶⁰

Further, it is important to recognise that government measures to reduce the environmental impacts associated with the production, consumption and disposal of products have both benefits and costs. Therefore, the outcome that achieves the highest net benefits for the community overall will not necessarily involve eliminating all the environmental impacts in question. At some point, the cost of further reducing the impact will exceed the benefit to the community. For example, a regulation that mandates a particular production technology to reduce airborne particulates might have a negligible effect in terms of reducing risks to human health, but significantly increase the cost of the products.

6.3 Is premature obsolescence a problem in Australia?

The evidence on whether premature obsolescence is a significant problem in Australia is mixed. The following sections considers evidence on: the prevalence of planned product obsolescence (including for software updates); the significance of information failures relating to product durability and reparability; and the significance of environmental externalities associated with premature obsolescence.

Prevalence of planned obsolescence

There are widely divergent views on the prevalence of planned obsolescence in Australia. Some stakeholders are convinced that there is widespread planned obsolescence. Claims of planned obsolescence presented in inquiry submissions related to a range of consumer products, particularly personal electronic devices and household appliances (box 6.3). Common concerns related to designs that prevented repair or upgrade, designs with structural weak points and software updates that reduced performance.

The main evidence used to support claims of planned obsolescence are examples of product features or marketing behaviour that seemingly have no plausible function other than to force consumers to replace the product after a short time (figure 6.2). One critic of planned obsolescence noted:

In terms of proving intentional deception, evidence is not difficult to find. In their hardware, all components of the iMac are fused to the motherboard, which makes repair impossible and can render an entire system broken when one element is faulty. Similarly, Apple has made it needlessly difficult to find certified parts when fixing iproducts, forcing consumers to use Apple-only retailers. (Sanford 2020)

⁶⁰ To date, the Australian Government has made no decision to add other products.

Box 6.3 **Claims of planned obsolescence from submissions**

Many inquiry participants expressed concerns about planned obsolescence in Australia. Most concerns were broad and covered a range of consumer products, and often related to issues such as e-waste generation or the disproportional impact on low-income people.

Getting rid of planned obsolescence in electronics and appliances is crucial for reducing waste and creating a sustainable and environmentally responsible future. (comment 157)

When vulnerable consumers are effectively cut out of a market due to planned obsolescence and an inability to afford an upgrade, they can either try to live without an essential good or they can turn to loans for these essential items, which may cause a debt spiral and much further financial loss. (CALC, sub. 119, p. 12)

However, some consumers and businesses made specific claims about planned obsolescence, particularly for electronic devices and household appliances. In these submissions, the most common claim was that the design of products prevented them from being repaired or upgraded.

Modern kettles are now made with fused plastics (and sometimes circuit boards!), so you cannot disassemble them for repairs even if you wanted to ... Then you have electric toothbrushes, which cannot be opened in any way (including for battery replacement) ... (Lewis-Fitzgerald, sub. 75, p. 3)

It is standard for storage in phones and tablets, and increasingly also in laptops, to be integrated into the mainboard. This means that if the board fails, it becomes impossible to access the data saved on the device. (Leighton, sub. 82, p. 2)

... when he opened up the laptop, he found the motherboard had been soldered to the hard drive in such a manner that it was impossible to upgrade the memory. (Storer, sub. 140, p. 1)

Similarly, some submissions made claims that products such as household appliances were made of poor-quality materials that break easily. For example, the SA Repair Café Coordinators noted that products are often unrepairable because ‘materials are non-durable’ (sub. 46, p. 7). Other participants claimed that particular products are designed to fail after a set period of use.

Printers are designed to self-destruct — many stop working after a certain number of prints (with a microchip controlling a ‘kill’ switch), so you’re forced to replace them. (Lewis-Fitzgerald, sub. 75, p. 3)

I’ve seen cables flex tested and found to last too long and be made weaker intentionally. I’ve had colleagues talk of lawn mower motors have [had] the brushes specified so the mower only runs for a certain number of hours. I’ve been told to life-cycle test a product I’m working on to match the two year warranty period, and absolutely not beyond. (comment 188)

In other instances, submissions claimed that non-physical features, such as software, prevented products from being updated and used, or reduced product performance.

Software updates are a key part of the planned obsolescence problem: rendering functional hardware effectively useless with newer updates, for example. (Stein and Crosby, sub. 51, pp. 3–4)

Apple was deliberately slowing down older iPhone devices, through discrete software upgrades, often making them extremely slow, and owners did not know what was wrong — causing many to purchase new devices instead of repairing their devices. (Australian Democrats, sub. 100, part 1, p. 18)

Critics of planned obsolescence also point to international studies that show shortening product lifespans for a range of products (such as consumer electronics and white goods) as further evidence of a problem — though some acknowledge these reports stop short of finding planned obsolescence is occurring (Bluff 2015; Wiens 2018b). For example, the Öko-Institute in Germany — a not-for-profit environmental research institute — recently examined trends on lifespan and use time for a range of electrical and electronic appliances (such as washing machines, televisions, and laptops) in Germany, over the period of 2004 to

2013. It found that the average period consumers held onto products (first useful service life)⁶¹ decreased for most of the analysed products, and an increasing proportion of appliances were replaced or disposed of before five years (Prakash et al. 2020, p. 5). For instance, the average first useful life decreased from 14.1 years in 2004 to 13.0 years in 2012-13 for large household appliances, and from 5.4 years in 2004 to 5.1 years in 2012 for laptops (Prakash et al. 2020, pp. 24–25). Prakash et al. also noted:

Critical is the increase in the proportion of large household appliances which have been replaced within less than 5 years due to a defect from 3.5 per cent to 8.3 per cent of total replacements between 2004 and 2012. (2020, p. 24)

Manufacturers in Australia and overseas have strenuously denied allegations of planned obsolescence, stating that competitive pressures and reputational risk mitigate such behaviour. They argue that many design features that are alleged to be planned obsolescence are driven by consumer demand or other practical considerations. For example, Ai Group noted that it:

... rejects the view that industrial designers and engineers routinely design products to create premature failure to generate more profit for [manufacturers]. While there are always nefarious players in any given environment (market or otherwise), the short life cycle of many products is easily explainable by competitive pressures on manufacturers to supply products that meet consumer needs at the lowest possible price. To achieve the rock-bottom price points consumers have come to expect, manufacturers must lower production costs. Among the strategies to do this is to reduce specifications for components and assemblies to the minimum necessary to meet consumer preferences and performance standards. Lower build quality specifications and the parts that make them up can add higher levels of uncertainty in respect to their long-term reliability and durability. This trade-off must be weighed in the particular context of different product markets and different consumer preferences. Extended product life is of little value to consumers who expect to use the product briefly or upgrade it rapidly. (sub. 32, p. 10)

The ACCC lent some support to the view expressed by manufacturers.

To date, the ACCC has seen little evidence of manufacturers designing a product to fail at a certain point to encourage a consumer to buy a new one. Competition limits the incentives for planned obsolescence as consumers are unlikely to buy the same product again if there are competing products with a reputation for lasting longer. Furthermore, third parties that investigate such products are likely to identify obsolescence by design and the reputational cost of being discovered engaging in such practices would be significant. (sub. 106, p. 4)

The Öko-Institute study also refuted some claims of planned obsolescence. The study examined three commonly cited examples of planned obsolescence (aluminium electrolytic capacitors used in televisions, plastic tubs in washing machines and ink pad reservoirs in ink-jet printers) and concluded ‘in all three cases, allegations of planned obsolescence in terms of wilful design manipulation failed to stand up’ (Prakash et al. 2020, pp. 30–31). Box 6.4 describes the example of ‘programmed printer death’. Similarly, in their consultation with the Federal Trade Commission (FTC) for the *Nixing the Fix: An FTC*

⁶¹ Not to be confused with the technical product life, which is the average time from the first purchase until the terminal defect of the product.

Report to Congress on Repair Restrictions, Microsoft argued that some manufacturing practices, such as the use of adhesives, promote durability.

... the use of adhesive, over screws, makes for a sounder, more durable and damage resistant device that can better survive ‘inadvertent drops or mishandling,’ while ‘also meet[ing] consumer demand for a high-quality, tactile, and ‘solid’ product feel by preventing internal components from rattling with the casing.’ (FTC 2021, p. 34)

Several studies also highlighted the role that consumers play, rather than just product faults, in driving shorter product lifespans. The Öko-Institute study found that ‘increasing numbers of electrical and electronic appliances are being replaced although they are still in working order. In such cases, the desire to possess an even better appliance is key’ (Prakash et al. 2020, p. 5). For instance, in 2012, over 60 per cent of the functioning flat screen televisions were replaced because consumers wanted to have a better device (Prakash et al. 2020, p. 25). Similarly, drawing on various European studies, van den Berge and Thysen noted:

Regarding reasons to replace products, responses from users’ surveys show that 31 per cent of washing machines ... 66 per cent of vacuum cleaners ... 56 per cent of TVs ... and 69 per cent of smartphones ... were disposed for other reasons than being broken ‘beyond’ repair. For three out of four product categories this is above 50 per cent of the discarded products. This provides evidence for the relevance of investigating the user and market related factors in relation to early product replacement. (2020, p. 28)

Box 6.4 Case study: ‘programmed printer death’

In 2010, there were various reports in Europe of product obsolescence in the form of ‘programmed printer death’. This is where some ink-jet printers signalled that the printer needed to be serviced, or should not be used, shortly after the warranty period had expired. Critics noted that after a certain number of printed pages, the software would stop the functioning of the printers, thereby deliberately shortening the lifespan of the product. However, there is more to the story.

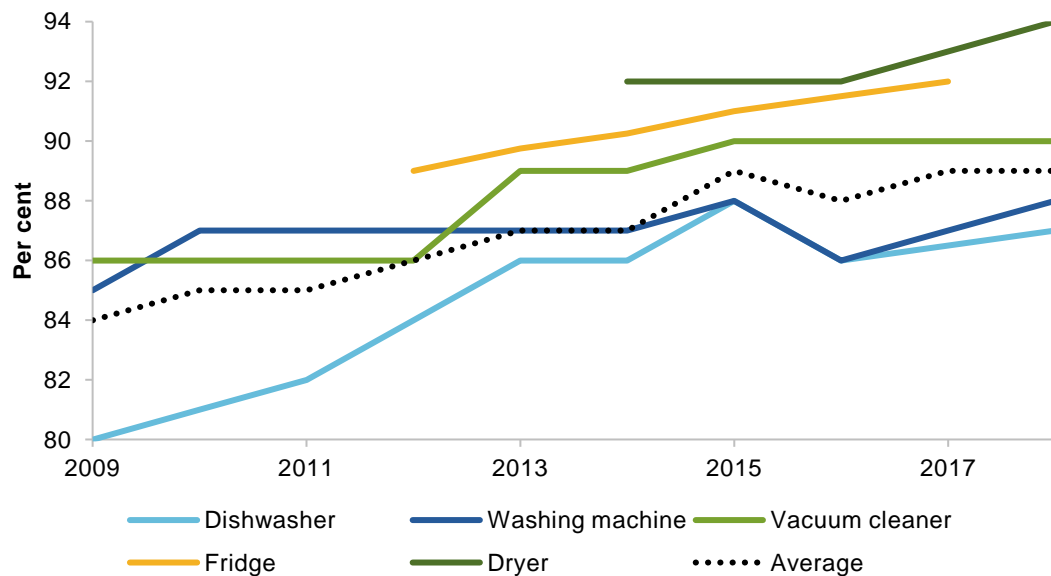
Every time a printer is used, a small amount of ink is flushed through the printer head and diverted into a waste-ink pad (an absorbent pad designed for a ‘normal’ printer lifespan). Generally, the saturation of the waste-ink pad is monitored by a ‘drop counter’ that ensures that the pad does not breach capacity and cause potential damage to the printer or its surroundings (for example, furniture or carpet). Therefore, the drop counter exists as a measure to protect the printer and its surroundings from damage and cannot be viewed as a form of planned obsolescence. That said, other technical options could be used (such as exchangeable containers for the waste-ink pad). Also, there could be an issue of consumer misrepresentation, as consumers may be unaware of this problem at the point of purchase.

Source: Prakash et al. (2020, pp. 176–177).

There is also evidence to counter claims that products are becoming less durable. For example, data from surveys conducted by Consumer NZ revealed that product reliability (measured as the percentage of consumers indicating they did not need to repair a product that was purchased within the past five years) has improved for a variety of products in recent years. For example, the reliability score for a range of white goods (such as dishwashers) increased between 2009 and 2018 (figure 6.3). Similarly, Prakash et al. found the average

lifespan of products in Germany that were replaced due to defect increased from 5.2 years in 2009 to 5.9 years in 2012 for televisions and was unchanged from 2004 to 2012 for hand mixers and blenders (about 11 and 10 years respectively) (2020, pp. 25, 106–107).

Figure 6.3 Reliability of white goods has increased in recent years
Percentage of products that have not needed repair^a



^a Consumers were asked about products they purchased within the past five years and whether they have required repair. The product reliability score is calculated as the percentage of products that have not required repair in this time frame. Consumer NZ does not survey every type of product every year — however, products such as vacuum cleaners and washing machines feature regularly, allowing for a trend analysis.

Source: Smith (2019).

It appears that the perception of a problem, rather than direct experience, is also partly driving concerns about planned obsolescence. A study based on a 2017 online survey in Germany (with 2000 participants aged 14–66 years) asked respondents (1) whether they agreed with the statement that some manufacturers design devices intentionally so that they break down after the warranty has expired and (2) if they had ever had a device that broke down within or shortly after the warranty had expired. The authors observed:

... the strong conviction that some manufacturers deliberately limit the lifetimes to the two-year warranty (held by 90 per cent) and deceive their customers (believed by 89 per cent) does not necessarily correspond with own experiences. This may be due to the fact that the majority of respondents refer to experiences from their social environment or the narratives around planned obsolescence presented by the media. (Jaeger-Erben and Hipp 2017, p. 19)

Software updates and ‘big tech’

In recent years, several cases have been filed internationally against large tech companies claiming the companies have engaged in planned obsolescence (box 6.5). One particular area of concern raised in these cases is software updates that reduce the functionality of older products. To date, no court has explicitly found that companies have engaged in planned obsolescence. In its submission, the ACCC noted the challenges associated with regulating planned obsolescence relating to software updates and support.

In many circumstances, obsolescence in computer software or devices with a software component is an inescapable characteristic of the product. As such, manufacturers may plan ahead for a product to become obsolete at a particular point in time, including by ceasing to provide security updates or updates necessary for continued functionality. This is a form of planned obsolescence, but is not necessarily intended to induce a consumer to purchase a new product. In many circumstances it will not be reasonable or efficient to require a manufacturer to support a product for an indefinite amount of time. At some point it may be cost prohibitive for manufacturers to continue to support older products. What is ‘reasonable’ will be circumstance-specific and depend on a number [of] factors such as what a reasonable consumer would expect for goods of that kind. (sub. 106, p. 4)

Regulators have nonetheless responded to concerns about software updates. Internationally, manufacturers (including Apple and Samsung) have been fined for misleading consumers about software updates affecting the functionality of older model smart phones (also known as ‘throttling’) in countries such as France and Italy. For example, the Italian Competition Authority (AGCM) found that:

... Samsung group and Apple group have carried out unfair commercial practices in violation of Articles 20, 21, 22 and 24 of the Consumer Code in relation to the release of some firmware updates for their mobile phones which caused serious malfunctions and significantly reduced their performance, in this way speeding up their replacement with more recent products. (AGCM 2018)

Samsung denied that its software updates reduced the phone’s performance (Gibbs 2018). Apple stated in 2017 that it slowed the performance of software for phones with degraded batteries to prevent the demands of software updates from causing batteries to shut down, but denied intentionally shortening the lifespan of the product (Gibbs 2018).

Similar software update cases have been filed for other types of products. Recently, a lawsuit in the United States was filed against Tesla claiming that software updates had deliberately reduced the battery capacity of Model X and S cars (Cissé et al. 2020; Sage 2019). In Australia, in 2018 the ACCC required HP Australia to compensate customers for misleading information and conduct, for failing to disclose at the time of sale that a subsequent software update would cause the printer to reject non-HP printer cartridges (at the time of purchase the printer accepted non-HP printer cartridges) (2018b).

Box 6.5 Cases filed against tech companies internationally

There have been a number of cases filed against international tech companies related to planned obsolescence. However, no cases have yet proven that companies were intentionally reducing product lifespans.

- The French environmental association Halte à l'obsolescence programmée (HOP) has filed two claims of alleged planned obsolescence under the French planned obsolescence law.
 - In 2017, HOP raised concerns about printer companies such as Epson, HP, Brother and Canon inserting sensors into their printer cartridges to stop them working before they were actually empty (Malinauskaite and Erdem 2021, p. 23). The outcome of this case is still pending (Boring 2020).
 - In 2017, HOP filed a complaint against Apple software updates that were slowing down the performance of older models. The French regulator (DGCCRF) did not find evidence that proved Apple intentionally reduced the lifespan of the product. The DGCCRF instead fined Apple for deceptive commercial practice by omission for not informing iPhone owners that the updates would likely cause their device to slow down (Boring 2020).
- The Italian Competition Authority (AGCM) investigated Samsung and Apple in regard to software updates that slowed down the performance of their smart phones. Similar to the DGCCRF, the AGCM only found that the software updates were misleading to consumers and fined both companies € 5 million (AGCM 2018). The AGCM also fined Apple an additional € 5 million for inadequately informing consumers about the essential characteristics of lithium batteries (such as average duration and deterioration factors) (AGCM 2018).
- In the United States, Apple settled a class action law suit in 2020 in regards to software updates slowing down their devices (Cissé et al. 2020; Stempel 2020). A law suit was also issued against Tesla in 2019 in regard to software updates reducing the battery capacity of Model S and X cars (Cissé et al. 2020; Sage 2019). Another lawsuit was filed against HP in 2020 for software updates that blocked customers from using third-party ink and toner cartridges, and forced them to buy the more expensive HP-branded supplies (Shaak 2020).

Summary

It is not possible to rule out that some manufacturers engage in strategies to intentionally reduce product lifespans, but there is no evidence that such practices are widespread. Further, Australian consumer and competition laws contain provisions that provide some protection against such behaviour (such as prohibitions on misleading conduct). Although there is evidence that the lifespans of some products are becoming shorter, this is often driven by consumers choosing to replace their products for newer ones rather than the products breaking. There is also evidence that some products are becoming more reliable or durable.

Significance of information failures

A number of inquiry participants — several from repair cafés — submitted that consumers often lack good information on product durability and repairability (Buckingham, sub. 22, p. 4; City of Melbourne, sub. 20, p. 3; Repair Café Woolloongabba, sub. 42, p. 2; SA Repair Café Coordinators, sub. 46, p. 15). For example, repairer Brett Buckingham noted consumers have very little understanding of the durability and repairability of products at the time of purchase and, in many cases, rely on their experience with a similar product assuming that the new product should last as long (sub. 22, p. 4). The Australian Democrats suggested consumers do not have good information about durability or repairability, and this is exacerbated by manufacturers providing inaccurate representations.

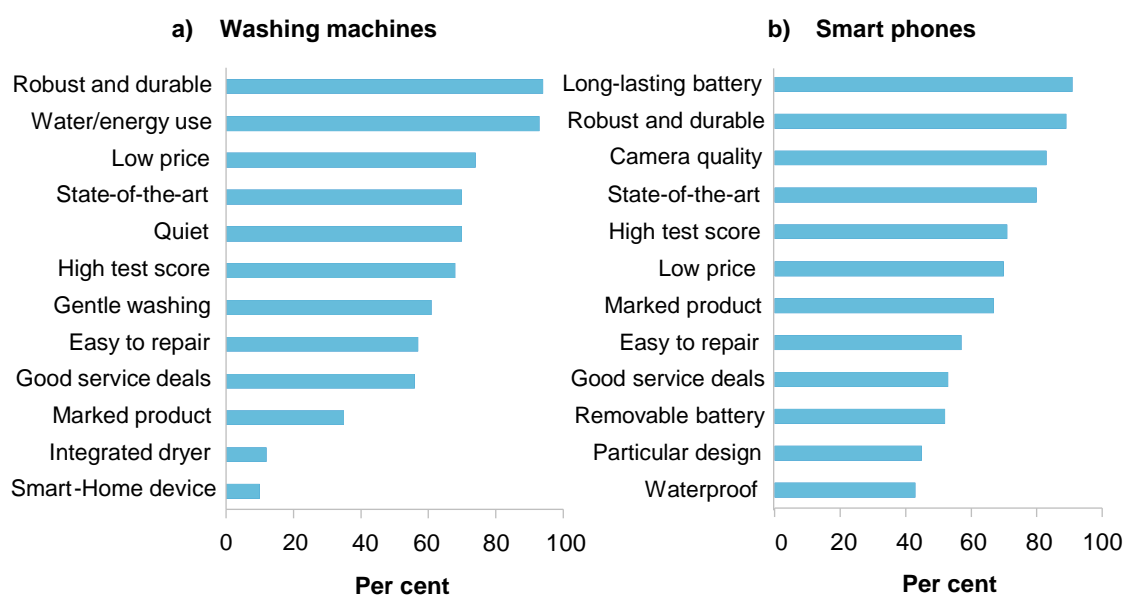
... there's no standard of repairability in Australia on which consumers could make a decision. [Manufacturers] often mislead consumers with 'free extended warranty schemes which are already covered by normal warranty'. (sub. 100, part 1, p. 40)

In contrast, Assistive Technology Suppliers Australia Ltd noted that the purchase of assistive technology (AT) medical devices 'will likely have a professional input from a health care professional to ensure the type of device to be purchased is suitable for the clinical needs and environment in which it is to be used' and 'due to the importance of, and the reliance on, the device that the AT user needs to get on with life, most suppliers of AT inform the purchaser of the backup services that are available for the device' (sub. 23, p. 14).

That consumers lack information on repairability or durability does not necessarily imply they face significant costs in obtaining such information; consumers may simply lack the motivation to seek out such information because it is not a key factor influencing their purchase decision. For instance, Local Government NSW observed that 'there appears to be a lack of interest or apathy in many people regarding repair options, as regularly the repair cost is more than the cost for replacement products, albeit of lesser quality' (sub. 97, p. 6).

International studies suggest that repairability is often less important in driving purchase decisions than durability and other product characteristics, such as price. For example, a recent study on consumer purchasing behaviour from Germany found that ease of repair was less likely to play 'a rather large/a large role' in purchase decisions for smart phones and washing machines, compared with features relating to durability (figure 6.4). Similarly, an EU consumer survey found that price, brand, quality and durability were ranked above repairability in consumer purchasing decisions for vacuum cleaners, televisions, smart phones and clothing (EC 2018, pp. 142–145). These results may reflect that the ease of repairing a product may be less important to consumers if the product is more durable and less likely to break (EC 2018, p. 163). That said, some EU studies have found evidence that providing more repairability information at the point of purchase can increase consumer choice towards more repairable products (including for washing machines, televisions and smart phones) (EC 2017, pp. 418,424), and that consumer interest in product repairability is higher for large and more expensive products (such as white goods) (EC 2018, p. 10).

Figure 6.4 Purchasing criteria — washing machines and smart phones^a



^a Responses to questions ‘What role did the following aspects play in selecting the current washing machine/smart phone?’ Percentages represent the share of respondents who indicated the aspect played ‘a rather large’ or ‘a large role’ for the respective products.

Source: Jaeger-Erben and Hipp (2017, pp. 6–7).

Public information on product durability or repairability is often readily available (and is expected to expand in the near future) if a customer seeks it out. For example, Australian consumers can already access repairability scores for smart phones, laptops, tablets and gaming consoles from iFixit’s website⁶². As France implements its repairability index for televisions, smart phones, laptops, washing machines and electric lawn mowers (discussed below), this information will become available to Australian consumers from French websites. There are also various online resources that provide information on product quality (and other proxies for durability), such as product review websites (CHOICE, CANSTAR and Consumer Affairs), YouTube and other online platforms. Price, brand reputation, previous experiences, warranties and guarantees can also help inform consumers of a product’s expected durability (EC 2018, pp. 116, 133).

In chapter 3, the Commission recommended that the ACCC develop guidance on product durability timeframes for major categories of common household products to help support the application of the consumer guarantees. These reasonable durability estimates would measure how long products should be expected to last, at a minimum, without fault when used in normal circumstances (for example, a fridge could be estimated to last for a minimum of 5 to 7 years without fault). Such guidance could act as another source of product durability information for consumers. However, the guidance would not be brand specific or include

⁶² iFixit scores were available across a range of smart phones and gaming consoles, however, the sample size for laptops and tablets was smaller.

information on the relative durability or repairability of different products in the same product category.

It is also difficult to find evidence that information gaps on durability or repairability are undermining the efficient operation of the market (such as by causing consumers to consistently choose products that break or malfunction well before they expect them to). For example, a UK survey found that about 77 to 85 per cent of consumers were satisfied with product lifespans across different durable product groups (Gnanapragasam et al. 2017, p. 146). Such results may reflect that consumers replace some types of products well before the end of their useful life. After reviewing European studies on the expected and actual life of different products, van den Berge and Thysen observed:

Looking at the expected lifetime, it is worth noticing that consumers expect products' lifetime before malfunctioning to be longer than the time they will use them (washing machine 8.3 vs 12.7; vacuum cleaner 10.3 vs 6.0 years; TV 11.0 vs 7.3 years; smartphone 5.2 vs 2.7 years). This might imply that the consumer has a role in premature obsolescence of products. Even if products lasted as long as they think they should, consumers indicate they expect not use it for that total amount of time, and replace it before. (2020, p. 28)

Summary

In many cases, consumers' decisions to 'prematurely' dispose of their products, or to opt for shorter-lived or less repairable products, reflect personal preferences rather than information gaps on product durability or repairability at the time of purchase. And for some types of products, such as smart phones, there is publicly-available information on product qualities such as product durability or repairability if consumers are sufficiently motivated to seek it out. For some products, such as televisions, smart phones, vacuum cleaners, and washing machines, it is not clear that more or better information on product qualities such as repairability would materially influence purchase decisions.

Australian data on the following matters would help shed further light on the issue:

- how long consumers expect products to last before they malfunction and how long they actually last
- how important specific product qualities (such as durability and repairability) are in driving purchase decisions for different products.

Significance of environmental externalities associated with short-lived products

As noted in section 6.2, government measures to reduce the environmental impacts associated with the production, consumption and disposal of products have both benefits and costs. Therefore, the outcome that achieves the highest net benefits for the community overall will not necessarily involve eliminating all the environmental impacts in question. This is important to keep in mind when interpreting studies used to support policies to reduce

environmental impacts by extending product lifespans, as they can often omit or do not fully consider some important trade-offs from intervention.

Most studies that examine the environmental impacts of premature product obsolescence use life cycle analysis (LCA). LCA measures specific environmental impacts throughout a product's life cycle from raw materials acquisition through to production, use and disposal. Analyses typically take the form of comparative analysis of products with shorter and longer lifespans. For example, Prakash et al. compared the ecological performance of short- and long-lived household products (such as washing machines, laptops and televisions) over a set period using indicators such as global warming potential, cumulative energy demand, marine eutrophication potential, and water depletion (2020, p. 224).

Such studies consistently find that products with longer lifespans tend to have lower environmental impacts than products with shorter lifespans. For example, Montalvo et al. noted that for decades the practice of LCA has provided product-specific assessments of environmental impact, such that the body of work on the environmental impact of longer product lifespans is 'sizable' (2016, p. 42).

For instance, changing the toaster market by extending the lifetime by 10 per cent would net a savings of around 4000 tonnes of CO₂ equivalent and prevent around 60 tonnes of waste per annum. The greatest benefits to be gained for global warming potential from a longer lifetime would be through a 10 per cent change in the market for the T-shirt, which would result in a reduction of circa 100 000 tonnes of CO₂ equivalent per annum ... (Montalvo, Peck and Rietveld 2016, p. 42)

Prakash et al. similarly concluded:

The outcomes of the ecological comparative calculation paint a clear picture. In all product groups investigated, long-life products do better than short-life variants in all environmental categories. This remains the case even having considered retrofitting options/repairs to long-life products with replacement parts (including their manufacturing impact) alongside the enhanced energy efficiency of new devices and the higher manufacturing impact of the long-life product.

... for notebooks, the long-life product (life-time of 6 years) produces almost 300 kg less CO₂e than the short-life variant over a given period of 12 years. The acidification potential environmental indicator is 49 per cent higher for a short-life notebook (life-time of 3 years) compared to the long-life variant. The cumulative energy demand of a short-life notebook is 25 per cent higher and the global warming potential is 36 per cent higher compared to a long-life notebook. (2020, p. 32)

LCA is often used to support policy intervention (such as product design standards and improved consumer information) to prevent premature obsolescence. Despite its practical advantages, LCA has several major limitations as a tool for estimating external costs and informing policy decisions about premature obsolescence (box 6.6). For example, LCA does not differentiate between externalities and impacts that have already been internalised through direct policy intervention (section 6.2). LCA may indicate that products with longer lifespans have lower carbon emissions than shorter-lived products. However, if a country that manufactures a product already has policies in place for reducing emissions,

product prices may already partly reflect the added impacts that shorter-lived products have on carbon emissions.⁶³ Consequently, if such policies exist, LCA will tend to overstate the externalities.

Box 6.6 Limitations of life cycle analysis for measuring external costs

Life cycle analysis (LCA) measures specific environmental impacts throughout a product's life cycle from raw materials acquisition through to production, use and disposal. LCA can be informative for assessing the environmental costs associated with a specific product. However, it alone cannot be used to inform government policy as it suffers from a number of limitations.

- LCA cannot differentiate between externalities and impacts that have already been internalised through other policy interventions (such as a carbon price) and so may overstate any environmental externalities if such policies exist.
- LCA does not account for the location of emissions. For example, urban air pollution has a higher external cost to society than pollution in less populated areas. The addition of imports and exports further complicates this problem. For instance, if Australia reduces consumption of a product that is produced overseas, there may be minimal external benefits to Australia as most air and water pollutants in the production process — the notable exception being greenhouse gases — have localised effects on human health and the environment.
- LCA does not take time into consideration. The environmental costs may occur over a long period of time — in general, the community places greater value on avoiding emissions today rather than tomorrow. In a cost–benefit analysis this would be reflected using discount rates. Therefore, LCA can overstate environmental externalities.

Source: PC (2006, pp. 447–449).

Further, LCA does not consider the economic and social impacts that also matter to consumers, businesses, and the community (Curran 2014, p. 192; Udo de Haes et al. 2008, p. 20). For example, it does not consider the costs associated with the additional regulations (such as product standards) that may be needed to achieve longer-lasting products, such as increased product prices and reduced consumer choice (discussed below). Therefore, LCA should be used in tandem with other research techniques to inform government policy.

⁶³ Moreover, where a country has a binding emissions cap, regulations to reduce emissions in one part of the economy (such as through product standards) might be offset by an increase in other parts of the economy. That is, reduced demand for carbon credits by industry A will tend to reduce the economy-wide carbon price. The reduction in the carbon price will mean industries B, C and D will then expand production of emissions-intensive products until the carbon price rises again to ration demand.

6.4 Are reforms needed to prevent premature product obsolescence – if it is found to exist?

This section assesses the following policy options for preventing premature product obsolescence.

- Expanding consumer protection laws.
- Product labelling.
- Mandatory product design requirements.

Expanding consumer protection laws

Several participants to this inquiry proposed expanding consumer protection laws to explicitly address unfair conduct and consumer harm associated with planned obsolescence. Many of these suggestions involved outright bans on planned obsolescence, including the designing of products to have low durability (Australian Democrats, part 1, sub. 100, p. 41; brief comment 162; Planert, sub. 36, p. 1; SA Repair Café Coordinators, sub. 46, p. 5; WALGA, sub. 86, p. 4; WWF, sub. 54, p. 4). Of these, the most detailed proposal came from the ACCC.

The ACCC argued that although it has seen little evidence of manufacturers designing a product to fail, the incentives for planned obsolescence are likely to increase as more products are computerised, and the information and power imbalances between manufacturers and consumers grow (sub. 106, pp. 4–5). It argued it is therefore important that regulators are equipped with an appropriate legislative framework to investigate new and emerging practices that may harm consumers (ACCC, sub. 106, pp. 4–5).

To this end, the ACCC advocated expanding consumer laws to cover several potential consumer harms relating to premature product obsolescence, which include:

- manufacturers strategically planning future obsolescence that results in unnecessary costs for customers who cannot easily switch providers due to lock-in
- manufacturers failing to disclose the product support period adequately, such that consumers are unable to meaningfully assess the value of competing products prior to purchase.

The ACCC argued that such matters are not adequately addressed by the current Australian Consumer Law (ACL) and fair-trading provisions (for example, it noted there is no express obligation on manufacturers to support a product for a minimum period or to tell consumers about the support period) (sub. 106, p. 5).⁶⁴ It contended that introducing a principles-based economy-wide prohibition on unfair trading practices could potentially address issues such as:

⁶⁴ While the ACL currently requires that the manufacturer take reasonable action to ensure that facilities for repair, and parts for the product, are reasonably available for a reasonable period after the product is supplied, the law is unclear as to whether this requirement also covers software, such as software updates. These issues are considered in chapter 3 along with a request for information about the costs and benefits of requiring that software updates be provided by manufacturers for a reasonable period of time after the product has been purchased.

-
- undisclosed, planned obsolescence that relies on high switching costs to force consumers to regularly purchase additional or replacement products
 - businesses not disclosing that, as a result of internal decisions on future support, a product will be obsolete in an unreasonably short period of time
 - a business not providing security updates for smart products for a reasonable amount of time, thereby putting sensitive consumer information at risk.

The ACCC noted that the scope of a prohibition on unfair trading practices would need to be carefully developed to ensure it is sufficiently defined and targeted, with appropriate legal safeguards and guidance drawn from comparable jurisdictions with existing unfair trade practices laws.

On 6 November 2020, the Consumer Affairs Forum (a meeting of state, territory and federal ministers responsible for consumer law) agreed that unregulated unfair practices warrant further exploration through a regulation impact assessment process. This process is still ongoing (ACCC 2021a).

The Law Council of Australia strongly opposed any laws prohibiting planned obsolescence (sub. 114, pp. 8–9). It argued that regulations that attempted to distinguish between planned obsolescence and the natural evolution of products would run into a serious risk of errors, such that consumers could end up worse off. It also noted that the ACL already provides a large measure of protections against consumer detriment resulting from any planned obsolescence (through the use of consumer guarantees, and preventative effects of provisions such as those prohibiting unconscionable conduct and misleading or deceptive conduct). It noted that reliance on these provisions would avoid needing to tackle ‘vexed questions’ such as:

- how to define planned obsolescence
- how to accurately determine what types of conduct harms consumers (outside of the bounds of the current consumer law) such that remedies are required, while avoiding ‘Type I’ (false positive) and ‘Type II’ (false negative) errors
- how to design remedies that best ameliorate consumer harm while avoiding imposing undue cost on manufacturers and stifling innovation.

On balance, the Commission considers there is insufficient evidence to warrant additional consumer protection measures to address planned obsolescence. The evidence that planned obsolescence is prevalent in Australia is mixed (section 6.3). And as noted earlier, the ACCC has successfully brought a case against HP for misleading behaviour relating to software updates in its printers (ACCC 2018b).

Although the proposal outlined by the ACCC could increase protections to consumers, more detail is required to understand how a general prohibition on unfair conduct (or other measures to address unregulated unfair practices) would operate in practice with respect to planned obsolescence. This would help clarify whether the practical challenges identified by the Law Council of Australia could be overcome, and the extent to which the law could strike a balance

between the interests of consumers and business. For example, the drafting of unfair practices laws that provide scope for an overly broad interpretation of ‘unfairness’ or planned obsolescence⁶⁵ may lead to unfairly penalising business and cause significant uncertainties. Accordingly, the Commission is unable to determine whether such general prohibitions on unfair conduct would effectively address planned obsolescence, if it was found to exist. Introducing further powers for the ACCC (as proposed) solely to address the potential harms associated with premature obsolescence would seem to be a disproportionate response.

Product labelling

Several repair cafés and environmental groups endorsed product labelling as a means of addressing premature obsolescence. Ideas for a labelling scheme included:

- a repairability rating system (East Waste, sub. 18, p. 6; City of Melbourne, sub. 20, p. 5; Barwon South West Waste and Resource Recovery Group, sub. 33, p. 6)
- the length of warranty (City of Melbourne, sub. 20, p. 3)
- a circular economy rating system that considered durability, repairability, reusability, recyclability, material recovery (Buckingham, sub. 22, p. 4)
- a durability rating (SA Repair Café Coordinators, sub. 46, p. 15; DIA, sub. 108, p. 5).

The idea of a labelling scheme also received some conditional support from industry. Ai Group noted:

Although greater detail would need to be ironed out in consultation with industry, the use of repairability ratings or labelling provisions to give consumers a greater understanding of product durability and repairability could be a useful tool to influence consumer behaviour for the better. (sub. 32, p. 12)

Several inquiry participants highlighted the recent vote by the EU Parliament in November 2020 calling for the EU Commission to ‘develop and introduce mandatory labelling, to provide clear, immediately visible and easy to understand information to consumers on the estimated lifetime and repairability of a product at the time of purchase’. They also highlighted France’s introduction of a mandatory repairability index for electrical and electronic products. Notably, France intends to add new criteria, such as product reliability, in the future (box 6.7).

⁶⁵ This might arise if the general law was complemented with specific prohibitions that listed planned obsolescence.

Box 6.7 The French repairability index

France recently implemented (January 2021) a mandatory repairability index for smart phones, laptops, televisions, washing machines and electric lawn mowers. The index aims to:

- increase consumer awareness about the possibility of extending their products lifespans and encourage consumers to purchase more repairable products, to help reduce e-waste and encourage the circular economy
- reduce product obsolescence — planned or not — to help preserve the natural resources required for production.

The index is a score ranked out of 10 and must be displayed near the product at the point of sale, and online next to the price of the product. The score is self-declared by the manufacturer — regulated through the French market surveillance authorities — and covers five categories, each worth 20 per cent:

- documentation: availability of technical documentation
- disassembly: ease of disassembly of the product for repair and the types of tools needed
- availability of parts: the duration of spare parts availability and the time taken to deliver them
- price of spare parts: the ratio of the sale price of spare parts to the price of the product
- product-specific assets: a score determined by product-specific sub-criteria. For example, for smart phones, laptops and televisions this criterion includes software aspects.

The score of each five categories should also be made available to consumers at the point of sale, and upon request. The repairability index will be replaced by a sustainability index in 2024, which will include both repairability and reliability aspects.

French repairability index product labels



Sources: Ministère de la Transition Écologique (2021); Right to Repair (2021).

Although a product labelling scheme could reduce information search costs for consumers who value repairability or durability, and potentially help them make better informed decisions, these potential benefits need to be considered against the costs. Costs include any public funding or resources contributed to developing and administering the scheme, as well as compliance costs for business. For example, Australia's water labelling scheme had annual approved budgets ranging from \$1.85 to \$1.96 million from 2012 to 2015 (WELSR

and DAWR 2015, p. 38). The size of the costs and who bears them will depend on the specific governance and funding model adopted (including whether the scheme is mandatory or voluntary and the extent to which it is publicly or industry funded), and the number of products the policy covers.⁶⁶

Currently, there is mixed evidence on whether a new product labelling scheme, such as a durability or repairability index, in Australia would provide benefits to consumers that would outweigh the costs. As noted in section 6.3, there are currently uncertainties about the extent to which consumers face significant barriers to obtaining information on product characteristics such as repairability and durability, how relevant such information is to consumer purchasing decisions for different product types, and the extent to which information gaps are undermining the efficient operation of the market (such as by causing consumers to consistently choose products that break or malfunction well before they expect them to).

Given the amount of stakeholder interest in product labelling, the Commission is seeking further information to understand how significant these information asymmetries (and search costs) are in practice. This information is necessary to clarify at a broad level what any scheme might look like and what benefits it might provide. To the extent that further evidence reveals there are significant barriers to obtaining information on certain product features, the Australian Government (in conjunction with industry) would need to ensure the scheme effectively targets these information barriers to maximise the net benefits to the community. For example, product labelling would need to provide information that is:

- **relevant to consumer purchase decisions.** For example, iFixit observed that one limitation of the newly released French repairability index for products such as smart phones and laptops, is the ease with which manufacturers can obtain a high rating (the threshold for gaining software rating points is quite low) (sub. 107, p. 25). It argues that this means ‘the index risks not differentiating enough between more and less repairable products, reducing its usefulness for consumers’ (sub. 107, p. 25). Consumers also seem to prefer durability over repairability in their purchasing decisions (EC 2018, pp. 142–145; Jaeger-Erben and Hipp 2017, pp. 6–7), possibly reflecting that the ease of repairing a product may be less important to consumers if the product is more durable and less likely to break (EC 2018, p. 163).
- **transparent and credible.** Lack of transparency in how manufacturers arrived at a particular rating may undermine consumer confidence in the label’s reliability and credibility.
 - For example, iFixit noted the second limitation of the French repairability index is that it is difficult to verify scores that have been self-declared by manufacturers, ‘for instance people should be able to know easily for how many years spare parts will be available

⁶⁶ The cost of the water labelling scheme is shared between the Australian, state and territory governments, and industry (through registration fees). The actual cost of the policy is quite volatile across years as a result of fluctuations in expenditure and revenue. For example, in 2012–13, expenditure reached a high of \$2.81 million (\$1 million more than the approved budget) (WELSR and DAWR 2015, p. 37). Historically, annual contributions by the Australian government and industry have been about 40 per cent each, with the remainder covered by state and territory governments (WELSR and DAWR 2015, p. 38). However, the amount of government assistance varies greatly from year to year due to the variability in registration revenue.

for a specific product. But this might not be the case as it is not yet clear how easily the public will be able to access information on how a product scores’ (sub. 107, p. 25).

- To be credible, a scheme would also require ongoing oversight and review. For example, the EU energy labelling scheme, which covers a range of electronics and other products, took a number of years to develop and has undergone various iterations in response to changing market conditions, policy priorities, and refinements in methodology (Valentová 2018). Also, there are already concerns that the French market surveillance authorities may not have adequate resources to extensively check manufacturer compliance with the repairability index (Right to Repair 2021).

The timing and implementation of any labelling scheme will also affect its net benefits. For example, Australia could consider delaying any decision on a product labelling scheme until the overseas labelling schemes have been in place for longer. A wait-and-see approach would allow time to determine whether the introduction of the labelling schemes in the European Union improved the general availability of information on repairability and durability in the Australian market, given that many products sold in and imported into the European Union may also be exported to Australia. It would also allow more time to collect data on the effectiveness of the overseas labelling schemes and help inform how to design any Australian scheme (including the possibility of adopting something very similar to the EU model to avoid the costs of designing a scheme from scratch). Alternatively, an initial pilot program (focusing on a small set of products) may allow scope for policy experimentation and learning while reducing unnecessary compliance costs.

The Commission is seeking further input on how the Government and industry might jointly design and implement any new labelling scheme.

INFORMATION REQUEST 6.1 PRODUCT LABELLING SCHEME

The Commission is seeking further evidence on the significance of information gaps that might contribute to premature obsolescence, including:

- *the specific type of information gaps (such as on product repairability, durability, or the environmental impacts of products) that prevent consumers from making informed purchase decisions*
- *the significance of these information gaps (for example, the cost to consumers from obtaining information independently)*
- *evidence that these gaps are undermining the efficient operation of the market (for example, evidence that consumers are systematically overestimating product durability and repairability when making purchase decisions)*
- *whether these information gaps affect specific types of products more than others.*

The Commission is also seeking input on how government and industry might work together to design a product labelling scheme to maximise the net benefits to consumers and the community.

Mandatory product design requirements

Another option for preventing premature obsolescence that was suggested by inquiry participants was to mandate that products meet certain requirements regarding durability and/or repairability. The Australian Democrats proposed government banning or heavily restricting the sale of consumer electronics that cannot be repaired in Australia and developing and enforcing a minimum standard for repairability (sub. 100, part 1, p. 21). The Design Institute of Australia noted that product design standards, such as the EU Ecodesign Directive, should be seriously considered for similar categories of electrical and electronic products in Australia (sub. 108, p. 5) (box 6.8).

To date, the EU Ecodesign regulations for repairability have mainly focused on improving access to spare parts and repair information, but also include design aspects such as ensuring spare parts can be replaced using commonly available tools. Other Ecodesign requirements are aimed at increasing product durability, such as ensuring television software updates are available for at least eight years after the last unit of product is sold on the market.

Mandating additional product standards relating to repairability or durability could mean that people would pay more for products and have less choice. For example, mandating that all ink-jet printers have exchangeable containers for the residual ink to prevent claimed ‘printer death’ (box 6.4) might mean manufacturers no longer provide printers at a lower price point. In the case of ‘essential items’ like fridges, such regulations might also raise affordability concerns for low income households.⁶⁷ The impact analysis for the new Ecodesign regulations (which includes energy efficiency standards) for washing machines noted:

Price increases are a consequence of — *inter alia* — redesign efforts, including investment and updating the existing production lines, the enhancement of the intrinsic quality of the appliances, as well as the additional profit motive *per se*. If the volume of sales were significantly affected by the increase in the purchase price, this could have a magnified effect on the household washing machine and household washer dryer sector, and the whole supply chain. (EC 2019b, p. 134)

A common counter to this point is that mandating increased repairability or durability would provide consumers with offsetting financial benefits (such as cost savings from less frequent product replacement). However, such benefits may be illusory as product life is also a function of consumer behaviour. For instance, consumers may (and frequently do) still replace a product before the end of its useful life in preference for the latest model, resulting in higher overall costs to consumers. With adequate information, consumers are best able to make decisions of what is in their interests when making trade-offs between upfront costs, ongoing costs and product qualities.

⁶⁷ As the new Ecodesign product design regulations relating to repairability only came into effect in early 2021 and cover a limited number of products, there is very limited data with which to assess the effects on product prices. Although the European Commission undertook impact assessments for the new Ecodesign regulations, the analysis covers a broad range of regulations other than mandatory product design standards relating to repair and durability, making it difficult to isolate the predicted impacts.

Box 6.8 EU Ecodesign Directive

The EU Ecodesign Directive was established in 2009 and sets regulations aimed at improving the environmental performance of energy-consuming products. Historically, the Ecodesign regime has focused on energy efficiency requirements, but in recent years has been used as a tool to help promote the circular economy (Brown and Hemmings 2019).

On 1 October 2019, the European Commission adopted new Ecodesign requirements relating to increasing the repairability and recyclability of household products. These regulations cover washing machines, dishwashers, fridges and electronic displays (televisions), and are the first to introduce repair and maintenance provisions for consumer goods in the European Union (besides motor vehicles) (Brown and Hemmings 2019; Mikolajczak 2021). The main repair requirements that manufacturers and/or importers must adhere to from March 2021 include:

- ensuring certain spare parts are available to professional repairers (including software for televisions, dishwashers and washing machines) for a specified period of time after the products have been placed on the market (for example, a minimum of seven years for fridges) and within a specified maximum delivery time (for example, 15 working days)
- providing professional repairers with access to repair and maintenance information
- providing certain repair and maintenance information (instructions, spare parts etc.) on freely accessible websites
- ensuring products are designed so that spare parts can be replaced with commonly available tools without permanently damaging the device (EU regulations 2019/2023, 2019/2022, 2019/2019 and 2019/2021).

These repair regulations also distinguish between repairs that can be commonly performed by purchasers and repairs that should be performed by professional repair workers. For example, the washing machine regulation requires manufacturers to make available to individuals and professional repairers the following parts: door, door hinge and seals, other seals, door locking assembly and plastic peripherals such as detergent dispensers (FTC 2021, p. 49). The regulation, however, requires manufacturers to make additional parts available only to repair professionals.

Some other Ecodesign requirements aim to increase product durability.

- New rules for electronic displays require the latest software update to be available for at least eight years after placing the last unit of the product on the market (EU regulations 2019/2021).
- Minimum product life requirements for a limited number of product categories, such as the components of vacuum cleaners (minimum operational motor lifetime: 500 hours) (EC 2019a, p. 6).
- Requirements that software and firmware updates do not result in a deterioration of energy consumption for washing machines, dishwashers, televisions and fridges (EU regulations 2019/2023, 2019/2022, 2019/2019 and 2019/2021).

Another counterargument is that mandating increased repairability or durability would provide broader public benefits that justify the reduction in consumer choice (and impacts on affordability). For example, governments often use mandatory products standards where there is an immediate risk to human safety or the environment and there are few other policy options for mitigating those risks. However, the case for using mandatory standards relating to durability and/or repairability to address premature obsolescence is much less convincing. First, as discussed in section 6.3, the evidence on the extent of the problem for consumers

and the environment is mixed. Second, there may be more effective ways of addressing consumer protection or environmental concerns associated with premature obsolescence than mandating that products meet minimum requirements regarding durability and/or repairability. Third, there can be trade-offs between durability and repairability: a product that is more durable may be less repairable and vice versa.

If the policy concern is reducing the environmental impacts associated with the production, consumption and disposal of products (such as carbon emissions), Australia could extend existing policies that directly address those specific environmental impacts (section 6.2). The advantage of this approach is that:

- **it would target each environmental concern directly and transparently.** For example, policies such as carbon prices directly discourage emissions-intensive activities and products. In contrast, mandatory standards (in the form of durability and/or repairability requirements) rely on there being a strong relationship between product durability/repairability and the environmental impact of concern. However, studies show the relationship between product features (such as durability, modularity and repairability) and different environmental impacts are highly complex. It is not always a case of more is better. Proske and Jaeger-Erben undertook case studies on selected smart phones and concept phones (Fairphone, Puzzle Phone, and Google ARA) that showed there is no ‘one-size-fits-all’ design to fulfil consumers’ needs and reduce environmental impacts with regards to different user habits (2019, p. 65). For example, they noted while a modular phone can increase product lifespan by allowing upgrades over time, it should not be so modular that consumers are constantly upgrading parts, so that the environmental benefits of longer use are no longer realised (Proske and Jaeger-Erben 2019, p. 64). Further, there can be trade-offs between durability and repairability. For example, the Ai Group observed:

In some cases, it is wasteful to build an extremely durable product, knowing that due to technological innovation it is unlikely to remain in use after a few years. In this case, a less durable design may conserve resources, while delivering a more affordable product to the consumer. When combined with effective product stewardship options for end of life, this may be a more desirable option to repairability (in some cases). (sub. 32, p. 11)

- **it would provide greater scope to minimise the overall cost of meeting the environmental objective.** Mandatory standards are inherently inflexible and thus provide limited scope to minimise the cost of meeting the environmental objective. For example, if the objective is to reduce carbon emissions, a mandatory standard essentially forces all carbon abatement to come from the limited set of products that are subject to the standards. In contrast, a more broadly based policy (which covers a range of activities) and directly targets emissions is likely to be much more efficient as it allows least cost abatement. At the very least, the cost of abatement through mandatory standards should be compared with other options.

Summary

On balance, additional policies to prevent premature product obsolescence (in the form of product standards or expanded consumer protection laws to address planned obsolescence) would be unlikely to have net benefits for the community. However, the Commission is seeking views and evidence on whether product labelling standards (information request 6.1) would provide net benefits to consumers and the community and how the Government and industry might jointly approach such a scheme, given such schemes are still in their early stages of development overseas. Other potential reforms relating to enhancing consumer rights (such as making it easier for consumer groups to lodge complaints under current consumer protection laws) and enabling access to repair supplies (such as expanding the consumer guarantee to include software updates) could also help address some of the stakeholder concerns associated with premature obsolescence (chapter 3).

DRAFT FINDING 6.1 PREMATURE OBSOLESCENCE IN AUSTRALIA

There is growing community concern in Australia and overseas that product lifespans are becoming unnecessarily short (premature obsolescence), with detrimental impacts on consumers and the environment.

Premature obsolescence is unlikely to be a significant problem in Australia.

- There is little evidence that manufacturers are intentionally reducing product lifespans.
- Consumers often choose to upgrade their products well before they come to the end of their useful life or break.

Additional policies to prevent premature product obsolescence (in the form of product standards or expanded consumer protection laws to address planned obsolescence) would be unlikely to have net benefits to the community.

Further views and evidence (in response to information request 6.1) will help clarify the potential net benefits of a product labelling scheme in Australia.

7 Managing e-waste

Key points

- Australia's generation of e-waste is increasing relatively quickly compared to other waste streams, but remains less than one per cent of total waste generation. Roughly half of Australia's e-waste is recycled, with the remainder disposed to landfill, and an unknown amount illegally dumped.
- Community concerns about e-waste tend to focus on the valuable resources that are lost when e-waste is landfilled and the risks to the environment and human health caused by hazardous materials in e-waste.
 - Markets provide incentives to prevent the loss of materials when their value exceeds the costs of extraction, but risks from hazardous waste may require government intervention, as those risks are dispersed and typically do not fall on those making disposal decisions.
- As a result, all levels of government maintain a role in e-waste management, coordinated by the National Waste Policy.
 - Australia's landfills are generally well-managed, helping to reduce the potential health and environmental damage of e-waste in landfill. Despite this, some State and Territory Governments ban disposal of e-waste to landfill.
- The Australian Government supports national product stewardship schemes for the recycling of some types of e-waste, including the National Television and Computer Recycling Scheme (NTCRS), Mobile Muster and a new battery stewardship scheme (expected to start soon).
 - These schemes have had some success. However, current scheme design only focuses on recycling of e-waste, with minimal emphasis on repair and reuse of products that have been disposed as e-waste. The recycling target for the NTCRS should be adjusted to also count e-waste that has been repaired and reused. There may also be merit in considering different approaches to improve access in regional and remote communities.
 - Before increasing the number or scope of regulated product stewardship schemes, the net benefits to the community would need to be established.
- Australia's domestic e-waste recycling capacity is limited, due to some structural barriers — including a small and dispersed population and relatively high labour costs. The lack of cost-effective domestic recycling can increase incentives to stockpile, dump or unlawfully export e-waste, despite existing regulations to prevent these outcomes.
 - Although the scale of stockpiling, dumping and unlawful exports is difficult to determine, there is some evidence that these activities are occurring in Australia. To better monitor these activities, the Australian Government should use global positioning system (GPS) trackers to determine the end-of-life location of e-waste collected for recycling through the NTCRS.

All products turn to waste eventually. Some working products are replaced or discarded by consumers in favour of newer, more valued versions. Repair and maintenance services often generate waste by-products from replaced parts. And even products that are well-maintained and well-loved will eventually break or fail. At this point, products become waste, with any electrical or electronic products generally referred to as ‘e-waste’. The terms of reference for this inquiry suggest that expensive repairs and complex product designs have been accelerating the transfer of consumer products into waste, and that the Commission should examine ‘the effectiveness of current arrangements for preventing ... the proliferation of e-waste, and further means of reducing e-waste through improved access to repairs’. Some inquiry participants also expected increased access to repair services to result in a reduction in the amount of e-waste generated.

A legislated right to repair would be a significant contribution to the reduction of e-waste going to landfill. (IT Professionals Australia, sub. 26, p. 7)

Right to Repair reform is also a step in the right direction for the significant issue of e-waste, reducing emissions and land/air pollution. (Australian Democrats, sub. 100, part 1, p. 45)

Others were more sceptical of the role that a right to repair could play in reducing e-waste. For example, both the Law Council of Australia (sub. 114, pp. 9–10) and the Australian Information Industry Association (AIIA, sub. 127, p. 22) suggested that a right to repair will have little impact on e-waste generation, as it is only a minor factor, with the AIIA also observing that:

... ultimately products will reach an end of serviceable life and be directed to waste management facilities. The replacement of faulty parts with repaired parts results in the faulty parts and the packaging of replacement parts then having to be directed to e-waste recycling facilities. (sub. 127, p. 22)

To some extent, barriers to repair can contribute to the proliferation of e-waste, by preventing consumers from repairing and reusing products and instead discarding them. Reducing barriers to repair (as proposed in previous chapters in this report) may also reduce e-waste generation. However, there are likely to be other, more direct and effective, ways of addressing the harms caused by the generation of e-waste to the community and the environment — this is the focus of this chapter.

In particular, this chapter discusses the impacts of e-waste generation and management, including policies for managing and preventing e-waste.

- Section 7.1 outlines recent trends and drivers in Australia’s generation of e-waste.
- Section 7.2 outlines how the Commission has assessed the benefits and costs of different e-waste management methods and discusses the nature of community concerns about e-waste, particularly the ‘loss’ of resources when e-waste is landfilled, rather than reprocessed and reused, and the hazardous nature of e-waste.
- Sections 7.3 and 7.4 discuss the main policies and programs for managing Australia’s e-waste, including the National Waste Policy, landfill regulations and e-waste product stewardship schemes.

- Section 7.5 outlines broader issues in e-waste management in Australia, relating to risks of stockpiling, dumping and unlawful exports of e-waste.

Some participants also raised e-waste issues within the context of the circular economy and broader product design issues. The circular economy and the environmental costs associated with short-lived products (including product design issues) are discussed in chapter 6.

7.1 Australia's generation of e-waste

What is e-waste?

'E-waste' refers to a broad range of electrical and electronic products (including batteries and products with plugs or cords) that become waste at the end of their useful life. Many of the products within the scope of this inquiry — including consumer electronics, household appliances and some vehicle parts — fall under this definition of e-waste (table 7.1). This list has been expanding over time as more products incorporate electronics and technology.

Table 7.1 Types of e-waste

<i>Large appliances</i>	<i>Small appliances</i>	<i>Electrical and electronic tools</i>
<ul style="list-style-type: none"> • White goods (fridges, washing machines, dryers) • Microwaves, cookers • Electric fans, air conditioners 	<ul style="list-style-type: none"> • Irons • Toasters, coffee machines • Hair dryers • Watches 	<ul style="list-style-type: none"> • Drills, saws • Sewing machines • Lawn mowers
<i>IT, telecommunications and TV equipment</i>	<i>Toys, leisure and sports equipment</i>	<i>Other</i>
<ul style="list-style-type: none"> • Computers, laptops • Printers • Mobile phones • Televisions, remotes 	<ul style="list-style-type: none"> • Game consoles, electric toys (trains, talking plush toys) • Amplifiers, speakers, radios • Musical instruments 	<ul style="list-style-type: none"> • Medical devices • Smoke detectors, thermostats • Solar panels, batteries • Lightbulbs, lamps

Source: Commission analysis, based on DELWP (2017).

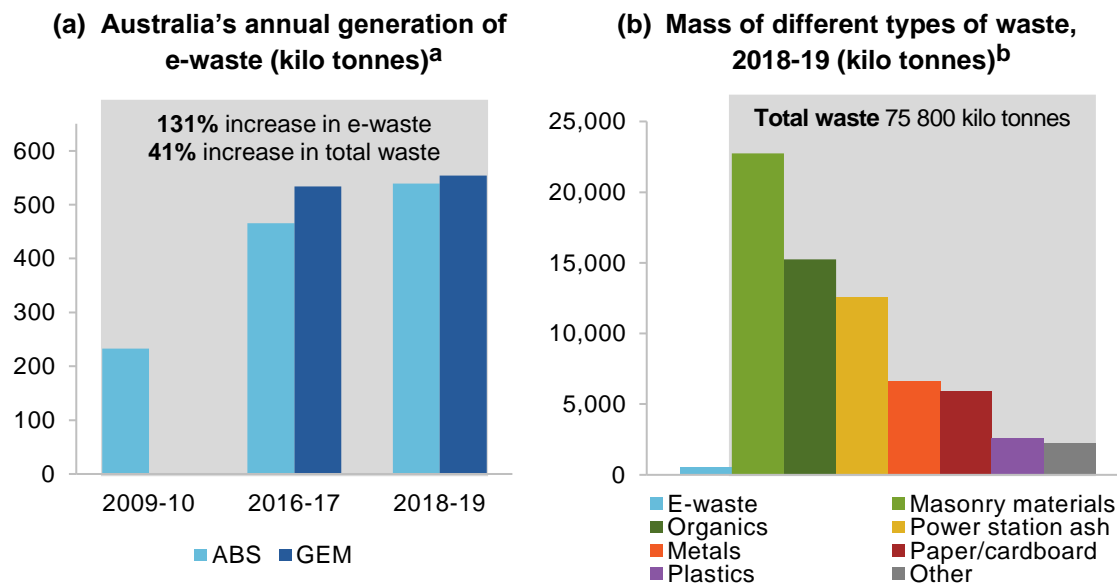
Some of these products might reach the end of their useful life because they are broken and cannot be repaired (or because repair is deemed too expensive by consumers or is not easily accessible, due to a lack of suitably skilled repairers). Other products might be replaced while still working (decisions to repair or replace are discussed further in chapter 2).

Australia’s e-waste generation is growing, but is a small share of total waste

Australia’s annual generation of e-waste is growing relatively quickly compared to other forms of waste (figure 7.1, panel a). Between 2009-10 and 2018-19, the weight of e-waste⁶⁸ generated annually has more than doubled, increasing from 233 to 539 kilo tonnes — a 131 per cent increase (ABS 2013, 2020a). By comparison, total waste grew from 53 700 kilo tonnes to 75 800 kilo tonnes over the same time period — a 41 per cent increase (ABS 2013, 2020a).

E-waste represents a small proportion (less than one per cent by weight) of total waste generated annually in Australia (figure 7.1, panel b). In part, e-waste’s relative importance as part of the broader waste management system depends on how it is measured, as well as the costs associated with its disposal and management (such as its hazardousness to the environment and human health, discussed in section 7.2).

Figure 7.1 E-waste generation has grown relatively quickly but is a small share of total waste



^a GEM refers to the Global E-waste Monitor estimates of Australia’s annual e-waste generation. ^b E-waste figures are double counted among the different waste types, as e-waste is not a formal waste stream. ‘Other’ includes glass, textiles, leather and rubber, and other wastes.

Sources: ABS (*Waste Account, Australia, Experimental Estimates*, 2013, 2019 and 2020, cat. no. 4602.0.55.005); Forti et al. (2020).

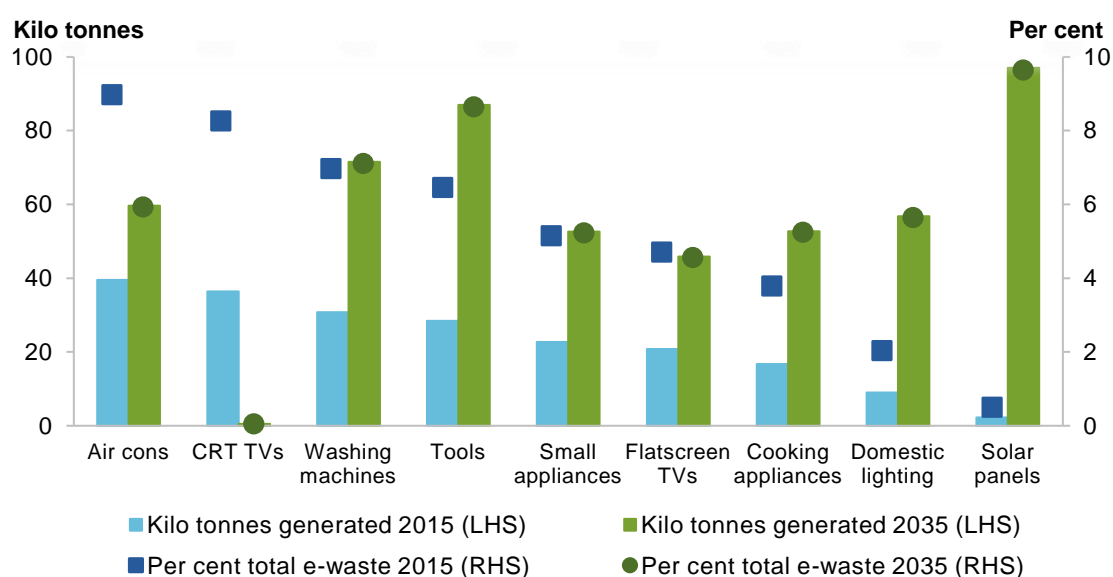
Over the course of the inquiry, the Commission heard stakeholder concerns about the increasing number of solar panels that are expected to reach the end of their life and become

⁶⁸ E-waste is typically measured by weight (kilo tonnes/tonnes), or by the number of disposed products (thousands/millions of devices). The Commission has used both measurements at different times, depending on the available data.

e-waste in the near future (LGNSW, sub. 97, p. 5), as well as concerns about batteries found in electrical and electronic products (comment 56; MTA Queensland, sub. 80, p. 3; WWF, sub. 54, p. 2). Estimates of the quantity of these products entering the waste stream are high — 100 kilo tonnes of solar panels are expected to require disposal in 2035 (Equilibrium 2019, p. 20) and up to 180 kilo tonnes of lithium-ion batteries are expected to become waste by 2036 (Zhao et al. 2021, pp. 17–18). Together, these estimates amount to over half the weight of e-waste currently generated (ABS 2020a).

Analysis for Sustainability Victoria in 2015 (figure 7.2) indicated that, between 2015 and 2035, solar panels were expected to be the fastest growing waste electrical or electronic product (increasing from 1 to 10 per cent of e-waste). Other main sources of e-waste over the period were expected to be tools, washing machines, air conditioners, domestic lighting, small household appliances (such as adapters, irons and clocks) and cooking appliances (such as food processors). Cathode ray tube televisions were anticipated to decrease in prominence between 2015 and 2035, falling from 8 per cent of e-waste generated to less than 1 per cent (Commission analysis of unpublished data from Sustainability Victoria 2015).⁶⁹

Figure 7.2 Looking back and to the future: major categories of e-waste^a
Products contributing the most (by weight) to e-waste, 2015 and 2035



^a Cooking appliances include toasters, grills, food processors; CRT = cathode ray tube; Flatscreen TVs = LCD, LED and plasma screen televisions; Small appliances include irons, clocks, adapters; Tools include professional and household tools (welding and soldering equipment, drills, high pressure cleaners).

Source: Commission analysis of unpublished data from Sustainability Victoria (2015).

Key drivers of global growth in e-waste generation include population growth, economic growth (as higher incomes have been associated with higher e-waste generation) and

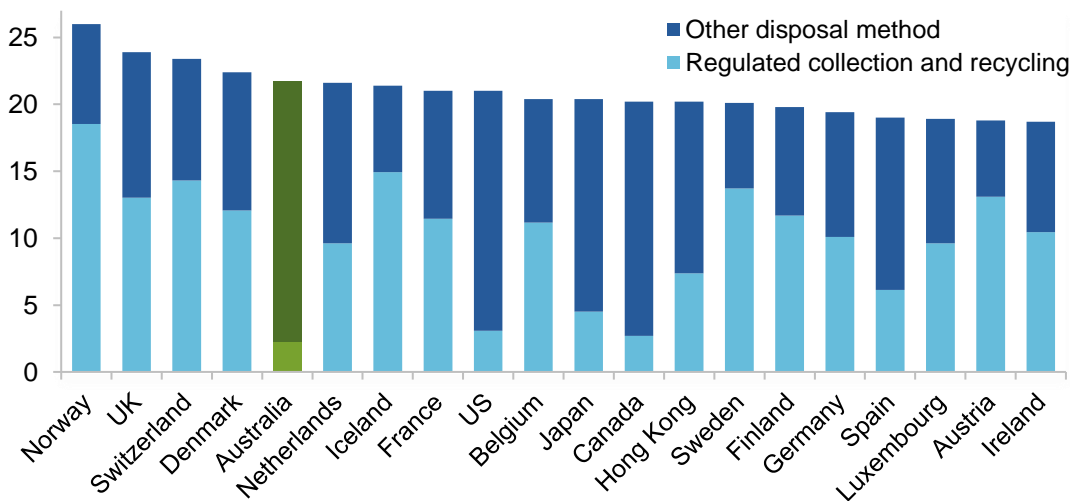
⁶⁹ The analysis did not separate out (lithium-ion) batteries as a unique category.

increasingly fast product turnovers (linked to consumer preferences, advancements in technology and, in some cases, short-lived products, as discussed in chapters 2 and 6) (Islam and Huda 2020, p. 1; Kusch-Brandt and Hills 2017, pp. 6–7; Purchase 2020, p. 2).

While some growth in e-waste is driven by the creation of new electrical or electronic products (innovation and technological obsolescence), other growth has been partially attributed to the electrification and computerisation of previously simple or analogue products (Knight 2020; LGNSW, sub. 97, p. 5; NSROC, sub. 117, p. 5) — for example, watches, toothbrushes, toys, scooters, furniture, and other ‘Internet of Things’ devices. Over the longer term, the growth in e-waste generation may also slow, as the number of products that can be electrified peaks, although this trend is not yet evident in the data. Unexpected fluctuations in demand can also increase some types of e-waste generation, such as the spike in consumption of IT equipment during the COVID-19 pandemic, as individuals set up home offices (PwC 2020, p. 8).

Compared to most other developed countries, Australia generates a large amount of e-waste per capita. The only countries estimated by the Global E-waste Monitor (GEM) to have higher generation per capita were Norway, the United Kingdom, Switzerland and Denmark, which were all estimated to recycle a higher share of e-waste through regulated schemes than Australia (figure 7.3).

Figure 7.3 Australia is one of the largest generators of e-waste per capita
 E-waste (kgs) generated per capita, 2018-19, top 20 countries



Source: Commission analysis, based on Forti et al. (2020).

About half of Australian e-waste is recycled, but e-waste data are patchy

Once e-waste is generated, it can either be recycled, disposed to landfill or, in some cases, illegally dumped. Recycling keeps materials in the economy, as products sent for recycling can be processed into new products, or used to re-create the original product (SECRC 2018, p. 6). Within the recycling process there are also a number of unique steps. Australia sorts and dismantles some of its e-waste to extract and recycle select materials domestically, such as aluminium, copper, glass, lead acid batteries and steel. Often, more complex materials will be exported for recycling, such as cables, hard drives, other batteries, polymers and printed circuit boards (Dias 2019, p. 125). Co-regulatory bodies of the National Television and Computer Recycling Scheme (NTCRS) reported that, on average in 2018-19, 58 per cent of e-waste materials were recycled domestically and 37 per cent internationally (section 7.5).

According to the ABS, the proportion of e-waste that was recycled increased from 27 to 50 per cent between 2009-10 and 2018-19, roughly the same rate as all other waste (ABS 2013, 2020a). The majority of recycled e-waste is estimated to be fridges and other white goods, collected and processed by commercial recyclers (Pickin et al. 2020, p. 88). The remaining 50 per cent of e-waste is landfilled (ABS 2020a), with an unknown amount dumped illegally.

By contrast, GEM measured Australia's recycling rate as just 10.5 per cent, one of the lowest rates among developed nations (figure 7.3 above). One explanation for this discrepancy between the ABS and GEM figures is that GEM only includes government-accredited e-waste recycling schemes (such as product stewardship schemes, discussed in section 7.4), not independent e-waste and scrap metal recyclers operating on a commercial basis, as in the ABS figures. As such GEM is likely to underestimate Australia's recycling rate.

This and other discrepancies between the ABS and GEM data (such as the different estimates of annual generation in figure 7.1 above) are also indicative of broader problems with reliable e-waste data. Many of the current estimates are periodical or experimental (including the ABS estimates), while ever-changing definitional boundaries and significant overlap with more established waste categories (such as metals, plastics and glass) often make e-waste difficult to accurately measure and account for. Some of these data issues are the same as those that the Commission identified in its 2006 inquiry into broader waste management, and recommended for improvement, such as adopting common definitions of waste categories and collecting data to facilitate evaluation of waste management policies across jurisdictions (PC 2006, pp. 20–36, 390). More accurate and comparable data greatly assists good policy design.

7.2 Community concerns about e-waste

The relatively fast growth in e-waste generation has led to substantial concerns from some groups in the community, with calls for additional government regulation and intervention, as well as broader cultural changes, such as a desire to minimise waste generation to take into account the environmental impacts of consumption (Bower Reuse and Repair Centre, sub. 48, p. 3; CESA, sub. 135, p. 1; GISA, sub. 113, attach. 1, p. 9; Gnieslaw, sub. 91, p. 4; Horan, sub. 11, p. 1; iFixit, sub. 107, p. 1; NSW Circular, sub. 93, p. 3; WWF, sub. 54, p. 2). For example, the Australian Democrats stated that ‘the world has finite resources, and the endless cycle of replacing new products with old products has a major, detrimental impact on the environment’ (sub. 100, part 1, p. 22). And the Northern Sydney Regional Organisation of Councils suggested that:

Electrical and electronic equipment is an obvious product class for focused policy attention and action due to its rapid growth and the presence of hazardous and/or toxic substances found in some materials and components. (sub. 117, p. 5)

In examining community concerns about e-waste, the Commission has taken an approach that assesses the economic costs and benefits of e-waste management policies, with community-wide impacts in mind. In particular, these economic benefits relate to the materials in e-waste, including recovering their value and avoiding their potential hazardous impacts on the environment and human health — discussed further below.

How the Commission assessed e-waste management systems

As the Commission outlined in its 2006 *Waste Management* inquiry, different types of waste (including e-waste) and the various methods of managing waste, generate different costs and benefits to consumers, households, businesses, the environment and to the community more broadly (2006, pp. 61–142).

- Community-wide benefits of e-waste management include any avoided damage to the environment or human health or loss of social amenity, while private benefits (particularly for businesses) include the financial gains to waste managers from selling valuable recycled materials (both discussed below).
- Yet no waste management system is free, with costs (of collection, transport, storage, processing and disposal) varying across different management methods. These costs accrue to either private companies (from collecting e-waste for access to the valuable components) or to consumers and the broader community (for example, from government mandated or financed waste collection and recycling programs).

Ideally, the best outcome for the community will occur when all costs and benefits of managing e-waste are taken into account as consumers, households and businesses decide how to dispose of e-waste. That is, net benefits to the community are maximised.

However, this does not always occur, as some benefits and costs of management decisions accrue to the broader community, resulting in distorted outcomes or a market ‘failure’. For example, consumers disposing of e-waste may only consider private costs (such as financial or time costs to deliver e-waste to landfill) but may not be aware of or consider the consequences of their choice on others, including the environmental, health and social amenity costs (‘externalities’) of different management methods.

Where this occurs there may be a role for government intervention to ‘internalise’ the externalities — ensuring that the prices faced by decision makers account for all of the impacts on the community. But, the choice of whether or not to intervene needs to be determined by weighing the costs associated with changing the way e-waste is managed against the benefits for the community (for example, through reduced health or environmental costs, which will vary by the type of e-waste and its disposal method). Any interventions need to be well-designed and implemented, to avoid exacerbating issues or creating adverse incentives that lead to greater costs to the community.

However, weighing up all of the potential costs and benefits to the community is difficult. For one, the relevant external costs are complex to quantify, as they are often unobserved and dispersed broadly throughout the community. One way to get around these difficulties is to ask consumers or other decision makers to state their willingness to pay (WTP) to avoid damage and risks to the environment or human health, and then use these stated preferences to assign monetary values to harm to the environment or human health. However, WTP surveys are often problematic to use and construct, as imperfectly informed consumers may systematically over- or under-estimate the harm to the environment or human health (box 7.1). An alternative method is to use estimates based on ‘revealed’ preferences — observations of actual behaviour in real-world settings — although no such Australian research appears to have been done for e-waste management.

The costs of government intervention can also vary considerably. For instance, some government policies can create adverse or unintended outcomes, as well as regulatory costs for waste managers, which may ultimately be passed on to producers and consumers of electrical and electronic products that become e-waste. Other policies can be subject to increasing or decreasing returns to scale (or sometimes both⁷⁰) making the cost of government interventions more complex to predict. Further, interventions are generally less costly when they target the source of the problem directly, rather than trying to intervene at a different point in the supply chain (PC 2006, p. 105). For example, using product standards to lengthen the life of products as a means of addressing the impacts from e-waste disposal is likely to be less effective and more costly than policies that directly manage the impacts of e-waste at the point of disposal.

⁷⁰ For example, policies to increase recycling can simultaneously benefit from economies of scale if they require up-front investments (such as in shredding machines), while also suffering from diminishing marginal returns due to increasing costs of collecting and transporting each additional tonne of e-waste.

Box 7.1 Willingness to pay as a non-market evaluation tool

Willingness to pay (WTP) is a survey method used to assign a monetary value to non-market goods and services (such as avoiding damage to the environment or human health) by asking consumers or other decision makers to place a value on the good or service in a hypothetical setting. WTP can be determined by directly asking respondents how much they are willing to pay for an outcome or by presenting prices for an outcome that respondents can accept or reject (Kristrom 1990, p. 32; McFadden and Train 2017, p. x).

Although WTP estimates can be useful, there are a range of limitations and methodological challenges that can hinder their accuracy and reliability in decision-making processes, including:

- incentives for respondents to overstate their WTP for public goods (such as a clean environment) to signal their values or if they are aware the results will inform policy decisions
- distortions created by incomplete, inaccurate or subjective information given to respondents
- WTPs that are inaccurate or have limited real-world applicability, as the survey questions are hypothetical
- poor sampling methodology or interviewer biases that limit WTP accuracy (Kristrom 1990, pp. 3–37; McFadden and Train 2017, pp. x–xvii).

Some Australian cost-benefit analyses for e-waste policies have calculated WTP estimates using a survey which asked consumers their recycling preferences, including options for the percentage of waste avoided, collection methods and additional costs per new computer or television purchased (URS 2009, pp. 58–59). The first assessment, in 2009, used WTP as an estimate of the environmental and health benefits of introducing a recycling scheme for computers and televisions (which became the National Television and Computer Recycling Scheme, discussed in section 7.4). This analysis valued consumer WTP at \$1186 per tonne of e-waste recycled (assuming a 50 per cent recycling rate was reached, 2020 dollars) (Commission analysis, based on PwC and Hyder Consulting 2009). In 2017, the Victorian Government’s assessment of its prospective e-waste landfill ban determined a WTP ranging between \$964–1048 per tonne of e-waste recycled (2020 dollars) (Commission analysis, based on DELWP 2017), although this was not used in the final decision on whether to implement the landfill ban.

Materials in e-waste

In general, community concerns about e-waste tend to focus on the potentially harmful environmental and health effects of the substances within e-waste, as well as the loss of valuable or scarce recyclable resources when e-waste is landfilled (box 7.2).

There is a range of different materials and substances within the broad umbrella of ‘e-waste’ — one study reported more than 1000 different materials within an e-waste sample (Ghimire and Ariya 2020, p. 156). However, the amount of these materials varies by product (figure 7.4) and over time, as product design and demand for different products changes. The value of recyclable substances often varies over time (as market forces change the values of different substances, for instance), while the hazardousness of other substances can differ by method of management or exposure. Some materials are also simultaneously valuable *and* hazardous (figure 7.5), but the degree of this value or hazard varies between substances.

Box 7.2 Participant views on the value and hazardousness of e-waste

Inquiry participants raised concerns about the potential value of materials 'lost' when e-waste is not recycled, or harm to the environment or human health caused by e-waste.

... product replacement has become increasingly detrimental both economically and environmentally. Electronics, white goods and light machinery ... result in toxic landfill. (Rattenbury, sub. 133, attach. A, p. 1)

The key aspect to focus on is the full life cycle of a product which includes the depletion of natural resources by overconsumption and the environmental impact of landfilling or burning products once they are no longer needed. (Bower Reuse and Repair Centre, sub. 48, p. 3)

Although there is a concern with e-waste and environmental harm it may cause at the end of life from hazardous substances, and there are moves internationally to remove these hazards from electronic equipment, e-waste will remain a concern because of the loss of various materials, precious metals and rare earth metals along with embodied energy in electronic products. The depletion and draw down of this natural capital has intergenerational costs and impacts. (GISA, sub. 113, attach. 1, p. 9)

Extending the lifespan of manufactured goods will benefit the environment, easing the demand on natural resources and keeping electronics out of landfills. (iFixit, sub. 107, p. 1)

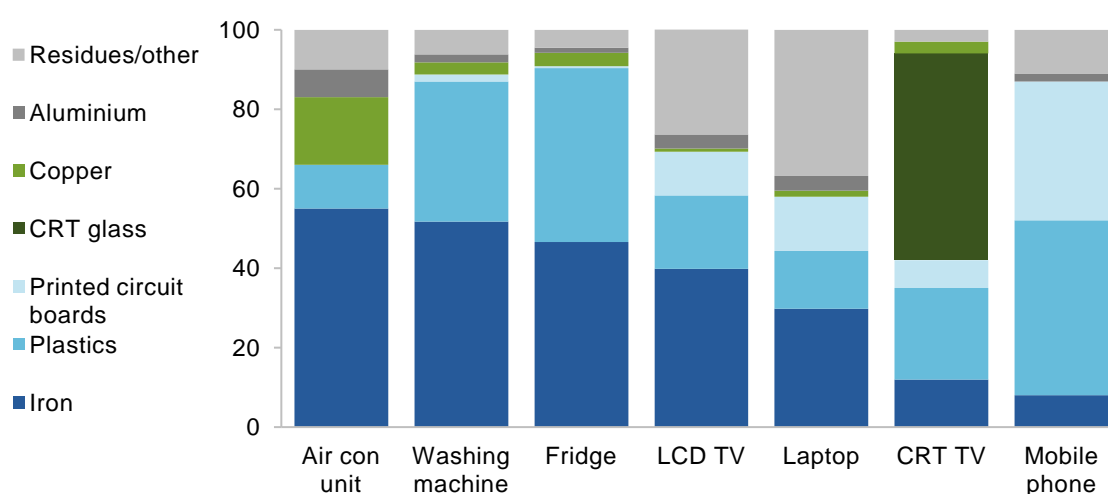
Once discarded, items such as electronics, appliances, televisions and batteries pose considerable risks to the environment and human health ... the nature of e-waste means these items can leach substances that are hazardous or toxic into the environment. (WWF, sub. 54, p. 2)

[Waste products] are often sent to landfill and deteriorate into toxic and carcinogenic chemicals which spread into the environment and ecosystem. (Australian Democrats, sub. 100, part 1, p. 22)

The vast space that e-waste takes up in landfill (particularly white goods) and the toxic chemicals that are leached from batteries and the plastics that comprise these items do grave environmental damage. (comment 56)

Figure 7.4 E-waste contains a range of materials^a

Per cent of material by weight, 2012



^a LCD = liquid crystal display; CRT = cathode ray tube.

Source: Commission analysis, based on Dias (2019).

Figure 7.5 Examples of recyclable and hazardous materials in e-waste



Sources: Commission analysis, based on Ari (2016), Cima (2018), Dias (2019), Enproc (2001), Partl et al. (2007).

How valuable are the resources in e-waste?

Many of the substances within e-waste are economically valuable, but may be ‘lost’ when e-waste is landfilled or illegally dumped — although as discussed below, it may be possible to recover some materials from landfill at a later stage (albeit at an additional cost). However, estimates of their value vary over time (due to changes in market prices and the material composition of e-waste products). For example, the value of gold in the e-waste that Australia generates each year could be between \$800 million and nearly \$12 billion, while the amount of copper could be worth \$600 million to \$1.3 billion.⁷¹ Similar analysis has also been conducted by others — for example, in 2014, the resale value of metals in Australia’s e-waste was estimated to be \$987 per tonne (Commission analysis, based on Golev and Corder 2017; 2020 dollars), equivalent to \$580 million for Australia’s 2018-19 e-waste generation (Commission analysis, based on ABS 2020a, 2021; 2020 dollars). And in 2020, the value associated with recyclable materials in lithium-ion batteries was estimated to be between \$4400 and \$17 200 per tonne of unrecycled batteries, equivalent to between \$603 million to \$4.1 billion per annum (Zhao et al. 2021, p. 18).

A substantial future increase in the value of some materials within e-waste has also been postulated by some, as a consequence of supply limits on the virgin extraction of copper, zinc (Sverdrup, Olafsdottir and Ragnarsdottir 2019), rare earths (Keilhacker and Minner 2017, p. 349) and lithium (King, Boxall and Bhatt 2018, pp. 8–10).

While it might seem wasteful to landfill such resources, extracting them from e-waste will only be economically viable if the value of the resources exceeds the costs of extraction. Not

⁷¹ This estimate is based on 1 April 2021 spot market prices — US\$55 540/kg for gold and US\$8.77/kg for copper (LME 2021) — converted to Australian dollars (at AU\$1=US\$0.7543), multiplied by estimates of the prevalence of gold and copper in one tonne of e-waste products — 20–300g and 100–200kg, respectively (Dias 2019, p. 48) — multiplied by total e-waste Australia generated in 2018-19 (ABS 2020a).

all resources are economically viable to extract, and viability can vary over time as resource values fluctuate and the cost of extraction falls with new technologies. The recycling processes for e-waste are generally able to recover a large proportion of the recyclable materials present in e-waste — for example, Mobile Muster’s recycling program reports recovery of 98 per cent of materials in mobile phones before it goes to landfill (Mobile Muster 2020a, p. 5). However, most recycling is labour-intensive and costly (recycling costs and barriers are discussed in section 7.5). And while some e-waste recycling can be commercially viable — for instance, analysis from 2014 suggested that about 90 per cent of air conditioners and about 60 per cent of refrigerators are collected for commercial recycling by private companies (KPMG 2014a, pp. 20–22) — more complex products can be harder to disassemble into component materials (Golev and Corder 2017, p. 81).

Reusing materials through recycling can align with broader goals of creating a ‘circular economy’ (chapter 6), where the economic use of products and materials is sustained for as long as possible. Yet, as the resources within e-waste are buried when landfilled, they do not disappear entirely. For these reasons, ‘landfill mining’ — deconstructing old landfill sites to extract valuable resources — has also been suggested as a potential alternative solution to supply constraints (Burlakovs et al. 2018, p. 81; Jones 2017; Krook, Svensson and Eklund 2012, p. 518). Costs associated with landfill mining can be considerable though, making the process largely uneconomical until resource values exceed the cost of recovery (Wang 2018). Disturbing closed landfill sites can also create new risks of toxic waste and leachate (Logan 2020), particularly in sites that were already well-designed, such as those with existing landfill liners and leachate collection systems.

How hazardous is e-waste to the environment and to human health?

While many of the materials in e-waste are relatively inert and no more harmful than general waste — such as glass, silver, tin and aluminium — numerous other materials in e-waste are hazardous to the environment or human health. The hazards these materials pose to human health vary greatly, including some that are carcinogenic or toxic to humans or soil and aquatic organisms (box 7.3). The components within e-waste are considered hazardous substances under national legislation — the *Hazardous Waste (Regulation of Exports and Imports) Act 1989* — although intact electrical and electronic products are not classified as hazardous by some states, such as Queensland (Queensland Government 2018, p. 20).

Measuring the relative hazardousness of different materials in e-waste is challenging. Ideally, the costs of exposure to the environment, human health and social amenity could be quantified and priced, allowing the benefits from reduction to be weighed against the costs of intervention. In practice, there are several difficulties with quantifying those impacts.

Box 7.3 Hazards to human health and the environment from e-waste

Substances found in e-waste can affect human health and the environment, with some examples listed below and in the table.

- Brominated flame retardants (such as polybrominated biphenyls/diphenyl ethers, commonly coated on plastics in e-waste) are toxic for reproduction, reducing fertility or leading to risks of birth defects (O'Driscoll et al. 2016, p. 13 223; Taheran et al. 2017, p. 25). They are also highly mobile, bio-accumulative and can 'bio-magnify' — once in the environment they pose health risks to increasingly large organisms on the food chain (O'Driscoll et al. 2016, p. 13 232).
- Heavy metals (such as cadmium, lead and mercury) are carcinogenic, toxic to human reproduction (Orisakwe et al. 2019, p. 7) and to the environment, reducing species diversity and abundance in soil organisms, and reducing growth and reproduction rates in aquatic organisms (de Vries et al. 2007, p. 2).
- Americium (found in smoke detectors) is radioactive (ATSDR 2012).
- Lithium-ion batteries (Liu et al. 2018, p. 1) and zinc (ECHA 2021c) are highly flammable, and any resulting fires release toxic smoke (DELWP 2018; Robinson 2009, p. 186).
- Chlorofluorocarbons and hydrochlorofluorocarbons release greenhouse or ozone depleting gasses (Gaidajis, Angelakoglou and Aktsoğlu 2010, p. 195). These substances were banned in 1995 and 2016, respectively (Lyones 2018), but remain a legacy issue, as they were used in products with long lifespans, such as refrigerators, which have a lifespan of approximately 17 years (KPMG 2014b, p. 38).

Hazardous materials in e-waste

<i>Material</i>	<i>Source in e-waste^{a,b}</i>	<i>Carcinogenic to humans^c</i>	<i>Hazard score^d</i>	<i>Toxic to humans^e</i>	<i>Toxic to aquatic life^f</i>
Arsenic	Some lighting	Yes	High	Yes	Very
Beryllium	Motherboards,	Yes	High	Yes	No
Cadmium	CRTs, batteries	Yes	High	Yes	Very
Chromium	Cabling	Yes	Extreme	N/A	N/A
Cobalt	Batteries, CRTs	Probably	Moderate	Yes	Maybe
Lead	Batteries, CRTs,	Possibly	Medium	Yes	Very
Mercury	Batteries, lighting	Unknown	Medium	Yes	Very
Nickel	Batteries, CRTs	Yes	Moderate	Yes	No
Selenium	LEDs	Unknown	Medium	Yes	No
Zinc	Circuit boards	N/A	Moderate	No	Very

^a Based on Ari (2016); Kiddee et al. (2013); Partl et al. (2007). ^b CRTs = cathode ray tubes. ^c Based on ratings by IARC (2021). ^d Measure of health and environmental hazardousness, based on Latimer (2015). ^e Covers substances deemed toxic to reproduction/unborn children, if swallowed/inhaled, or that may damage organs through prolonged or repeat exposure, based on ECHA's Summary of Classification and Labelling (2021a). ^f Based on ECHA's Summary of Classification and Labelling (2021a).

For one, hazardousness often depends on the amount and type of exposure, typically requiring ingestion (through the lungs, throat or skin, for example) in sufficient concentration. Most people who use electrical and electronic products would therefore not be exposed to hazardous substances in sufficient quantities or conditions to generate harm. Instead, these kinds of risks are more likely to manifest during e-waste management

processes, such as when products are disassembled or broken, or when collected in large quantities, like in landfills. As an example, exposure to cobalt ‘to the levels normally found in the environment’ is not harmful to humans or animals (ATSDR 2011a), but exposure to higher quantities (that might be found in concentrated e-waste disposal sites) can be carcinogenic and toxic for human reproduction, and may cause lasting harmful effects to aquatic life (ECHA 2021b). Even copper — found as electrical wiring in almost all e-waste — is a gastro-intestinal irritant that can cause nausea and diarrhea if ingested in large quantities, despite also being necessary for human health in smaller doses (ATSDR 2011b).

In addition, the hazardousness of products within e-waste will vary over time. One driver of this is that the material composition of the individual e-waste products will change over time, as manufacturers find new production methods that avoid using hazardous substances (GISA, sub. 113, attach. 1, p. 9). For example, Apple has eliminated the use of brominated flame retardants and ‘phased out its use of mercury in display backlighting, arsenic in glass, and beryllium from connectors and springs’ across all products, replacing them with safer alternatives (Guzzo et al. 2016, pp. 2–3). And LG Electronics has similarly reported reducing the use of brominated flame retardants in some devices, such as smartphones, televisions, laptops and monitors (LG 2020, p. 44). However, this has not occurred across all brands and products — a comparison of a range of smart phones from 2006 and 2015 found a significant increase in the content of toxic materials (Singh et al. 2019, p. 1).

Moreover, the hazardousness of different materials strongly depends on the method of e-waste management, which affects exposure. Some management methods can mitigate most of the dangers posed by these materials — for instance, estimates of the environmental and health impacts of e-waste in landfill range from only about \$11 to \$17 per tonne, in large part due to the mitigating effects of well-regulated landfills (discussed in section 7.3).⁷² Some management processes can even generate additional hazards, such as particulate matter created by mechanical shredding processes at recycling facilities (Robinson 2009, p. 188). In reaction to these concerns about e-waste, some federal and state jurisdictions regulate e-waste, considering it to be its own category of hazardous waste (section 7.3).

7.3 Australia’s National Waste Policy and e-waste

Australia has a well-developed system for managing waste (including e-waste) across all levels of government. The primary responsibility of managing waste falls to State and Territory Governments, which determine policy and regulatory frameworks. Local governments work within these frameworks to provide waste management services, and to educate the community about service availability. The Australian Government provides national leadership and coordination and negotiates and implements Australia’s international treaty obligations (SCIISR 2020, pp. 27–29).

⁷² By comparison, the harm caused by each tonne of mercury was estimated at between \$4.8 million and \$11.1 million in 2016 (DELWP 2017, p. 188).

Although a full assessment of the efficacy of broader waste management policies and product stewardship schemes is beyond the scope of this inquiry, the Commission has considered the main types of policy approaches used in e-waste management and identified some broad issues associated with their implementation.

National Waste Policy and the waste hierarchy

Australia's overarching waste policies are coordinated and supported by the National Waste Policy and the National Waste Policy Action Plan (box 7.4), facilitated by a range of initiatives, including landfill regulations, landfill bans and fees/levies, and product stewardship schemes, among others (discussed below).

Box 7.4 The National Waste Policy

The National Waste Policy 2018 creates a framework for Australia's waste and resource recovery, aimed at reducing policy fragmentation across different jurisdictions (ACG 2009, p. v) and to shift Australia towards a circular economy. The Policy is based on five underlying principles:

- avoiding waste
- improving resource recovery
- increasing use of recycled materials and increasing demand and markets for recycled products
- better manage materials flows to benefit human health, the environment and the economy
- improve information to support innovation, guide investment and enable informed consumer decisions (Australian Government 2018, p. 11).

The National Waste Policy Action Plan was published one year after the policy and outlines national waste targets and actions to achieve them, in line with the goals of the policy. Targets that are relevant to e-waste include:

- 10 per cent total waste reduction per person by 2030
- 80 per cent average resource recovery rate by 2030 for all waste streams
- significantly increase use of recycled materials by industry and governments
- improve waste data collection and information sharing (Australian Government 2019, p. 2).

The National Waste Policy is largely based on the 'waste hierarchy', which originated in 1989 from the European Union's *Community Strategy for Waste Management* (SEC (89) 934) and ranks different waste management options from most to least preferable, such as by preferring the reduction of waste over recycling, and recycling over landfill disposal. The waste hierarchy typically ranks repairing broken items very highly, as it helps to avoid waste creation or to reuse items that would otherwise be wasted. Further avoidance of waste creation is suggested through the development of sustainable design standards that 'maximise the value of materials throughout the life of a product' (Australian Government 2019, p. 10).

The waste hierarchy often forms part of a broader transition to what is called a circular economy — it aims to maximise resource efficiency and avoid unnecessary resource consumption. The hierarchy may be a useful heuristic or rule-of-thumb for decision makers, but it does little to assess net community benefits of different waste management options (including the costs associated with moving waste up the hierarchy) or to assist policy makers to prioritise public expenditure. And it can sometimes be unclear where different types of waste should sit on the hierarchy (PC 2006, pp. 145–146; Van Ewijk and Stegemann 2016, pp. 125–156). At its worst, strict adherence to the hierarchy could lead to perverse outcomes and greater environmental harm where, for example, more resources are consumed in maintaining a product for reuse, instead of disposing it to landfill. Other structural barriers can also prevent the movement of different waste streams higher up the hierarchy, such as limitations on Australia’s recycling capacity (section 7.5).

E-waste in landfill

As part of the National Waste Policy’s focus on the waste hierarchy, much of Australia’s e-waste management policy aims to divert e-waste up the hierarchy, from landfill disposal towards recycling. Half of Australia’s e-waste was landfilled in 2018-19 (section 7.1). Disposing e-waste to landfill can generate costs to the environment, human health and social amenity (as well as forgoing the value of scarce resources within e-waste), but these external costs can be reduced through adequate regulation and good landfill management.

Disposing e-waste to landfill can generate environmental and health costs ...

A key environmental and health concern associated with e-waste in landfills is contaminated waste water, or ‘leachate’ (box 7.5). Landfill leachate has been found to contain roughly 200 different hazardous substances, all of which are detrimental to the health of the environment, with some also deemed to be a risk to human health (Mukherjee et al. 2015, p. 5), as discussed above. E-waste is a large source of contaminants within leachate — it has been estimated to supply 70 per cent of the heavy metals and 30 per cent of polybrominated diphenyl ethers (PBDEs) found in landfill leachate (Kiddee et al. 2014, p. 2293).

The risk of direct exposure to leachate is likely to be very low, but there may be risks associated with indirect exposure. For example, there is some evidence that landfill leachate containing contaminants found in e-waste has polluted groundwater. An assessment of groundwater near South Australian landfills with limited leachate management systems found levels of aluminium, arsenic, iron, nickel and lead that exceeded Australian drinking water guidelines (Kiddee et al. 2014, p. 2292), although the proportion of contaminants that came from landfilled e-waste is unclear. Depending on the use of groundwater and its

filtration process,⁷³ contamination could lead to a range of health and environmental issues (as discussed in section 7.2).

Box 7.5 Leachate from e-waste

Leachate refers to liquid that has passed through solid waste and may be contaminated with metallic, organic and inorganic compounds and toxins (PC 2006, p. xxi). Water forming leachate can come from rainfall or other liquids within landfilled waste.

E-waste leachate generally contains: metals and heavy metals (such as arsenic, cadmium, chromium, copper, lead, nickel and zinc); metal oxoanions (such as arsenate, chromate and selenate); and brominated flame retardants (such as polybrominated diphenyl ethers, or PBDEs) (Dagan et al. 2007, p. 169; Kiddee et al. 2014, pp. 2294–2295; PC 2006, p. 74).

The composition and volume of leachate is determined by factors such as:

- landfill climate and geological conditions (including rainfall and groundwater)
- landfill management and operation (including regularity of waste compaction, liquid waste disposal and waste pre-treatment) and age
- landfilled waste characteristics (including initial moisture content, density and chemical composition) (Mukherjee et al. 2015, pp. 7–8).

There is also some evidence that mixing disposed e-waste and municipal waste (general household rubbish) can increase the toxicity of leachate, as organics in municipal leachate can increase the leachability of PBDEs and other brominated flame retardants found in e-waste (Kiddee et al. 2014, p. 2302).

Disposing e-waste (and other waste) to landfill can also result in a loss of social amenity for surrounding neighbourhoods. The expansion and filling of landfills can cause noise, litter and increased traffic congestion, reducing social amenity. In 2006, the Commission estimated that households and businesses close to landfills faced a loss in amenity of less than \$2 per tonne of general waste added (2020 dollars), depending on landfill management (Commission analysis, based on PC 2006, pp. 75–76). Other estimates of this loss of amenity suggest it is between \$1 and \$13 per tonne of general waste (2020 dollars) (Commission analysis, based on BDA Group 2009, pp. 41–42). Given its low population density, Australia is also unlikely to run out of suitable landfill space in the future, although transport costs may increase as landfill sites are pushed out of growing cities (PC 2006, pp. 108–109).

Other environmental and health hazards associated with e-waste in landfill include dust pollution, fire risks and the generation of greenhouse gas emissions (section 7.2).

The combined costs of these hazards are estimated to range between \$11 and \$17 per tonne of e-waste disposed to landfill (table 7.2), largely due to the estimated cost of leachate.

⁷³ Groundwater has a range of uses: irrigation, agriculture and industrial uses; watering private gardens and public parks; and bottling for sale as drinking water. It also feeds into lakes and other surface water bodies (Geoscience Australia 2013).

However, the Commission has not found accurate estimates of the costs of environmental and health damage caused by dust pollution or fire risks specific to e-waste landfill disposal.

... but good management and regulation can reduce these impacts

To prevent or reduce these kinds of risks, Australian landfills are subject to a range of regulations and guidelines, determined by State and Territory Governments (SECRC 2018, pp. 27–31). In general, these regulations aim to ensure that Australian landfills feature industry best-practice systems and management techniques to reduce risks, such as being sited in a geographically suitable location — for example, on stable land (Tas DPIWE 2004, p. 17) or away from residential zones or dwellings (EPA NSW 2016, p. 4). Well-managed landfills are also designed using long-lasting liners,⁷⁴ leachate collection systems, gas extraction facilities, and feature post-closure management, such as maintenance of leachate and drainage systems, monitoring of surface and groundwater, and revegetation (NT EPA 2013, p. 47).

As such, Australian landfills are generally well-managed, offering considerable protection from pollutants and other costs for the community (PC 2006, p. 75; SECRC 2018, p. 30). This broadly effective management and regulation of Australia’s landfills is one explanation for the relatively low estimates of external costs from e-waste in landfill (table 7.2).

High-quality landfill disposal also generates financial costs. These costs are associated with waste collection and transport, land purchase and site preparation, capital investment (equipment and buildings), and landfill operation (such as labour). There are also regulatory costs from site preparation, ongoing environmental management, and post-closure rehabilitation and aftercare (BDA Group 2009, p. 10). Recent estimates find total landfill management costs to be about \$12 to \$22 per tonne of e-waste landfilled (in 2020 dollars), with costs varying within this range depending on the above factors (table 7.2). Previous work by the Commission in 2006 estimated landfill disposal costs for general waste to be \$25 per tonne (\$33 per tonne in 2020 dollars) (Commission analysis, based on PC 2006, p. 70).

There is also variation in landfill quality across and within jurisdictions — for example, in the past, Queensland’s landfill management and regulatory practices have been singled out by industry bodies for being relatively lax in comparison to the regulatory requirements of surrounding jurisdictions (SECRC 2018, pp. 31–32). Moreover, some older or smaller landfills may not meet updated guidelines for their relevant jurisdictions or modern best-practice design (PC 2006, pp. 173–185; WCS 2010, p. 11; Xu, Rudolph and Greenfield 1999, pp. 172–174).

Waste management services are also not provided equally across urban, regional and remote areas in Australia (PC 2006, p. 185). A review of waste management and its effect on the health of Aboriginal and Torres Strait Islander people in regional and remote communities sponsored

⁷⁴ Accepted landfill liners include single, composite or double liner systems — for instance, in the Northern Territory, all medium and large landfills are required to have a composite liner system including a sub base, clay liner, plastic geomembrane and drainage layer/leachate collection system (NT EPA 2013, pp. 35–37).

by WasteAid and the Swinburne University of Technology found that poor waste management was placing community health and the local environment at risk. Key issues with waste management included collection service irregularity, limited landfill maintenance and inadequate management of hazardous wastes (Seemann, McLean and Fiocco 2017, pp. 17–26).

Table 7.2 Estimated costs of landfilling and recycling e-waste
Per tonne^a

<i>Type of cost</i>	<i>Managing e-waste in Victoria: Policy impact assessment (DELWP 2017)</i>	<i>Decision regulation impact statement: Televisions and Computers (PwC and Hyder Consulting 2009)</i>
Environment and health impacts of landfill	\$16 – 17	\$11 – 12 (includes amenity impacts) ^b
Value of landfilled reusable materials	\$332 – 487	\$140 – 164
Landfill management costs	\$16 – 22	\$12
Costs of collecting and processing e-waste	\$490 – 523 (includes sorting and transport costs)	\$1198

^a Estimates have been inflated to 2020 Australian dollars. ^b This estimate of the environmental and health impacts of landfill was not used in the final cost–benefit analysis. Instead, the results relied on a willingness to pay measure equivalent to \$1186 per tonne of e-waste recycled (assuming a 50 per cent recycling rate, inflated to 2020 dollars — box 7.1).

The regulation of e-waste in landfills varies across jurisdictions

Despite Australia’s largely effective landfill regulation and management, some jurisdictions (Victoria, South Australia and the ACT) have banned most or all e-waste from landfill disposal.⁷⁵ These bans were primarily to reduce the residual hazardous risks that e-waste poses, but also as a mechanism to encourage and support the e-waste recycling industry (DELWP 2017, p. 32). Although these landfill bans are encouraged by the National Waste Policy Action Plan (Australian Government 2019, p. 14), it is not clear whether they are a cost-effective policy solution. For example, all options considered in Victoria’s impact assessment were expected to have annual net costs (costs greater than benefits) by 2035 (the final year of the evaluation period). However, the total benefits of the option that eventually proceeded (a ban alongside a ‘medium level’ of access to collection services) were estimated to outweigh total costs over the full evaluation period (2017–2035), with this option expected to deliver a ‘significant improvement’ to e-waste recycling rates (DELWP 2017, pp. i–iii). Bans can also create unintended consequences (such as stockpiling or unlawful exports) if there is not sufficient capacity for the additional e-waste in domestic recycling (discussed in section 7.5). Further, bans can have considerable enforcement issues for some e-waste items

⁷⁵ South Australia has banned all e-waste, including appliances, white goods and toys (EPA SA 2021). The ACT has banned computers and televisions (ACT DESD 2011, p. 26). Victoria has banned all e-waste from landfill, and defines e-waste as ‘any waste item that uses a plug, battery or power cord’ (EPA VIC 2020b).

that are disposed by households in kerbside bins (DELWP 2017, p. 38). As Local Government New South Wales noted:

E-waste can end up in the domestic waste stream predominantly in the kerbside general waste bin. According to a 2019 Southern Sydney Regional Organisation of Council's kerbside waste audit of 10 metropolitan councils household's general waste bin, electrical items and peripherals make up 1.17 per cent of the bin by weight and are consistently the most common hazardous items found in the domestic waste stream along with batteries. (sub. 97, p. 7)

In jurisdictions where e-waste is not banned from landfill, levies on waste (including e-waste) are often used to discourage landfill disposal. These levies, which are charged for each tonne of waste landfilled, are determined by State and Territory Governments and are collected from landfill operators (Read and Serpo 2019, p. 7; SECRC 2018, pp. 43–44), with the levy often passed onto landfill users through gate fees.

In principle, landfill levies can internalise landfill disposal externalities (PC 2006, pp. 220–221), reducing the quantity of e-waste disposed to landfills and increasing recycling rates (SECRC 2018, p. 45). In practice, this is difficult to implement. For one, few landfill levy rates take into account variations in externalities caused by different waste types, landfill types and landfill locations (PC 2006, pp. 222–226). E-waste is typically covered by levies on general or municipal waste,⁷⁶ and smaller or more remote landfills (with greater environmental and health risks, discussed above) are normally exempt from levies (Read and Serpo 2019, p. 8). Further, current levy rates are much higher than estimated externalities — ranging up to \$146 per tonne (NSW EPA 2020b). Although these higher rates may generate additional government revenue or increase waste diversion, they may generate worse outcomes for the community by increasing stockpiling, illegal disposal or unlawful exports (PC 2006, pp. 223–224) (discussed further in section 7.5). Levies may also encourage waste managers to transport waste long distances to landfills with lower levies (Read and Serpo 2019, p. 31).⁷⁷

⁷⁶ Some states, such as Queensland, also levy higher rates on the hazardous materials commonly found in e-waste, though not on intact or partly disassembled e-waste (Queensland Government 2018, 2020).

⁷⁷ The Commission has previously found that, as a mechanism to achieve waste diversion targets, landfill levies are not very efficient, given price signals seldom reach households for municipal waste (2006, pp. 222–226). There is considerable evidence to suggest that landfill levies are an effective revenue raising measure though — for example, New South Wales was estimated to raise about nine times more revenue from landfill levies than was required to cover the cost of landfill waste management in 2018-19 (Read and Serpo 2019, p. 11) — but the narrow revenue base can still create distortions in behaviour (PC 2006, pp. 222–226).

DRAFT FINDING 7.1 E-WASTE IS A SMALL BUT GROWING WASTE STREAM

Annual e-waste generation is growing relatively quickly (more than doubling by weight between 2009-10 and 2018-19), but is a small share (less than one per cent by weight) of total waste generated in Australia.

Information on e-waste is limited, but available data suggests that:

- the main sources of e-waste (by weight) over the past decade were tools, washing machines, air conditioners, small domestic appliances (such as adapters, irons and clocks), cooking appliances (such as food processors and grills), and cathode ray tube televisions
- solar panels and lithium-ion batteries are expected to generate growing quantities of e-waste over the coming decade.

Although e-waste contains some hazardous materials that can be harmful to the environment and human health, Australia's landfill management systems and regulations are generally effective in substantially reducing these impacts (particularly in newer and larger landfills).

7.4 E-waste product stewardship schemes

E-waste recycling is promoted by the Australian Government through national product stewardship schemes, which can be voluntary or regulated by the Australian Government. Product stewardship is an approach to manage the environmental, health and safety impacts of products, including electrical and electronic products that become e-waste. It promotes the shared responsibility of these impacts between consumers, producers, manufacturers and retailers across the full life cycle of a product, including from sourcing raw materials to manufacturing and distributing products to its use and end-of-life management (Ley 2020, p. 2).

A national approach to product stewardship schemes was established in the *Product Stewardship Act 2011* (PSA), which has since been replaced by the *Recycling and Waste Reduction Act 2020* (WRA). Broadly, the WRA maintains the previous approach and structure of product stewardship schemes with some changes as recommended in a recent review of the PSA, including a stronger lifecycle approach to product stewardship (box 7.6). Several inquiry participants noted that the WRA has a focus on durability, repairability and reusability of products, as well as end-of-life disposal (DIA, sub. 108, pp. 3–4; NSROC, sub. 117, p. 2; WMRR, sub. 85, p. 3), but also noted that 'more needs to be done to turn aim into action' in regards to improving product durability, repairability and reusability (ALGA, sub. 79, p. 3).

Box 7.6 **The Recycling and Waste Reduction Act 2020**

The *Recycling and Waste Reduction Act 2020* (WRA) provides a national waste management and recycling framework for Australia, replacing the *Product Stewardship Act 2011* (PSA).

The Bill will encourage a circular economy for waste in Australia by enhancing voluntary product stewardship, supporting businesses to realise the full value of recyclable materials and to work towards more sustainable resource use ... (Ley 2020, p. 2)

There are several differences between the PSA and WRA:

- The PSA was solely focused on establishing a product stewardship framework (Ley 2020), while the WRA also includes commitments from State and Territory Governments to regulate waste exports (such as glass, paper, tyres and some plastics) (Farrell 2011, p. 2).
- The Commonwealth Minister for the Environment will continue to publish a priority list (as established by the PSA) online and table it in Parliament to notify industry of products being considered for product stewardship schemes. The WRA requires that the Australian Government can only establish a co-regulatory or mandatory scheme once a product has been on the list for 12 months (prior to the end of the 12 months, industry can establish its own voluntary scheme) (Farrell 2011, pp. 64–66). Products relevant to e-waste on the list for 2020-21 include batteries, photovoltaic systems and 'electrical and electronic products' (DAWE 2020a).
- Outcomes for co-regulatory schemes have been expanded to also include designing products to be more easily repaired. Previously established outcomes (related to avoiding waste generation, use of hazardous substances and waste management) remain consistent (Farrell 2011, pp. 67, 73).

The WRA maintains the three types of accredited product stewardship schemes that were previously established in the PSA.

- *Voluntary schemes* are established by industries, which may choose to apply for government accreditation. Accredited schemes, such as Mobile Muster, are required by government to publish annual outcomes (such as collection and recycling rates) (WRA, ss. 70-71).
- *Co-regulatory schemes* are established through regulation passed by the Australian Government, which makes importers, manufacturers and distributors of the relevant products 'liable parties' (WRA, ss. 76-82). Regulation defines the scope, minimum outcomes (including the proportion of products that need to be recycled) and operation requirements of the scheme, but industry is largely left to determine how these are achieved. The National Television and Computer Recycling Scheme (NTCRS) is the only co-regulatory scheme for e-waste.
- *Mandatory schemes* are also established through Australian Government regulation. These schemes place a legal obligation on industry to take certain actions with little/no discretion on how requirements are to be met (WRA, ss. 92-94). Mandatory provisions have not been used to date under either the new or old Act.⁷⁸

⁷⁸ Mandatory schemes covering oil recycling and managing ozone depleting substances exist under separate Commonwealth legislation (DAWE 2020d, p. 6).

At present, a range of product stewardship schemes recycle different types of e-waste. This includes existing co-regulatory and accredited voluntary schemes — the NTCRS, Mobile Muster and the anticipated battery stewardship scheme — as well as unaccredited voluntary product stewardship schemes such as Cartridges 4 Planet Ark and general recycling programs run by private companies.

Current e-waste product stewardship schemes

The National Television and Computer Recycling Scheme (NTCRS)

The NTCRS is a co-regulatory product stewardship scheme established through the Product Stewardship (Televisions and Computers) Regulations 2011. The NTCRS provides access to industry-funded collection and recycling services for televisions, computers, printers and computer parts. The three objectives of the scheme are to: reduce waste to landfill (especially hazardous materials found in e-waste); increase the safe, scientific and environmentally sound recovery of reusable materials; and provide convenient access to collection services across Australia (DAWE 2021d).

Manufacturers, importers and distributors of products covered by the scheme are considered ‘liable parties’ if they manufacture, sell or import relevant products over certain thresholds.⁷⁹ Liable parties are required to fund the scheme as a member of a co-regulatory body of their choice (DAWE 2021d). Between 2012 and 2015 the cost of running the NTCRS was reported to be roughly \$134 million (DAWE 2020d, p. 15), suggesting a running cost for this time period of roughly \$34 million per year.

Three industry-run co-regulatory bodies are currently approved to administer the scheme — the Australia and New Zealand Recycling Platform (ANZRP), Electronics Product Stewardship Australasia (EPSA) and E-Cycle Solutions. Approval for a fourth co-regulatory body — MRI PSO — was cancelled by the Minister for the Environment on 15 April 2021 (DAWE 2021a). These bodies are responsible for achieving scheme outcomes set and monitored by Government, as determined by the number of products manufactured, imported or sold by their liable parties (DAWE 2021d). The co-regulatory bodies compete to attract liable parties as members, and use their funding to provide collection and recycling services. To provide these services, bodies often partner with both domestic and international recycling services (Dias 2019, p. 129).

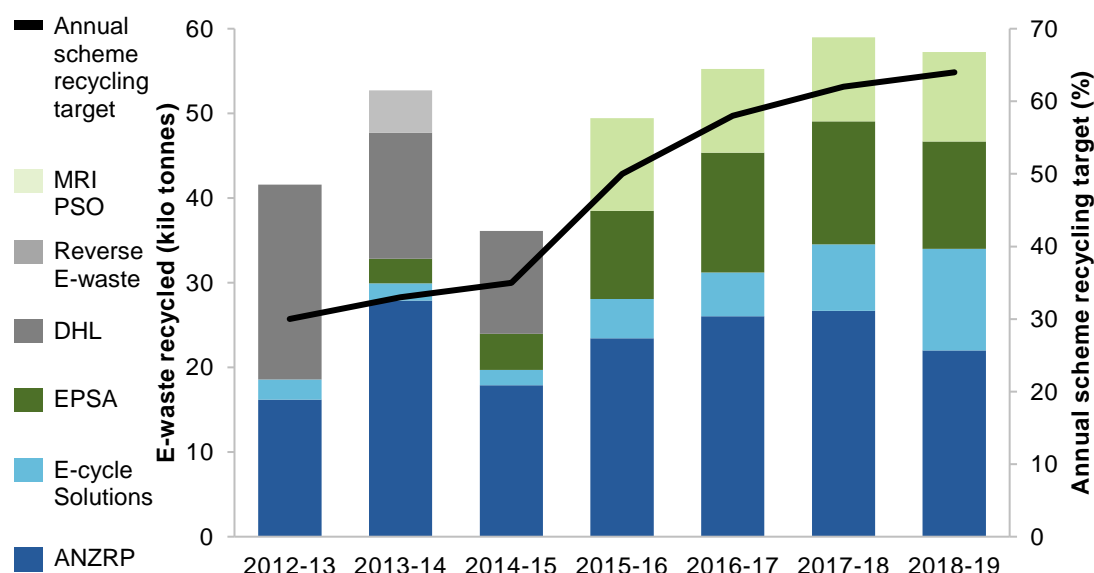
Between 2012-13 and 2018-19, the NTCRS recycled more than 350 kilo tonnes of e-waste (figure 7.6). In 2018-19, the NTCRS recycled 57.3 kilo tonnes of e-waste, or 10.6 per cent of total e-waste generated.⁸⁰ In the same year, all co-regulatory bodies reported meeting the requirement for their recycling process to recover at least 90 per cent of the materials from

⁷⁹ Minimum thresholds are 5000 units of televisions, 5000 units of computers or printers and 15 000 units of computer parts or peripherals per year (DAWE 2021c).

⁸⁰ Commission analysis, based on ABS (2020a) and annual reports from NTCRS co-regulatory bodies, found at DAWE (2020e).

recycled e-waste (ANZRP 2019, p. 4; E-cycle Solutions 2019, p. 7; EPSA 2019, p. 3; MRI PSO 2019, p. 3).

Figure 7.6 E-waste recycled annually by NTCRS bodies



Sources: Commission analysis, based on annual reports from NTCRS co-regulatory bodies, found at DAWE (2020e); Product Stewardship (Televisions and Computers) Regulations 2011 (schedule 2).

The Australian Government sets the NTCRS e-waste recycling target, as well as the targets for individual bodies under the scheme. Currently, the whole scheme is required to recycle 66 per cent of total in-scope waste products, which in 2018-19 equated to 57 kilo tonnes of e-waste.⁸¹ This total target has increased since 2012-13 from 30 per cent (DSEWPC 2011, p. 3), but this has been slower than expected to ‘ensure stability and on-going capacity in the e-waste recycling industry’ (DAWE 2020d, p. 19). Originally, the scheme was going to have a recycling target of 80 per cent in 2021-22 (DSEWPC 2011, p. 3), but this has been delayed to 2026-27 (DAWE 2020d, p. 14).

The targets for individual co-regulatory bodies are determined by the proportion of in-scope products that are manufactured, imported or sold by their members (Product Stewardship (Televisions and Computers) Regulations 2011, r. 3.04). In 2018-19, all four bodies met their targets (ANZRP 2019, p. 9; E-cycle Solutions 2019, p. 9; EPSA 2019, p. 3; MRI PSO 2019, p. 4).

⁸¹ Commission analysis, based on annual reports from NTCRS co-regulatory bodies, found at DAWE (2020e). Total in-scope waste products is a proportion of the average annual weight of relevant products purchased over the previous 3 years (90 per cent for televisions, 72 per cent for computers, 71 per cent for printers and 88 per cent for computer parts and peripherals) (Product Stewardship (Televisions and Computers) Regulations 2011, r. 3.04).

Mobile Muster

Mobile Muster is a national voluntary product stewardship scheme established by the Australian Mobile Telecommunications Association (AMTA). Currently, the scheme's in-scope products include waste mobile phones and their chargers, batteries and accessories, as well as wireless mobile modems and smartwatches (Mobile Muster 2017, p. 18). The AMTA established Mobile Muster in 1998 (AMTA, sub. 130, p. 2), and it became an accredited national product stewardship scheme in 2014 (Mobile Muster 2021a). Mobile Muster lists its four objectives as:

- keeping mobiles out of landfill and optimising resource recovery
- creating awareness and educating the community on mobile phone recycling
- enabling our members to deliver a sound product stewardship scheme
- delivering an effective, equitable and sustainable program for its members (Mobile Muster 2020a, p. 1).

As a voluntary industry-run and funded scheme, key parties include the AMTA (which manages the program for members), industry members (which include handset manufacturers, network carriers and accessory manufacturers and distributors⁸²), collection network members and recycling partners.

Between 1998 and 2019, Mobile Muster collected and recycled slightly more than 1500 tonnes of mobile phones and accessories (AMTA, sub. 130, p. 4). Mobile Muster reported its recycling process recovered 98 per cent of component materials (2020a, p. 5).

To run its collection service, Mobile Muster has a network of 3500 public drop off points, which includes retailers, repair shops, schools, workplaces, community organisations and post offices (Mobile Muster 2020a, p. 12, 2021a). The program also allows for individuals to have a collection satchel posted to their address, which can be filled and posted back to Mobile Muster for recycling (Mobile Muster 2020a, p. 12).

Other product stewardship and recycling schemes

There are also several unaccredited national product stewardship schemes currently running (including schemes that are no longer accredited), as well as a new accredited scheme expected to commence soon (box 7.7).

⁸² Members currently funding Mobile Muster include: Alcatel, Apple, Google, HMD Global, HTC, Huawei, Motorola, Oppo, Optus, Samsung, Telstra, TPG Telecom, vivo Mobile and ZTE (AMTA, sub. 130, p. 2).

Box 7.7 Other product stewardship schemes

Several e-waste product stewardship schemes operate domestically.

- In 2020, the Battery Stewardship Council was approved by the Australian Competition and Consumer Commission (ACCC) to introduce a levy on the sale of batteries (4 cents per 24 grams) to fund a national battery product stewardship scheme. The funds raised by the levy will be distributed among battery collectors and recyclers (ACCC 2020i). The scheme intends to cover all batteries (including lithium-ion batteries), except for lead acid batteries and those already covered by current product stewardship schemes. Conditional approval for the levy has been given until September 2025 (ACCC 2020i), but it is unclear when the scheme will begin to collect batteries, or when it might gain accreditation under the new national *Recycling and Waste Reduction Act 2020*.
- Cartridges 4 Planet Ark is a recycling and remanufacturing program for Australian printer cartridges. Since 2003, it has recycled more than 46 million printer cartridges through a large network of public drop-off sites and registered workplace collections (Planet Ark 2021a). The program's recycling partner Close the Loop disposes zero waste to landfill and recycles cartridges into outdoor flooring, road surfaces, fencing, garden beds, pens and ink (Planet Ark 2021a, 2021b).
- FluoroCycle is a collection and recycling scheme for mercury-containing lamps established by the lighting industry in 2010 (Lighting Council Australia 2016, p. 3). The scheme gained temporary accreditation as a voluntary product stewardship scheme in 2014 (DAWE 2021f) but is not currently an accredited scheme. In 2015–2016, the scheme collected 1200 tonnes of lighting waste (estimated by the Lighting Council of Australia to be 12 per cent of total waste lighting), leading to the recycling of 117 kg of mercury (Lighting Council Australia 2016, pp. 5–6). The program is focused on waste lighting from commercial and public spaces, and works with almost 300 signatories for collection (Lighting Council Australia 2016, p. 8).

Other countries also use product stewardship or other regulation to promote e-waste recycling.

- In Switzerland, consumers are required to return waste electrical and electronic products to collection points. Consumers are also charged an 'advanced recycling fee' at the point of sale to fund e-waste collection, transport and recycling (up to AU\$40). Importers and manufacturers are responsible for collecting and recycling e-waste (and fund part of the costs), and retailers host e-waste collection points (Islam, Dias and Huda 2018, pp. 611–614).
- Japan regulates the role of consumers, manufacturers, importers and retailers in recycling e-waste. Consumers are required to recycle their e-waste and pay a fee at the time of disposal to transport and recycle large appliances (including air conditioning units, televisions and refrigerators). Manufacturers and importers outsource recycling services and liaise with retailers to establish collection points (OECD 2016, pp. 264–267).

Many individual manufacturers and recyclers also encourage recycling through takeback schemes, typically offering payment or some other reward to consumers. For example:

- Apple takes back any Apple products and some Android products for free recycling, with some (generally newer) e-waste products exchanged for online or in-store credits or gift cards (Apple 2021d)
- Toyota Australia provides a rebate to customers who return hybrid car batteries for recycling (Toyota Australia, sub. 118, p. 9)

- Normal posts a free satchel for consumers to return unwanted or broken sex toys for free recycling in exchange for a \$20 store credit (Normal 2021)
- Dell collects up to 50 kg of waste notebooks, monitors and printers (of any brand) for free recycling from new customers (Dell 2021).

There is also a well-established commercial recycling industry for white goods, with a mix of schemes. In particular, white goods are often recycled through retailer or service technician takeback schemes, through state and territory-run recycling schemes, or when individuals take products to metal recyclers (KPMG 2014b, pp. 20–26). For example, an energy provider in the ACT runs a fridge buyback scheme, where individuals who have their fridge or freezer picked up for recycling receive a \$30 credit on their next electricity bill (ActewAGL 2021).

States and Territories also provide funding to encourage the development of new product stewardship schemes (box 7.8).

Box 7.8 State and Territory funding for e-waste recycling

Some State, Territory and local governments also operate or fund separate e-waste collection and recycling programs, as part of broader goals to reduce waste and promote the circular economy. For example:

- The NSW Government announced a preliminary round of funding to the value of \$10 million to establish a recycling scheme for solar panels and battery systems. Additional funding rounds are expected at a later date (NSW EPA 2020a).
- The Victorian Government recently banned the disposal of e-waste to landfill and is providing two rounds of e-waste infrastructure grants to the value of \$15 million to 'build the capacity and capability' of e-waste managers and improve e-waste collection, storage and reprocessing standards. The first round delivered upgrades to 123 local government e-waste transfer stations and resource recovery centres and 50 e-waste hubs (Sustainability Victoria 2021).
- The Western Australian Government has provided \$1 million in funding to support research into processes for e-waste reuse and recycling. Funding has also been provided to local governments and private companies to provide e-waste collection events and permanent drop-off locations (Western Australian Government 2021).

The purpose and net benefits of product stewardship schemes

There may be a role for government regulation to support product stewardship schemes where a market failure or policy problem exists and the benefits of intervention are expected to outweigh the costs across the entire community (section 7.2).

With respect to voluntary industry-led schemes (accredited or not), industry participants have made a willing and collective choice that the benefits of participation (including to brand reputation from meeting corporate environmental and social responsibility goals)

outweigh the costs of being involved in the scheme. However, the effectiveness of these schemes is another matter (discussed below).

The case for government intervention through additional co-regulatory or mandatory schemes is more complex. Although co-regulatory or mandatory product stewardship schemes can help to overcome some issues with voluntary schemes — such as ‘free-rider’ problems (ANZRP, sub. 56, p. 6; GISA, sub. 113, attach. 1, p. 11), difficulties with industry coordination, and limited oversight of scheme effectiveness⁸³ — it is still necessary to ensure that co-regulatory or mandatory products stewardship schemes deliver net benefits to the community. Analysis prior to implementation can help to determine whether these net benefits exist.⁸⁴

However, analyses do not always show that government-regulated product stewardship schemes are worthwhile for the community. For example, the most recent assessment of a potential product stewardship scheme for refrigerators, air conditioners and freezers did not lead to implementation, as the costs of co-regulatory and mandatory schemes were found to outweigh community benefits (KPMG 2014a, pp. 6–9). The costs included the financial costs of running a retailer-based takeback scheme, costs of disassembling and collecting products for recycling, and regulatory compliance costs (for industry and government). The benefits included reductions in landfill management and environmental costs, metal and plastic resource recovery, and reductions in emissions from escaped refrigerant gases (KPMG 2014a, pp. 6–9).

Even where headline results suggest that the benefits of introducing a scheme outweigh the costs — as with the analysis that led to the introduction of the NTCRS (PwC and Hyder Consulting 2009) — careful interpretation of results may be necessary. The finding that benefits outweighed costs for the NTCRS relied on the use of WTP measures (at \$1186 per tonne of e-waste recycled — table 7.2 above). However, as discussed in section 7.2, WTP estimates can have significant limitations. As an alternative to the WTP measures, the NTCRS analysis also estimated values for the environmental and health costs of e-waste, which were much lower (\$11–12 per tonne — table 7.2), but these were not relied upon in the headline results. This raises considerable uncertainty about whether the NTCRS originally generated net benefits to the community.⁸⁵

⁸³ ‘Free-rider’ issues can occur where manufacturers or importers refuse to join and fund voluntary industry schemes, despite their products being collected. Industry coordination can be difficult if there are many individual manufacturers and retailers selling a type of product and small suppliers can quickly enter and exit the industry.

⁸⁴ In its 2006 waste management inquiry, the Commission recommended that a panel of independent scientists should review the scientific evidence of a product’s alleged environmental and health impacts to ensure there is a thoroughly-researched and clearly-articulated case for intervention (2006, p. 311).

⁸⁵ In 2006, the Commission also highlighted several other concerns about the implementation of a computer and television recycling scheme, including: limited evidence on environmental and health concerns for electrical products; assumptions (with limited evidence) that the benefits of resource recovery and waste avoidance will outweigh financial costs; limited awareness of the already available recycling facilities; high labour costs of disassembly; and issues with monitoring and enforcing scheme participation from small-scale manufacturers and importers moving quickly in and out of the market (2006, pp. 295–300).

However, the costs of continuing with the NTCRS now are not the same as the costs of implementing it a decade ago. Since the implementation of the NTCRS, collection and recycling costs have fallen. For example, between 2012-13 and 2018-19 the NTCRS co-regulatory body ANZRP has almost halved its costs of recycling e-waste — from \$1500 to \$700 per tonne of e-waste recycled (ANZRP 2019, p. 5), compared to the initial estimate for the NTCRS of \$1198 per tonne (PwC and Hyder Consulting 2009, p. 113).⁸⁶ ANZRP credited its cost reduction to ‘improved workflow and logistics efficiencies’ (2019, p. 7).⁸⁷ More broadly, increased economies of scale from both collection and downstream recycling partners, improved technology and innovation, and competition between co-regulatory bodies are also likely to reduce the cost of e-waste recycling. Further improvements to the existing product stewardship schemes (discussed below) may help to make net benefits to the community even more likely.

Current scheme design may be leading to adverse incentives

The current design of the NTCRS may be generating adverse incentives that limit the capacity of the scheme to either reduce e-waste or provide high quality recycling and collection services.

Product stewardship is currently limited to recycling

At present, there are minimal incentives for the NTCRS to do anything other than end-of-life recycling of e-waste. This could result in otherwise functional products being dismantled and destroyed for their component materials, rather than being reused after repair.

The NTCRS was designed as a recycling scheme, with co-regulatory bodies required to meet annual *recycling* targets, where products only count if they are recycled to a specified standard or its equivalent (DAWE 2020d, p. 22). Bodies that fail to meet targets are required to collect the shortage the following year and may be at risk of losing their approval to operate as a co-regulatory body (as well as potentially losing liable party members and any associated funding to other more competitive bodies). Similarly, despite Mobile Muster’s survey suggesting roughly 60 per cent of replaced mobile phones are still working (Mobile Muster 2020b, p. 6), the program sends all collected phones for recycling, although it does encourage some repair and reuse by advertising reuse schemes on its website (Mobile Muster 2020a, p. 9).

⁸⁶ Values from ANZRP (2019, p. 5) and PwC and Hyder Consulting (2009, p. 113) converted to 2020 dollars using ABS (2021).

⁸⁷ ANZRP also suggested that recycling costs would halve if the amount processed each year doubled, as the additional volume could justify ‘significant investment’ in mechanical shredding and separation (sub. 56, p. 5). Barriers to additional recycling capacity are discussed in section 7.5.

Changing scheme outcomes to include recycling *or* reuse (including through repaired e-waste products) could reduce e-waste by extending product lifetimes, supporting the repair and resale industry and generating additional environmental benefits. Such changes were supported by the recent review of the PSA (DAWE 2020d, p. 21) and are one of the stated objectives of the new WRA. Several inquiry participants supported changes to promote reuse (specifically for the NTCRS), including some local government associations (ALGA, sub. 79, p. 3; LGNSW, sub. 97, p. 8; NSROC, sub. 117, pp. 17–18) and an independent repairer (Mend it Australia, sub. 101, p. 5). For example, the Australian Local Government Association suggested that ‘product repair and re-useability must be made an integral part of Australia’s product stewardship toolkit’ (sub. 79, p. 3).

Reuse could be implemented in the NTCRS in two main ways.

- A specific reuse target that sits alongside annual recycling targets, as is currently used in Spain, which has specific reuse targets for household appliances (3 per cent) and IT equipment (4 per cent) alongside a broader 50 per cent recycling target for all waste (ANZRP, sub. 56, p. 7). However, a specific reuse target may impose a net cost on the community by requiring products to be reused, when it may be less costly to recycle.
- Scheme targets that are modified to count reuse *or* recycling outcomes, reducing barriers to reuse in the NTCRS, but not creating an obligation for any reuse (instead leaving it to negotiations between co-regulatory bodies and their liable parties to find the most efficient option between reuse and recycling). Although this is likely to lead to slower uptake of reuse outcomes than a specific reuse target, decisions on whether to reuse or recycle would be based on the most cost-effective option.

More broadly, a number of issues need to be considered prior to enacting change.

- Over a longer time period, some double-counting is inevitable and reasonable, as the purpose of reuse is only to extend the life of a product, not to make it last forever. However, activities that constitute ‘reuse’ would need to be clearly and carefully defined, to prevent any unreasonable double-counting of reused products (such as the same product being ‘reused’ and counted towards a target multiple times in a short period), as well as to meet relevant safety protocols in the repair sector (discussed in chapter 4). Standards for repair and reuse may be required, similar to how the NTCRS uses standards to ensure adequate recycling outcomes.
- Some inquiry participants supported exporting products for repair and reuse as part of an expanded NTCRS (such as ANZRP, sub. 56, p. 7). However, this can generate additional risks of adverse health or environmental outcomes, particularly as non-waste exports (notionally for reuse or repair) are already a known enforcement issue for e-waste export controls (section 7.5). Some exported products may also be recycled in the ‘informal’ sector in recipient countries (section 7.5) at the end of their extended lives (labelled a ‘disappointing’ outcome by the AIIA, sub. 127, p. 21). Given these risks, consideration could be given to excluding reuse exports to certain destinations — better monitoring and enforcement of exported e-waste may also be needed to identify and manage such risks (discussed in section 7.5).

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- Currently, there is a lack of evidence on the proportion of products in the NTCRS that could be reused and their potential resale value. Estimates from the United Kingdom and Germany on the proportion of collected e-waste that could be easily repaired for reuse varied between 13 and 63 per cent (Johnson, McMahon and Fitzpatrick 2020, p. 1181).
 - Concerns about data security may reduce consumer willingness to engage with the schemes if they involve reuse of their products. For these reasons, at least one former NTCRS co-regulatory body advertised its data wiping services and explained how data-wiping works in the recycling process (MRI PSO 2021b, 2021a).⁸⁸
 - It is not clear whether all industry participants in existing schemes have a strong incentive to support repair and resale of older products, as this may negatively affect the manufacturer or importer's profits from new sales (McMahon, Johnson and Fitzpatrick 2019, p. 1015). For changes to receive support from liable parties, NTCRS funding arrangements may need to be modified, such as through reused products being exempted from scheme fees (as recommended by LGNSW, sub. 97, p. 9).

However, careful scheme design should be able to minimise these risks, which suggests that at a minimum the Government should remove the unnecessary barriers to reuse that co-regulatory bodies currently face within the NTCRS (and any future co-regulatory or mandatory product stewardship schemes for e-waste).

DRAFT RECOMMENDATION 7.1 IMPROVING THE MANAGEMENT OF E-WASTE

The Australian Government should amend the National Television and Computer Recycling Scheme (NTCRS) to allow e-waste products that have been repaired or reused by co-regulatory bodies to be counted towards annual scheme targets.

The exact design features that need to be incorporated into the NTCRS to enable reuse options should be determined in consultation with the scheme's liable parties and co-regulatory bodies. The changes should be designed in a way that minimise any adverse incentives, including risks from:

- double-counting, where the same products cycle through the scheme without legitimately being reused
- unlawful exports for reuse that result in more products in the informal recycling sector, generating worse health and environmental outcomes.

Any future co-regulatory or mandatory product stewardship schemes should also include repair and reuse as options within their targets.

⁸⁸ Similarly, Mobile Muster advertises that all data on devices will be physically destroyed during the recycling process (Mobile Muster 2021b).

How reasonable are ‘reasonable access’ requirements?

As part of this inquiry, submissions from local government associations also raised concerns that the NTCRS fails to provide equitable service access in regional and remote areas, compared to the permanent access available in most metropolitan areas (LGNSW, sub. 97, p. 8; WALGA, sub. 86, pp. 3). This echoed concerns heard during the review of the PSA, which found remote collection services to be ineffective — for instance, more than 60 per cent of remote area collections failed to collect any e-waste between 2013-14 to 2017-18 (DAWE 2020d, pp. 18–19).

However, in 2018-19, three of the four co-regulatory bodies reported meeting their ‘reasonable access’ requirements (ANZRP 2019, p. 5; E-cycle Solutions 2019, p. 5; EPSA 2019, p. 4; MRI PSO 2019, p. 3), suggesting that, to the extent that there is a problem, the issue may instead lie with the NTCRS’ definition of ‘reasonable access’. The current definition requires varied levels of service across metropolitan, regional and remote areas, including at least one collection service in each town every year (for regional areas) or every two years (for remote areas) (Product Stewardship (Televisions and Computers) Regulations 2011, r. 3.03).⁸⁹

One co-regulatory body noted that bodies were not adequately advertising collection events, and timed their collection events in remote areas for the end and start of consecutive financial years to meet the requirements, which left areas without collection services for up to 20 months (ANZRP 2020, p. 33). The Western Australian Local Government Association noted that poor design in the NTCRS shifted ‘significant’ financial and organisational burdens onto local governments, including costs associated with negotiating collection events with co-regulatory bodies, contributing to the cost of recycling e-waste and disposing of collected out-of-scope products (sub 86, p. 3). Poor collection services may also increase incentives to stockpile, illegally dump or landfill e-waste (section 7.5), leading to negative environmental and health outcomes (particularly in remote communities that lack well-regulated landfills — section 7.3).

While the current regulatory requirements could be tightened — such as through stronger requirements for advertising, on-site signage, local government notification and collection event duration times, as suggested by ANZRP (2020, p. 33) — this would increase costs for all co-regulatory bodies (which could be passed on to consumers), and may also increase expenses for local and federal government (through monitoring and enforcement).

As an alternate solution, the ‘reasonable access’ requirements could be modified, to no longer require every co-regulatory body to run collection services in every region. There are a number of possible ways to do this — for example, through a government-supported

⁸⁹ Collection services can include events and collection stations where consumers submit products for recycling, locations that are used for consumers to submit products for recycling (that are also used for other purposes), and programs where consumers register products to be collected from a designated point within a specified time or post them for recycling (Product Stewardship (Televisions and Computers) Regulations 2011, r. 3.03).

co-operative arrangement between all co-regulatory bodies (MRI E-Cycle Solutions 2018, p. 3), or a tender process (possibly supported by subsidies for the most remote areas) to allocate a single co-regulatory body to each regional and remote area for a given period. The aim, regardless of the method used, would be to reduce duplication between collection services, while also improving the quality and frequency of services. As one former co-regulatory body noted, ‘the benefit of competition in driving innovation and cost effectiveness between arrangements in outer regional and remote areas is questionable’ (MRI E-Cycle Solutions 2018, p. 3).

The effectiveness of current schemes can be limited by data and accountability issues

Several other issues also have the potential to reduce the effectiveness of existing e-waste product stewardship schemes.

First, poor data collection can limit understanding of e-waste generation and flows and the effectiveness of current schemes. Data problems (outlined in section 7.1) mean it can be uncertain how much e-waste is being generated or how it is disposed of. Although costly to collect, better data — such as details on the types of e-waste generated — would assist in ensuring the annual collection targets for NTCRS co-regulatory bodies are accurate, as well as allowing for simple estimates of the effectiveness of voluntary schemes like Mobile Muster. It would also assist in determining the growth and associated costs of different products, allowing for more accurate prioritisation for any new product stewardship schemes.

Second, accountability issues have been raised regarding the NTCRS, which may create inconsistent assessments of co-regulatory bodies’ compliance with scheme requirements, and failure to identify poor practices.⁹⁰

- Co-regulatory bodies are largely reliant on downstream recyclers (which can include overseas recyclers) to recycle materials into a reusable form. However, bodies are not required to report on recycling completed by downstream partners (DAWE 2020d, pp. 15–23), and as such there is little or no understanding of the final destination of hazardous materials (Dias 2019, pp. 137–143). Further, co-regulatory bodies are not required to audit domestic or international downstream recyclers for quality assurance, and so it is unknown whether the full e-waste recycling process is meeting health and environmental standards (ANZRP 2017, p. 24; Dias 2019, pp. 126, 143).
- The Department of Agriculture, Water and the Environment (DAWE) has stated that it has limited resources to monitor the NTCRS (2020d, pp. 15–23). Inadequate monitoring could potentially result in double-counting of e-waste towards targets, stockpiling of e-waste and improper storage of hazardous wastes going unmanaged (Dias 2019, p. 136). It could also mean that some e-waste collectors and recyclers do not meet specified

⁹⁰ Accountability issues may also be leading to concerns that the competitive nature of the NTCRS is encouraging a ‘race to the bottom’, where sub-standard collection and recycling processes are used to reduce costs. These kind of concerns were raised in the review of the PSA (DAWE 2020d, pp. 15–16).

standards — for example, in 2018, an assessment of 148 Victorian e-waste collection and storage facilities found almost all sites did not meet the required health and safety requirements (the AS/NZS 5377) for at least one category of e-waste (Genever, Randell and Baker 2018, p. 5).

Third, voluntary industry-run product stewardship schemes (including government accredited schemes) face little accountability to meet self-determined collection or recycling targets, potentially limiting their effectiveness beyond improving brand reputation. For example, despite Mobile Muster’s annual collection targets only being about 10 per cent of all imported phones — compared to a broadly-equivalent target of 66 per cent for the NTCRS (discussed above) — the targets were not met in three of the four years up to 2018–2019 (Mobile Muster 2019, pp. 16–17).⁹¹ The Commission has previously raised concerns about the effectiveness of voluntary schemes, given that firms are expected to bear the cost of addressing a market failure without capturing any of the benefits to society (PC 2006, pp. 263–265).

The future of product stewardship

Ongoing growth in e-waste generation (section 7.1) may create new pressures on existing waste management systems — particularly for the types of e-waste that are growing the fastest (such as solar panels) — leading to calls for expanding the scope of existing product stewardship schemes, or creating new schemes for new products.

To some extent, this pressure is already leading to expansions of product stewardship schemes. For example, concerns about the hazardousness of batteries that are expected to become e-waste in the near future (comment 56; MTA Queensland, sub. 80, p. 3; WWF Australia, sub. 54, p. 2), led to the industry-led creation of the new scheme for battery stewardship to better manage battery-related risks. Under the WRA, the Minister for the Environment is also required to annually table a priority list of products to be considered for voluntary accreditation or co-regulatory and mandatory schemes in Parliament (s. 67), as well as determine whether voluntary schemes can gain government accreditation (ss. 70–71) and review co-regulatory schemes every five years (s. 86). Priority lists from previous years (under the PSA) have all included some form of e-waste, including batteries, air conditioners, refrigerators, solar panels and, more broadly, electrical and electronic products (DAWE 2013, 2014, 2015, 2016, 2017, 2020a).

Currently, the priority list suggests an expansion of the NTCRS to better cover electrical and electronic products, in part because co-regulatory bodies often report receiving out-of-scope products from members of the public (DAWE 2020a). Expanding the scope of the NTCRS to include other waste electrical and electronic products was also recommended in the recent review of the PSA (DAWE 2020d, p. 17). While the recommendation did not specify any particular products to be added to the scheme or how to navigate overlapping scope with

⁹¹ Mobile Muster appears to no longer publish its targets or performance for collections against imports, as of its 2020 annual report.

other schemes, there is some support for this approach (ALGA, sub. 79, p. 3; ANZRP, sub. 56, p. 5; LGNSW, sub. 97, p. 5). Mobile Muster has also recently received funding from DAWE to develop a business case for expanding its scope beyond mobile phones, accessories, wireless mobile modems and smartwatches into products not covered by current schemes (DAWE 2020c).

The costs and benefits of any new or expanded co-regulatory or mandatory product stewardship schemes need to be assessed prior to implementation. Based on past performance (discussed above), it is not apparent that new or expanded schemes would deliver net benefits to the community, given the sizeable costs involved in establishing and running schemes for select products.

Moreover, despite the small number of schemes currently operating, there is already a relatively high level of overlap between them. For example, the NTCRS recycles end-of-life printers and cartridges, while cartridges are the sole recycling product of Cartridges 4 Planet Ark. Mobile Muster and the NTCRS both recycle computer and mobile phone accessories such as chargers, headphones and small lithium-ion batteries, and these batteries are also covered by the new battery stewardship scheme. And in some cases, product stewardship schemes are duplicating work completed by their own industry partners (such as Apple supporting Mobile Muster while also running its own in-store program).

Further proliferation in the number of product stewardship schemes for e-waste could also risk generating added sorting costs for scheme bodies, as well as for local governments. Local governments have already reported incurring costs from disposing of out-of-scope products collected for recycling through the NTCRS (WALGA, sub. 86, p. 3). Increased coordination for collection and consumer outreach may reduce any out-of-scope collections and associated costs, but such coordination may require further government assistance, including funding from state and federal governments — for example, local governments could create one-stop-shop drop-off points to collect e-waste for all product stewardship schemes, as could participating retail businesses, similar to the collection points currently run by most Officeworks stores (Officeworks 2019, p. 28).

An alternative option is for existing and future product stewardship schemes to evolve into a single product stewardship scheme covering all types of e-waste (possibly with multiple bodies competing for funds from liable parties). Exploring the feasibility of this option was recommended in the review of the PSA (DAWE 2020d, p. vi). While conceptually simpler, this option is not without its challenges, such as establishing a transition path from the current schemes, developing economies of scale for items that are not readily recycled and coordinating among the hundreds of different manufacturers, importers and distributors who would be liable parties under a broader e-waste scheme. More fundamentally, it would also require an assessment of whether or not there is a need for government intervention across all products, as some recycling markets already seem to operate efficiently without regulation (for example, white goods recycling) and the benefits of recycling some products (especially those containing few hazardous or valuable materials) are unlikely to outweigh the costs.

7.5 Broader issues in Australia's e-waste management

Although Australia has a well-developed system for waste management (including for e-waste), there are broader issues that can limit recycling capacity and create incentives for stockpiling, dumping or the unlawful export of e-waste.

Australia's e-waste recycling capacity and barriers to expansion

Australia does not have the capacity to recycle all of its own e-waste. In 2010, Australia's e-waste recycling infrastructure was found to be limited to steel, plastics and glass. More complex electrical components, such as batteries, hard drives, keyboards and printed circuit boards were exported for recycling (WCS and Rawtec 2010, pp. 6–9). This may still be the case — Australian e-waste recyclers have reported using processes such as manual and automatic sorting and dismantling, shredding, magnetic separation and sieving, but do not use more 'high tech' processes, such as leaching (using liquids to drain metals or minerals from e-waste) or smelting (extracting metals through different heating and cooling processes) (Dias 2019, pp. 132–133).⁹² In 2012, Geoscience Australia listed nine facilities for reprocessing e-waste in Australia, all on the east coast (Orr and Gordon 2012). In 2018-19, the average rate (by weight) of e-waste materials recycled domestically was 58 per cent across NTCRS bodies (although it is not clear which materials tend to be recycled domestically or internationally).⁹³

Limited domestic recycling capacity is likely due to the comparatively high costs of domestic recycling, which is driven by a number of factors, many of which are also barriers to the further expansion of capacity.

- Australia has a small and relatively dispersed population. This increases transport costs for recycling collection (Khaliq et al. 2014, p. 172), due to rapidly diminishing marginal returns and decreasing economies of scale for both collection and recycling. A small, dispersed population can also fail to generate a sufficient quantity of some types of e-waste to make investment in some recycling methods (such as mechanical recycling) cost-effective (AIIA, sub. 127, p. 22; ANZRP, sub. 56, p. 5; Golev and Corder 2017, p. 81). A related factor is that it is also common for consumers to keep some old devices that are technically e-waste, with an estimated 24.5 million unused mobile phones stored in Australian households, 5 million of which no longer work (Mobile Muster 2020b, p. 19).
- Australia has a small, highly-specialised manufacturing sector with high input costs (Langcake 2016, pp. 31–32), which reduces demand for many basic recycled materials and commodities (Wigley and Gertsakis 2019, p. ii).

⁹² While Australia disposes of 4 per cent of its waste through waste-to-energy recovery (including organics, tyres and some solvents and paints), at present there is also no waste-to-energy processing of e-waste or its components (Pickin et al. 2020, pp. xi, 19).

⁹³ Commission analysis, based on annual reports from NTCRS co-regulatory bodies, found at DAWE (2020e).

-
- Opposition from local communities about risks from recycling facilities — such as from particulate matter or fumes (Ceballos and Dong 2016, p. 157; Robinson 2009, p. 188) — may also be a barrier to greater recycling capacity.
 - Australian recyclers largely manually disassemble e-waste (Dias 2019, p. 25), incurring substantial labour costs in the process, due to Australia’s comparatively high cost of labour (OECD 2020; PC 2015, pp. 181–183).
 - Contamination can also increase sorting costs for recyclers — in 2020, the average national kerbside recycling bin contamination rate was 13 per cent (by weight) (Pickin et al. 2020, p. 70), while in 2018 contamination rates were found to be as high as 30 per cent (Kaufman et al. 2020, p. 3).

Some of these barriers may be reduced by government policies — such as through the National Waste Policy Action Plan (section 7.3) or State and Territory Government funding of e-waste recycling programs (box 7.8). However, other barriers are largely beyond the control of policy makers concerned with waste management — such as Australia’s population density or changes in the market value of raw materials.

Lack of cost-effective domestic recycling can lead to adverse outcomes, especially if recycling capacity grows at a slower rate than e-waste recycling or reuse targets (including from co-regulatory product stewardship schemes or the implementation of landfill regulations). In particular, lack of recycling capacity can result in domestic stockpiles or illegal dumping, or in the unlawful international trade in e-waste (discussed below).

Domestic stockpiling and dumping

E-waste collected for recycling might be stockpiled for several reasons. Recyclers may intentionally stockpile waste to make recycling rarer materials more cost-effective (through economies of scale) and to smooth commodity price fluctuations (DELWP 2018, p. 12). Stockpiling may also be used to avoid or manage recycling fees, landfill levies (ANZRP, sub. 56, p. 2) or transport costs (NSROC, sub. 117, p. 17). Some e-waste stockpiles may be at high risk of being abandoned, due to high transport and processing costs (EPA SA 2020, p. 9). Product changeovers (for example, television users switching from CRT to LCD televisions) can also generate unintentional stockpiles (Randell and Latimer 2018, p. 59).

Some recyclers may not be able to safely maintain their stockpiles or they may grow beyond the point where risks can be adequately controlled on site. Broadly, the environmental and health effects of poorly-managed stockpiles can be similar to illegal dumping, as hazardous materials enter the ecosystem, often without any form of containment or mitigation. A key concern for e-waste stockpiles are fire risks from batteries (King, Boxall and Bhatt 2018, p. 45) and other flammable substances found in e-waste, such as beryllium, polychlorinated biphenyls and zinc (Latimer 2015, pp. 59, 98, 108). Estimates of the financial, environmental and health costs of high and extreme risk fires in waste management facilities range between \$6-\$100 million per fire (DELWP 2018, p. 6).

For these reasons, most states and territories regulate waste (and e-waste) stockpiling. Tools used include licensing thresholds, waste stockpiling levies and reporting requirements (Randell and Latimer 2018, pp. 7–33). For example, in South Australia, licensing is required for any waste processing facilities (including transfer stations) that receive or have the capacity to treat more than 100 tonnes of solid waste matter (*Environment Protection Act 1993 (SA)*, schedule 1, part A, s. 3).

There is limited evidence on whether Australia has a systemic issue with stockpiling. There are, however, some recent incidents that suggest stockpiling can be a significant issue. For instance, in the past three years there have been reports of stockpiling and some fires in e-waste recycling facilities in Melbourne and Sydney, some of which were unlicensed (EPA VIC 2019; Vedelago 2020a, 2020b, 2021a, 2021b). Some Victorian recyclers were also ordered by the Victorian Environmental Protection Agency (EPA) to stop accepting materials for recycling due to high fire risks (EPA VIC 2021b, 2021a). After one fire, the environmental and health risks from water pollution led the Victorian EPA to issue warnings to the public to avoid contact with bodies of water near the fire (EPA VIC 2020a).

International dumping and informal recycling

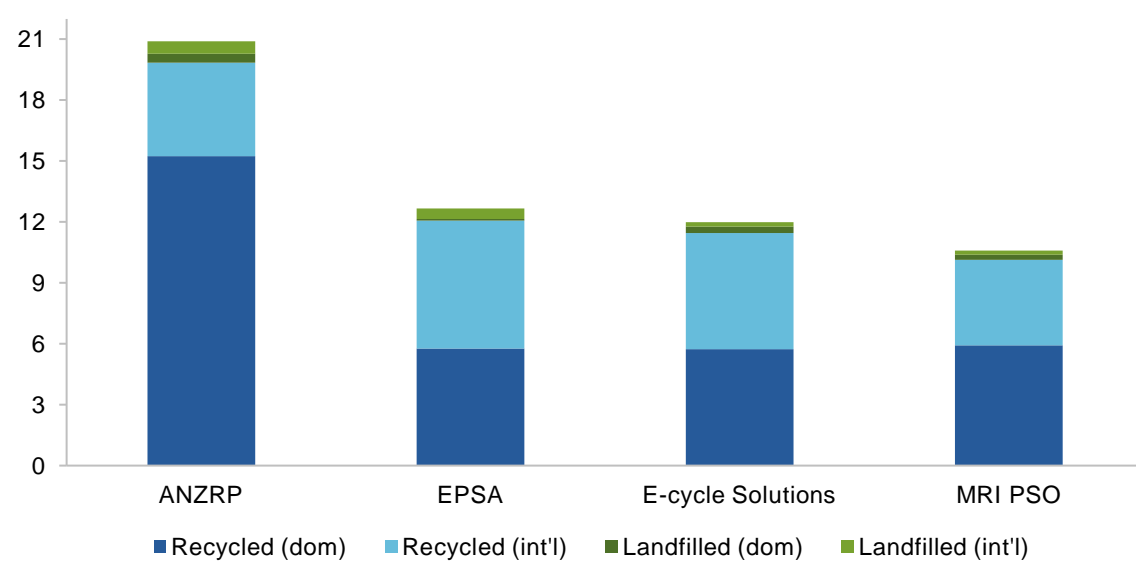
Due to the limits on Australia’s recycling capacity, much of Australia’s e-waste is processed or recycled overseas. For example, e-waste collected by NTCRS co-regulatory bodies is generally sorted and partially dismantled, before being sent for domestic or international downstream processing and recycling. On average in 2018-19, NTCRS co-regulatory bodies reported 58 per cent of e-waste materials (by weight) were recycled domestically and 37 per cent internationally (the remainder was landfilled domestically or internationally) (figure 7.7). In 2018-19, Malaysia, China and Japan imported the most e-waste from NTCRS co-regulatory bodies (accounting for almost 80 per cent by weight) (Commission analysis, based on ANZRP 2019; E-cycle Solutions 2019; EPSA 2019; MRI PSO 2019).

Informal recycling and the Basel Convention

Exporting e-waste can be a cost-effective and environmentally responsible solution — particularly where Australia’s international recycling partners run high-quality and adequately-regulated facilities that minimise local environmental and health impacts. However, some exports can have adverse consequences, particularly in ‘informal’ recycling facilities (often in developing countries) that lack the necessary infrastructure, regulation and safety net to prevent adverse environmental and health outcomes. For instance, the informal e-waste recycling sector can involve workers burning and acid-washing e-waste components to extract precious metals, with the by-products dumped or buried in uncontained sites (Park et al. 2017, p. 2; Purchase 2020, p. 15; Wang, Qian and Liu 2020, p. 2). Multiple studies of a town in China — Guiyu — have linked pollutants from its informal e-waste recycling sector to high blood levels of lead and cadmium for local children, low child body-mass indexes, smaller child head circumferences, high infant mortality, and high rates of male

genital diseases (Grant et al. 2013, p. 353; Huo et al. 2007, p. 1113; Kim et al. 2020, p. 1; Walters and Santillo 2008, p. 6; Wang, Qian and Liu 2020, pp. 6–8; Xu et al. 2013, p. 1).

Figure 7.7 Australia exports some e-waste components for recycling and disposal
Kilo tonnes, 2018-19



Sources: Commission analysis based on ANZRP (2019); E-cycle Solutions (2019); EPSA (2019); MRI PSO (2019).

Due to such risks, the international trade in hazardous wastes (including e-waste) is governed by the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, implemented in Australia through the *Hazardous Waste (Regulation of Exports and Imports) Act 1989* (Cth).⁹⁴ The Basel Convention restricts e-waste imports and exports, only allowing countries to export hazardous wastes if the importing country has given prior informed consent. It also sets minimum environmental, health and safety standards for waste management, requiring exported hazardous waste to be recycled at high-quality facilities. In Australia, those wanting to export e-waste require a permit, with permit fees costing between \$6300 to \$13 400 (DAWE 2021b). In 2019-20, 33 permits were granted, and one was refused (DAWE 2020b, p. 174).

However, the Basel Convention has enforcement challenges, both in Australia and around the world, and has been criticised as only regulating (rather than banning) the movement of hazardous wastes (Faga 2016, p. 25). In particular, while more than 180 countries are

⁹⁴ E-waste is considered to be hazardous by the Basel Convention, *unless* it can be shown to *not* contain: leaded glass; nickel cadmium and mercury containing batteries; selenium drums; printed circuit boards; fluorescent tubes; brominated flamed retardants; waste oils and liquids; asbestos; and waste metal cables coated or insulated with plastics (Forti, Baldé and Kuehr 2018, pp. 18–19).

signatories or parties to the Basel Convention, unlawful shipments of waste to the informal recycling sector in developing countries still occur. To by-pass enforcement of the Basel Convention, some unlawful exports of e-waste from around the world were reported to have been deliberately mislabelled as working products for the overseas second-hand market (BAN and IPEN 2020, p. 14; Peluola 2016, p. 4).

An amendment to strengthen the Basel Convention was introduced in 1995 (the Basel Ban Amendment), which prohibits member states from the OECD and EU from exporting hazardous waste to any countries not in the OECD or EU. In December 2019, three-quarters of parties had ratified the Basel Ban Amendment (BAN and IPEN 2020, p. 4). Australia has not ratified the Basel Ban Amendment, with the Australian Government citing concerns that ratification would mean it can no longer conduct mutually beneficial trades of waste with regional partners, and that the Amendment excludes non-OECD countries with formal recycling capacity, limiting competition and reducing supplies of recyclable materials (ACG 2001, pp. 90–92).

Beyond the Basel Ban Amendment, a number of countries have also eliminated or restricted waste imports more broadly. For example, in September 2020, Thailand banned the import of most e-waste, with reports of the ban citing damage to its environment and citizens' health (Arunmas 2020). And since 2000, China has significantly restricted its imports of e-waste (Wang, Qian and Liu 2020, p. 12), although NTCRS co-regulatory bodies have still been able to send partially disassembled e-waste and e-waste components to China (ANZRP 2019, p. 27; E-cycle Solutions 2019, p. 7; EPSA 2019, p. 3).

Compliance and enforcement for unlawful e-waste exports from Australia

Currently, waste exports from Australia are monitored by DAWE, working with the Australian Border Force (ABF). As at the end of June 2020, there were eight matters under active investigation by DAWE (DAWE 2020b, pp. 174–175).

Due to the unlawful nature of the activity, the true size of Australia's engagement with the international informal recycling market is unclear, although there is some indication of instances of unlawful exports (box 7.9). The Australian Government has an inherently limited capacity to monitor activities in international jurisdictions, and threats to the Australian community from inbound cargo (such as from drugs, weapons, human trafficking and biohazards) are typically a greater focus than export monitoring. For example, during 2017-18 and 2018-19, the ABF reviewed nearly 12 000 import declarations, compared with 1563 reviews of export declarations (DHA 2019, p. 76).⁹⁵

To complement ABF monitoring and provide a supplementary data source for monitoring and compliance, one option available to DAWE is to use global positioning system (GPS)

⁹⁵ Compliance levels for export declarations were also lower during this period, at 68 per cent compliant declarations in 2017-18 and 51 per cent in 2018-19, compared to a compliance rate of over 75 per cent for import declarations for both 2017-18 and 2018-19 (DHA 2019, p. 76).

trackers within broken (beyond economic repair) e-waste products. Use of GPS trackers could help to determine the final destination of Australia's e-waste, including whether there are any recyclers unlawfully exporting e-waste.

In recent years, environmental groups (such as the Basel Action Network) have used GPS trackers in e-waste products dropped off randomly at collection sites to monitor e-waste exports and landfilling (domestically and internationally) (BAN 2018; Lee et al. 2017).⁹⁶ Although recent samples from Australia using this methodology have been small (box 7.9), they have indicated considerable problems. This suggests that using GPS trackers to target high-risk products or parts of the e-waste supply chain could greatly improve monitoring by creating a dataset on real outcomes. It could also assist e-waste recyclers to better understand and audit their downstream recycling partners, ensuring that their recycling outcomes are meeting the required standards.

Box 7.9 Concerns about Australian exports of e-waste

Although there is no official data, there have been some reports of e-waste being unlawfully exported from Australia.

- Between January 2008 and May 2009, media reporting suggested that 12 ships carrying Australian e-waste without hazardous materials permits were intercepted by Australian Customs and the Department of Environment (Cubby 2009). Similarly, four shipments were reported to have been intercepted between January and May 2011 (Harrison 2021).
- In 2017, a computer monitor from Australia was reportedly found in an e-waste dump in Accra, Ghana, with its serial number traced to a not-for-profit computer resale group in Australia. Children as young as five were reportedly working in the e-waste dump (Le Tourneau 2017).
- An estimated 3580 tonnes of e-waste were exported as used products without a hazardous waste export permit in 2015. These products included laptops, printers, flat display panel monitors and televisions and small pieces of IT equipment (Commission analysis, based on unpublished data from Sustainability Victoria 2015).
- A study by the Basel Action Network used global positioning system (GPS) trackers to determine the final location of e-waste given for recycling to National Television and Computer Recycling Scheme bodies. The study found at least one of 35 tracked pieces of e-waste was exported to a 'highly polluting primitive circuit board and acid stripping operation in Thailand'. Another two tracked pieces were exported to an informal e-waste recycling factory in Hong Kong, reportedly known for e-waste trafficking and employment of undocumented workers in poor conditions. Another five tracked pieces found their final resting place in a domestic landfill (BAN 2018, p. 3).

There are some potential issues with using GPS trackers for monitoring e-waste exports. One issue is cost, including the costs of the equipment and trackers themselves — in 2018, one tracker was reported to cost US\$300 (BAN 2018, p. 9) and it is unlikely any of the trackers

⁹⁶ The television show 'War on Waste' also placed GPS trackers in six televisions and computer monitors and dropped them at NTCRS collection points. Five of the tracked products were delivered to recycling facilities in Australia, after which two were exported to South Korea for formal recycling. One product appeared to be informally reused after being taken from a collection site (Boylan and Welkerling 2018).

would be recovered. There are also costs associated with data analysis and follow-up investigations (Lee et al. 2017, p. 8). However, the size of any such program is inherently scalable to the desired costs, so a program could range from using a dozen or so trackers each year, to several hundred. Funding could be provided by the Australian Government or obtained from the parties being monitored, such as through fees or charges.

There may also be privacy issues with using GPS trackers to track items given to another party. Some sources have claimed that the risk of privacy issues is likely to be low, because the GPS trackers have typically been placed in waste objects (beyond the possibility of economic repair), rather than being used to track individuals in their home or business (Lee et al. 2017, p. 3). One way to further reduce these risks would be to limit any initial program to the NTCRS, where systems to permit the use of GPS trackers could be a design feature of associated regulations, or a condition for approval of co-regulatory bodies. Expanding any tracking program to other types of e-waste (beyond NTCRS products) could then be considered if GPS tracking within the NTCRS proves successful at preventing poor outcomes and assisting NTCRS co-regulatory bodies in their downstream auditing.

DRAFT RECOMMENDATION 7.2 USE OF GPS TRACKERS TO MONITOR E-WASTE EXPORTS

The Australian Government should amend the monitoring arrangements for the National Television and Computer Recycling Scheme so that global positioning system (GPS) trackers can be used to determine the end-of-life location of e-waste collected for recycling as part of the scheme. This should be done using a risk-based sampling approach that focuses on the types of products and supply chains that present the highest risk of unlawful exports or disposal of e-waste.

A Public consultation

The Commission has actively encouraged public participation in this inquiry. This appendix outlines the consultation process undertaken and lists the organisations and individuals that have participated in this inquiry.

- Following the receipt of the terms of reference on 29 October 2020, an advertisement was placed in *The Australian*, and a circular was sent to identified interested parties.
- An issues paper was released on 7 December 2020, to assist those wishing to make a written submission to the inquiry. The Commission received 146 submissions prior to the release of the draft report (table A.1). The Commission also received 196 brief comments. The submissions and brief comments are available online at www.pc.gov.au/inquiries/current/repair/submissions#initial.
- Consultations were held with representatives in Australia and internationally, including from Australian, State and Territory Government agencies, manufacturers, suppliers and their peak bodies, industry groups, consumer and community groups, waste management bodies, and academics and researchers (table A.2).
- The Commission welcomes further contributions to the inquiry to discuss the content of the draft report, including responses to the information requests and draft recommendations.
 - Public hearings will be held between 19–22 July 2021. Further details on registering for hearings and making submissions can be found on the inquiry website.
 - Submissions on this draft report are due by 23 July 2021.
 - The inquiry final report will be provided to the Australian Government by 29 October 2021.

Table A.1 Public submissions^a

<i>Participant</i>	<i>Submission no.</i>
Abbas, Dr Muhammad Zaheer	34
Adelaide Appliance Repairs	102
Agney, Terry	109
Alcock, Ralph	104
Apple	132*
Assistive Technology Suppliers Australia Ltd (ATSA)	23
Australian and New Zealand Recycling Platform (ANZRP)	56
Australian Automotive Aftermarket Association (AAAA)	81
Australian Automotive Dealer Association (AADA)	98
Australian Competition and Consumer Commission (ACCC)	106
Australian Computer Society (ACS)	66
Australian Democrats	100
Australian Government Department of Health	121
Australian Industry Group (Ai Group)	32
Australian Information Industry Association (AIIA)	127
Australian Local Government Association (ALGA)	79
Australian Mobile Telecommunications Association (AMTA)	130
Australian Small Business and Family Enterprise Ombudsman	59
Australian Water Heating Forum (AWHF)	94
Bader, Dean	146
Barwon South West Waste and Resource Recovery Group	33
BehaviourWorks Australia	95
Bersten, Ian	138, 139
Bower Reuse and Repair Centre	48
Brisbane Tool Library	73
Brunswick Tool Library	77
Buckingham, Brett	22
Calidad	145*
Canegrowers Herbert River	12
Caravan Industry Association	76
Carmichael, Otis	17
CHOICE	126
Chu, Crystal	10
City of Melbourne	20
CNH Industrial Australia Pty Limited (CNHI)	116
Communications Alliance	131
Cole, Craig	9
Consumer Action Law Centre (CALC)	119
Consumer Electronics Suppliers Association (CESA)	25, 135
Cooper, Amy	67
CS Watch Repairs	88

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Table A.1 (continued)

<i>Participant</i>	<i>Submission no.</i>
Darebin Repair Café (DRC)	69
Das, Chironjit	31
Davies Collison Cave Pty Ltd	141
Deighton, Kath	72
Design Institute of Australia (DIA)	108
Dilday, Melanie	143
Downes, Jenni	96
Dux Manufacturing Ltd	21
Dyer, Robert	1
Eastern Waste Management Authority (East Waste)	18
Eglinton, Malcolm	5
Electronic Frontiers Australia	65
Federal Chamber of Automotive Industries (FCAI)	115
Fitzgerald, Leon	142
Free Software Melbourne	43
Fusinato, Daniel	6
Gas Appliance Manufacturers Association of Australia (GAMAA)	58
GEOTAB Australia Pty Ltd	61
GiveGet	35
Gnieszlaw, Simon	91
Grain Producers Australia (GPA)	27
Green Industries SA (GISA)	113
Hamilton, Carrie	57
Hamilton, Maureen	3
Helstroom, Robert	30
Honey Bee Manufacturing Ltd	2
Horan, Anita	11
iFixit	107
Insurance Council of Australia (ICA)	120
Interactive Games and Entertainment Association (IGEA)	103
IT Professionals Australia	26
JB HI-FI	124*
Jandey, Brigitte	37
John Deere Limited (JDL)	84
Johnston, Derek	49
Keulemans, Dr Guy	144
Law Council of Australia	114
Legal Aid Queensland (LAQ)	68
Leighton, Laura	82
LG Electronics Australia Pty Ltd	38
Lewis-Fitzgerald, Erin	75
Local Government NSW (LGNSW)	97
Marriott, Jason	16

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Table A.1 (continued)

<i>Participant</i>	<i>Submission no.</i>
Mate, Kirsty	70
May, Karl	129
McGrath, Glenn	15
McIntosh and Sons	24
MD Solutions Australasia	41
Mend it Australia	101
Moodie, Thomas	64
Motor Trades Association Queensland (MTA Queensland)	80
Muradian, Shane	47
National Farmers Federation (NFF)	55
Norris, Brendan	89
Northern Sydney Regional Organisation of Councils (NSROC)	117
NSW Circular	93
Osborne, Luke	7
Park, Dr Miles	52
Peters, Rodger	19
Pirate Party Australia	74
Planert, Dorte	36
Pleszczynski, Mark	63
Proctor, Nathan	92, 128
Product Stewardship Centre of Excellence	123
Queensland Consumers Association	122
Quealy, Walter	40
Rattenbury, Shane MLA, ACT Minister for Consumer Affairs	133
Refrigerants Australia and the Air Conditioning and Refrigeration Equipment Manufacturers Association (RA & AREMA)	62
Repair Café Hobart	14
Repair Café Woolloongabba	42
Rheem Australia	53
Rinnai Australia Pty Ltd	71
South Australian Repair Café Coordinators	46
Scallan, Shaun and Gertsakis, John	125
Shaw, Russell	4
Stein, Dr Jesse Adams and Crosby, Dr Alexandra	51
Storer, Judi	140
Stryker South Pacific	87
Stuart, Katherine	29
TCO Development	137
Tobin, Steve	39
The Phone Spot	50
Thorpe, David	8
Toyota Australia	118

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Table A.1 (continued)

<i>Participant</i>	<i>Submission no.</i>
Tractor and Machinery Association of Australia (TMA)	111
Transition Town Sunshine Coast	28
Victorian Automotive Chamber of Commerce (VACC)	136
Victorian Farmers Federation (VFF)	60
Vintage Time Australia	13
Waste Management and Resource Recovery Association of Australia (WMRR)	85
Watch and Clockmakers of Australia Inc (WCA)	83
Watch and Clockmakers of Australia Vic Division	110
Western Australian Local Government Association (WALGA)	86
Western Australian Small Business Development Corporation	99
Witherby, Angus	134
Wilson, Edwin	78
Williams, Philippa	112
Wiseman, Prof Leanne and Kariyawasam, Dr Kanchana	105
World's Biggest Garage Sale	45
World Wide Fund for Nature Australia (WWF)	54
Zero Waste Victoria (ZWV)	90
Zyllberg, Catalina and McDonnell, Dominique	44

^a An asterisk (*) indicates that the submission contains confidential material not available to the public.

Table A.2 Consultations

<i>Participant</i>
ACT Chief Minister and Treasury Economic Development Directorate
Australian and New Zealand Recycling Platform
Australian Competition and Consumer Commission
Australian Industry Group
Apple
Ascend Waste and Environment
Australian Automotive Dealer Association
Australian Government Attorney General's Department
Australian Government Department of Agriculture, Water and Environment
Australian Government Department of Foreign Affairs and Trade
Australian Government Department of Infrastructure, Transport, Regional Development and Communications
Australian Government Department of Industry, Science, Energy and Resources
Australian Government Department of Prime Minister and Cabinet
Australian Government Department of Treasury
Australian Mobile Telecommunications Authority
Australian Retailers Association

(continued next page)

Table A.2 (continued)

Participant

Australian Securities and Investments Commission
Basel Action Network
Blue Environment
Boomerang Alliance
Bower Centres
Cabrini Technology Group
Calidad
CHOICE
Consumer Action Law Centre
Consumer Affairs Victoria
Consumer Electronics Suppliers Association
Consumer NZ
Environmental Protection Authority Victoria
Epson
E-waste Watch
Federal Chamber of Automotive Industries
Green Industries SA
Heads of EPA Australia and New Zealand, National Waste Working Group
Home Appliance Europe
iFixit
Institute of Patent and Trade Mark Attorneys
Insurance Council of Australia
Law Council of Australia
MRI PSO
National Farmers Federation
Northern Territory Consumer Affairs
Northern Territory Department of Corporate and Digital Development
Northern Territory Department of Environment, Parks and Water Security
Northern Territory Department of Industry, Tourism and Trade
NSW Department of Customer Service
NSW Department of Planning, Industry and Environment
Organisation for Economic Co-operation and Development
Planet Ark
Queensland Department of Child Safety, Youth and Women
Queensland Department of Education
Queensland Department of Employment, Small Business and Training
Queensland Department of Environment and Science
Queensland Department of Housing and Public Works
Queensland Department of Justice and Attorney-General
Queensland Department of Local Government, Racing and Multicultural Affairs
Queensland Department of Public Safety Business Agency
Queensland Department of Regional Development and Manufacturing
Queensland Department of Youth Justice

(continued next page)

Table A.2 (continued)

Participant

Queensland Office of Industrial Relations
Queensland Treasury
Randell Environment Consulting
Repair.eu
Rimmer, Matthew
Small Business Commissioner South Australia
South Australia Consumer and Business Services
South Australia Environment Protection Authority
Sustainability Victoria
Tasmania Department of Justice
The Repair Association
Total Environment Centre
Transport Canberra and City Services
United States Public Interest Research Group (US PIRG)
Victoria Department of Environment, Land, Water and Planning
Victoria Department of Jobs, Precincts and Regions
Waste Management and Resource Recovery Association
Western Australia Department of Mines, Industry, Resources and Safety
Western Australia Department of Transport
Western Australia Department of Treasury
Western Australia Department of Water and Environmental Regulation
Western Australia Economic Regulation Authority
Western Australia Small Business Development Corporation
Wiseman, Leanne
WWF Australia

B Competition theory in aftermarkets

This appendix contains material to support the analysis of competition in repair markets in chapter 4. It is structured as follows.

- Section B.1 reviews aftermarket competition theory to develop the Commission’s framework for assessing competition in repair markets. The framework is then summarised into a ‘checklist’ to guide the competition analysis in chapter 4.
- Section B.2 uses available data to analyse one aspect of the framework for repair markets — high-level competition indicators, such as market concentration, profit margins, and entry and exit rates.
- Section B.3 uses available data to analyse another aspect of the framework — whether firms that raise repair prices compete away those additional profits by lowering new product prices in the primary market (termed the ‘waterbed effect’).

B.1 Framework to assess competition in repair markets

‘Aftermarkets’ are markets for the supply of products or services (‘secondary products’) used in connection with an existing product that has already been acquired (‘primary products’) (Coppi 2007; OECD 2017). Aftermarkets are very common, and may involve:

- consumable products — such as ink for printers or spare parts for cars
- complementary products — such as games for game consoles or blades for razors
- related services — such as repair and maintenance.⁹⁷

There is a significant body of literature discussing the economics of aftermarket competition (BIAC 2017; Borenstein, Mackie-Mason and Netz 2000; OECD 2017; Shapiro 1995; Voortman 1993). The main cause for competition concerns is the incentives of original equipment manufacturers (OEMs) — manufacturers of primary products, such as printers or motor vehicles — to restrict competition from non-authorised firms in the aftermarket for that product, particularly from independent repairers. This is mainly because OEMs inherently have control over their products — such as product design, repair information and spare parts — and they may have an incentive to leverage this primary market position into the aftermarket by either raising prices for the aftermarket product or restricting output.

⁹⁷ From here on, this appendix uses the term ‘product’ to mean either products or services (including repair).

Broadly, economic literature suggests that assessing competition concerns requires answering two threshold questions.

1. Is there evidence that competition in repair markets is restricted?
2. If so, is there harm to consumers?

The first step requires assessing evidence of a lack of competition in repair markets either through high-level market indicators or specific cases of OEMs engaging in anti-competitive behaviour. If the first step uncovers reason for concern, the second step involves assessing to what extent consumers are harmed by the lack of competition. In some cases, the behaviour may be justified if it safeguards against risks to consumers (such as safety or security) or if competition in the primary market counteracts any potential harm in the repair market.

Is there evidence that competition in repair markets is restricted?

There are two sources of evidence which can indicate that competition in repair markets is restricted. One source involves analysing high-level market measures (such as market concentration) that may indicate that a repair market for a particular product is not competitive. Another way involves identifying the specific methods that OEMs use to restrict access to repair markets and any evidence that OEMs are engaging in this type of anti-competitive behaviour. Both sources of evidence should be used where possible.

Do high-level measures indicate a lack of competition?

There are several market characteristics that can provide an indication of whether an OEM is dominant in repair markets and whether competition from other firms constrains its ability to exercise market power (ACCC 2008, pp. 33–50).

Market concentration refers to the number and size of firms in a market. Markets that are concentrated around one or few firms provide greater opportunities for those firms to engage in anti-competitive behaviour because there are fewer substitutes available to consumers. That said, even one other firm that is a vigorous and effective competitor can be enough to provide competition in a highly-concentrated market.

Profit margins refer to profits as a proportion of sales revenue. In general, an increase in price will result in a corresponding increase in profit margins. Therefore, a firm's ability to significantly and sustainably increase profit margins may indicate a lessening of competition. For example, an OEM may be able to raise the prices at which it sells spare parts to competing repairers, thereby increasing its profit margins. However, profit margins alone are not a conclusive indicator of an OEM's ability to exercise market power, because other factors may influence profit margins. For example, firms may increase their profit margins by selling innovative new products or increasing their scale of operations to reduce average costs (economies of scale).

High barriers to entry can prevent new firms from entering the market and competing with incumbents. Even one new entrant that is a strong and vigorous competitor, or the credible threat of a new entrant, can prevent an existing firm from raising prices. There are several types of barriers to entry:

- legal or regulatory — such as licensing conditions or intellectual property rights (for example, a smartphone OEM enforcing its intellectual property rights to prevent a new independent repairer from accessing repair manuals)
- structural or technological — such as high consumer switching costs (which may limit the viability of entry) or access to key products or technologies (for example, restricting access to spare parts for new independent repairers)
- strategic barriers — such as deliberate consumer switching costs through contracting (for example, claiming to void warranties if repair is undertaken by a non-authorised repairer).

Entry and exit rates show the number of new and exiting firms as a proportion of total firms. These rates can be useful indicators to show whether new firms are able to enter the market, whether many firms are forced to exit the industry, and whether exiting firms are replaced by new ones.

The Commission has used available data to analyse these indicators for repair industries (section B.2).

Are there specific cases of OEMs restricting competition?

Anti-competitive behaviour in aftermarkets typically involves firms engaging in practices to exclude rivals from being able to enter or compete effectively in the aftermarket. Restricting competition allows the firm to profitably raise prices above the competitive outcome or reduce non-price dimensions of its offering (such as quality, range or service). Common exclusionary practices include ‘refusal to deal’ and ‘tying’ (OECD 2017, pp. 26–28).

Refusal to deal covers a range of exclusionary practices that typically involve an OEM limiting its competitors’ access to repair supplies, including:

- refusal (or delays) to supply spare parts or other inputs to repair (such as specialised tools)
- refusal to license intellectual property rights
- refusal to disclose necessary technical information relating to the product
- charging excessively high prices to repair market competitors.

Tying involves an OEM making a sale of the primary product conditional on purchasing the aftermarket product. For example, offering consumers a warranty (the tying product) on a new car on the condition that the car is exclusively serviced (tied product) at an authorised dealership.

The Commission has examined cases of OEM behaviour that could constrain competition in particular repair markets. It concluded that there is evidence of some OEMs limiting third-party access to repair supplies (typically through refusal to deal) and that terms that void manufacturer warranties after any non-authorized repair can deter consumers from seeking independent repair (chapter 4).

Is there harm to consumers?

The second step of the Commission's framework looks at the extent to which consumers are harmed by a lack of competition. This involves assessing several factors that may affect the likelihood and magnitude of harm, including the ability of consumers to limit or counteract harm.

Do market characteristics encourage higher prices in repair markets?

A threshold question to consider is whether the OEM will find it profitable to restrict competition in the repair market. If it is possible to demonstrate that OEMs do not have the incentive to restrict the repair market, then there is likely no competition problem.

There are several market characteristics that provide firms with an incentive to engage in anti-competitive behaviour to increase repair prices. The Commission has considered these characteristics in its assessment of competition (chapter 4).

Consumers are 'locked-in' to the repair market

Lock-in occurs when consumers are unable to substitute to other aftermarket products without incurring substantial switching costs (Coppi 2007, p. 55). For example, a consumer may need to purchase a different primary product (such as a different brand of machinery), incurring high switching costs, in order to use a competing aftermarket product (such as using an independent repairer). The cost of switching can be particularly high for:

- high-cost durable products (such as tractors or cars) that cost a lot to replace (this can be alleviated somewhat if consumers can recoup some costs through secondhand markets)
- products that appreciate in value, because it may be costly to replace with a like-for-like product to the same value, or the replacement product will have lower value
- consumers that have invested significantly in a particular brand's ecosystem, because other brands may not be compatible with the existing brand ecosystem (ACCC, sub. 106, p. 4)
- consumers who need to spend time and effort learning how to use a replacement product
- consumers that may lose personal or paid content, such as contacts or e-books
- consumers who are locked into a contract to use a particular brand, with high exit fees.

Lock-in gives OEMs the ability, and in some cases the incentive, to engage in anti-competitive behaviour.

... incentives depend on whether monopolisation of the aftermarket could be profitable for the manufacturer of the primary good. This depends on the trade-off between the increased profits from exploitation of locked-in customers in the aftermarket and the potential loss of sales in the primary market, due to existing customers switching to other primary goods ... (OECD 2017, p. 8)

However, if the OEM's reputation is likely to be significantly damaged from exploiting its locked-in customers, then future primary product customers (such as new or upgrading customers) may choose competing firms instead. If this 'reputation effect' is stronger than the lock-in effect, then anti-competitive behaviour is less likely to occur. The reputation effect is likely to be stronger for OEMs that are active in several markets because the repercussions are likely to be broader. It is also likely to be stronger for OEMs that tend to place a higher value on future profits (low discount rate) compared with short-term profits. One example could be products (such as online marketplaces) that rely on 'network effects' — whereby growing the number of users improves the value of the product leading to even more users — which creates significant long-term gains. The internet and social media have provided consumers with additional means (such as reviews) to express displeasure against lock-in.

One indicator to assess the strength of the lock-in and reputation effects is the ratio of locked-in to new customers. A high ratio of locked-in customers reduces the influence of the reputation effect, increasing the likelihood of anti-competitive behaviour. Primary markets that are declining in value are unlikely to have a strong reputation effect, and thus offer a better opportunity to exploit locked-in customers. One option to gain insight into the ratio of locked-in customers is to measure customer loyalty, such as from consumer surveys.

Consumers face difficulties estimating repair costs

The 'lifecycle cost' of a product involves the cost of the initial purchase of a primary product as well as the cost of operating and maintaining the product (secondary products) over the course of its life. For example, consumers may calculate the lifecycle cost of a car — the initial purchase price plus the ongoing cost of running, servicing and repairing the car (based on risks of damage or failure) — and compare substitute bundles at the time of the initial purchase.

If consumers adequately consider the lifecycle costs of products they are better able to compare the value of product offerings across firms. This limits the ability of an OEM to charge higher prices in the aftermarket, and facilitates competition between firms at the point of the initial purchase to deliver the best value bundle to consumers.

However, if consumers do not fully consider lifecycle costs (often termed 'consumer myopia'), they tend to be more sensitive to upfront costs than to future aftermarket costs (OECD 2017, p. 13). In this case, OEMs have a greater incentive to charge higher prices in the aftermarket because they will not need to reduce prices for the primary product in order

to compete on the best value bundle to consumers. There are several barriers that may prevent consumers from considering the full lifecycle costs of products.

- Lack of information — in some cases, consumers may not have access to the high-quality information needed to properly assess the lifecycle cost of a product. This includes if there is a significant monetary, time or effort cost to search for this information. For example, consumers may not be able to easily find information on the likelihood that a product needs repair or the cost of repairing different problems. The incentive for consumers to search for information would be expected to increase as the price of the product increases. There is some concern that OEMs deliberately hide or obscure information from consumers (termed ‘shrouding’) to make it difficult to estimate lifecycle costs (OECD 2017, pp. 13–14).
- Complexity and uncertainty — even if the information is available, estimating lifecycle costs may be too complex or uncertain. For example, consumers may find it difficult to assess the likelihood that they will need something repaired.
- High discount rates — some consumers simply disregard or discount future costs and instead make an assessment largely based on upfront prices, making them less sensitive to repair prices in the future. For example, some studies have shown that consumers discount future costs when choosing between different models of electrical appliances (Orbach 2004, p. 16).

One way to assess the extent to which consumers consider lifecycle costs is to identify if these characteristics exist in specific product markets. For example, it is naturally more difficult to calculate lifecycle costs for products with unpredictable maintenance or repair needs. Another way is to consider the type of consumer. For example, large businesses likely have greater capabilities (such as in-house expertise or the ability to obtain advice) to calculate lifecycle costs, whereas smaller businesses and households may find it relatively more difficult. Therefore, a low ratio of households to business consumers may assist in determining the extent of the problem. As long as a large enough proportion of consumers consider lifecycle costs, this can be enough to constrain OEM behaviour.

The repair market is large

The larger the size of the aftermarket (relative to the primary market) of the product — in terms of revenue or profits — the greater the potential gain to OEMs from increasing prices for aftermarket products, and the lower the potential cost of losing primary product customers. The size of a *related* aftermarket may also be relevant. For example, OEMs may have an incentive to restrict competition in the video game aftermarket if it is large, which could indirectly impede repair.

Expensive products (such as motor vehicles and machinery) are more likely to have larger repair markets because the cost of replacement is high (chapter 2), they are typically held for a long time, and they involve ongoing maintenance.

Market characteristics inform market definition

Defining the ‘relevant market’ is an important step in competition cases for assessing whether an OEM is engaging in anti-competitive behaviour. This involves determining whether the aftermarket is considered separate to the primary market. In general, there are three possible ways to define relevant markets for competition cases involving aftermarkets, ranging from completely separate (narrow) to completely integrated markets (wide) (table B.1).

Table B.1 Market definition relies on market characteristics

<i>Relevant market</i>	<i>Broad or narrow</i>	<i>Definition</i>	<i>Example</i>	<i>Conditions</i>	<i>Risk of competition concerns</i>
Systems market	Broad	A single market comprising both the primary and secondary products	One market for all cars and all car repairs	<ul style="list-style-type: none">• Consumers consider lifecycle costs• Reputation effects are strong enough to limit consumer lock-in	Least likely to result in competition concerns
Dual markets	Middle ground	A single market for primary products and a distinct aftermarket for secondary products	One market for all cars and a separate aftermarket for all car repairs	<ul style="list-style-type: none">• Consumers can choose any combination of primary and secondary products (all secondary products are compatible with all primary products)	Somewhat likely to result in competition concerns
Multiple markets	Narrow	A single market for the primary product and multiple separate aftermarkets for each primary product	One market for all cars and separate aftermarkets for car repairs for each car brand	<ul style="list-style-type: none">• Consumers are locked-in to using a restricted number of secondary products	Most likely to result in competition concerns

Source: OECD (2017, pp. 19–23).

The ACCC approach to defining a market generally relies on identifying its appropriate product and geographic dimensions (2008, pp. 13–21). In doing so, it assesses how easily consumers can substitute to alternative products if a firm attempts to increase prices (or how easily other firms can pivot to producing a substitutable product). If consumer lock-in is high and/or consumers do not consider lifecycle costs, markets are more likely to be defined in a narrow sense and therefore more likely to result in competition concerns.

Competition regulators around the world have typically defined relevant markets for aftermarket products as ‘dual’ or ‘multiple markets’, including for repair. For example, in a luxury watch repair case, the European Commission ‘defined multiple separate markets for spare parts, each associated with a particular watch brand’ (OECD 2017, p. 23). In another example, in an auto spare parts case, the Competition Commission of India ‘defined multiple markets for spare parts, diagnostic tools and after-sale repair and maintenance services of separate brands’ (OECD 2017, p. 23). There have been some cases in which a systems market was defined. For example, in a computer maintenance case, the UK Office of Fair Trading ‘concluded that there was a single market for the supply and maintenance of computer equipment with ICL mainframe functionality in the UK’ (OECD 2017, p. 17).

OEMs have financial ties to the repair market

It is important to determine whether OEMs have the practical ability to extract profits from the aftermarket. This depends on the extent to which OEMs are vertically integrated across both the primary market and aftermarket. Broadly, there are three ways in which OEMs may be engaged in aftermarkets: integrated, separated, and semi-integrated.

OEMs that are fully integrated in the aftermarket (such as repairing their own products) may have the ability to directly extract profits from restricting aftermarket competition (such as raising repair prices). Many OEMs are active in aftermarkets, directly operating their own service and repair operations. Examples include some game console manufacturers (IGEA, sub. 103, pp. 14–15) and Nikon, the latter of which terminated its authorised repair program in the United States in 2020, and now only conducts repairs in-house (PetaPixel 2019).

OEMs that are completely separated from aftermarket firms have less ability to directly receive profits from raising aftermarket prices. For example, this can occur in repair markets largely made up of independent repairers, such as repair for some clothing and footwear products. However, in this case, OEMs may still be able to extract profits from repairers by raising the price of repair inputs, such as spare parts or repair information, if they are the only supplier of those inputs. If alternative repair inputs exist (such as generic spare parts), then OEMs may have an incentive to restrict the use of those alternative inputs (such as by designing products that limit the compatibility of generic spare parts) in order to profit from the sale of authorised repair inputs.

The ability to extract aftermarket profits is less clear for the many OEMs that are semi-integrated in the aftermarket, such as by authorising third parties to repair their products. The process of authorising repairers may be a way for OEMs to extract profits from the aftermarket without the need to directly provide repairs itself. OEMs often impose conditions on authorised repairers — such as the use of specialised training and tools — to enable them to access its market for repairs.⁹⁸ This relationship may involve agreements, contracts or licensing fees, which allow the OEM to extract profits from the aftermarket. Many product repair markets in Australia involve authorised repairers, such as motor vehicles, smartphones and agricultural machinery (chapter 4). That said, OEMs may not have any arrangements in place to extract profits from authorised repairers, in which case they would have little incentive to restrict aftermarket competition.

Therefore, it is important to assess the level of vertical integration between OEMs and aftermarket firms (such as repairers) to determine their ability to extract aftermarket profits. However, the Commission has had limited ability to assess the nature of these relationships because authorised repair networks can vary considerably by product type and brand, and contracts with OEMs are seldom public (chapter 4).

⁹⁸ For example, authorised repairer and dealership agreements — like those used by Apple (2021b) or car manufacturers (ACCC 2017b, p. 32) — often specify obligations relating to authorised spare parts or facilities (such as layout and showroom requirements), and may require the business to actively promote the brand, making multi-brand storefronts difficult.

Are consumers compensated by lower prices in the primary market?

The degree of consumer harm from restricting competition in aftermarkets can depend on the level of competition in the primary market (Cabral 2014, p. 61; Klein 1996, p. 143; Shapiro 1995, p. 485). In principle, if primary market competition is high, firms will have an incentive to ‘compete away’ any profits they earn in the aftermarket by lowering prices in the primary market (BIAC 2017, p. 10). This balance of low primary market prices (and profits) and high aftermarket prices (and profits) is known as the ‘waterbed effect’ (Davis, Coppi and Kalmus 2012, pp. 4–5). Examples include printers and cartridges, or razors and razor blades. In the context of repair, a waterbed effect would result in lower primary product prices (and profits) and higher repair prices (and profits).

The existence of a waterbed effect is critical to assessing consumer harm from anti-competitive behaviour in repair markets, and therefore the merits of introducing competition regulation. While there is strong theoretical support for the waterbed effect (BIAC 2017; Coppi 2007; Davis, Coppi and Kalmus 2012), there is limited empirical evidence on whether it exists and its magnitude (section B.3).

The degree to which consumers are compensated for high repair prices through lower primary product prices can be categorised as incomplete or complete.⁹⁹

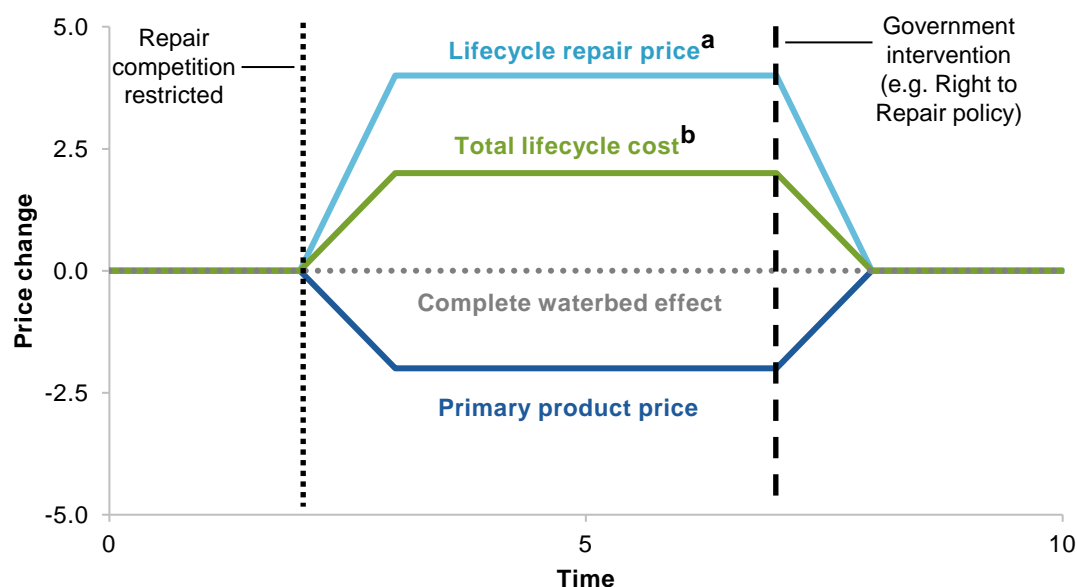
- An incomplete waterbed effect does not fully compensate consumers for higher repair prices (the overall lifecycle cost of the product increases).
- A complete waterbed effect fully compensates consumers for higher repair prices (the overall lifecycle costs of the product do not change).

Figure B.1 shows a stylised model of an incomplete waterbed effect. A firm decides to restrict aftermarket competition in order to profit from increasing the price of repairs. The firm will then have an incentive to use these additional repair profits to lower the price of the primary product in order to compete for consumers in the primary market. Other firms are also likely to follow this strategy in order to compete. This competitive process therefore lowers the price of the primary product further, but it is not necessarily strong enough to completely offset higher repair prices. In this scenario, consumers are only partially compensated on price, such that the overall lifecycle cost of the product is higher. Therefore, there may be some merit for government intervention because it is more likely to result in lower product lifecycle costs.

⁹⁹ In principle, the waterbed effect can also be ‘overcomplete’. This could occur when there are increasing returns to scale or network effects, and customers are locked-in. These factors cause intense competition in the primary market as firms try to attract more customers, reducing the firm’s overall profitability (Davis, Coppi and Kalmus 2012, p. 12). However, this can have long-term implications for competition in the primary market as larger firms aggressively undercut smaller firms to gain new customers, resulting in a small number of dominant firms in the industry (Davis, Coppi and Kalmus 2012, pp. 52-53,70). An overcomplete waterbed effect can be expected to occur less often.

Figure B.1 An incomplete waterbed effect does not fully compensate consumers through lower new product prices

A stylised model of an incomplete waterbed effect



^a The lifecycle repair price is the repair price multiplied by the number of repairs. ^b The change in the total lifecycle cost is the net effect of changes to both the lifecycle repair price and primary product price for a product.

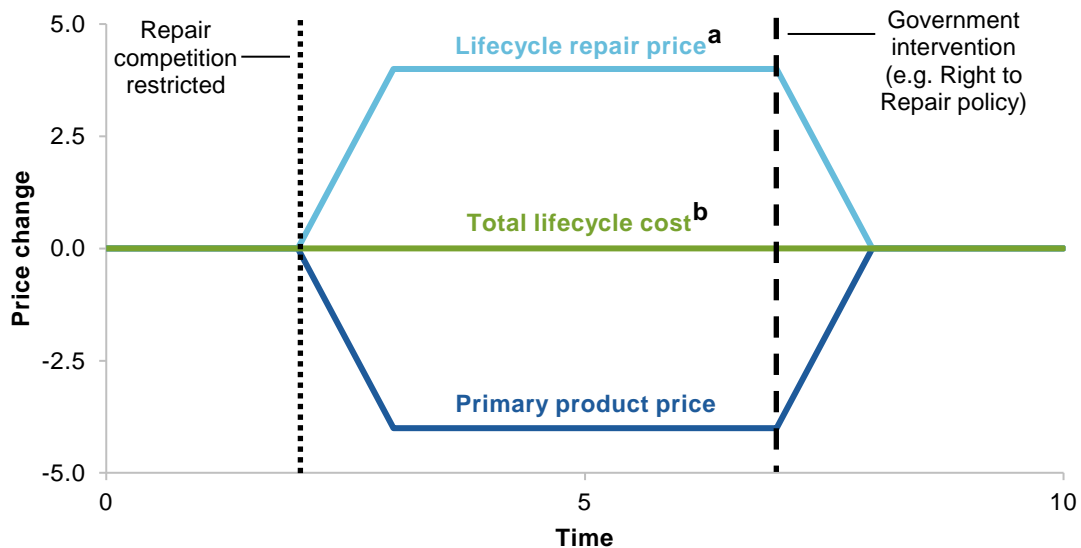
Figure B.2 shows a stylised model of a complete waterbed effect. In this scenario, once a firm increases the price of repairs, the competitive process is strong enough to lower the price of the primary product to the point where it completely offsets the higher repair price. In this scenario, consumers are fully compensated on price such that the overall lifecycle cost of the product remains constant. Firms may engage in this strategy if they are uncertain as to whether the waterbed effect would be complete, or to drive out competitors that cannot maintain low primary product prices. Without consumer harm, there is less merit for government intervention based on price concerns. In theory, a complete waterbed effect will occur when there is perfect competition in the primary market.

There is an emerging consensus in the literature that anti-competitive behaviour in the aftermarket will likely result in some consumer harm (an incomplete waterbed effect) whenever consumers are locked in. However, whether the magnitude of this harm is sufficient to justify regulation is heavily debated (BIAC 2017, p. 9; Coppi 2007, p. 68). Some authors argue that consumer harm will be small as primary market competition is usually strong enough to adequately compensate consumers from higher aftermarket prices (Cabral 2014, p. 61; Klein 1996, p. 143; Shapiro 1995, p. 485). Others argue that some primary market characteristics result in insufficient competition to create enough downward pressure on prices, resulting in greater consumer harm. For instance, product differentiation can limit competition in the primary market (Coppi 2007, p. 60). Further, if only some firms can maintain higher aftermarket prices, then only those firms will have the capacity to

compete down primary market prices, limiting price competition in the primary market (Voortman 1993, pp. 162–163).

Figure B.2 A complete waterbed effect fully compensates consumers through lower primary product prices

A stylised model of a complete waterbed effect



a The lifecycle repair price is the repair price multiplied by the number of repairs. **b** The change in the total lifecycle cost is the net effect of changes to both the lifecycle repair price and primary product price for a product.

The less competitive the primary market, the more likely the waterbed effect will be incomplete and result in consumer harm (BIAC 2017, p. 10; Coppi 2007, p. 70; OECD 2017, p. 42). Competition regulators and policymakers can assess the level of primary market competition — and therefore the likelihood of an incomplete waterbed effect — using general competition indicators, such as concentration, profit margins and barriers to entry (discussed above).

The literature also points to several other market characteristics that may influence the completeness of the waterbed effect. For instance, network effects and increasing returns to scale in the aftermarket can result in a fairly complete or even overcomplete waterbed effect (footnote 3). A high proportion of locked-in customers, relative to new customers, is also more likely to result in an incomplete waterbed effect (Davis, Coppi and Kalmus 2012, pp. 69–70).¹⁰⁰

¹⁰⁰ This is because when there is a high proportion of locked-in customers, firms are less likely to lose customers (and therefore profits) from raising aftermarket prices. Thus, the incentive to reduce the price in the primary market to attract new customers decreases, resulting in an incomplete waterbed effect.

Are there adverse non-price outcomes for consumers?

Even if consumers are compensated on price, anti-competitive behaviour can still lead to adverse non-price outcomes for consumers — such as reduced choice and convenience of repairs — and alter consumer purchasing decisions.

A less competitive repair market may result in fewer independent repairers and a larger market share for OEM-authorised repairers. Inquiry participants have raised concerns that this can diminish consumers' choice of repairer, and increase the time and travel costs of repair (Fusinato, sub. 6, p. 1; Proctor, sub. 92, p. 2). For example, long waiting times or delays for repair can be particularly detrimental for products relied upon for work, such as agricultural machinery. While consumers can purchase business interruption insurance to mitigate these risks, this comes at a cost. Such concerns were a key factor resulting in the ACCC's recommendation for mandating the sharing of motor vehicle repair information.

... the ACCC's view is that consumers benefit from competitive aftermarkets for the repair and servicing of new cars, and they also benefit from having a choice of providers to repair and service new cars. (2017b, p. 132)

While non-price impacts in major urban centres may be small, they can be much larger in regional and remote areas (ACCC 2017b, p. 118, 2021b, p. 22). Authorised repairers may help fill the void left by fewer independent repairers to some extent. However, some authorised repairers are exclusive to one or few brands (depending on their agreement with the OEM (footnote 2)) making their customer base smaller, and therefore many stores may be uneconomical. For these reasons, many of the concerns about consumer choice and access have focused on the repair of agricultural machinery (chapter 4).

Higher repair prices and lower new product prices (as a result of the waterbed effect) can lead to consumers undertaking fewer repairs and buying more new products, compared with a situation where both markets are competitive (chapter 2). This can have unintended consequences. For example, new products typically generate greater environmental costs (such as e-waste which can have negative effects on the environment if not managed well — chapter 7) compared with repair and continued use of existing products (chapter 6). Calculating the environmental impact is complex and varies by product, the manufacturing process, and the way the product is disposed. Another potential outcome is that lower primary product prices can provide more consumers (including those with lower incomes) with the opportunity to purchase the product.

Are there valid reasons for restricting third-party repair?

Restricting third-party repair may be justified if it is necessary to safeguard against the risks from poor-quality repair or to provide additional benefits to the community, including:

- safety — some products, such as medical equipment or motor vehicles, may present a greater risk to consumer safety if they are repaired to a lower standard

-
- security and privacy — restricting access to repair can reduce the risk of data and software breaches, as well as protect consumer privacy
 - quality control — controlling the quality of the primary product, such as by restricting the use of inferior spare parts in repair, can protect an OEM’s brand and reputation and provide a more accurate signal of product quality to consumers. It may also reduce the time and cost of determining fault, which may ultimately be passed on to consumers
 - safeguarding environmental standards — preventing consumers from modifying or disabling software can ensure products remain compliant with emissions standards
 - innovation — restricting access to their intellectual property provides OEMs with an incentive to invest in innovation, delivering wider community benefits (chapter 5)
 - efficiency — OEMs can use their ability to adjust primary and aftermarket prices as a way to charge customers differently based on their usage of the system (termed ‘metering’) (Borenstein, Mackie-Mason and Netz 2000, p. 185; Coppi 2007, pp. 61–63; Tirole 2005, p. 16). Customer demand for aftermarket products can be used as a measure of their willingness to pay for the primary product. This allows the OEM to charge higher prices to customers who are willing to pay more overall and lower prices to customers who are willing to pay less, increasing overall output. For example, OEMs may earn more per car from repairs for fleet customers if they tend to use their cars more often.

While restricting repair may reduce some of these risks to consumers, it is necessary to weigh this against any consumer harm caused. In some cases, the benefits may be small or the risks overstated. And there may be other ways to manage these risks without having to restrict competition. The Commission has examined many of these reasons for restricting competition in its assessment (chapter 4).

Checklist to identify competition issues in repair markets

The above framework can be summarised in a checklist of factors that may indicate a competition problem (figure B.3). The Commission has used this checklist to assess the state of competition in repair markets at a high level and identify which product repair markets are likely to have competition concerns that may warrant further investigation (chapter 4). It can also be used to guide a more in-depth assessment of those particular product markets of concern.

Figure B.3 Checklist to identify competition issues in repair markets

A. Is there evidence that competition in repair markets is restricted?	
Do high-level measures indicate a lack of competition?	
<input type="checkbox"/> Highly concentrated aftermarket	<input type="checkbox"/> High barriers to entry
<input type="checkbox"/> High or increasing profit margins	
Are there specific cases of manufacturers restricting competition?	
<input type="checkbox"/> Refusal to deal (limits on third-party access to repair supplies)	
<input type="checkbox"/> Tying (can only buy the primary product if they buy the secondary product)	
B. Is there harm to consumers?	
Do market characteristics encourage higher prices in repair markets ?	
<input type="checkbox"/> Consumers are locked-in to the repair market (high switching costs)	
<input type="checkbox"/> Consumers face difficulties estimating repair costs (lack of information, complexity)	
<input type="checkbox"/> The repair market is large (relative to the primary market)	
<input type="checkbox"/> Manufacturers have financial ties to the repair market (vertical integration)	
Are consumers compensated by lower prices in the primary market ?	
<input type="checkbox"/> Lack of competition in the primary market (incomplete waterbed effect)	
Are there adverse non-price outcomes for consumers?	
<input type="checkbox"/> Reduced access, convenience or choice	
<input type="checkbox"/> Altered consumer purchasing decisions (negative environmental impacts)	
Are there valid reasons for restricting third-party repair?	
<input type="checkbox"/> Quality, safety and security	<input type="checkbox"/> Protection of intellectual property
<input type="checkbox"/> Environmental safeguards	<input type="checkbox"/> Other efficiency rationales (metering)

B.2 Analysis of high-level competition indicators

The Commission has analysed high-level measures to assess the state of competition in repair markets, including indicators of market concentration, profit margins, and barriers to entry and exit.

However, data limitations meant that the Commission was unable to investigate individual *product* markets (such as mobile phones or washing machines). Available data sources did not disaggregate to the level necessary for such analysis. Instead, the Commission analysed these indicators at the repair *industry* level (aggregations of multiple similar product markets, such as appliances or electronics).¹⁰¹ While an industry-level analysis may provide some

¹⁰¹ The Commission used the ABS Business Longitudinal Analysis Data Environment (BLADE) dataset to analyse some indicators. Detail about this dataset and its limitations can be found in chapter 2.

high-level insights, it is limited because consumers cannot necessarily substitute between all repairers in an industry. For example, consumers of agricultural machinery repair cannot necessarily substitute to repairers of mining machinery.

This high-level analysis of competition across repair industries does not indicate an obvious systemic competition problem. However, this reinforces the conclusion that a case-by-case investigation is needed to assess individual product repair markets (chapter 4). Therefore, without deeper investigation it is not possible to dismiss competition concerns in specific product markets. For example, the ACCC identified some potential competition concerns with motor vehicle and agricultural machinery repair, including limited access to independent repair (2017b, 2021b).

Market concentration

The Commission used the Herfindahl–Hirschman Index (HHI) as a measure of market concentration in repair industries. The ACCC uses the HHI measure of concentration to indicate the likelihood that a merger will raise competition concerns requiring more extensive analysis (2008, p. 35). The HHI is calculated by adding the sum of the squares of each firm’s market share (in terms of total sales) in the relevant market.¹⁰² The ACCC notes that it will generally be more likely to identify competition concerns when the HHI is greater than 2000.

Calculating the HHI at the industry level, rather than the product level, can be problematic. The HHI is calculated in such a way that it is possible for each product market to have high concentration, but once aggregated to the industry level, show low concentration. Nevertheless, if the HHI at the industry level had a high market concentration, this would provide a strong indication that at least one product market within that industry is highly concentrated.

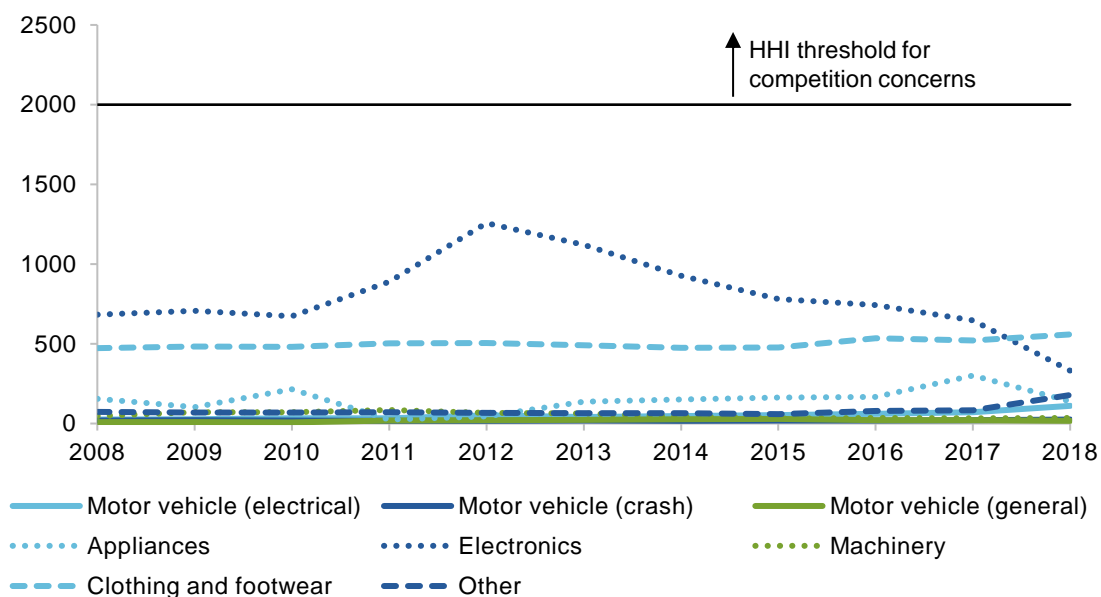
The Commission did not find that any industry had a high market concentration (figure B.4). Therefore, it is not possible to immediately conclude that there is significant market concentration within particular product markets. Further analysis at the product level would be required.

Further, given data limitations, market concentration may be underestimated for two reasons. First, HHIs were calculated across all of Australia, rather than smaller geographic markets (such as states or territories). This is because some repair businesses service many areas but only report sales in one or a few areas (such as a head office), which would significantly overestimate HHIs in those areas. However, using this large geographic market is also not an accurate reflection of concentration because consumers are unlikely to substitute to alternative repairers in other states or territories. This may be more problematic for some products (such as cars) than others (such as cameras) that may be posted to repairers

¹⁰² The formula for the HHI is: $HHI = s_1^2 + s_2^2 + s_3^2 + \dots + s_n^2$ where s_n^2 is the market share percentage of sales revenue for firm n (expressed as a whole number, not a decimal). This measure gives greater weight to firms with larger market shares than other measures, such as a simple concentration ratio that adds up pure market share percentages.

elsewhere in the country. Second, industries with many franchised businesses with separate Australian Business Numbers — a potential example being the 279 Toyota dealership sites across Australia (Toyota, sub. 118, p. 3) — may be counted separately, rather than grouped, depending on whether they report to the ATO separately or through a single ‘GST group’.

Figure B.4 Market concentration is not an immediate cause for concern
Herfindahl–Hirschman Index (HHI)^a by repair industry^b



^a HHIs were calculated using total sales from Business Activity Statements submitted to the ATO. ^b Repair industries based on the four-digit ANZSIC class codes within the (94) Repair and maintenance subdivision. Source: ABS (*Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata).

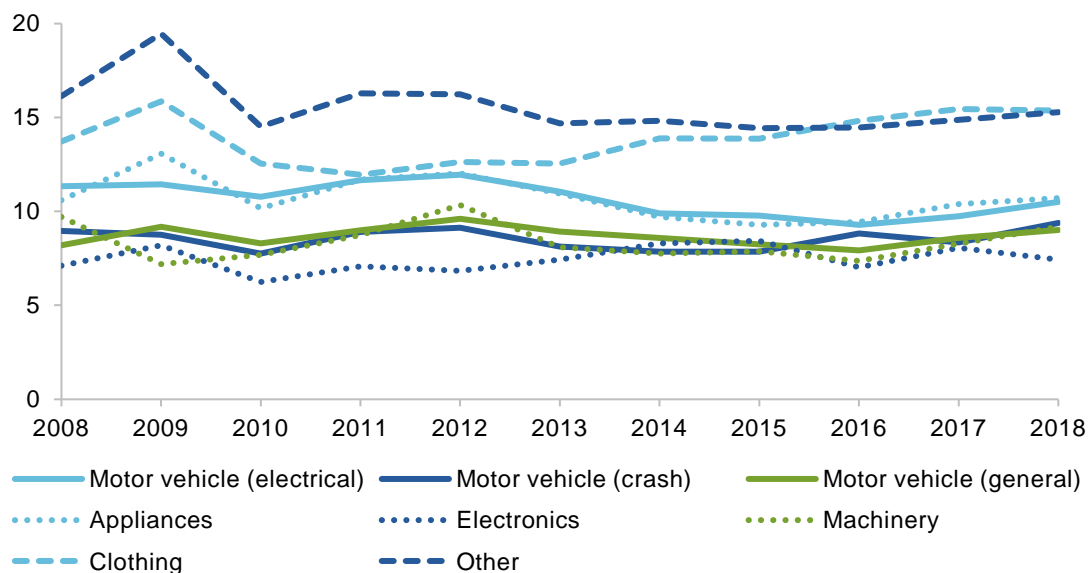
Profit margins

In principle, increasing profit margins over time may indicate that businesses are able to profitably raise prices by restricting competition.

Profit margins do not appear to be growing at the industry level (figure B.5). However, again, this may mask significant variation in levels and trends of profit margins within specific product markets.

Figure B.5 **Profit margins have remained stable**

Per cent by repair industry^{a,b}



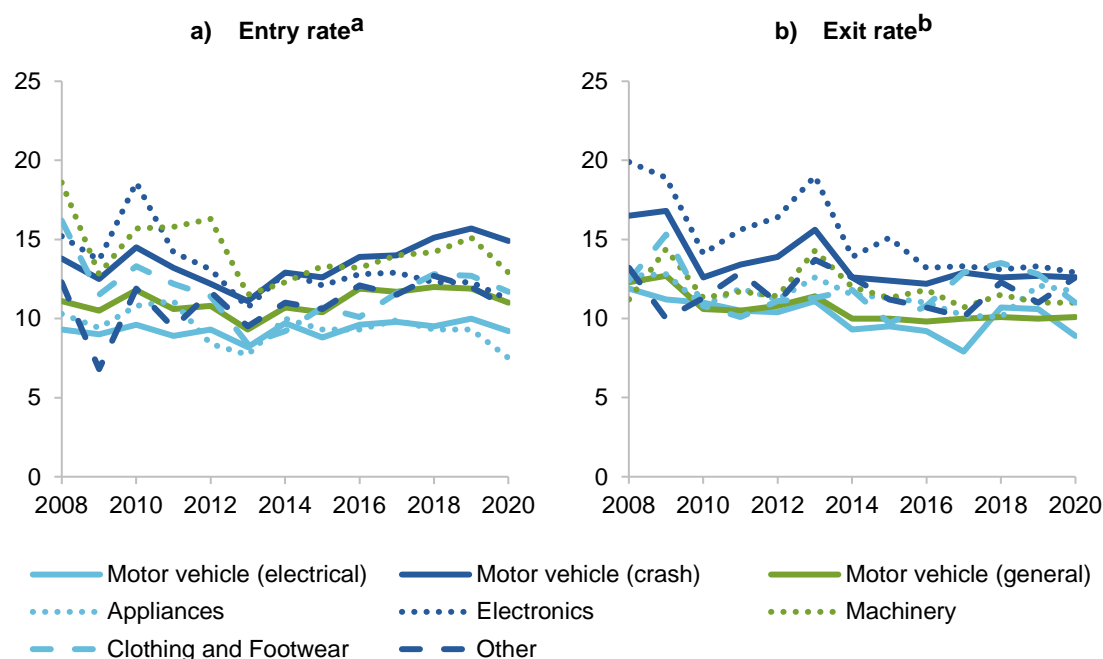
^a Profit margins were calculated using total profits divided by total income from Business Income Tax forms submitted to the ATO. ^b Repair industries based on the four-digit ANZSIC class codes within the (94) Repair and maintenance subdivision.

Source: ABS (*Business Longitudinal Analysis Data Environment, BLADE*, 2018-19, Cat. no. 8178.0, Microdata).

Entry and exit rates

Barriers to entry can enable firms to exercise their market power by restricting competition from new repairers entering the market. From 2008, between 7–19 per cent of repairers were new entrants each year (figure B.6). This is broadly in line with the 8–20 per cent of repairers who exit each year. This high rate of turnover indicates that it is possible for new repairers to enter (and potentially compete) across industries, and that this has remained steady over the past decade. Entry and exit rates appear broadly comparable with average rates across the rest of the economy.

Figure B.6 Entry and exit rates indicate low barriers to entry
Per cent of businesses entering and exiting the repair industry each year



^a Number of entries divided by the number of businesses operating at the end of the financial year. ^b Number of exits divided by the number of businesses operating at the end of the financial year.

Source: ABS (*Counts of Australian Businesses, including Entries and Exits, 2011–2021*, Cat. no. 8165.0).

B.3 Analysis of the waterbed effect

The waterbed effect should be considered when assessing the extent of consumer harm from anti-competitive behaviour in repair markets (section B.1). If primary market competition is sufficient to compensate consumers for higher repair prices, there is less merit for competition regulation. While there is strong theoretical support for the waterbed effect, the Commission found no empirical research showing the waterbed effect in repair markets. Several international studies have examined it in other contexts and found mixed results (box B.1). Due to the lack of empirical evidence, the Commission conducted an analysis to test the existence of the waterbed effect in repair markets.

Box B.1 **Empirical evidence of the waterbed effect**

There are many products with low primary market prices (and profits) and relatively high aftermarket prices (and profits). For example, printers (low price) and cartridges (high price), razors and blades, game consoles and games (OECD 2017, p. 10). The ACCC also found that car dealerships generally earn low profit margins on car sales and higher profit margins on repair and servicing (2017b, p. 45).

While such examples are an expected outcome of the waterbed effect, there is limited empirical evidence to show that the waterbed effect is the underlying cause. Some studies have tested the waterbed effect in telecommunications and credit card markets.

Telecommunications

Several studies examined the regulation of mobile termination rates (MTRs) and its impact on the mobile retail prices charged to consumers. MTRs are the wholesale payments made by an operator (such as Telstra) whose customer initiates the call, to another operator (such as Optus) whose customer receives the call. MTRs are set by the company who receives the call. Many countries regulate MTRs due to concerns of operator monopoly power resulting in high MTRs (Genakos and Valletti 2009, p. 2; Growitsch, Marcus and Wernick 2010, pp. 119–120). However, regulation which reduces MTRs may result in higher retail prices for customers (a waterbed effect). Some studies found empirical evidence of the waterbed effect (Genakos and Valletti 2011, p. 15, 2009, p. 25; Growitsch, Marcus and Wernick 2010, p. 134; Jongyong and Duk Hee 2012, p. 16). However, Veronese and Pesendorfer found no relationship (2009, p. 4).

Credit cards

One study examined how regulating credit card fees changed the interest charges consumers received. Agarwal et al. examined the *US Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009*, and its effectiveness on lowering borrowing costs to consumers (2013, pp. 1–2). The CARD Act aimed to reduce fees charged to consumers, but this could also cause an increase in interest charges (a waterbed effect). No change in interest charges was found because of the CARD — meaning there was no waterbed effect detected (Agarwal et al. 2013, pp. 28–30).

Methodology

In section B.1, the waterbed effect was described as the extent to which high repair prices are offset by low primary product prices. However, to empirically test for a waterbed effect, it is necessary to pinpoint a ‘shock’ to the market — such as a policy intervention — which affects prices. Given that most aftermarket competition policy interventions aim to reverse the outcomes of the waterbed effect — by placing downward pressure on aftermarket prices — it is possible to test for the waterbed effect by observing the extent to which falling repair prices are offset by rising primary product prices.

The Commission used the car market to test for the waterbed effect because a relevant policy intervention exists — a right to repair policy for cars has operated in the United States for

several years.¹⁰³ Further, repair and new car price data were available, and the primary market appears reasonably competitive (ACCC 2017b, p. 4; IBISworld 2021).

In the United States, Massachusetts voted to implement ‘right to repair’ legislation (hereon MAS) for cars in November 2012. Under the MAS, manufacturers were required to share with independent repairers and car owners the same repair and diagnostic information and tools available to dealerships, at a fair and reasonable price. This eventually led to a similar nationwide memorandum of understanding (MOU) in January 2014.

The Commission analysed whether the MAS and the MOU resulted in lower repair prices and higher new car prices in the United States. While the MAS was only implemented in Massachusetts, it is possible (and perhaps likely) that manufacturers changed their national pricing strategies in anticipation of more states implementing similar policies (such as the MOU), resulting in a spillover effect to the rest of the United States.

In order to examine the effects of the MAS and MOU, it is necessary to consider how trends in prices would have prevailed if they were not implemented. Therefore, the Commission compared US price trends with a control group. Australia was chosen as the control group because it is a country which shares similar characteristics to the United States and does not have a similarly effective motor vehicle right to repair policy.¹⁰⁴

The Commission used the difference-in-differences technique to estimate the effect of the MAS and MOU (box B.2). This involved comparing new car and repair prices in the United States (the treatment group) with prices in Australia (the control group) before and after the MAS and MOU were implemented. The hypothesis is that, after the MAS or MOU was implemented, a waterbed effect would cause (all else equal):

- US new car prices to increase relative to Australia; and
- US motor vehicle repair prices to decrease relative to Australia.

The following difference-in-differences model for country i , at month t , was estimated using ordinary least squares.

$$y_{it} = \beta_0 + \beta_1(country_i) + \gamma_t + \beta_2(policy * country_i) + \beta_3(country_i * time_t) + \beta'X_{it} + \varepsilon_{it}$$

¹⁰³ Jurisdictions such as the United States, Canada and the European Union have implemented repair information sharing schemes for motor vehicles. The US right to repair policy was chosen for the analysis because it is the most commonly cited right to repair policy and has the best publicly available data.

¹⁰⁴ Although Australia implemented a voluntary motor vehicle repair information sharing scheme in 2014, this was deemed ineffective by the ACCC (2017b, p. 92), and was less restrictive than the US MOU and MAS. Australia recently announced a repair information scheme for motor vehicle repairs, but this is not due to come into operation until 1 July 2022 (Sukkar 2021, p. 3).

Box B.2 The difference-in-differences method

Difference-in-differences is a statistical technique that makes use of longitudinal data to estimate the effect of a specific intervention or treatment (such as a passage of law or enactment of policy). The technique compares changes in the variable of interest among a population that is subject to the treatment (the treatment group) and a population that is not (the control group).

In order to estimate a causal effect using a difference-in-differences method, several assumptions must be satisfied. Most notably, this approach requires that in the absence of the treatment, the difference between the 'treatment' and 'control' group is constant over time (common trend assumption). However, additional control variables can be added to the specification to account for time-varying factors that might affect the difference between the two groups over time. Other assumptions are that the treatment is unrelated to outcomes before the treatment, and that the composition of treated and control groups is stable over time

Source: PC (2020, p. 338).

Table B.2 provides descriptions of the variables. Two different dependent variables (y_{it}) were used — the new car price and the repair price. United States and Australian consumer price index (CPI) data were used for both variables.¹⁰⁵ β_2 is the coefficient of interest, and shows the impact of the MAS (or MOU) on US repair and new car prices, compared with Australia. β_2 is expected to be negative for repair prices and positive for new car prices.

This model also includes country (β_1) and month (γ_t) fixed effects, and country-specific linear time trends (β_3). Country fixed effects control for any time-invariant differences across countries, such as their geography (remoteness of the country). Time fixed effects control for trends in factors over time that affect prices across both countries, such as the changing technology in cars. Country-specific linear time trends control for the different time trends in prices for each country.

Three empirical specifications were used for the two dependent variables (table B.2):

- specification 1 — baseline specification (monthly observations from 2000–2019)¹⁰⁶, which includes month and country fixed effects
- specification 2 — baseline specification with country-specific linear time trends
- specification 3 — baseline specification with country-specific linear time trends and macroeconomic controls.

Specification 3 is the preferred estimation.

¹⁰⁵ The Australian *motor vehicle CPI* includes new cars and new motorcycles (given the share of motorcycles is small, it is likely a good proxy). The US *new car CPI* only includes new cars. *Motor vehicle repair and maintenance CPI* data were used as a proxy for car repair prices (although it includes maintenance as well as repair). The US *repair and maintenance CPI* includes motor vehicle body work, maintenance and repair. All indexes are seasonally adjusted.

¹⁰⁶ The time period of 2000–2019 was chosen to remove noise in the trends for new car prices in Australia from the late 1980s to the late 1990s.

Table B.2 Model variables and parameters

Variable / parameter	Variable or parameter descriptions	Included in specification:		
		(1)	(2)	(3)
y_{it}	Dependent variable. ^a Repair price ^b or new car price ^c for country i at month t , measured as indexes from the CPI (indexed at the average price level of 1995)	✓	✓	✓
β_0	Intercept	✓	✓	✓
$country_i$	Country dummy variable (1 = United States)	✓	✓	✓
β_1	Country fixed effects	✓	✓	✓
γ_t	Monthly time dummy variables (time fixed effects)	✓	✓	✓
$policy * country_i$	An interaction variable between the country dummy variable and the MAS (or MOU) dummy variable (MAS = 1 from November 2012 onwards; MOU = 1 from January 2014 onwards)	✓	✓	✓
β_2	The coefficient of interest (difference-in-differences effect) which shows the impact of the MAS (or MOU) on US new car or repair prices	✓	✓	✓
$country_i * time_t$	An interaction variable between the country and a time trend variable, to account for country-specific linear time trends		✓	✓
β_3	Vector of coefficients corresponding to country-specific linear time trends		✓	✓
X_{it}	Vector of controls to account for macroeconomic conditions, including the average monthly indirect exchange rate, quarterly GDP growth, car tariffs and luxury car tariffs			✓
β'	Vector of coefficients corresponding to each control variable			✓
ε_{it}	Idiosyncratic error	✓	✓	✓

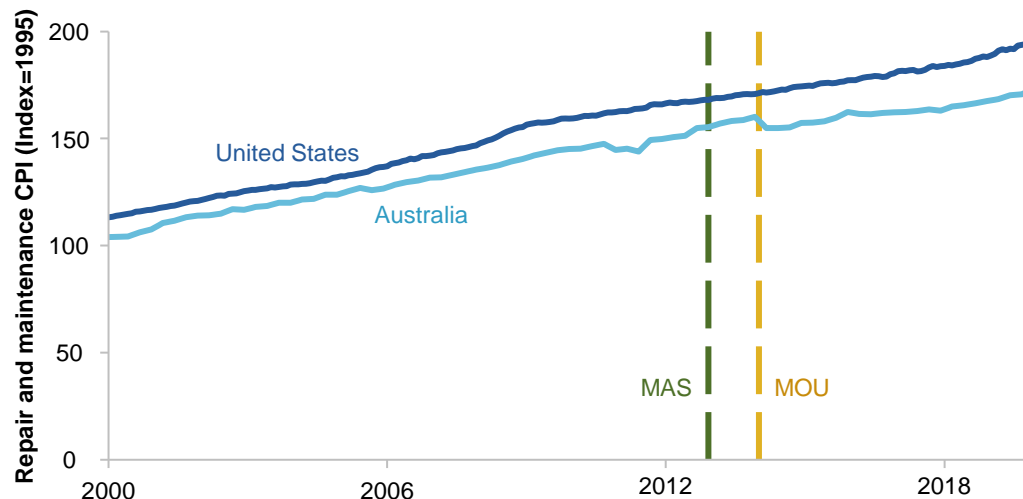
^a Two dependent variables are used for each model specification. The first uses new car prices and the second uses repair prices. Both are indexed to the average price level of 1995. ^b Repair and maintenance CPIs are used as a proxy for repair prices. ^c Motor vehicle CPI is used for Australia as a proxy for new car prices. Australian CPI data are measured quarterly and were converted into monthly observations via linear interpolation.

Results

Descriptive trends

Figures B.7 and B.8 present pre- and post-MAS (and MOU) CPI trends for repair and new cars. These trends indicate that the common trend assumption (box B.2) might not hold. Before the MAS or MOU were implemented, US repair prices increased slightly faster than Australia (figure B.7). And Australian new motor vehicle prices decreased slightly faster than the United States (figure B.8). These differences in trends were accounted for by including country-specific linear time trends in specifications 2 and 3 of the model.

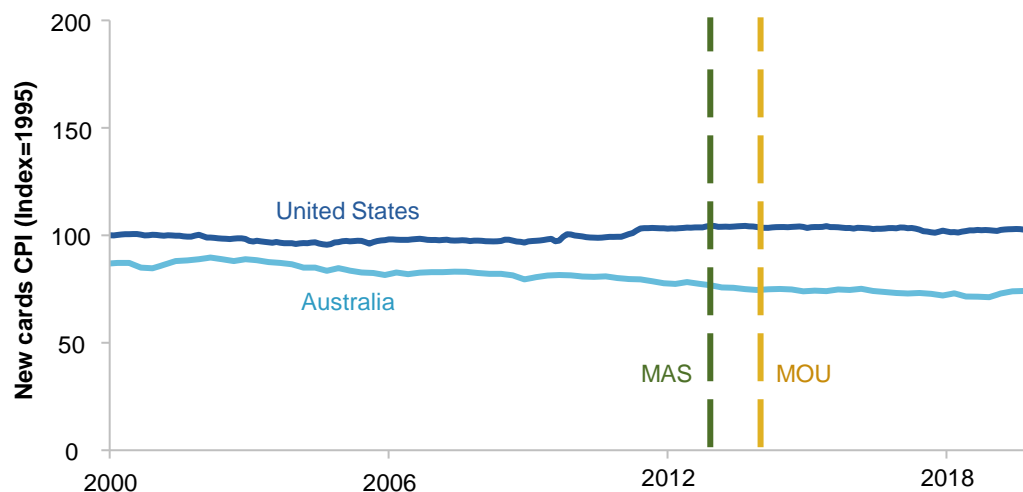
Figure B.7 Car repair prices over time^a
 Australian and US CPI for car repair and maintenance



^a The MAS (Massachusetts) legislation was passed in November 2012. The MOU (Memorandum of Understanding) was implemented in January 2014.

Sources: Commission estimates based on ABS (*Consumer Price Index, Australia*, September 2020, Cat. no. 6401.0, Table 9) and U.S. Bureau of Labor Statistics (*CPI for All Urban Consumers*) data.

Figure B.8 New car prices over time^a
 Australian and US CPI for new cars



^a The MAS (Massachusetts) legislation was passed in November 2012. The MOU (Memorandum of Understanding) was implemented in January 2014.

Sources: Commission estimates based on ABS (*Consumer Price Index, Australia*, September 2020, Cat. no. 6401.0, Table 9) and U.S. Bureau of Labor Statistics (*CPI for All Urban Consumers*) data.

The price trends suggest that the introduction of the MAS or MOU did not reduce repair prices and increase new car prices in the US, as there was no significant deviation from pre-MOU price trends. However, the following section examines whether there is evidence of the waterbed effect after controlling for various factors outlined in table B.2.

Regression results

These regression results show that the MAS increased new car prices *and* decreased repair prices in the United States compared with Australia — that is, a statistically significant waterbed effect in specifications 1, 2 and 3 (table B.3). The preferred specification (3) estimated that the MAS increased US new car prices by 6.8 percentage points on average and decreased US repair prices by 4.1 percentage points (based on 1995 prices), compared with Australia.

The regression results for the MOU (the alternative treatment point) show that it increased new car prices, but did not decrease repair prices (table B.3). The preferred specification (3) estimated that the MOU increased US new car prices by 3.4 percentage points on average, compared with Australia (based on 1995 prices), but did not have a statistically significant effect on US repair prices. This statistically insignificant result suggests that the initial impact on repair prices may have been captured by the earlier MAS treatment.

Overall, this shows that implementing regulations to reduce repair prices may result in higher new product prices, providing some evidence of a waterbed effect.

However, after conducting a number of robustness tests the results appear to be sensitive to the treatment point used. Also, the analysis is subject to a number of limitations (discussed below), which likely reduce the accuracy and confidence of the results.

Robustness checks

To examine whether the regression results were robust, the Commission analysed the sensitivity of the results by varying the:

- time periods for the observed sample
- treatment points, by changing the treatment points to before the MAS policy change
- index years for the CPI.

Table B.3 Regression results^a

	<i>Specification 1 (Baseline: time and country fixed effects)</i>	<i>Specification 2 (Baseline with country-specific linear time trends)</i>	<i>Specification 3 (Baseline with country-specific linear time trends and macroeconomic controls)</i>
MAS treatment^b			
New car prices^c			
Effect of MAS	13.88***	4.83***	6.79***
Standard error	(0.50)	(0.56)	(0.54)
R-squared	0.94	0.98	0.99
Observations	480	480	480
Repair prices^d			
Effect of MAS	6.35***	-2.58***	-4.14***
Standard error	(0.46)	(0.43)	(0.47)
R-squared	0.99	0.99	0.99
Observations	480	480	480
MOU treatment^e			
New car prices^c			
Effect of MOU	12.93***	1.48**	3.38***
Standard error	(0.68)	(0.61)	(0.79)
R-squared	0.91	0.97	0.98
Observations	480	480	480
Repair prices^d			
Effect of MOU	7.40***	0.68	0.68
Standard error	(0.43)	(0.44)	(0.64)
R-squared	0.99	0.99	0.99
Observations	480	480	480

^a Results using monthly data from January 2000 to December 2019. The results (effect of MOU and MAS) show the average percentage point change in new car/repair prices in the United States compared with Australia. ^b The MAS (Massachusetts) legislation was passed in November 2012. ^c The dependent variable is the CPI for new cars, indexed at the average of 1995. ^d The dependent variable is the CPI for motor vehicle repair and maintenance, indexed at the average of 1995. ^e The MOU (Memorandum of Understanding) was implemented in January 2014. * p<0.1, ** p<0.05, *** p<0.01.

Sources: Commission estimates based on ABS (*Consumer Price Index, Australia*, September 2020, Cat. no. 6401.0, Table 9), Federal Reserve (*Foreign Exchange Rates*), OECD (*Quarterly GDP indicator*), U.S. Bureau of Labor Statistics (*CPI for All Urban Consumers*) data.

The results were robust across different index years and time periods. However, the results were not robust when testing different treatments points — November 2008 and 2010 (table B.4). This test found that changes in new car prices were also positive and statistically significant prior to the MAS and MOU policy changes. This implies that time trends in the data may be driving the results for new cars because there are diverging trends in new car prices across both countries — new car prices increased over time in the United States and decreased over time in Australia (figure B.8). However, the magnitude of the new car effect was increasing up until the point of the MAS policy change (table B.4), suggesting car

manufacturers may have been adjusting their pricing strategies around this time in anticipation of the law change.

Table B.4 Robustness check using different treatment points^a
Specification 3 dependent variable results using different treatment points

<i>Regression</i>	<i>Nov 2008</i>	<i>Nov 2010</i>	<i>MAS (Nov 2012)</i>	<i>MOU (Jan 2014)</i>
New car prices ^b	2.37***	6.61***	6.79***	3.38***
Repair prices ^c	1.07*	-0.33	-4.14***	0.68

^a Results using monthly data from January 2000 to December 2019. The results show the average percentage point change in new car/repair prices in the United States, compared with Australia, as a result of the treatment point used. ^b The dependent variable for the new car regressions is the CPI for new cars, indexed at the average of 1995. ^c The dependent variable for the repair regressions is the CPI for motor vehicle repair and maintenance, indexed at the average of 1995. * p<0.1, ** p<0.05, *** p<0.01.

Sources: Commission estimates based on ABS (*Consumer Price Index, Australia*, September 2020, Cat. no. 6401.0, Table 9), Federal Reserve (*Foreign Exchange Rates*), OECD (*Quarterly GDP indicator*), U.S. Bureau of Labor Statistics (*CPI for All Urban Consumers*) data.

Limitations of the analysis

While the difference-in-differences model found some evidence that the US right to repair policies resulted in some waterbed pricing, there are several limitations to the analysis.

- Figures B.7 and B.8 indicate that the common trend assumption (box B.2) may not hold. While the use of country-specific linear time trends may alleviate this problem to some extent, it cannot fully correct for the lack of a common trend — a key assumption of the difference-in-differences model.
- There is only one treatment and one control group, meaning that other country-specific policy changes coinciding with the treatment point may affect the results.¹⁰⁷
- It was difficult to find high-quality controls for the model that were consistent across both countries, such as the proportion of cars that are imported. Some basic controls, such as GDP and exchange rates, may alleviate this problem to some extent.
- The waterbed effect can show up in ways other than changes in new car or repair prices, which would not be observed in the model. For example, through lower quality of the new cars, or through shorter or less generous warranties.
- The analysis also does not show the ‘completeness’ of the waterbed effect. The completeness of the waterbed effect cannot be determined because the lifecycle repair

¹⁰⁷ For example, Australia entered into free trade agreements with major car producing countries (such as Republic of Korea in December 2014 and Japan in January 2015), which could lower new car prices in Australia (through lower tariffs) relative to the United States. Adding other countries, such as European nations and Canada, into the model may help alleviate this. However, right to repair policies differ across jurisdictions (for instance, Canada’s policy is not legislated and there is little evidence of its effectiveness).

price cannot be calculated (that is, the total repair expenditure over the life of the car), and CPIs were used in the model instead of dollar values.¹⁰⁸

Conclusion

Overall, these results show some evidence of a waterbed effect from the implementation of a right to repair policy in the United States. The model using the Massachusetts right to repair legislation as a treatment point resulted in higher new car prices and lower repair prices in the United States relative to Australia. The model using the nationwide memorandum of understanding in the United States as a treatment point resulted in higher new car prices in the United States relative to Australia, but had no significant impact on repair prices.

However, the results are subject to a number of limitations and are specific to the car repair market, with limited applicability to other repair markets. Also, the results are not robust across varying treatment points, although this may be explained by manufacturers changing their pricing strategies in anticipation of the policy changes.

The empirical approach outlined above may provide some guidance to competition policy makers and regulators about how to analyse the waterbed effect in repair markets. For example, this approach could be used in the future to analyse the waterbed effect in Australia's motor vehicle market once the Australian Government implements its proposed Motor Vehicle Service and Repair Information Sharing Scheme (chapter 4). This would help policy makers better understand the impact of their decisions and make more informed decisions when implementing policy.

¹⁰⁸ To determine the completeness of the waterbed effect, one would need to calculate the average new car price and the average repair price, as well as the average number of times a consumer repairs their car over its product life. Then one would compare the change in new car prices (average new car price times the percentage change in new car CPI from the regressions) with the change in lifecycle repair price (average repair price times average number of repairs times the percentage change in repair CPI).

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