# South Australian Repair and Maintenance Services Sector Study

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This report on the Repair Sector in South Australia is based on research conducted by Net Zero Lab on behalf of GISA.

**Research Team/Investigators**

Dr Robert Crocker

Penny Lara

Dr Aaron Davis

Dr Niki Wallace

Richie Khoo

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# Executive Summary

Repair and reuse must play a vital role in developing a circular economy. Funded by a Green Industries SA's Circular Economy Market Development Grant, the state-based repair and maintenance sector study presented here sought to map the current state of repair in South Australia, to understand existing barriers to repair, and to identify opportunities for growth, including practical ways to support, grow and build repair skills across the state.

Our study did not address the repair and maintenance of cars, trucks or larger industrial and agricultural machinery, but was focused on common consumer products such as clothing, appliances and communication devices. This is because these are often not repaired but are discarded prematurely, and so must play an outsized role in the state government's waste strategy and related attempts to implement the circular economy at local and regional levels. Accordingly, the goal of the project was to identify and develop pathways towards a more widespread use of repair amongst consumers, in order to increase circularity in South Australia.

This report begins with an overview of the literature on the state of repair, with a special focus on relevant cases from Europe and some American states, where concern for the state of repair or its absence has been strongest. This is followed by findings from interviews with 54 stakeholders engaged in various forms of consumer-oriented repair or repair advocacy, both in the state and nationally. This section of the report provides some local and more specific insights to the themes identified in the literature.

A number of significant barriers to repair were identified in both the literature and our interviews, most notably design decisions making the repair of certain products a more difficult, even impossible, option, the availability of spare parts and their cost, and in some cases the availability of technical information required for the repair. Also prominent in the barriers to repair identified were changing consumer attitudes, including the tendency to value the new over the old, and to replace the broken or damaged item with the new immediately, rather than to seek out repair.

The uneven availability of repair services, and the difficulty or even impossibility of repairing some items, especially low-cost clothing, footwear, furniture and electronic products, has made encouraging repair in these areas especially challenging. Most users now will replace these items when they break down, since repair has ceased to be a viable option.

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*While most people now accept that recycling has environmental benefits, most are unaware of the larger benefits of 'Avoidance' and 'Reuse'*

Mobile phones and tablets have other issues undermining a user's recourse to repair. These include the design of the devices themselves, the availability of spare parts, technical restrictions on independent repair and access to the technical information, tools and software required to complete a repair, as well as the cost of the repair itself, and the time required to do it. Larger household appliances, although more likely to be offered for repair, may be too expensive or difficult to repair, again because of their design and the availability and cost of parts.

As a result of these barriers, many types of repair have become more expensive and repair services more difficult to locate, compared to buying a replacement product. The business of repair has also been complicated by the increasing number of goods having digital components, with the parts of some products now difficult to locate in a timely and cost-effective manner. Some products are also designed using paired components that effectively exclude any 'unauthorised' or independent repair. This has become another reason for the user to 'trade up' to the new rather than repair the 'old'.

Accessing, paying for, and waiting for a repair, which may turn out not even to be viable, can involve delays and uncertainties that may also push the user towards upgrading to the new. These problems have led to a noticeable decline in repair services for many consumer products, and an ageing demographic of working repairers, a problem made worse by a matching decline in training opportunities for those who might have otherwise considered working in the sector.

On the positive side, there are many people interested in having their goods repaired rather than being obliged to buy new, and a push-back against planned obsolescence, and against companies routinely violating their users' right to repair. There is also increasing concern amongst legislators about the environmental impacts of the waste generated by unrepairable, and unrecoverable products, especially of the increasing volumes of e-waste and clothing waste.

Key themes and issues emerged from the interviews undertaken for this project, which echoed those uncovered in the expert literature on repair and repairability from Europe and USA. Following a discussion of the key findings from both the literature and stakeholder interviews, a number of policy options were developed for further consideration. Of these, the state-based options were presented for review to a policy workshop in late October 2024. Longer-term, more complex options needing some federal government involvement were then presented for discussion to a group of repair advocates and policy experts during an online meeting in November 2024. The final list of policy options can be found at the end of this report.

# Introduction

The circular economy promises to reduce emissions and the consumption of resources, materials and energy by keeping products in use for as long as possible (EMF 2024). By reducing the need to manufacture entirely new goods, the circular economy also aims to regenerate environmental systems. The South Australian government committed itself to developing a circular economy in 2017 (GISA 2024), and since then the other states, and now the federal government (CEMAG 2024), have moved towards developing a circular economy. In December 2024 the federal government released Australia's Circular Economy Framework (DCCEEW 2024). The Productivity Commission is also currently conducting an enquiry on opportunities in the circular economy (AGPC 2024). They have understood that increasing circularity will result in greater resource efficiency, waste reduction, environmental regeneration, and also lower emissions plus other positive environmental and economic impacts.

Beyond recycling, repair and reuse must play a vital role in the circular economy. For without ensuring that repair is widely available and affordable to the majority of consumers, it will not be possible to develop a genuinely circular economy. Recycling alone is unable to restrain today's growth in consumption. Without more effective recourse to reuse and repair, especially in everyday consumer products, it is unlikely that the goals of the circular economy can be met.

Household consumption is an important and often neglected component of the 'human activities' behind climate change. Indeed, it has been estimated that over 60% of greenhouse gas emissions now derive directly from household consumption, and 'between 50% and 80% of total land, material, and water use' (Ivanova et al. 2017). This means that even doubling the life of most common household products in use could have far reaching consequences for the environment, and climate change (Crocker 2012). Repair also has many often underestimated social and economic benefits, including job creation and skill development (D'Urzo & Campagnaron 2023; CRA & EPANSW 2024).

This report is the outcome of a research project funded by a Green Industries SA's Circular Economy Development Grant (2023). The South Australian Repair and Maintenance Services Sector Study aimed to:

* Map the current state of repair in South Australia,
* Identify barriers discouraging repair in South Australia,
* Strengthen connections between those already engaged in repair in the state, and
* Identify ways to support, grow and build skills in the repair sector in South Australia.

Summarising the findings from this project, the report starts with a literature review on the state of repair in the consumer domain, with a particular focus on attempts to revive and integrate repair to support a circular economy in Europe. Having identified the major barriers and enablers of repair and the policy responses being adopted in Europe and in some American states in the literature, we then conducted in-depth interviews with 54 individuals engaged in repair and the promotion of repair through a range of affiliated expert domains, including policy, law and design.

Two workshops with policy makers and experts on repair were then held in late October 2024 and early November 2024.  These discussed and reviewed a range of policy options emerging from our findings. A final revised list of policy options is discussed in Section 3 and then listed in the Conclusion.

The literature review (Section 1) identified many of the issues encountered during our interviews (Section 2). These include a number of barriers to repair, notably planned obsolescence, design decisions making repair more difficult, the availability and cost of the parts and technical information required to repair something, the high price of the repair to the consumer, along with changing consumer attitudes. These have been encouraged to value the new over the old, and in this way discount repair as a less viable option.

Different types of goods we found were subject to sometimes quite different issues when it comes to their repair and repairability. For example, clothing and footwear are now rarely repaired in Australia because of the relatively low cost of replacing them, and the relatively higher costs of repair. A similar issue exists with furniture: despite being usually easy to repair, cheaper imports (and flat packs, which are often harder to repair) result in people purchasing new rather than repairing their older furniture.

Mobile phones and tablets, on the other hand, have quite distinct issues associated with their repair, including 'perceived obsolescence', the availability of parts, the cost of repair, and the time a repair might take. By contrast, while household appliances are more likely to be offered for repair, many are not able to be repaired, or repaired successfully. Increasing efficiencies in their manufacture, including the 'lightweighting' of their components, have rendered many of these appliances difficult and/or costly to repair (Laitala et al 2021).

We approached a range of stakeholders to interview, from independent repairers and repair café volunteers, to experts engaged in researching, promoting or advocating for repair at a state or national level. While an outline of our indicative questions can be found in the Appendix, these were adjusted to accommodate sometimes quite divergent individual activities, as well as the time they had available. From our interview data we took standardised notes. A sample of these is also included in the Appendix.

We interviewed 54 individuals in total, with most involved directly in repair in Adelaide, around ten from interstate, contributing more specific policy, law or design expertise. We are very grateful for their voluntary participation and vital contribution to this project. Some of the repairers we interviewed did not want to be named, and so we have de-identified them, but still linked them to their skills and the general area of their work.

Since South Australia has a small population and is situated at the end of lengthy, invariably linear global supply chains, it was not surprising that most of the themes emerging from the literature review and its European or American cases were reflected in our interviews.

Repair is being challenged everywhere, largely because of a global economic context we introduce and discuss below. Continuous technological improvement and increasing efficiencies in production (of textiles, products, household appliances and electronic devices) have lowered their relative costs (and prices) over time, and in this way encouraged more, and more frequent replacement consumption, since the price of the new has fallen relative to the purchaser's income.

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To illustrate this global trend, a study by Schor (2010) found that individual items in a 'basket' of common household goods (from stoves to mobile phones) imported into the USA over the decade 1995-2005 declined in unit price and weight over the same period, but increased in overall volume. This is a global trend that has also pushed up the cost of repair, relative to the price of product replacement. Many products can now be replaced with new ones, often for only moderately more money than having them repaired (Crocker 2018).

For example, the price of replacing the keyboard on a two-year old Apple MacBook Air laptop, a job quoted to one of the researchers in 2020, was nearly 70% of the cost of replacing it with a new laptop. This presented them with a common dilemma, particularly in electronic products: offer the damaged product for repair, with its attendant uncertainties and high costs, or purchase a new one, and enjoy the benefits of a new product and warranty. Relatively short warranty periods, coupled with the high price of many types of repair, especially when controlled by the manufacturer, has made replacement seem easier, quicker and cost effective to the user.

In practice, this means repairers are set an increasingly unenviable task, of repairing products whose relative price may not have risen for ten or more years, whilst they must pay themselves and their employees a living wage, and for parts, workshop space, storage and associated costs, which all have risen, and continue to rise. Repair has become more expensive relative to the cost of replacement in many categories of products, putting extraordinary pressure on many kinds of repair businesses.

This has become more apparent since digitization, for more repairs now involve not just replacing mechanical parts but integrated components, themselves complex digital products, with their own supply and cost issues. This same digitization has also enabled manufacturers to more precisely control the end of life of their products, and through this encourage their users to upgrade sooner.

And yet repair has an essential role to play in keeping things in use for as long as possible, as the circular economy requires. Without ensuring people's recourse to repair for everyday products is more affordable and accessible, it seems unlikely that the circular economy can ever be implemented widely. For this reason, it is necessary to look more closely at what can be done to slow today's throwaway culture, and promote and encourage a more widespread and effective use of repair.

# Literature Review

Recycling may be socially valued but is an unevenly effective, often technically complicated, and in many cases a less environmentally positive process than it is assumed to be...

# Introduction

Interest in the circular economy has grown dramatically since 2015, when both Europe and China adopted the concept to shape their environmental policy goals (Kirchherr et al 2017). Unlike the prior emphasis on sustainable development, and focus on complementary environmental, social and economic outcomes, the circular economy approaches our environmental crisis primarily from a 'material flows' perspective (Geissdoerfer et al 2017). By keeping things in use for longer, the circular economy aims to reduce waste generation, reduce energy and resource use, and regenerate natural systems (DCCEEW 2022).

Emerging from earlier studies in industrial ecology and ecological economics (Winans, Kendall & Deng 2017; Crocker 2018), the concept of the circular economy has been defined in many ways, with now over one hundred definitions found in the literature (Rizos, Tuokko & Behrens 2017). The most widely used definition today, however, is that of the Ellen Macarthur Foundation (EMF 2024), the British charity engaged in promoting its benefits to governments and corporations across the world. For the Ellen Macarthur Foundation, the circular economy is one 'that is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times' (now slightly updated, EMF 2024).

In this definition, three principles or 'pillars' are identified:

* Designing out waste and pollution;
* Keeping products and materials in use for as long as possible; and
* Regenerating natural systems.


These three principles emerged from the older (zero) waste hierarchy (see below), which prioritises avoidance and reuse over recycling, energy recovery and disposal. This is important because recycling alone has been found to be an inadequate means for reducing waste. Many wastes are not easily recycled, others are not separated and recycled when they could be, and even where recycling occurs the process still requires significant energy inputs (Korhonen et al 2018). Another issue supporting the circular economy's emphasis on 'designing out waste', and preference for using products for longer periods over recycling, is that some waste materials are now of such low quality that recycling these is not economically viable, and in some cases technologically impossible.

Recycling is not only a technological activity but also a product of history, and changing attitudes and expectations. Some wastes that are successfully recycled now, such as glass and metals, have been collected and processed in large volumes because systems have been developed over time to target, sort and handle them. In the case of glass, these originated in response to the now forgotten danger of broken bottles cutting the feet of children and domestic animals in the early twentieth century (Macbride 2013; Strasser 2013). Recycling may be socially valued but is an unevenly effective, often technically complicated, and in many cases a less environmentally positive process than it is assumed to be (Ragossnig & Schneider 2019).

Unfortunately, many years of successfully promoting the benefits of recycling to consumers have eclipsed more sporadic attempts to emphasise the environmental benefits of Avoidance and Reuse, which sit higher on the waste hierarchy. These are prioritised within the circular economy for a good reason. As the expanded waste hierarchy below makes clear, more environmental, energy and material savings can be made through these higher order activities than recycling, with avoidance and reuse the most important of all (DCCEEW 2022).



| The waste hierarchy | Expanding the waste hierarchy | Example actions |
|---|---|---|
| Avoid / reduce | Make do | Use existing, use sparingly, make self, do without |
| | Borrow or rent | Borrow, rent/lease, 'as-a-service', outsource, get digitally |
| Reuse | Source second-hand | Rescue, receive, buy |
| | Buy to last | Buy durable, buy reusable, buy repairable / upgradable |
| Recycle | Reuse yourself | Participate in reuse scheme, reuse own item, repurpose own item |
| | Share with others | Lend, swap, share own item |
| Recover | Repair or upgrade | Preserve, maintain, repair, upgrade, upcycle |
| Treat | Pass on/back | Sell, give away, donate, return for resale, repair or disassembly |
| Dispose | Recycle Recover Treat Dispose | |

*Figure 1. Expanding the top of the waste hierarchy to incorporate waste prevention activities (DCCEEW 2022)*

Avoid / Reduce in this hierarchy are the most difficult areas in which to intervene, or have much impact on. This is because most products enter the market without there being any requirement for establishing whether they may have an adverse impact on the environment during their use or at the end of their life. The modern economy is largely built around producing more products in the hope they're attractive to consumers, and that they can perform the function they've been designed for and be disposed of when reaching their end of life. This is referred to as a 'linear' economy in the circular economy literature, and is often contrasted with the circular economy and its goals (EMF 2024).

..the circular economy aims to reduce the demand for resources, materials and energy which has expanded in the linear economy...

In the circular economy, avoidance (or longer use), reuse and repair are especially important, since they help realise one of its main principles, namely the complete use of a product or material, for the full duration of its potential lifespan. Through this longer use of products and materials, the circular economy aims to reduce the demand for resources, materials and energy which has expanded in the linear economy, since this requires the making and replacement of so many more new products more often (Stahel 2016).

'The most logical approach to closing the 'loop' on product use is simply to repair and extend the product's life'

*(King et al 2006: 259).*

A simple example of the benefits of extending the lifespan in use of consumer goods can be found in the history of mobile phone retention rates: when these first appeared in the late 1990s, their average lifespan in use was around four years. This has now fallen to less than two, suggesting that the average user will now require twice as many of these devices during their lifetime than they might have in the late 1990s (Crocker 2012). However more efficient newer mobile phones might be than their older counterparts, the impact of the energy, materials and resources required to make twice as many of them per user inevitably increases the environmental impacts of their production, use and disposal.

**The Advantages of Repair**

Most forms of reuse and extended use (or avoidance), are dependent on the ability to maintain and repair the product in question, and on the ability of trained individuals to service, fix or improve a product when this is required (Vinsel & Russell 2002). If a product cannot be repaired, then it cannot be maintained for use, and it will not be possible to continue using it in the manner intended, in this way prematurely forcing its end of life. Repair is thus a significant leverage point in advancing the circular economy.

By ensuring a product can be maintained and repaired, it becomes possible to extend its life in use, and in this way reduce its environmental impacts over time, and also to conserve the resources and materials that have contributed to its production (Stahel 2016). This process of maintaining and fixing a product to ensure its extended use is described in terms of 'inner loops' in the circular economy literature (EMF 2023), since acts of maintenance and repair prevent a product being disposed of as waste, and instead return it to use. 'The most logical approach to closing the 'loop' on product use is simply to repair and extend the product's life' (King et al 2006: 259).
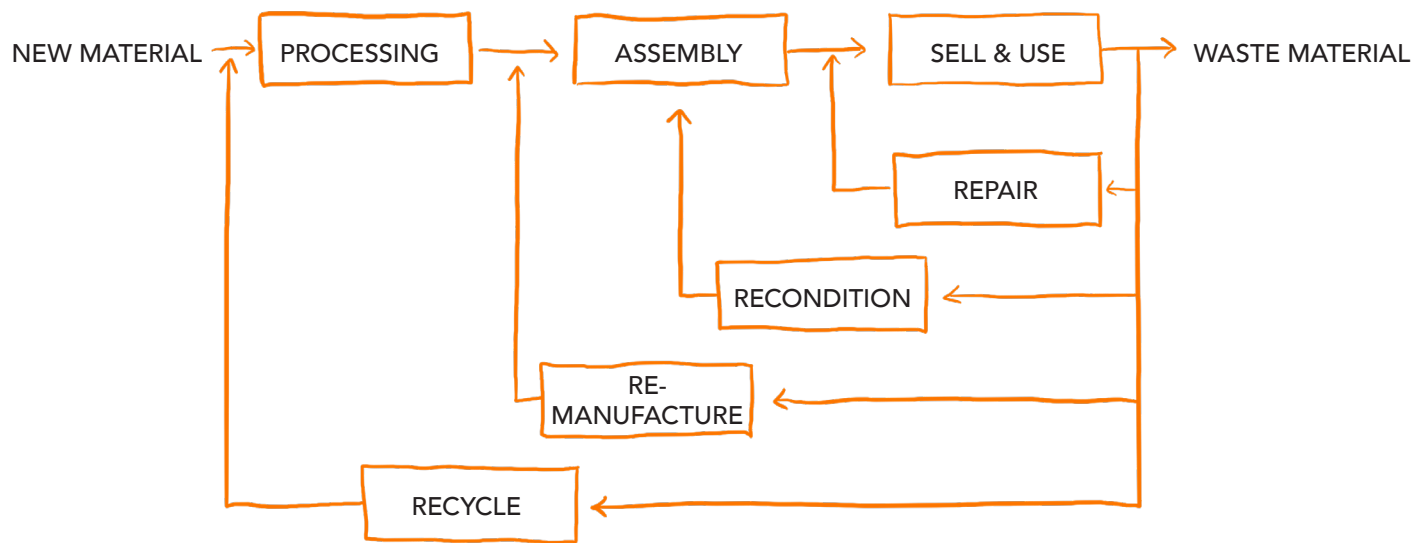
*Figure 2. Repair, reuse, remanufacturing and recycling (re-drawn from: King et al., 2006).*

As the Ellen Macarthur Foundation has repeatedly emphasised,

> *The closer the system gets to direct reuse, i.e. the perpetuation of its original purpose, the larger the cost savings should be in terms of material, labour, energy, capital and externalities such as greenhouse gas emissions, water, or toxic substances (EMF 2023).*

Repair and maintenance have the additional advantage in economic and social terms of inverting the 'energy/work ratio', replacing the energy and materials required to make a new product with labour. This can create many new jobs, and in some places even reindustrialisation (CRA & EPANSW 2024; Campagnaro & D'Urzo 2021; Ram et al 2022; and Stahel & Reday-Mulvey 1981). Recent studies have shown that where recycling can create one job, reuse activities, and especially repair, can create many times more (Campagnaro & D'Urzo 2021). According to a recent report commissioned by NSW EPA and Charitable Reuse Australia, this figure could be as high as 25 more jobs generated by reuse and repair activities than by recycling per tonne of materials processed, although obviously some waste materials now can only be recycled and not-reused (CRA & EPANSW 2024).  Another advantage of reuse and repair is that this kind of work can be carried out locally, and in some instances by people now excluded from the labour market (Bovea et al. 2017).

## Understanding Repair and Maintenance

It is important to understand what is meant by repair, since this can cover many different kinds of activity, from complex engineering or scientific interventions to simply replacing a heel on a boot. The word itself comes from the Latin *reparare*, to restore or 'make (something) ready again', or to 'put in order again' (Oxford Dictionary), while the word maintenance is derived from the Latin for 'holding something in the hand', in order to keep it in its 'existing state or condition' (Oxford Dictionary).

In pre-modern societies, repair and maintenance played a critical role in the artisan's work. Repair therefore has a long history, but this is often overlooked in today's linear economy, that routinely privileges the new over the old (Strasser 2003). In fact, in a linear economy waste has to be created to 'make room for the new', and so it becomes important for growth (Liboiron 2013).

This is a recent phenomenon, since the much higher cost of resources and materials in the past made people value maintenance and repair much more. Repair and maintenance also helped generate and support specialised skills across many industries. Knowing how to repair something could stimulate problem solving and innovation in a workshop or factory setting. 'Repair and maintenance are not incidental activities. In many ways, they are the engine room of modern economies and societies' (Graham & Thrift 2007: 19).

Without repair and maintenance, products and systems soon break down and can cease to function (Jackson 2014). This means not only more waste but a potential loss of time, money and effort. 'Things are made, and things fall apart' (Jackson 2014: 225), but repair and maintenance can ensure their continuing functioning and use (Graham & Thrift 2007: 8). The car is a familiar example of this. 'A large penumbra of garages and other repair institutions', along with specialised skills, are needed to keep cars on the road, and this has always been the case (Graham & Thrift 2007: 15).

Every breakdown makes repair's significant contributions to the local economy more visible, including skills beyond those directly involved in the repair. In the case of the car, there are ambulance personnel, police, fire crews, tow trucks and insurance agents, along with experts in civil engineering and construction who ensure our roads are up built, repaired and maintained. These all support what Graham and Thrift call the car's 'crash ecology' (2007: 17), which is closely aligned with the its own repair ecology.  In much the same way, all large 'socio-technological' systems such as information and communication (ITC) require a similarly wide range of supporting expertise to keep them functioning, from electrical engineers to network specialists. This larger social and economic set of relationships can be seen in many domains, but are often taken for granted, at least until things break down (Jackson 2014: 230).

### Consumption and Repair

Consumption and its many contexts play a key role in enabling, or disabling, repair (Jaeger-Erben et al. 2021: 10). Dominant linear systems of provision such as supermarkets and online stores can frame the 'options and possibilities within which people make consumption choices', including repair, steering them to consume and act in certain ways, to privilege the new over the old or second-hand, and to not repair, and to discard what they have in order to encourage them to upgrade to the new (Vaughan et al. 2007: 121).

Survey studies in Australia (Lane et al 2024) and the UK (Rogers, Deutz & Ramos 2021) suggest that a small majority of households now undertake repair and maintenance activities themselves on items such as clothing, furniture and appliances, but that this willingness to engage in repair is influenced by the household's education level, income, gender, employment, family type and household setting. However, a decline in the repairability of many items, notably in clothing, furniture and appliances, and the difficulties many now encounter in accessing or paying for professional repair, and getting their products successfully repaired (Laitala et al 2021), is part of a larger and growing economic, technological and cultural problem.

Practices of repair and maintenance are now often influenced by retailers whose interest may encourage users not to repair, but to upgrade to the new. It may be in the retailer's interest also to encourage their customers to seek out novelty in new products, rather than encouraging them to find quality, longevity and durability in what they buy (Jaeger-Erben et al. 2021). If product obsolescence and marketing promote a more rapid replacement of certain goods, especially if they are relatively cheap, this can make their later repair and maintenance seem difficult, 'expensive' and time-consuming, and so reduce the buyer's 'propensity to engage in repair' (Scott & Weaver 2014). This advantages the seller of new goods, often to the detriment of those engaged in repair.

Repair may not appear to be a viable option if buying a new version of the product is cheap, and if repurchase is promoted as the 'easiest solution' to the breakdown of the old, as occurs especially in devices like mobile phones and tablets, and even sometimes as the 'best' solution to any potential future breakdown. This is especially the case if barriers to repair become more onerous.

If replacing a laptop keyboard or screen involves going back to the manufacturer, and costs two thirds of the cost of a new product, many will opt to purchase the new. This is a potential 'red flag' for those interested in promoting 'a right to repair', and to encouraging repair in order to help grow a circular economy, especially if the company has also created software or firmware-based barriers to prevent independent, and usually more cost effective repair. Indeed, in-house repair can become a means for discouraging getting something repaired and instead promoting its replacement.

> Practices of repair and maintenance are now often influenced by retailers whose interest may encourage not to repair, but to upgrade to the new.

From the consumer's perspective, the mental arithmetic involved in deciding to upgrade to the new is termed 'discounting', since the consumer compares the 'old' in their possession with the new, and comparatively reduces its value, until eventually discard and replacement seems 'necessary' or advantageous. The seller can exploit this mental arithmetic to their advantage. For this reason, researchers have found that the rate at which consumers 'discount' their products is especially relevant to their 'propensity to repair' (Makov & Fitzpatrick 2021). Mental discounting is also related to the price of the new and likely cost of repair.

As a recent article on Choice's website suggests (2025), it appears to be more cost effective to upgrade to the new at the end of an expected lifespan in use, determined by both the cost of the new and its depreciation. But as Choice pointed out, this 'average end of life' is often not met in practice, with consumers opting to upgrade mobile phones, for example, every two years, instead of the four years 'expected' lifespan Choice awards to these devices (Choice 2025).

While consumers might delay a replacement and opt to repair a product where access to repair is easy and the cost is low, especially when 'front-loaded' into a product warranty or a maintenance contract, they may prefer to buy a new product outright on credit if they have to suddenly come up with extra money to repair it, and if the repair requires surrendering a product they use frequently such as a laptop or phone. In this situation, they will prefer to buy the new immediately, since they will not have to wait for the repair to be completed (McCollough 2010). The price of the repair itself can also influence their decision, with recent research from Belgium suggesting that the majority of customers seeking repair in one major store were unwilling to pay for repairs beyond the equivalent of about $150-$200 Australian, the 'ready cash' they are likely to use to have something repaired, even if the original product cost much more to purchase (Bunodiere, interview).

In a market full of new, relatively low-cost goods and, for many people, instant credit, opting to repair the 'old' can seem a more uncertain, worrying and anxiety-inducing decision to make, whereas buying the new appears to take away this uncertainty: with the new product comes a warranty, and there is often no wait involved in its purchase, whereas repair may take time.

This preference for the new over repairing the 'old,' or even of buying second-hand, is promoted ubiquitously in the media. This has been observed also in developing societies, where those with money now opt to buy new, even if the new product is unlikely to last as long as the quality second-hand item they might once have considered and chosen (McCollough et al. 2018; Dewick et al. 2022). Recent investigations show that low-cost but short-lived items are now undercutting quality second-hand or repaired goods across Africa and South Asia, as urban middle-class consumers shift their preferences towards the new over the 'old' (Minter 2019).

Making repair services more convenient, cost-effective, and transparent may reduce this tendency to opt for the new before even considering repair as an option (Jaeger-Erben et al. 2021). However, as the above suggests, there are a number of structural, technological, psychological and economic barriers to people prioritising repair over replacement that need to be considered first.

### The Main Barriers to Repair

Generally, consumers face five options when a product breaks down (Svensson et al. 2018):

1. Contact the seller or an 'authorised repairer';

2. Find and contact a local independent repairer;

3. Try to perform the repair themselves;

4. Discard (hand back/ trade in) and replace;

5. Do without.

Users are often actively encouraged to discard and replace their products sooner, because of an increasing number of legal and non-legal barriers to repair, including the high price of many types of repair, the lower relative cost of many new products, and the larger attitudinal issue just mentioned, which is now encouraged by advertising, marketing and social media (Campagnaro & D'Urzo 2021: 10; Campbell 2014). In mobile phones, for example, the cost is often incorporated into the service charge, so unlike taking a mobile phone to be repaired, there is no up-front charge to replace.

The inconvenience and relatively higher cost of repair has been well documented in a number of recent studies (Scott & Weaver 2014; Svensson et al. 2018; Liatala et al. 2020). To uncertainties around cost and 'lost' use time while the repair takes place (sometimes undertaken in another city), researchers have discovered that more consumers now imagine they need to replace a broken-down product because of its perceived age, or apparent obsolescence, relative to the new. This is reinforced by advertising and marketing focused on the advantages of replacement consumption, and of 'keeping up' with the new technology (Scott & Weaver 2014; Laitala et al. 2021; Tecchio et al. 2019; Makov & Fitzpatrick 2021; Wieser & Tröger 2018).

A significant issue here, noted in a recent Norwegian study (Laitala et al. 2021), is the relatively low price of new products, with many being the same (relative) price they were some twenty years ago. This means consumers have to face higher costs for repairs than they once might, since spare parts and labour have increased in cost over time, whereas the prices of many goods have stayed the same, sometimes for a decade or more. Up to half of the consumers in Laitala et al's Norwegian study (2020) opted not to repair because it was just too expensive. The relatively low price of the new and its often poorer quality was also found to contribute to the low profitability of much repair work, and to its consequent decline as a commercial activity. Caught in the scissors of higher costs and lower margins, many repairers now struggle to stay in business, or have to adapt their work to suit these additional economic pressures. In many cases, this means not repairing anything that might take too long or be too expensive to repair.

Users are often actively encouraged to discard and replace their products sooner...

As a result of a reduction in the quality and (real) price of products needing repair, it has become increasingly difficult to make a living in many areas of repair. In Laitala and colleagues' survey (2021) of actual repairs on washing machines, dishwashers, stoves, fridges and mobile phones, only around 15% of all these products were repaired successfully. There was a failure rate in attempted repairs of around 19%, with repairs not attempted on a staggering 60% of broken items. These are confronting figures, suggesting that repairers now have to carefully select what they can repair quickly and easily, and reject anything that might take too long, or where the repair depends on parts that are perhaps too expensive or difficult to procure.

Similarly, Tecchio and colleagues (2019) examined 11,000 datasets from professional repairers on repairs carried out on washing machines and dishwashers, and found that repairs were not attempted on more than three quarters of these because the likely costs of the repair were too high (2019: 1120). The low price and poor build quality of many new products directly contributed to this failure to undertake repair, and it seems this has also resulted in a decline in trained repairers, with low profit margins for repair work expected to increase in the coming years (Laitala et al. 2021). This should alarm policymakers, who have to face up to the social and environmental consequences of an increasingly 'repairless' throwaway society.

A real shortage of skilled repairers, and the difficulty of accessing these, is likely due to the rising cost of many repairs and parts, and the ease of replacing a 'broken' product with a new. In one recent Masters thesis on the new French Repairability Index from the Catholic University of Louvain's business school, the author noted that Belgium alone would need 240,000 repairers to effectively reduce the current volumes of e-waste generated by its population. Needless to say, this is a figure many times greater than the number of repairers now working in that nation (Cavillot 2024: 9). Even if the author's figure is an over-estimation, it makes the point that to increase repair activity will require increasing the profitability of repair work, along with the numbers of qualified repairers.

Other widely reported reasons for consumers not getting a product repaired include the time the repair might take. This is particularly important for goods like mobile phones and tablets, where their absence, even for a day or so, can cause all kinds of problems for their users (Wieser & Tröger, 2018). Many users also had doubts about the extra years of use repairing this kind of product might yield, thus doubting the continuing efficacy of repair. They were also conscious of likely problems the repairer migh have obtaining spare parts, and of the possibility that the repaired product might fail again after being repaired. Some were also aware of the difficulties involved in disassembling some products to repair them in the first place (Tecchio et al. 2019: 1114). Consequently, in one study (Bovea et al. 2017: 98), researchers found only about 10% of users were willing to repair their smaller electronic and electrical equipment (SEEE), with over 90% preferring to discard them to recycling or landfill, and replace them with new ones. Cost again comes into this, since the price of a replacement is often not much greater than the price of the repair.

**Planned Obsolescence**

Behind many of these barriers to repair is 'planned obsolescence', a loosely defined term capturing a series of deliberate design and marketing decisions made by producers during product development. Its overall aim is to set an approximate end date to the product's life, and thus to encourage its early (or earlier) discard and replacement (Guiltinan 2013). The main advantage of planned obsolescence from the producer's perspective is the creation of a predictable timeline for 'product rollover' (Koca et al 2022). This is a revealing term used in marketing to describe the optimum window of time when the consumer is thought to be most likely to discard a product and upgrade to a new one, typically in response to marketing offers, such as EOFY sales (Koca et al 2021). Repair may interrupt the smooth transition or rollover to the new product envisaged by the item's designers and marketers.

While planned obsolescence is thought to have been first named in 1920s America, the concept was anticipated in Thorstein Veblen's notion of 'strategic sabotage' (1904), where a business may deliberately lower the quality and longevity of its products in order to increase its revenues (Dillon 2025). Sixty years later planned obsolescence was identified as an environmental issue because of the pollution, resource overconsumption and waste this strategy generated (Packard 1960). Over the last three decades the strategy has grown into a sophisticated array of coordinated technological and psycho-social media-based techniques intended to encourage the user to upgrade sooner (Slade 2009). These align advertising, marketing, design and technology, and increasingly, digital and physical barriers that make it difficult or even impossible for the user to keep using the 'older' product beyond a certain date (Satyro et al. 2018). Repair, and product repairability, must be made more difficult, or even impossible, if planned obsolescence's goal of reducing the lifespan of a product is to be achieved.

In digital products, premature discard may be determined by software and firmware interventions that make extending the life of the product through repair effectively impossible (Barros & Dimla 2021). For example, the 'paired' components used in many digital products ensure that 'non-authorised' replacements, either through DIY or independent repair, will likely disable the product in use, encouraging even the most unwilling to upgrade (Hanley et al. 2022). Another example is the way software updates, including security updates, may only be 'supported' by the manufacturer for the first three or four years of ownership, also encouraging the owner to upgrade to avoid the dangers their potential exposure might create. These types of practice are now drawing the attention of lawmakers (and lawyers), since they disadvantage consumers, and in some key products, such as wheelchairs and agricultural machinery, can expose them to injury, physical danger or financial loss (Hanley et al. 2022; Pihlajarinne 2020; 404 Media 2024).

In smaller digital products, a common marketing strategy to encourage discard and replacement is to emphasise the rapid technological advance of the product concerned, and to encourage the user to feel that their now 'old' product has been 'left behind' by technological advances (Spinney et al. 2012). This is sometimes referred to as 'perceived obsolescence'. In one study of smartphone use in Austria by Weiser and Tröger (2018), only about 30% of the participants replaced their phones because of an actual malfunction, while the other 70% replaced them

despite them continuing to function well. Novelty and a desire for the latest technology have been found to be significant reasons for the consumption of new mobile phones, with existing ones more likely to be replaced, even if they still work (Jaeger-Erben et al. 2021). In fact, two thirds of survey respondents in the study by Weiser and Tröger (2018) did not even attempt to repair their phones, because of these and similar anxieties. This is consistent with an older study of Apple iPhones, which showed that over 70% of new iPhones purchased in the first few days of the iPhone 4's release went to owners of existing devices, most of these working ones (Kim & Paulos 2012). Keeping up with the technology, and also avoiding the stress of surrendering a phone or tablet for repair, seem to be important barriers to repair in the smartphone and tablet markets.

As we might expect, consumer behaviour in longer-lasting household appliances like washing machines and dishwashers differs markedly from this. Replacing a washing machine usually occurs when the user encounters real technical problems (Jaeger-Erben et al. 2021). This may be due to the fact that the absence of a washing machine being repaired can be tolerated for a week or so in most households, whereas a non-functioning phone can distress its user after only a few hours. Nevertheless, it is worth emphasising that the increasing use of digital components (and pairing) in both types of product, and in many other household products, and their increasing interdependence through the 'internet of things', may also shorten their lives in use, creating challenges to attempts to increase their lifespans in use, as the circular economy requires (den Hollander et al. 2017).

## Perceived Obsolescence
Despite these differences, 'perceived obsolescence' of the type found in users' preferences for the 'latest and best' in mobile phones is one of the most significant marketing goals in all forms of planned obsolescence. This encourages the user to believe – often on false evidence  - that their product is soon to become obsolete and may need to be upgraded, even if there is no factual reason for this.

Despite a common belief amongst users, mobile phone performance, for example, does not in fact significantly decline over time, but rather is perceived to decline in performance, and this – along with worries about the phone's absence during repair - can lead consumers to be less interested in repairing their phone, and more willing to upgrade (Makov & Fitzpatrick 2021).  This ready mental depreciation of their phone can be manipulated through advertising and marketing, assisted by the software-based interventions outlined above, to bring forward the 'death' of the product in the consumer's eyes (Crocker 2018). A lighter body and screen, for example, so easily dropped and damaged, can lead the user to believe that her phone needs replacing, even if the damage could still be repaired.

After assessing 22 million visits to iFixit.com offering free repair manuals, Makov and Fitzpatrick (2021) found that consumer interest in repair declines over time, regardless of the ease of repairing a device and access to repair manuals. This shows that access to repair information alone may not improve mobile phone lifespans, at least not without some action taken to tackle the problem of perceived obsolescence, and the user's tendency to discount their phone more rapidly, and the larger social and communication contexts in which this occurs, including often

many frequent encouragements to upgrade sooner (Makov & Fitzpatrick 2021). Makov and Fitzpatrick suggest a more effective strategy to reduce the discounting of working phones might be to highlight how well they continue to work over time, a marketing approach radically different to that which now prevails in the sector (2021).

Makov and Fitzpatrick (2021) concluded their study with a recommendation that communication strategies be reoriented to focus on product quality, durability and performance, and not only on the availability or efficacy of repair services. However, this may well challenge the prevailing business models of the manufacturers, and its reliance on annual upgrades or 'roll-overs' in a consumer culture where the new has been privileged over the old for many years (Campbell 2014).

### The Role of Design in Repair

A determining factor in a product's durability and repairability lies in its design. In general, durability and repairability require the integrated application of four main supporting strategies (Bracquene et al. 2021):

1 *Maintainability,* to avoid premature failure of a product through proper use and care;

2 *Reliability,* including robust parts, especially those most critical to a product's function;

3 *Repairability,* enabling easier repair, with accessible information and available parts; and

4 *Upgradeability* (or internal upgradeability), to improve its functioning without replacement.

Design determines whether any of these can work effectively. Many mobile phones, for example, have been designed to be difficult or even impossible to repair, and some are impossible to repair independently, given the likelihood of paired parts and software restrictions created by the manufacturer (Pozo Arcos 2024). Many also have cases and screens that break easily, another designed encouragement to upgrade. From the perspective of increasing circularity, designed or 'planned' obsolescence becomes a central, even growing, problem, not only for the designer (Bakker et al 2014) but for the user and the policy-maker. For if obsolescence is to be 'reversed by design' in a circular economy, repairability and durability has to be designed into more products (den Hollander et al. 2017; Bakker et al. 2014a).

While mobile phones are something of a special and resistant case, designers have been considering how the goals of a more circular approach to design can be met, and how repairability can be built in to product lifecycles. Taking into account some of these systemic issues, D'Urzo and Campagnaro (2023) recently developed a Design-led Repair and Reuse (DLRR) framework. This framework builds upon an earlier understanding of the convertibility of energy and materials into labour in the circular economy (Stahel & Reday 1981). For maintenance and repair can not only support products in use for longer, but also create jobs and develop skills critical to many industries (Stahel 2016). While these jobs could well be in the manufacturers concerned, in D'Urzo and Campagnaro's model this may not be necessary, if the kind of durability strategies noted above are followed in the initial design.

Although dependent on a radical change in the design of the product, their approach provides a smaller-scale local and regional model for encouraging reuse and repair, and contrasts with the tendency to overemphasise larger scale interventions promoting circularity, for instance focusing on recycling at a city- or state-based scale. Their model is aimed at organisations with limited resources, even the smallest ones. This bottom-up localized approach 'favours the creation of jobs and the reduction of energy and capital expenditure' (D'Urzo & Campagnaro 2023: 13).
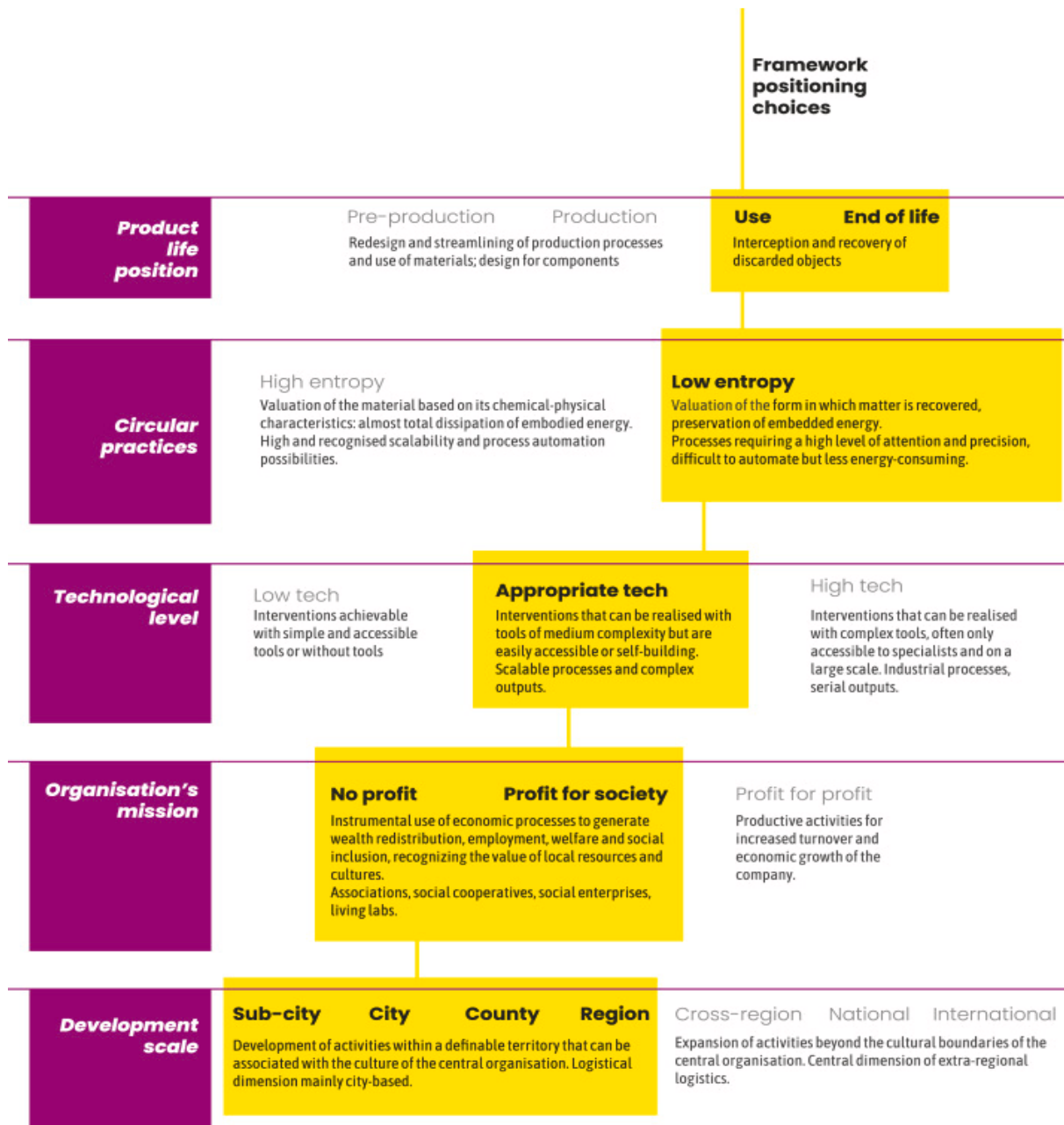
**Framework positioning choices**

| | | | |
|---|---|---|---|
| **Product life position** | Pre-production | Production | **Use**      **End of life** |
| | Redesign and streamlining of production processes and use of materials; design for components | | Interception and recovery of discarded objects |
| **Circular practices** | High entropy | | **Low entropy** |
| | Valuation of the material based on its chemical-physical characteristics: almost total dissipation of embodied energy. High and recognised scalability and process automation possibilities. | | Valuation of the form in which matter is recovered, preservation of embedded energy. Processes requiring a high level of attention and precision, difficult to automate but less energy-consuming. |
| **Technological level** | Low tech | **Appropriate tech** | High tech |
| | Interventions achievable with simple and accessible tools or without tools | Interventions that can be realised with tools of medium complexity but are easily accessible or self-building. Scalable processes and complex outputs. | Interventions that can be realised with complex tools, often only accessible to specialists and on a large scale. Industrial processes, serial outputs. |
| **Organisation's mission** | **No profit**      **Profit for society** | | Profit for profit |
| | Instrumental use of economic processes to generate wealth redistribution, employment, welfare and social inclusion, recognizing the value of local resources and cultures. Associations, social cooperatives, social enterprises, living labs. | | Productive activities for increased turnover and economic growth of the company. |
| **Development scale** | **Sub-city**   **City**   **County**   **Region** | | Cross-region   National   International |
| | Development of activities within a definable territory that can be associated with the culture of the central organisation. Logistical dimension mainly city-based. | | Expansion of activities beyond the cultural boundaries of the central organisation. Central dimension of extra-regional logistics. |

*Figure 3: Flowchart of Framework Positioning within the spectrum of the Circular Economy Debate (D'Urzo & Campagnaro 2023: 13)*

### Community-based Responses

This small-scale socially-oriented repair and reuse framework recalls the kind of approach to repair and reuse found in many community-led initiatives around the world, including most prominently repair cafés. These are able to respond more directly, and patiently, to the challenge that an increasing number of products are difficult or expensive to repair, and so are not repaired but discarded, creating a growing environmental problem (Niskanen et al. 2021).

The global Repair Café movement is a prime example of this bottom-up 'activist' response, having been started by Martine Postma in Amsterdam in 2007 (Charter & Keiller 2019). The movement has since grown to include over 2900 repair cafés around the world, including over 100 in Australia. Their aim is to promote repair as a viable activity, and the superiority of repairable products, and also encourage the development and preservation of repair skills, many of these threatened or lost to the changes listed above (Charter & Keiller 2019).

This more collaborative, social and relational approach to repair shifts the circular economy's focus from technical market-based waste and resource use reduction strategies, towards more socially inclusive, local and cooperative forms of making and remaking, repair and reuse.

Community shared spaces such as repair cafés and makerspaces (Kohtala 2019), aim to be inclusive places for local communities to engage more directly with the repair, maintenance, and even creation, of their own products (Bradley & Persson 2022). To this category, we can add groups interested in reviving 'lost' or neglected trades, or those engaging in traditional crafts. In Walker et al.'s Design Roots (2018) research project, a selection of traditional making (and repairing) skills across the UK were examined from a contemporary perspective as models, perhaps, for a more sustainable, circular future (Walker, Evans & Mullagh 2019).

While repair is understood to be a means for extending a product's life in the circular economy, community and independent repair may also contribute to people's attachment to their things, through the 'caring and sharing' such community-based, non-market engagement with repair encourages (Van Der Velden 2021; Godfrey, Price & Lusch 2021). This more collaborative, social and relational approach to repair shifts the circular economy's focus from technical market-based waste and resource use reduction strategies, towards more socially inclusive, local and cooperative forms of making and remaking, repair and reuse. This may be more effective over the long term for developing a more deeply rooted 'circular society' of long-term users (Jaeger-Erben 2021).

This makes repair cafés and other voluntary organisations such as bike kitchens, craft workshops and makerspaces especially valuable. These can help people begin to see themselves as users rather than consumers, able to live with their things and use them over longer periods of time. A circular economy will require larger numbers of such users, comfortable with maintaining and repairing their things (Jaeger-Erben 2021).
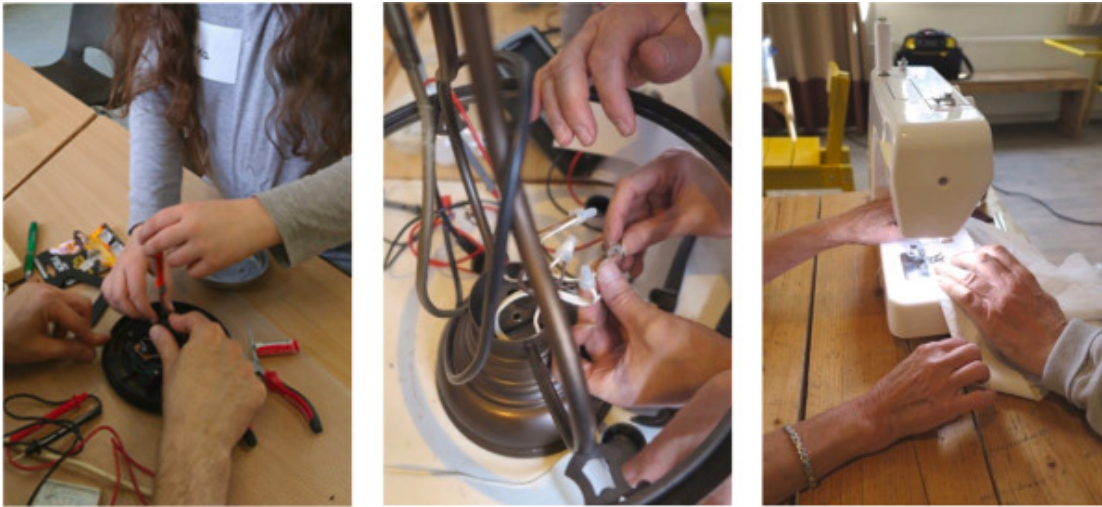
Engaging individuals in DIY or community-based repair activities may also help overcome some of the significant barriers to repair identified above, notably the cost, time taken, and availability of specific repair services. For example, a study by Sandez et al. (2023) suggests that individuals who may be reluctant to get their small electric and electronic equipment (SEEE) repaired due to the low replacement costs of these products, may be more willing to repair them themselves, if they were provided with the information required, and if the product was cheaper to repair than to replace (and Raihanian Mashhadi et al. 2016). This suggests that it may be possible to manufacture low-cost repairable products, if DIY repair was more clearly signalled, and enabled through design.
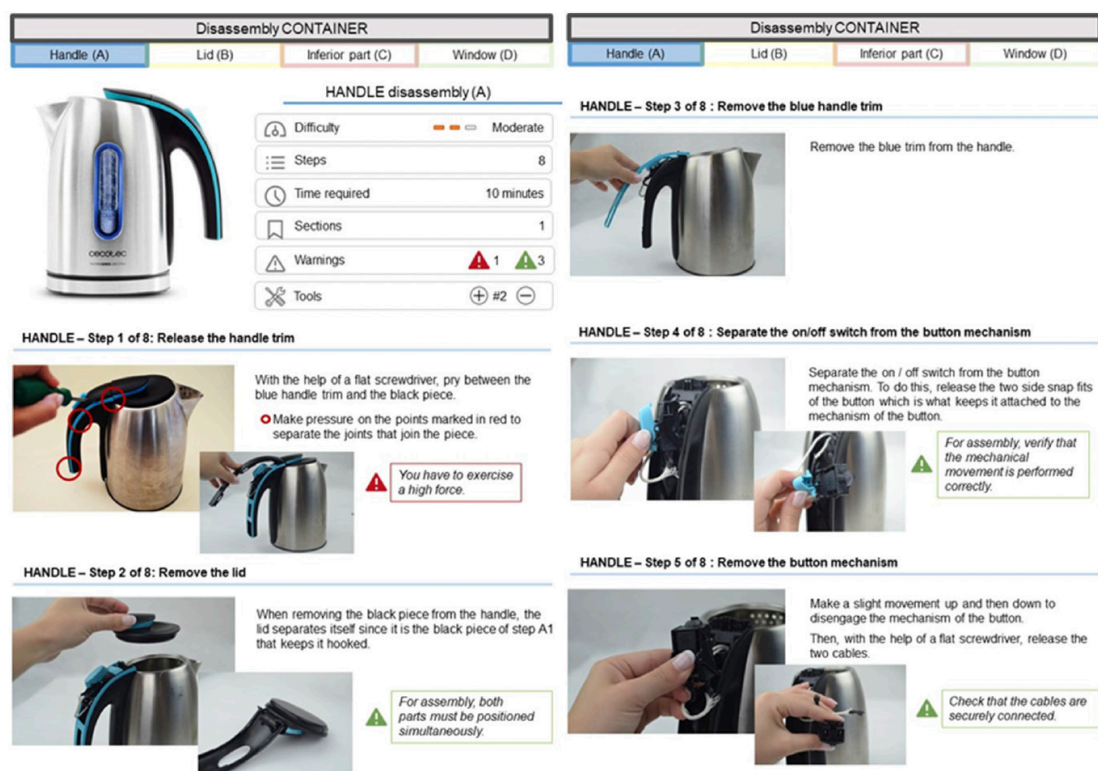


Fig. 5: Step-by-step instructions (Sandez et al. 2023: 248)

## Caring and Sharing in a Repair Café

To better understand how individuals can become involved in the repair of their own products, it is necessary to look more closely at the process of repair itself in a repair café-type setting. Hielscher and Jaeger-Erben (2021) in their study of DIY and independent repair, explain that this process typically follows three main phases:

1  Pre-diagnosing or diagnosing the defect or problem,

2  Fixing it, or repairing the object, and

3  Getting it ready for use again.

Further, they discovered different kinds of 'restorative acts' emerge during these phases: 'quick fix', 'routine fix', 'serious repair' and sometimes a 'larger repair project', requiring considerable time (Hielscher & Jaeger-Erben 2021: 9).

**ACTS OF DOMESTIC REPAIR.**

|  | Acts of repair | Competences | Routine live | Valuation of objects |
|---|---|---|---|---|
| Quick fix | Easy diagnosis as defects are often visible. Diagnosis, fix and integration processes are often fluid. | No need for specialized repair competences. | Often carried out to be able to keep daily routines going for as long as possible. | There is a likely devaluation of objects (unless it develops into a repair project). |
| Routine fix | Diagnosis, fix and integration are often part of everyday life. These fixing activities are regularly part of cleaning and maintenance routines. | Some specialized repair competences that have become part of daily routines. | Fixes often are part of daily routines and therefore have minor influence on the performance of daily routines. | Object keeps its value as it is being restored to its original condition. |
| Serious fix | Diagnosis and fix are often part of one process, as defects might not be visible and objects need to be opened up. The fixing process is often structured by specific procedures (e.g. taking pictures).<br><br>Specialized tools and spare parts are often needed. | Several repair competences are needed for these fixes. In addition, trust in one's own abilities that often derive from early socialization processes. | The repair process influences the actualization of daily routines and therefore disrupts people's daily life. | The valuation of the object can depend on the outcome of the repair: Devaluation if it cannot be fixed and keeping its value if it is restored. Revaluation is possible if an object becomes a spare part for another 'broken' item. Repair activity can become a repair project. |
| Repair projects | The fixing process can often differ. The repair process sometimes becomes more important than actually fixing the object. | Mix of repair competences needed, depending on the repair project. In addition to repair competences, creative thinking and time to engage in longer repair projects is required. | Performances linked to fixing the object often become equally important as fixing the object to be able to perform daily routines. Disruptions are minor. | Objects are likely to become higher value items over time. This value creation is often not only linked to restorative acts but also creative ones. |

*Table 1. Independent repair phases and restorative acts*
*(redrawn from: Hielscher & Jaeger-Erben, 2021: 9)*

Their study echoes other studies on repair cafés, which also emphasise the social dimensions of repair, and how repairing can stimulate a sense of caring and sharing in, and among, the owners of what is being repaired (van der Velden 2021; Godfrey et al. 2021). Meißner (2021: 1), for instance, found in her study of repair cafés 'four dimensions' of this caring and sharing, which overlap and reinforce each other in the repair café environment:

1   Taking care of the object

2   Taking care of each other

3   Taking care of the community, and

4   Taking care of the environment.
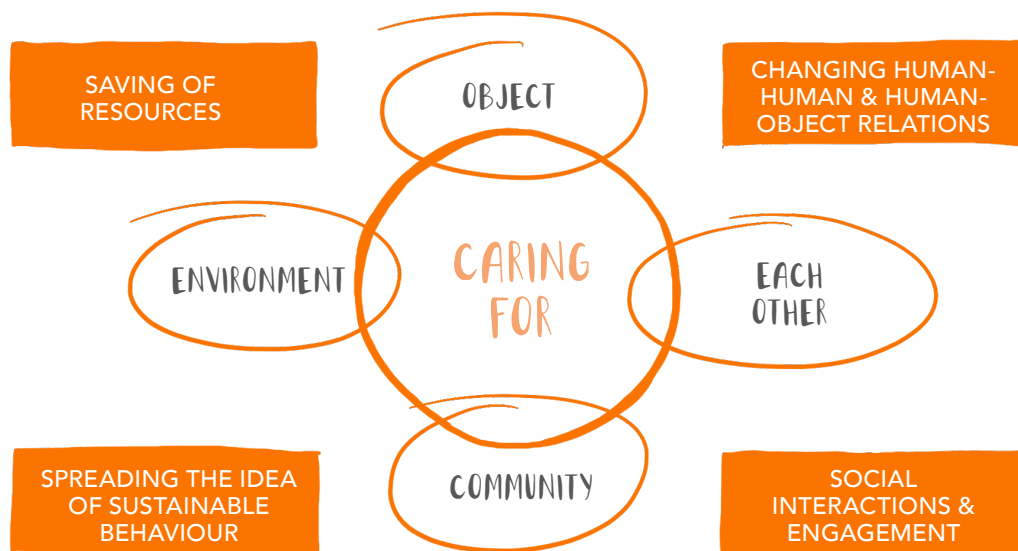


*Figure 6. The four dimensions of care found in repair (re-drawn from: Meissner 2021: 5)*

Her 'object care' dimension refers to the relationship between people and their objects (Godfrey et al. 2021). This captures the attachment many feel towards their more valued objects, sometimes expressed through stories about the object, and its role in their lives (Meißner 2021: 5; Mate 2018). A sense of care emerges, Meißner concludes, through a 'deep exchange' between repair actors, with the object enabling a 'human-object-human relationship' (Meißner 2021: 6). In this way, repair cafés can improve social and environmental relationships at a local level, and add value, purpose and a sense of connection in a neighbourhood. Their benefits may not be market-based, but can contribute to the development of a more circular society (Bradley & Persson 2022: 1322).

Meißner also notes that 'Caring for the environment and saving of resources is a key issue for a lot of visitors and expert repairers at repair cafés. It seems that participating in a repair café is part of larger concerns about global environmental problems' (2021: 7).

However, the question remains how to extend this environmental concern from a relatively small group to the broader community, and to encourage more people to become engaged in repairing their own goods, or the goods of others. Not everyone has the time or inclination to visit or volunteer in a local repair café. How to encourage this larger group of people to repair their products may require structural changes able to remove some or all of the barriers to repair listed above. These include being able to locate independent repairers, who will need to be able to access information and parts, to reduce the uncertainties many now experience around repair costs and the time a repair might take, as well as the sometimes uncertain outcomes of the repair itself.

First and foremost, however, it is important to consider the legal right of access to repair itself. Is it fair, or even legal, to withhold product parts, pair components, and create other technical or financial barriers to discourage people repairing their own products (Wiseman & Kariyawasam 2022)? Is being able to access repair for a damaged product a person owns a legal right, or can this be swept aside by some fine-print disclaimers buried in the 'terms and conditions' of a product license or warranty?

## The Right to Repair

In response to these questions and related issues, a Right to Repair movement has grown rapidly across the developed world, especially over the last decade (Ozturkcan 2023). It aims to make repair more accessible, affordable and accepted as a cultural norm, and to counter commercial strategies that make repair impossible, inconvenient and more costly than discarding to buy again. This movement has had considerable success, and is now influencing a range of policies and regulations to expand maintenance and repair, and counteract some of the restrictions and barriers to repair noted above. It has had considerable success in encouraging changes to consumer and competition law, copyright law, intellectual property protection, and labelling, particularly in many US states and Europe (Pozo Arcos 2024; Dao et al. 2021; Pihlajarinne 2020).

While there is no universal definition of the 'right to repair', the Australian Productivity Commission in its recent report on the issue defines it simply as

> the ability of consumers to have their products repaired at a competitive price by the repairer of their choice (AGPC 2021; see also Svensson et al. 2018).

A significant problem confronting this right to repair is the ability of manufacturers to prevent 'unauthorised' repairs through sophisticated digital means. This appears to be part of a comprehensive 'asset-based' strategy to steer consumers into in-house repair and, in many cases, from there to encourage them to discard their 'old' product as perhaps too expensive or time-consuming to repair, and then to upgrade to the new (Lloveras, Pansera & Smith 2024). In this approach manufacturers might

concede a need for some repairability in their products, but may work to control the process, to encourage users to upgrade to the new (Boniface et al. 2024). This in-house strategy locks out independent or DIY repair, and can encourage repurchase through making the repair in question a more expensive or time-intensive option than it should be.

Manufacturers can also use software interventions to achieve these aims, including a failure to support cyber security in their 'old' products by stopping software upgrades after four years of use. They may also use 'paired' components in them that require each other's presence to function properly, and these components can become 'unavailable' after a certain time (Cadia 2019). In this situation an independent repairer will not be able to replace a component paired with another, and its absence after the repair may prevent the product from working properly (Cadia 2019). Much of the effort expended on promoting a right to repair thus concerns 'opening' access to the software and hardware controlling the product's use, and to the technical information required by the DIY or independent repairer to repair it.

Manufacturers, for their part, point out that they can become liable if the independently repaired product develops problems, or if that repair fails. However, since repairs of digital products are typically carried out by trained repairers, and usually involve replacing one or more defective components, another important issue at stake here is the repairer's access to spare parts, and to the software required to reset the machine for use after the repair. By restricting access to parts, information and software, manufacturers can monopolise repair and then encourage users to upgrade sooner. In effect, in-house repair can be used to support an integrated and comprehensive form of product obsolescence.

### The United States

The penumbra of technical issues relating to digital products and the right to repair them can be found extensively documented by a number of key contributors to the debate, especially the American online organisation iFixit (2024). This is a large and significant online repair community which provides access to spare parts, tools and free repair manuals, sometimes in opposition to the manufacturers of the products concerned. The number of individuals and companies making use of iFixit has grown rapidly, into the millions, much of this driven by the Right to Repair movement's opposition to the increasing capacity of producers to prevent DIY and independent repair (Wiens 2019). Other online networks that have played a significant role in gaining support for the Right to Repair movement include the US-based Repair Association (Repair 2024) and the Right to Repair Europe coalition (Repair EU).

These groups are different from each other, since each advocates on behalf of distinct groups of users across a broad range of domains, from medical equipment remarketers and servicers (IAMERS), to service industry associations (SIA), activist organisations wanting an open internet (Electronic Frontier Foundation, or EFF), and more traditional public interest groups or consumer associations (US.PIRG and Consumer Reports) (Repair 2024). These many different groups began to coalesce around key right to repair issues that had been generated by the digitization of products in the 2000s, including the refusal of manufacturers to supply manuals,

parts and tools for repairing their products to users, or even to independent repairers. iFixit became their natural ally in this advocacy work, being determined to change legislation and business practices to promote repair, and to oppose companies restricting access to repair tools and manuals, and designing deliberately difficult to repair products (Cadia 2019; Pihlajarinne 2020).

Advocacy for a right to repair is not new in corporate America, but goes back to 1956, when the US Department of Justice determined IBM must allow independent repairers to fix their equipment, and also sell these through second-hand equipment markets (Repair 2024). However, more complex restrictions now embedded in many digital products have given this issue a new urgency. More recently, laws against restrictions on repair have emerged across many American states, from the Automotive Right to Repair bill passed in Massachusetts in 2012, to a series of state-based 'Right to Repair' Acts in process today (Repair 2024; Pozo Arcos 2024). Medical and agricultural products, including wheelchairs and tractors, are of particular concern to lawmakers, since corporate restrictions on their repair can come at a high, even lethal, cost to their users (Wiseman & Kariyawasam 2022; Gomez 2024).

It is not surprising that the right to repair seems to be one of the few issues uniting politicians across the political spectrum in the USA. In October 2023 the Biden White House convened a group of business leaders and policy makers to consider the impact of corporate practices restricting repair on jobs, consumers and the environment. One of the speakers was Apple's Brian Naumann who called for a nationwide right to repair law, and even declared that Apple would like to design their products for longevity and repairability: 'Apple supports a uniform federal law that balances repairability with product integrity, data security, usability and physical safety'. Whether this repairability will enable outside repair of their products is yet to be determined.

Another speaker at the White House convention, Donald Jones, from Allstate Insurance, spoke to the problem of car manufacturers using IP to restrict independent repair: 'The manufacturing of aftermarket parts has been severely limited due to OEM (Original Equipment Manufacturer) use of design patents on basic cosmetic car parts,' he noted, pointing out that current legislation in the USA only enables the sale of matching replacement parts 15 years after the original part was patented. This reflects a long-standing complaint against the use of patents and intellectual property laws to restrict repair for the manufacturer's benefit (Cadia 2019; Wiseman & Kariyawasam 2022).

## *Europe*
A similar determination to establish a right to repair in Europe has been driven by a campaign involving 38 NGOs (Repair 2020), all demanding minimum design guidelines for repairability in products, laws allowing access to information and spare parts for repairers, and the introduction of a repairability scoring system to determine and reward more repairable products (Repair 2020). This echoes the principles enunciated in the European Commission's Ecodesign Directive of 2009 (and applied to computers in 2013), the EU's (voluntary) Ecolabelling standards (2010), and its Green Public Procurement standards (2008) (Schischke et al. 2022).

To support the original Ecodesign Directive's call for greater durability in products, the European Commission also sent a 'standardization request' to the European Standardization Organisations in 2015 to develop a number of new standards for material efficiency, including products' repairability (Schlegel et al. 2019).

These developments have led researchers at KU Leuven to develop a 'Matrix for ease of Repair' (AsMeR) (Bracquene et al. 2018), and the Joint Research Centre (JRC), the European Commission's science and knowledge service, to write and publish a comprehensive report on the analysis and 'development of a scoring system for repair and upgrade of products' (Cordella et al. 2019). These two scoring systems informed the development of the better known French Repairability Index, which is discussed below. The EU's Circular Economy Action Plan (EU 2020) also takes up concerns expressed in these initiatives, and contains a number of concrete measures to make repairable products the norm in the EU, and to ensure consumers have access to information on the durability and repairability of the products they buy.

Five different classes of policy instruments are now being deployed to extend product lifetimes in use across the above overarching directives in Europe (Dalhammer, Larson & Mont 2023):

1 Repair vouchers and repair funds,

2 Information on the service life and repairability of products,

3 Minimum product repairability requirements,

4 A ban on destroying unused goods, and

5 The criminalization of planned obsolescence.


Further, in March 2023 the European Commission adopted a right to repair proposal to promote repair and strengthen consumer rights to repair, as part of the European Green Deal (Svensson-Hoglund et al. 2021). This was agreed in January, 2024. The aim of these legislative interventions has been to help transform the EU into a circular economy through responsible production, consumption, and resource management (SDG 12). The resulting Green Deal Directive contains three initiatives that attempt to harmonise existing durability and repairability initiatives within a circular economy framework across Europe (Dalhammer, Larson & Mont 2023):

1 Eco-design for sustainable products (focusing on the production cycle and extended use);

2 Empowering consumers for a green transition (focusing on repair and durability); and

3 Common rules for the repair of goods (focusing on repair after products have been used).

The purpose of these rules is to make it easier and more cost-effective for consumers to keep and repair rather than replace their goods, as well as to create incentives for producers and sellers to develop more repairable goods and more sustainable business models, since repair is essential to product life-extension (Salvia & Cooper 2018).

The Directive contains rules to prioritise the repair and repairability of goods, provide tax incentives to support independent repair, encourage meaningful product guarantees, and make clear the producer's obligations. It also requires the development of an online national repair platform to help consumers find and compare different repair services 'based on various repair conditions, including indicative prices. Consumers can also find sellers of refurbished goods and purchasers of used goods for refurbishment' (Dalhammer et al. 2021: 673). This amounts to a direct challenge to the environmentally destructive regime of planned obsolescence now dominating the global economy.

**EXAMPLES OF ADOPTED AND PROPOSED POLICIES TO INCREASE PRODUCT LIFETIMES (AMENDED VERSION OF TABLE IN [6]. A: ADOPTED MEASURES, P: PROPOSED MEASURES)**

|  | European Union | EU Member States | Other (local/regional) |
|---|---|---|---|
| Adopted | Ecodesign Directive: new mandatory requirements on products put on the EU market; related to durability, reparability, provision spare parts etc. <br><br> Standardisation activities to develop new product standards on concepts such as 'durability', 'reuse', 'reparability' and 'recyclability'; will make it easier to regulate these issues in future laws (ongoing process) | Criminalising planned obsolescence (France) <br><br> Fines for planned obsolescence (competition authority of Italy) <br><br> Strengthening legal (mandatory) product guarantees in consumer law (several EU countries) <br><br> Tax reliefs for repair (e.g. Sweden) National accreditation of reuse organisations (e.g. Belgium) <br><br> Repairability index (France) | Public procurement of remanufactured ICT and furniture (e.g. Sweden) <br><br> Reuse parks and similar infrastructure; diverting EOL products towards reuse <br><br> Networks for reuse, including infrastructure, quality controls and marketing (e.g. the <br><br> Flemish reuse network) and repair networks (e.g. Vienna) <br><br> Encouraged use of remanufactured spare parts for federal government vehicle fleet maintenance (e.g. USA) <br><br> Government support for private reuse firms (e.g. Sweden) <br><br> Quality labels for reused goods to instil consumer confidence (several EU countries) |
| Proposed | Consumer law changes to ensure that consumers receive trustworthy information on product lifespan, the availability of repair services, spare parts and repair manuals <br><br> Measures to promote right-to-repair (R2R) <br><br> Public procurement criteria for remanufactured goods | National public procurement criteria for remanufactured goods like furniture and ICT products (under development) <br><br> Standards and quality labelling schemes for reused products (under development) | Right-to-repair (R2R) laws proposed in several US states; including several provisions to enable consumers to repair their products and allow independent repairers to access the after-sales market |

*Table 2. Emerging 'new generation' of policies (Dalhammar et al., 2021: 673)*

## Repairability Indexes

In an expanding literature responding to these initiatives, researchers and policy makers have been attempting to understand how the repairability of products can be made more visible to users. A key development here is a shift from identifying barriers to repair to understanding enablers, particularly from the user's and the designer's perspectives (Ackerman 2018; Hernandez, Miranda & Goni 2020). While the idea of scoring a product's repairability emerged first amongst activist groups like iFixit, there was considerable uncertainty about what exactly should be measured, and the difficulties involved in developing a 'score' that could be understood by both non-expert users and expert repairers alike (Dao et al 2021).

The studies undertaken so far (e.g. Alfieri et al. 2022; Barros & Dimla 2023) agree that the most important aspects of repairability can be listed under specific headings such as available product documentation, product disassemblablity, the availability of spare parts and, importantly, the ability of the repairer to reset the software of the product for use again. However, one key issue is how to embed sometimes complex technical information into such a scoring system, which is necessarily an 'average of averages'.

Under French law, manufacturers are obligated to calculate the repairability of their own products in a score based on 5 criteria...

Some indexes such as the French Repairability Index, are aimed primarily at shifting consumer perceptions of a product's repairability, but within some significant limitations. Others, such as the iFixit index have 26 criteria, and are largely aimed at expert repairers. These provide a more in-depth snapshot of a product's repairability than the consumer-facing French index (Flipsen et al 2016).

The French Repairability Index is an outcome of the 2020 French Anti-Waste and Circular Economy (AGEC) Law which worked to adapt the EU's legislation to the French context (Chasson & Vasseur 2021). This law aimed to reduce the costs of repair to consumers through a system of subsidies funded by the EU. As part of this initiative, it presented consumers with a Repairability Index and labelling system for 5 common household products (smartphones, laptops, front-load washing machines, TVs and lawn mowers), which was later extended to 9 (including top-load washing machines, dishwashers, pressure washers and vacuum cleaners), to enable all consumers to understand the lifecycle and repairability of what they were purchasing (Barros & Dimla 2023; Raillard 2021). The Index aimed to encourage consumers to choose more repairable products, and manufacturers to improve the repairability of what they were offering.

Under French law, manufacturers are obligated to calculate the repairability of their own products in a score based on 5 criteria: 1. The availability of technical documentation to enable repair, 2. The product's ease of disassembly, 3. The availability of spare parts for it, 4. The price of spare parts, and 5. Some specific criteria addressing its repairability (Chasson & Vasseur 2021). Each category is scored out of twenty, and the total is then divided by 10 to gain the numbers seen by the consumer (a number out of ten). The manufacturers then pass on the

scores they have calculated to their retailers, who must present this score to their customers. If the score is found not to be accurate, manufacturers can be fined, which becomes a disincentive to game the system (iFixit 2024). So while iFixit notes that the Index is much less rigorous than their own, with some electronic products from Samsung scoring higher in the French Index than in their own (iFixit 2024), the fact that the manufacturers themselves are obliged to score their own products, iFixit regards as a huge win over any voluntary use of an index like their own (iFixit 2024).

The French Repairability Index is currently being expanded to include a durability component, sometimes confusingly referred to as a 'Durability Index'. However, the ultimate aim of this addition is to create a more comprehensive and holistic 'Sustainability Index' starting in 2025 (Entreprendre Service Publique 2024). The Durability Index (or add-on) will initially cover only TVs and washing machines, two of the categories included in the Repairability Index. Its method of calculation is built on that of the Repairability Index, and will summarise the first four criteria of the latter as a 'Repairability Score', but will add to this a 'Reliability Score'. This aims to address issues related to a product's 'particular resistance to stress and wear, ease of maintenance and servicing, as well as the existence of a commercial guarantee and a quality process' (Entreprendre Service Publique 2024). In other electronic items, a third criteria will be added to these two, concerning software and hardware upgrades. This is a promising development, and suggests that legislators are now responding to manufacturers' comprehensive 'asset-based' product obsolescence strategy (Lloveras, Pansera & Smith 2024), where their control of the repair process becomes a means of encouraging consumers to discard and upgrade sooner.

> ..there is increasing discussion in the literature on the strengths and weaknesses of the existing scoring systems and how they, along with the design of the products themselves, might be improved.

While a uniform European Repairability Index is still under development, there is increasing discussion in the literature on the strengths and weaknesses of the existing scoring systems and how they, along with the design of the products themselves, might be improved (Dangal et al 2022; Barros & Dimla 2023). Design, and the selection of the components and subsystems that make up most modern products, is a critical issue here, since break-down typically occurs at this level, and repairability and longevity to a great extent depend on the designer's selection of components with repairability and longevity in mind, their replacement during repair, and their effective integration within the product after the repair (Dangal et al 2022; Barros & Dimla 2023).

This is particularly an issue in electronic products, or products that make use of electronic components. And since more and more products have computerised controllers, ensuring that they have robust components and a good supply of spare parts (and that these can be replaced more easily), and supporting software updates, become especially important when assessing their repairability. For it is at this level of components, parts and software that the product's end of life is now most likely to occur (Ruiz-Pastor & Mesa 2023).

The Joint Research Centre (the research centre funded by the European Commission) has been working on a draft version of a European-wide index, and the Commission has been considering its applicability (Dangal et al 2022). A recent comparative, design-oriented study of the six repairability indexes developed so far and their effectiveness supports a need for a broader, cross-national approach, and for more comprehensive standards of assessment (Dangal et al 2022). The six indexes examined by Dangal et al (2022), included the French, iFixit's, the EU's JRC-led one, and three additional specialist ones created by various research groups.

These have some overlaps, with most developed for engineers and professional repairers. Most cover the availability of technical information, the availability of parts, the disassemblability of the product, the type of fasteners used, the product's modularity, the availability of tools for undertaking repairs, as well as whether the repairer is able to do a firmware reset after the repair, a critical issue in most electronic products (Cavillot 2024). From a design perspective, Dangal et al. (2022) also found these indexes tended to overlook the product's ease of handling, the interchangeability of parts, the product's robustness during the repair itself (for example, whether it will break when a part is being taken out or inserted), and the availability of software diagnostics (to identify the original fault), along with a consideration of the health and safety of the repairers themselves (Dangal et al. 2022).

These studies recognise the value of a comprehensive Europe-wide index able to assist both consumers and repairers, and for a clearer, uniform and applicable legislative directive to the manufacturers. Manufacturers are keen to see a basic uniformity in legislation and regulation. APPLiA (2023), the European consortium representing many of the continent's appliance manufacturers, has so far supported the intention behind these indexes, but has voiced concerns about the absence of uniform EU-wide laws on repairability. They too have advocated for a single Europe-wide repairability index (APPLiA 2023).

**SUMMARY OF EXISTING METRICS RELATED TO PRODUCT REPAIRABILITY MEASUREMENT.**

| Metric or Indicator | Focused on | Criteria & Scoring System |
| --- | --- | --- |
| French Repairability Index (French Government, 2021) | Electronic products (smartphones, laptops, televisions, washing machines, lawnmowers) | Five criteria: Documentation, Disassembly (accessibility, tool, fasteners), availability of spare parts, Price of spare parts, Criterion specific to the category of equipment concerned 0-20 points range and normalized to 0-10 |
| EN 45554:2020 (European Committee for Standardization 2020) | Energy-related products | 11 Rating criteria: Disassembly depth, Fasteners, Tools, Working Environment, Skill level, Diagnostic support and interface, Availability of spare parts, Types and Availability of information, Return models, Data transfer and deletion, password and factory reset for reuse  Classes A-F, aggregation: numeric values for each class |

**SUMMARY OF EXISTING METRICS RELATED TO PRODUCT REPAIRABILITY MEASUREMENT.**

| Metric or Indicator | Focused on | Criteria & Scoring System |
|---|---|---|
| JRC Analysis (Spiliotopoulos et al., 2021) | Generic products | Six parameters: <br><br> Disassembly depth, Fasteners (type), Tools (type), Spare parts (target group), Software updates (duration), Repair information <br><br> 1-5 score per Criterion and weighted importance |
| BENELUX Repairability criteria (Bracquené et al., 2018) | Energy-related products | Three main criteria types (Information provision, Product Design, Service) across five repair steps that include product identification, failure diagnostic, disassembly & reassembly, spare part replacement, and restoring to working condition <br><br> Normalized to 0–100% |
| iFixit/Flipsen (Flipsen et al., 2017) | Electronic portable products | 26 criteria that include: <br><br> Repair manual available, no special tools needed, spare parts available, no substantial efforts needed, easy access to critical components, cost of repair/spare parts/tools, standardized spare parts, risk of injuries, no excessive amounts of adhesives, ease of identification of the problem, no comprising other components, time to repair, modularity of parts/components, identification of components, availability of tools, no special training needed, number of tools, upgradeability, self-explanatory repair processes, recyclable components, others. <br><br> Normalized to 0-10 |
| ONR 192102:2014 (ISO, 2014) | White goods, brown goods | 40 criteria for white goods and 53 criteria for brown goods. Criteria are focused on repairability to ensure long-lasting, durable products. 17 and 21 criteria for white and brown goods are marked as mandatory, respectively. <br><br> Three Quality levels Good (5–6 points), very good (7–8), and excellent (9–10) |

*Table 3: Metrics in Repairability Indexes compared (Ruiz-Pastor & Mesa 2023)*

## Incentivizing Repair

Another well-documented barrier to encouraging more consumers to seek out and use repair services is the cost of the repair itself. In response, a number of jurisdictions, especially in Europe, are offering consumers financial and other incentives, including subsidies, to access and use repair services. Amongst the better known are the schemes now running in Austria, France, Thuringia in Germany, and in America, in Portland, Oregon (Lechner et al. 2021). These aim to alert consumers to the existence and benefit of repair services, and to reduce the cost of repairs for them, especially for inexpensive items whose repair often competes with the low cost of their replacements. The granting of subsidies can be seen as a type of bridging strategy, a short-term solution to the larger structural changes required to establish a more circular society, one where ordinary people return to seeking out and using repair services.

In France there is now a 'Repair Bonus Scheme' to help reduce fashion waste. Local governments in France give citizens subsidies of between 6 and 25 euros to bring in their clothes for repair, the sum determined by the type of fabric and complexity of the repair. These subsidies are drawn from a 154 million Euro EU sustainability fund,

which is to be distributed over 5 years. The hope is that consumers will purchase more quality apparel, and that the subsidies will increase business activity for tailors and shoemakers, amongst those most threatened by fast fashion.

In Vienna, Austria, the city government developed a pilot repair subsidy in 2020, the Reparaturbon (Lechner et al. 2021). In this scheme, the government covers 50% of repair costs of clothing, electronics, and furniture submitted to qualified repairers, with the subsidy available capped at 200 Euro. Its aim is to promote repair and support local small businesses, and so far over 35,000 items have been repaired through the scheme. This Austrian Repair Bonus scheme is intended to continue until at least 2026, and aims to fund approximately 400,000 repairs. It is funded by a portion of the nation's Covid-19 recovery fund (130 million Euros) from the European Union. At a recent repair summit in Australia, Markus Pringer observed that the funding scheme is well received by those who use it, and that subsidies can be shown to increase repair activity. He observed that people are more likely to repair not only cheap items but also more expensive electronics under such schemes.

The state of Thuringia in Germany has a repair bonus that subsidises repairs of common household electrical appliances for up to 50%, a scheme in which a household can receive a maximum of 100 euros per year. It's a joint initiative by the Thuringian Ministry for Environment, Energy and Nature Conservation and the Thuringian Consumer Advice Centre, funded by the ministry, and aims to extend service life of products and conserve natural resources. The same group also encourages and supports free repairs through local repair cafés, and refunds 50% of the cost of any spare parts required for an item repaired in a repair café.

In a recent post, the European Right to Repair movement (Rezende 2024) summarised the main repair voucher schemes running across Europe. It has been widely reported that the most effective, or at least those taken up by the most consumers, tend to be those with the fewest bureaucratic demands on the consumer, with the French reward system, noted above, regarded as perhaps the least effective in this regard.

Local governments in France give citizens subsidies of between 6 and 25 euros to bring in their clothes for repair, the sum determined by the type of fabric and complexity of the repair.

**SUMMARY OF MAIN REPAIR VOUCHER SCHEMES ACROSS EUROPE.**

| Nation | Start Date | Eligible Products | Amount of funding | Per Person |
|---|---|---|---|---|
| Austria | December 2022 | Some Electrical Appliances, Clothing, Shoes | Between 7 and 50 euro | No limit |
| Thuringia | June 2021 | Electrical, & electronic devices | Up to 100 euros or 50% of the repair invoice (half of these figures for Repair Cafes | Max of 100 euros a year |
| Saxony | November 2023 | Electrical, & electronic devices | Up to 200 euros or 50% of the invoice (above 75 euro) | Up to 2 repairs a year |
| Starnberg | January 2022 | Electrical & electronic devices | Maximum of 50 euros or 20% of the repair cost | 50 euros per year |
| Vienna | October 2020 | All items repaired by businesses within Repair Network Vienna, excluding EE devices | Maximum of 100 euros or 50% of the invoice amount, and max. of 55 euros for cost estimates | No limit |
| Graz | 2017 | Costs of running repair cafés until 2023, repairs of EE appliances, devices | Up to 1200 euros per repair café per year until 2023, max of 100 euros or 50% of invoice amount | Until 2023, max of 200 euros a year |
| Aschaffenburg | 2024 | Electrical & electronic devices / costs for conducting repair cafés | 20% of the invoice amount up to a max of 50 euros per repair | Up to 2 repairs per year |

*Table 4: Adapted from Rezende 2024.*

In 2022, the city of Portland in Oregon introduced a similar pilot Repair Voucher program funded by the Oregon Department of Environmental Quality, where Repair PDX partnered with two community repair businesses, JD's Shoe Repair and a tailor, offering 50 repair vouchers for each business of $40 USD towards the cost of repair. Their purpose was to stimulate a repair culture and economy, reduce financial barriers to repair, and prioritise communities of colour and LGBTQ communities.

A common thread in all these schemes is an attempt to counter the rising costs of repair work relative to the relatively low costs of new products, whether in electronic goods, appliances, furniture or clothing. This is a fundamental economic problem: larger producers can create products at lower costs for global markets, and lower entry prices for common household goods generate more consumption in the aggregate, while the cost of repair itself continues to rise with the cost of living (Crocker 2025).

# The Australian Context

## Repair in focus

In Australia, consumer protection laws and fair trading legislation cover a number of aspects of product quality and consumer rights, including some rights to repair. For example, repair is mentioned in Schedule 2 of the Corporation and Consumer Act 2010. This covers the consumer's rights to repair, replacement, and refunds for faulty goods. In addition, each Australian state and territory has its own legislation that complements and supports consumers' rights under Australian Consumer Law (SA Consumer Law 2025).

Australian Consumer Law distinguishes between guarantees and product warranties. Under consumer guarantees, products must have spare parts and repair facilities available 'for a reasonable time after purchase', unless the consumer is informed otherwise. Price is a significant factor here. If a product costs $400 and has a 12 month warranty, but fails after 13 months, the consumer now the right to demand a replacement, but not if the product cost only $45 (SA Consumer Law 2025).

Warranty law conforms to this right to replacement or refund, with the right to repair waived if the seller offers a replacement instead. 'Express' or written warranties attached to the product can also trigger product replacement or refund rather than repair (SA Consumer Law 2025). The consumer's right to repair tends to be treated as equivalent to a right to replacement or refund, if the minimum terms in the guarantee or warranty are not met. This suggests that repair is now a less common remedy for faulty goods in Australia. In a nation that imports the majority of its household goods, product replacement or refund seems to be the most common solution offered by sellers.

**..a re-introduction of the second-life product into the market has added benefits to consumers, including broadening access to the product, whose brand may also be enhanced, as presently occurs in the second-hand car market and amongst a wide variety of luxury goods, from clothing and bags to furniture and lighting.**

However, rising waste volumes and their environmental impacts have raised concerns in state and federal governments that more could be done to limit the volume of goods being sent to landfill. In 2019, Australia's State Ministers of Consumer Affairs met to consider a 'right to repair' paper developed by the ACT Government. This led to an agreement that the Australian Productivity Commission should work towards a public Inquiry into the Right to Repair in Australia. This inquiry led to the publication of a White Paper addressing 'unnecessary barriers to repair', and resulted in over 250 submissions (AGPC 2020). The final 'Right to Repair' Inquiry Report (AGPC 2021) recommended extending existing consumer protection law to increase consumer rights to repair, and improving the quality of product information, and especially that relevant to repair and maintenance.

The recommendations contained in the final Productivity Commission Report echo many of the initiatives in Europe and America discussed above, most notably (AGPC 2021):

* Copyright laws should be strengthened to facilitate accessing and sharing repair information (such as repair manuals, and repair data, now often hidden behind digital locks);

* Manufacturers should provide guarantees that include software updates and ensure that spare parts be available for a reasonable time period after the release of the product;

* Text should be included in guarantees explicitly stating that the consumer's right to repair is not invalidated by the use of non-authorised repair services or spare parts;

* More detailed investigations should be carried out into markets where practic-es restricting repair have been identified, including mobile phones, tablets and medical devices;

* Suppliers of agricultural machinery in particular should be required to provide access to diagnostic information and parts to both owners and repairers at a reasonable cost;

* Copyright law should be amended to enable access by all repairers to diagnostic software, and to allow the sharing of information required for repair;

* The current e-waste recycling scheme should be amended to include targets that encompass re-use and repair, and electronic trackers in e-waste to ensure the scheme can no longer be manipulated to support the unlawful export of e-waste, while still supporting related consumer concerns over data security;

* A labelling scheme for products should be trialled and introduced to provide the consumer with information about repairability and durability, starting with white-goods.

Australia's first national 'right to repair' legislation was developed in parallel to this inquiry and report (2017-2022). This is the Commonwealth Government's mandatory Motor Vehicle Information (sharing) Scheme (MVIS) (ACCC 2024). This enables all Australian motor vehicle repairers and registered training organisations to have fair market access to motor vehicle service and repair information, including diagnostic software, updates and codes for computerised car systems (ACCC 2024; AASRA 2024). The law is the result of the ACCC's partnership with other global associations whose work is embodied in a 'position paper'. This included 'ten principles of best practice right to repair legislation' (AAAA 2024). Although these are clearly aimed at the vehicle repair market, they echo many of principles promoted by other right to repair groups in Europe and America.

The Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) is currently in the process of consulting with stakeholders to develop a regulatory product stewardship scheme for small Electrical and Electronic Equipment (EEE) and solar Photo Voltaic (PV) systems. However, there are minimal outcomes in these addressing reuse and repair, with the focus instead being on e-waste under 20kg. Implementation would mean the current National Television and Computer Recycling (NTCR) Scheme would operate within the new scheme, but would not include some electronic appliances such as washing machines and dishwashers.

Other approaches to managing the impacts of products' end of life where manufacturers take responsibility is through extended producer responsibility (EPR) legislation, which is an extension of the 'polluter pays' principle (King et al., 2006, p. 258). EPR was first defined by the OECD as:

> *the principle that manufacturer and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product lifecycle, including impacts from the selection of materials, the production process, and from the use and disposal of the products at the end of life-cycle (OECD, 2001 in King et al., 2006).*

Currently, manufacturers of goods sold in Australia have little liability beyond their products' warranty. If used products are collected and returned to the manufacturer or approved supplier for repair, reconditioning or disassembly for remanufacturing, or even recycling, further environmental benefits will occur. Such a re-introduction of the second-life product into the market has added benefits to consumers, including broadening access to the product, whose brand may also be enhanced, as presently occurs in the second-hand car market and amongst a wide variety of luxury goods, from clothing and bags to furniture and lighting.

The Australian Productivity Commission report (AGPC 2021) provided both federal and state governments with a list of potential actions to take to improve Australian consumers access to repair and repairability, and to increase circularity in Australia's economy. However, because of the complex overlay of legislation and regulation governing access to repair in Australia at the moment, and the strategies developed by many companies to work with, or around, current legislation, more needs to be considered and enacted, both at a federal and state level.

### Repair and the Circular Economy

Beginning with South Australia's report, 'Creating Value: Potential Benefits of a Circular Economy in South Australia' (GISA 2017), a series of reports and case studies have been published by state and federal government agencies on the environmental, economic and social benefits to be derived from a circular economy. The Australian Circular Economy Hub (ACEH 2020), a large charity founded by Planet Ark and supported by Sustainability Victoria, has acted as an information exchange for businesses interested in the circular economy, rather like a local version of the Ellen Macarthur Foundation in Britain (EMF). This increased interest and focus on the circular economy at a national level has helped dispel the myth that the circular economy requires only increased recycling rates and waste reduction, with many larger businesses, particularly in development and construction now appointing circular economy experts to their sustainability teams.

More recently, the federal government has developed a comprehensive 'Circular Economy Framework' (DCCEEW 2024) setting out a vision for the nation, with the goal of doubling the Australia's circularity by 2035. In this report, as in a number of GISA's reports and initiatives, repair and repairability were highlighted as significant means to increasing circularity, with the suggestion that products should be redesigned to be repairable and durable (DCCEEW 2024 pp28-30).

This was closely followed by the final Circular Economy Ministerial Advisory Group's report, 'The Circular Advantage' (CEMAG 2025) which set out a number of recommendations highlighting the need for increasing repair activities, changing business strategies and shifting consumer attitudes, particularly around fast fashion, electronic goods and household products. This report also recommended following Europe in raising consumers' awareness of the value of repair for the environment, and rating goods' repairability along the lines of the French index but perhaps using a more familiar 'star system' (CEMAG 2025, p.38).

In March 2025, the Productivity Commission (AGPC 2025) launched an interim report on 'The Australian Circular Economy: Unlocking opportunities…'. This echoed a number of the recommendations to be found in 'The Circular Advantage' (CEMAG 2025), including harmonizing Australia's current patchwork of state-based waste, recycling, take back and reuse legislation, and integrating these under a national circular economy framework (2025), protected by a Circular Economy Act (CEMAG 2025 pp.25-35). Significantly CEMAG's report also recommends establishing eco-design standards based on the EU's Ecodesign Directive, initially focusing on fast-moving consumer goods such as packaging, electronics, textiles and batteries (p. 39).

Another important recommendation in 'The Circular Advantage' is to empower consumers and communities by building circular economy literacy (p.79) and ensuring that key information on product and material repairability and durability is made available to consumers (p.111).

**Repair in South Australia**

The repair economy in South Australia, as in the other Australian states, has been losing ground due to the problems outlined above. South Australian consumers, like those in other states, have suffered from a lack of focus on repair and repairability in relevant national and state legislative instruments. With few exceptions, the focus of the state government has been further down the waste hierarchy at the level of waste diversion and recycling rather than avoidance and reduction. While there have been some initiatives in sharing certain goods and services, repair, re-use and the extended use of products have not been in focus, at least in policy and regulation, even though these sit higher on  the waste management hierarchy and can play a central role in the development of a circular economy.

The ground-breaking Green Industries SA 2017 report, 'Creating Value: Potential Benefits of a Circular Economy in South Australia', predicted that implementing a circular economy could add 25,700 full time equivalent jobs to the South Australian economy (GISA 2017). It also calculated that implementing a circular economy in the state would reduce South Australia's greenhouse gas (GHG) emissions by 27% or 7.7 million tonnes of $CO_2$ equivalent (GISA 2017). This kind of calculation can also be found in the federal government's more recent 'Circular Economy Framework' (DCCEEW 2024), for there is no doubt that increasing circularity has multiple environmental, economic and social benefits.

The repair sector's role in these figures is not always clear from these projections, but other studies from Europe (D'Urzo & Campagnaro 2023) suggest that up to 18 times more jobs can be created through repair activities than through recycling, and a recent study commissioned by the NSW government's EPA (CRA & EPANSW 2024) calculates that this figure could be 25 more jobs than generated by recycling per tonne of materials processed. Given the size of the resource sector in South Australia, the value of increasing repair activities in the state is clear.

Green Industries SA, in partnership with Charitable Reuse Australia, launched the SA Reuse Data Study, a survey aimed at understanding the scale and impact of reuse activities in South Australia (GISA 2024a). The study seeks to gather data to assess the environmental and economic benefits, employment opportunities, and social contributions of the reuse sector across the state and help the South Australian government identify ways to grow or accelerate reuse efforts. The circular economy is an important focus for Green Industries SA, with the Green Industries SA Act of 2014 incorporating the concept as a guiding principle. South Australia's current Waste Strategy 2020-2025 was developed with the objective of supporting the state's transition to a circular economy (GISA 2024b). Encouraging reuse and repair for further waste avoidance is identified there as one of the priority actions to support the state's transition to a circular economy. Reuse and repair will continue to be an important focus area for the state waste strategy currently under development.

There have been a number of recent projects specifically linked to repair and reuse in the state. One was Green Industries SA's assistance developing a MakerSpace in Adelaide, and various local governments' assistance to repair cafés and men's sheds in communities across the state, enabling these to establish, expand and operate safely (Makerspace 2024; Mens Sheds 2024). The network of such facilities still needs to be improved and extended, and their benefits to communities better documented and promoted, so that financial and logistical support can be established for these organisations on a more permanent basis. Their social benefits include improved mental health outcomes for participants, skills transfer between generations, as well as the environmental savings derived from not buying new, but making and repairing products to ensure their longer use.

### Understanding the Repair Sector

The present lack of knowledge, and data, about repair in South Australia, as in the rest of Australia, and its likely further decline in the face of the economic situation outlined above (and revisited below), suggests that a focus on repair and repairability is long overdue. For it is clear that the potential benefits of increasing repair activities in the state could add appreciably to the state's economic development and job creation. However, there's a real need for a more detailed understanding of SA's existing repair sector, the community's engagement with it, and of existing barriers to increasing this engagement, not only as a means towards waste reduction, but as a way of encouraging the broader community to 'go circular' and increase their understanding of the environmental, economic and social benefits of the circular economy in the long term.

In addition to the issues and barriers identified in the Productivity Commission's report (2021) and revisited in more recent reports discussed above (DCCEEW 2024; CEMAG 2025), the South Australian government will need to gather more specific and detailed data on repair, which is at present lacking. This data should include:

* Who is engaged in repair: This will require an ability to identify and record repair facilities, and to have resources available to keep such a database up to date;

* What is now being repaired: Having repairers report their own data (which they may see as confidential data) in an aggregated form for government evaluation, such as how many white goods or which brands are being repaired. This data could be used along with other data gathered to add to the state's circularity report. Trends in repair, types of repair and need for improvements could be identified and measured through this data.

* What are the needs of the repair sector: Other data relating to repair to be collected might be on jobs in repair, along with training needs and skills required in different areas of the repair economy.

* Where repair services can be found: Promoting the existence of repair facilities to the general public in a cost effective way via a website, an app or some other digital mechanism.

* Whether procurement can be used to promote repair and repairability: Government could identify repairability and upgradeability as a major consideration in the contracts and tenders used to purchase new equipment across everything from IT equipment to uniforms.
* Costs of repair: Gaining an understanding  of the costing of typical repairs, and whether these are a barrier to the person seeking the repair, and if this barrier can be reduced through some form of incentivization.

If these gaps in knowledge can be addressed, more targeted legislative change, policy and support measures can be developed to grow and expand the repair economy in South Australia. These needs are revisted below in the Discussion section (5.) and Conclusion (6.) of this report.

..there's a real need for a more detailed understanding of SA's existing repair sector, the community's engagement with it, and of existing barriers to increasing this engagement, not only as a means towards waste reduction, but as a way of encouraging the broader community to 'go circular'...

# Stakeholder Engagement

After reviewing the available expert literature (in the Literature Review section above), we conducted a series of semi-structured interviews with 54 individual stakeholders. These were either directly engaged in repair themselves, or were active in various roles promoting repair at a state or national level.

The results from our interviews are presented below under thematic headings in the Findings section (4.) below, and then in summary form in the Discussion section (5.) that follows. The Conclusion (6.) then presents a series of suggested policy options. To ensure their practical viability, these were presented in draft form to various stakeholders, including local and state government representatives in a workshop held at the end of October 2024, and to another group of interstate experts via an online workshop in November 2024. We are grateful to all those who participated in these workshops, and providing us with their insights into the options we had identified.

To locate the 54 individuals we interviewed or surveyed, a snowballing recruitment method was used. This method seemed appropriate since we were not seeking to demonstrate anything of statistical significance (there now being so little available data on repair in the state), but to map and locate active members of several significant groups involved in repair activities, especially those commonly used by the community, including those working in clothing and shoe repair, watch repair, bicycle repair, mobile phone and tablet repair, and those working in the repair of larger household appliances and smaller electronic items. We also included a few participants involved in more specialised areas, including upholstery, cameras, musical instruments, medical instruments and furniture and fireplace restoration.

Because repair is a time-intensive occupation, and repairers are increasingly under pressure to perform their work as quickly and efficiently as possible, some of the people we initially contacted, and some who elected to be interviewed, were unable to find the time to speak to us. A number of our interviewees also had some difficulties understanding us, not having English as their first language, so these were provided with the same questions we were asking in the interviews on paper, so they could find someone to help them translate and answer our questions, and to write down their responses. Our interviewees were also asked if they had any further contacts within their networks, and where possible these were followed up to be interviewed in turn.

Where someone didn't feel comfortable participating in a face to face interview, or simply had insufficient time, they were offered the opportunity to respond through a printed or emailed version of our questions. These questions were the same as those asked in the semi-structured interview, and so provided an additional asynchronous option for participation. All interviews were transcribed and if permission was granted, audio was recorded and then transcribed.

All responses were analysed using a thematic analysis process. Every interview was also summarised in a standardised note form, to provide some consistency between what might be very different conversations.

Of the 54 responses:

* 26 were face-to-face Interviews,
* 8 were online interviews through Zoom,
* 6 were phone Interviews, and
* 10 provided written responses via email.

The research design was intended to enable our participants to contribute in a format, and at a time, that best suited their individual circumstances (Davis et al. 2021). This approach was found to be more useful, given the difficulties many had finding the time to talk to us, often during, or at the end of, a busy day of repair-related activities.

Our interviewees fell into three broad categories:

1 Professional repairers, mostly working for themselves, with some in small businesses employing less than 10 people,

2 Volunteers from repair cafés and other community organisations engaged in repair such as the Adelaide Bike Kitchen, and

3 'Policymakers', a broad category including those advocating for repair at a local government, state and national level, those researching aspects of the subject such as the right to repair, those interested in design for repairability and durability, and those in government or non-government organisations interested, for various reasons, in repair.

In response to our project's broad aim to 'map' the state of repair in South Australia, the questions we presented to our participants explored a number of related themes:

* An individual's or group's relationship to repair;
* The repair and repairability (or not) of products;
* The repairers' relationship with and understanding of their customer base;
* The barriers to repair they or others known to them have experienced;
* Their understanding of product durability and design, in relation to repair; and
* The future of repair as they understood it, including any challenges with business, customers, manufacturing and existing legislative systems.

# Findings

Unsurprisingly, all of our interviewees spoke of the main barriers to repair and repairability identified in the literature review. In particular, they all mentioned the problem of product obsolescence, and the lack of durability of many items, a problem they considered to be getting worse. Our interviewees also all emphasised the negative impact of the economic context, and the challenges of running a business or voluntary organisation engaged in different kinds of repair.

Another barrier which all repairers commented on was the current shortage of young, trainee repairers. This was evident in every category of repair, and related specifically to the lack of training available in South Australia. Surprisingly, this issue was evident even in the most common types of repair, including watch, shoe, garment and upholstery, where training is now only available in Melbourne or Sydney. Since apprenticeships in these skills are no longer subsidized, this adds an unsustainable cost burden to any repairer wishing to employ a young person to train with them.

Many repairers also considered that few of their customers now valued or understood repair, or the skills and time required to repair something. Unrealistic, and even sometimes disrespectful, consumer attitudes were evident in all types of repair we encountered, with few consumers seeming to grasp that repairing anything requires substantial prior expert knowledge, experience and skill.

Each interviewee, from the repairers to the experts interviewed, all had important and valuable insights into various enablers of repair, and most had useful ideas about the future they would like to see, including particular remedies for the problems or issues they had identified, and what government might be able to do to encourage and expand both the community's recourse to repair and the repairability of the products needing repair.

The findings from our 54 interviews are summarised below, and we have included illustrative quotations from the interviews themselves to enable the reader to get a sense of the 'lived experience' of the repairers, volunteers and advocates for repair. We have included in the Appendix one page of notes summarising one (real) interview to give the reader an idea of our approach and method. All interviewees named in the text below gave us permission to do so, with those preferring not to be identified appearing as 'Anonymous'.

*Planned obsolescence*

Most of the repairers, both professional and volunteer, were concerned about the widespread use of planned obsolescence in the products they were asked to repair. It was evident in the choice of short-lived materials or components, and in the design decisions that made many of these items difficult or even impossible to repair. In several product categories, especially mobile phones and bikes, repairers were confronted with propriety components that could only be sourced through the manufacturers themselves, with some manufacturers either stopping making these when it suited them, or restricting their supply so as to deliberately limit people's recourse to independent repair. The aim of these strategies is to encourage consumers to buy again.

Across many domains repairers also spoke of the ways manufacturers were restricting repair by forcing repairers to pay for technical information, and even to access basic fault codes. Peter Bunn from Goldline Appliances, for example, who started his company 43 years ago (repairing dishwashers, washing machines and dryers), said that he has seen many changes over the years, including issues with more products becoming digitized: 'a lot of them have (require) binary codes and fault codes to work.' Despite many being easy to repair, Goldline has had to modify their services. 'A lot of the higher end stuff you need ... laptops and that to service, we don't do a lot of that anymore, as a lot of the manufacturers want you to pay for the information.' Companies charging for the technical information required to repair something was mentioned in a number of other interviews.

..access to tools, equipment, and information are now often restricted, and so become significant barriers to repairing...

Greg Olsson from the Battery Bar, who repairs small electrical battery-based appliances, and has done basic watch, torch and other small electronic device repairs for 30 years, thinks problems with the design of the products he is asked to repair are becoming more apparent. He used to be able to repair most things, but design changes over the years have been really restricting his business. For example, his sales in phone batteries diminished by 98% because batteries in many phones can no longer be easily replaced. He emphasised that access to tools, equipment, and information are now often restricted, and so become significant barriers to repairing these products. He was also concerned with 'echo' or paired chips or components, which are appearing in more products. These have to be sent back to the manufacturer to be repaired. He thought that this was not for 'consumer safety', as the manufacturers liked to claim.

Greg Anastasi, who works as a field engineer and services medical imaging equipment, said he used to work at HP for 4 years. Most of the machines he worked on there were higher end and repairable, where you could pull them apart and repair them. However, 'Once you get past (below) a certain value, they are not made to be repaired.' Generally, if a customer had a problem with these machines they would be scrapped and go into e-waste. The customer's attitude and lack of awareness of repairability could also influence what was done, since they often believed buying new was better than getting their existing machines repaired.

Anastasi now mainly repairs medical imaging equipment like x-ray machines. 'I'm in a really lucky position - we are in sales and service - so in my field generally the people who sell the machines also repair them.' He emphasised that the machines he repairs are too valuable not to be repairable, and in over 30 years of work in the field he has only twice been unable to repair a machine. 'We are talking about machines costing between $160,000 and $300,000…they are repairable and made to be repaired. The only time that the machine would not be repairable is if they are damaged in transport, for example if it has dropped off the back of a truck. Anything apart from that you can repair- It may take 3 or 4 days to repair it. I've had repair jobs that have taken me 40 hours.'

He was very concerned with obsolescence in cheaper products. 'What people tend to do is they buy something for say $5 and it may fail in a week, but they won't return it, and so, manufacturers will continue to make (expletive) if people don't want to return it. But if we made it so people saw it as being correct to return (it), things might be very different'. Secondly, he believes raw materials are too cheap. 'We need to make raw materials much more expensive - so they cannot make (something) for $5! Things are too cheap!' He considered that much of the problem is unethical business calculations: 'Someone has looked at the columns and figured out the prices, and that if they throw 100 tonnes of plastic into landfill the company would make more money than if they improve a part.'

E-waste from easily repairable machines is also prominent in larger organisations. For example, an independent computer repairer (Anonymous) did their internship in a large organisation's IT department where they had to check over 100 devices that had stopped working, which the organisation had stockpiled over time, including, laptops, iPads and desktop computers. They found that the main issues were in laptops and desktops, including speaker issues, keypad issues, battery power, motherboard issues, broken screens and some that would not switch on. They found over 20 devices that were repairable and/ or under warranty. However, they were told to put them all in e-waste after saving the data, since the organisation thought it wasn't worth the time or effort, despite the fact that the internships were unpaid. There was an IT budget to purchase new for which they could receive tax benefits, so the interns had to go through the E-waste decommissioning process.

'Someone has looked at the columns and figured out the prices, and that if they throw 100 tonnes of plastic into landfill the company would make more money than if they improve a part.'

*Greg Anastasi*

Obsolescence does not have to be 'built-in', but can be encouraged or enabled by larger businesses and governments, particularly in IT where companies are being rewarded for not repairing and more frequently upgrading their equipment. This repairer would like to see other pathways for devices such as these: 'If large organisations don't have time for repair they can give it to volunteer groups to repair for charity groups or others in need.' Policies such as a limit to what companies can put into e-waste per year could also help, he considered. They also emphasised that repair to reduce e-waste needs to be taught in all IT courses, since 'there is a lot of training in IT but not in repair.'

By contrast, while most of the repairers interviewed spoke of some obsolescence, there were a handful who repaired products with little or no apparent obsolescence. Apart from the x-ray machines just described, guitar repairers from Salvi's, Doug Tapfield and Steve Salvi, claimed they had almost never been unable to repair a guitar, whether a wooden or an electric one. 'There is almost no planned obsolescence put into guitars as with other products because it is not a consumable product,' explained Doug Tapfield, noting their high cost and sentimental value.

Business owner Steve Salvi's understanding of obsolescence was derived from when he had worked for Ford in the past. 'They introduced plastic componentry that is easier to break, so the whole component will have to come out to repair it. For example, the thermostat used to be made from aluminium and now it is made out of plastic, so the whole component has to come out to repair. That way a lot of money can be made from replacing the broken part'.

Doug Tapfield thought that the government needs to have paid advertisements on television to promote repairing and education about building things to last - 'like the old fashion days.' Further they both believed that government import regulations should be a lot stricter, and things sold in Australia should have to be repairable and have replaceable parts available at a reasonable cost. This potential government involvement can be seen in France, where planned obsolescence was recently outlawed.



Figure 7. Guitar repairers at Salvi's

Planned obsolescence was a prominent concern amongst volunteer repairers in repair cafés. Bron McNab, Coordinator of the Hut Repair Café in Aldgate, noted: 'In our repair café, even though probably over 90% of the time we can repair most things that come in, there is a small amount - up to 10% of items that are not repairable - not because they're not repairable, but because they have built-in obsolescence from manufacturers, who put parts in that can't be replaced, or produced in such a way that you can't actually undo them and repair whatever might not be working.'

Shoddy materials or parts that could not be repaired or replaced was a complaint echoed across the board in the repair cafés we approached. Sue Croser, jewellery and hand sewing repairer at the Campbelltown repair café, said there is built-in obsolescence even in jewellery today. 'The rise of plastic necklaces. When they are made, the pieces are heated together and there are no ways to repair that, and it will have to be tossed. That's when I suggest an alternative use such as a Christmas ornament. It is such a useless thing and I don't know what else people can do with it other than that.'

Similarly, planned obsolescence was of particular concern to Michael Brisco, the founder of Bikes for Refugees, a community bike repair service and charity that has repaired more than 15,000 bikes over 20 years. He said 'planned obsolescence is a major issue with bikes…' The worst offenders for his repairers were the 'supermarket bikes', or 'K-Mart' bikes.  These 'seem to be designed to last the school holidays'…

Amongst the experts we spoke to, most saw the issue of planned obsolescence in similar terms, but focused more attention on the role of design. Many things, they emphasised, were now 'designed to break' after a certain period, and this was apparent in domains as distinct as shoes, clothing and textiles (Omer Soker), IT products, cars and furniture (Vaughan Levitzke), agricultural equipment and simple domestic products such as household fans (Paul Huxtable). These had all been designed to become prematurely obsolescent. The fact that some products with similar price tags differed remarkably, while others, often much more expensive, could be difficult or impossible to repair, suggested for several of our interviewees that more products are now designed to fail.

To point out how good design can ensure a long-lived product, Edward Khoury from Form Design in Perth, spoke of Q cookware based in Melbourne. Their products, while very expensive, have a unique life-time guarantee attached to them, and most will work like new after twenty years or more. The repairability and long life of such products could be made more explicit to the buyer, and the high cost he thought could be spread over several months or years, as some retailers are already doing.

Paul Huxtable considered that warranties could play a more significant role in pushing manufacturers to produce more durable, repairable goods, citing the cynical exploitation of Ozito products by some tradesmen he knows. Ozito tools are sold in Bunnings with a limited one or two year warranty, and a label expressly declaring that they are designed for the handyman. But one carpenter told him that he would use these tools on a building site until they failed

Shoddy materials or parts that could not be repaired or replaced was a complaint echoed across the board in the repair cafés we approached.

(usually within 6 months or so), and then return them to swap them for free replacements, as the warranty promised. Paul Huxtable thought that doubling the warranty of products like these could ensure that they would be designed to last longer.

John Gertsakis, a long-time supporter of change in this area, was particularly concerned with the use of planned obsolescence in IT products, small electronic products and household appliances, and noted that it was primarily encouraged by 'Producers, brands and retailers opposing the use of repair services.' This was again something echoed by many in the repair business, confronted with products that had been effectively disabled for repair 'by design'. Gertsakis also emphasised the 'government's poor understanding of the value that repair has in relation to waste prevention, circularity and consumer empowerment.'

### Durability and Design

Durability and obsolescence were understood by the majority of interviewees as opposing faces of the same coin. Many products were difficult or impossible to repair because of their lack of durability, having been designed with parts or components that ensured early failure or breakage. This seems to be part of a now widespread business strategy to encourage consumers to discard and upgrade to the new rather than repair the product they already have.

The advantage to a company like Apple to offer to repair a broken screen or keyboard themselves, often for up to half or more of the cost of a complete new product, is a well-known case in point, and was mentioned by several of the independent IT repairers. These repairers would have to send their customers back to Apple if they had a broken screen, battery issue or keyboard. While these products might have been designed to be relatively robust, they have been assembled in such a way as to make disassembly and repair difficult and time consuming, and thus expensive. Paired components also ensured that all 'unauthorised' repair results in some malfunction, in this way discouraging the consumer from getting the product repaired at all.





*Figure 8. Brenton Lay, Mr Minit, repairing soles of shoes and a car key*

The related issues our interviewees drew attention to were very similar: poor design, including a lack of durable materials and components, and proprietary parts that required specialist tools, or simply parts that couldn't be located, replaced or fixed. The product's design itself was the problem, since it had been created within a business model requiring premature disposal and replacement.

Marketers in the relevant literature now refer to this planned moment of upgrade as 'product roll-over', making it clear that this premature 'death' of the product has been planned in advance, and is considered essential to their business model. The designer's choice of parts and materials play an important role in making sure products fail when they do, and that they can't be repaired. Low quality, unrepairable parts and assemblies put together in a way that are difficult or even impossible to fix, and standard, simple parts that have been deliberately varied, often only slightly, force the repairer to go back to the manufacturer for spares.

*Clothing and Footwear:* A problem with durability and design was also found across all kinds of clothing and footwear. For example, Brenton Lay from Mr Minit, who mainly repairs shoes and watches, said that if he thought an item would break, or would sustain damage during repair, he wouldn't touch it. 'When customers bring in cheaper products, we don't fix it as it may not last.' He's a cobbler by trade, and with soles being the most common repair, he would love to see shoes go back to leather soles: 'You can buy a pair of RM (Williams) boots for $400 but I can repair them for 20 years. It is more difficult to fix other soles.' He tries to explain to his customers what they should look for when purchasing shoes. He also sees a lack of quality in watches that limits the repairs he can take on. However, while 'even some cheaper products are still good quality, but then it's more about the ethical side of supply'.

All of the repairers, and especially tailors and garment repairers, were concerned with manufacturers cutting corners and making low quality, deliberately short-lived clothes. This was echoed by Omer Soker, CEO of Charity Reuse Australia, from the unique vantage point of trying to encourage the resale of clothing across Australia's substantial charity store sector. Like the repairers we interviewed, he emphasised that low quality garments were not worth repairing, due to their low asking price. As he also made clear, many were also hard to resell, since these could not cope with a second round of use. Only one of the many larger stores in his group (in Perth) offered repair services, which were run through a local disability group subsidized by a government scheme.

Concerns with the lack of durability and repairability of much of the clothing they were presented with was a concern amongst all the garment repairers we interviewed. The seamstress Adriene, for example, was very concerned about the increasing lack of durability in clothes, and would like to see changes to their design. She noted that most new garments are very poorly made, and that garment manufacturers need to make better garments and not cut so many corners: 'It's all made to be worn once and thrown away, now fabrics are awful too.' The Marion dressmakers interviewed supported her, emphasising that this is especially true with 'lightweight fabrics, nylons, chiffon.'

Concerns with the lack of durability and repairability of much of the clothing they were presented with was a concern amongst all the garment repairers we interviewed.

A dressmaker who works in a garment repair and alterations store in Mile End said she had noticed changes in durability with the coming of fast fashion, especially in denim. She said older jeans stood the test of time, but newer ones had so much stretch in them, with blends including elastane and lycra. This changed the look, feel and wearability of the product. 'Basically, you can wear them for a short amount of time and then you must bin them, as they lose all their shape. A customer just brought in a pair of jeans where the crotch needed repairing because there is a hole, but you can see through the leg it's so obvious the shape has changed… It never used to be like that, they were just cotton. They didn't have blends and they were so strong. But of course, the industry do not want things to be like that because they want you to buy things constantly and turn (them) over.' This was echoed by two dressmakers in Marion, who said they had noticed jeans becoming weaker over the years.

Knowing that their products cannot be repaired, many manufacturers now fail to provide even basic care instructions: They 'regularly do not put care instructions (on labels) so people are ruining their clothes when they wash them, and people will come to us to repair them, but often it is too late.'  There are even issues with manufacturers not pre-shrinking materials. As a Marion-based repairer noted, 'Some manufacturers won't pre-shrink their clothes… so this is an issue for us. People will come in with clothes with tags still on and we need to recommend washing it first because it might affect the repair, and the clothes won't fit them. They have come back before many times and sometimes even wanting the repair for free'. One repairer mentioned the way tags are now attached can also lead to problems. 'People have tried to remove tags and that has torn holes in the garment, so we are forever repairing where the tags are attached.'

In fast fashion, sizing has also become a problem, with manufacturers producing very long legs in jeans and trousers to avoid having to produce size variations. As a repairer in Mile End put it, 'they are catering for really tall people and the customers have commented 'has something changed? Like sizing standards?' as before they could have gotten by without hemming.'

Fouad Keddeh, who's been a tailor for more than 50 years, echoed their complaints. He has had his own businesses in tailoring since arriving in Adelaide from Lebanon 20 years ago. The biggest barrier to repair he can see is that the cost of repair now heavily outweighs the cost of purchasing new, due to the rise of fast fashion and online shopping. 'Everything is cheap now online and this is trouble for this business… People look for cheap now, as every day new design.'

He would also like to see more natural fibres used in garments. 'A lot of materials is cheap and plastic, not hard to repair but not as strong- the plastic more damage with iron it's weak. Everything you do on the machine you need to iron and plastic makes trouble for the sewing machine and iron.' This was a point also emphasised by Omer Soker, who noted that very few charity shops could afford to repair the clothes that came to them, because of the type of materials used, and the low price paid for them.

*Figure 9. Fouad Keddeh at Tailor Alterations*

*Electronic Products:* Poor materials and faulty parts were also commonly encountered in electronic repairs. A mobile phone repairer in Arndale stated that they have had issues with their local supplier giving them faulty parts, which meant the repair might take three days longer. 'Customers will be unhappy as they have already waited a couple of days in some instances.'

Some companies make more money from their replacement parts, and so they make things a little more difficult when phones are repaired with aftermarket parts. All the repairers interviewed offer both aftermarket or original parts from a supplier for Apple products, but any phones that are repaired with aftermarket parts, at least after the iPhone 11, will have a service message saying 'not a genuine apple part' when they turn their phone on and off, and some customers become concerned.

John Chen from PTC Burnside Village stated that they have a customer policy to tell people that the aftermarket parts are not original, and will result in a message on their iPhones. However, if a customer is concerned, they will recommend purchasing an original Apple part, which is more expensive.

Some of these repairers stated that Samsung make it easier for them to repair their products, and all stores use genuine Samsung parts. One repairer mentioned that Google phones are more difficult to repair, while another explained that the OPPO, NOKIA and Motorola frames and screens are harder to repair than Samsung and iPhone, which he said were of better quality and easier to repair. All repairers interviewed appeared to deal more with suppliers and not directly with manufacturers.

Peter Bunn from Goldline Appliances thought that a lack of durability was the reason there was such a high rate of appliance repair jobs, with cheaper washing machines and dishwashers just not lasting. Another independent repairer in IT revealed that in one job he had, there was a faulty machine and a certain part would break all the time. They would send him out to replace the same faulty part. 'The manufacturing process is so long that someone has worked out that it is cheaper to replace the part multiple times rather than to change the manufacturing process and produce a better part.'

Repair café volunteers also emphasised design issues in products they were asked to fix, especially in those with electronic components. To diagnose the repair, they need to gain access and disassemble items that are often not designed to be pulled apart. They also encountered other strategies to limit repair, such as different types of screws requiring unusual screw drivers, as well as some screws placed in inaccessible locations, so that drivers had to be specialized to access them.

Susan Lloyd from the Campbelltown repair café said that this forced them to purchase special tool sets and extensions. Like the other repairers interviewed, she would like to see all products made to be disassembled and reassembled, and with universal parts. 'There isn't a need to have 55 different heads on screws. You get the feeling that it has been done intentionally so people don't pull them apart.'

Some repairers also offered first-hand insights into what kind of products were more durable. Patrick Kelly from the Gawler Repair Café, one of the youngest electronics repair volunteers at 36 years old, explained that small electrical items are the most common things they repair. He has seen a lot of lamps because they have sentimental value to their owners. 'The little plastic bits (that) break off seem to be the number one issue and every now and then it's a cord, because it's such a simple device and it's quite standard in how they're put together. We can take parts from another lamp or just buy parts from Bunnings.'

Interestingly, he now sees no clear distinction between branded and unbranded products anymore. 'Some of the (higher value) brand name equipment I've seen has been a pain in the butt to repair. I've had a cheap little radio brought in and thought it would be a mess but it actually unscrewed quite nicely and it was well laid out. I think (it's) because they've made it cheaply and (kept it) quite simple. They haven't overcomplicated it. (but) Stuff like Dyson, which gets really celebrated with (their) design, we had one that had the power switch gone, we just physically couldn't get to the switch because of all the shaped plastic, I think (because) of the way it was glued and had things clipped into it.' However, other products from other brands, like Sony 'is really nice to work on. They've actually put little arrows on the outside where the screws are you need to do [disassemble].'

Short-lived parts are another big problem for the repair café volunteers. Bron McNab said 'Toasters are really difficult because they're built so cheaply, that once you pull them apart … the manufacturers have designed it in a way that you can't actually repair it, with plastic parts inside and that you can't get to.'

> 'Some of the (higher value) brand name equipment I've seen has been a pain in the butt to repair. I've had a cheap little radio brought in and thought it would be a mess but it actually unscrewed quite nicely and it was well laid out. I think (it's) because they've made it cheaply and (kept it) quite simple. They haven't overcomplicated it.
>
> *Patrick Kelly*

*Bicycles:* Michael Brisco from Bikes for Refugees explained the relative repairability of the different types of bikes that repairers are now confronted with: Firstly, there are supermarket bikes, mentioned above. 'Generally, they are made to be assembled and not repaired… Flat tyres we can do, but adjustments, taking things to bits, changing cables and things like that, you cannot do because they are not made to be taken to bits and reassembled… The parts are made with thin pressed steel which bends, rather than double walled wheel rims which means you can ride downstairs with them, and they are okay.' These bikes have 'low-quality metals that rust out quickly. We used to joke that the metal will rust before the paint work gets scratched.'

Secondly, there are shop bikes, from stores like 99 bikes, Super Elliot, Bicycle Express, and others. These are designed to be more robust with better quality components. They can be taken apart, and can be serviced and repaired. These are more durable and last longer, and people bring them in and they can often fix them, or adjust them, lubricate gear controls, change cables, etc.

Thirdly, there are the high end bikes, which have been designed to be 'technically quite difficult to repair. We don't have the skills to do that, that's another limit.' People will bring them in, but if it's made from carbon fibre they say no and to take it to the service shops', such as Biomechanics (below).

Fourthly, Brisco explained, there are E-bikes, which require a lot more expertise, but they can usually look at the machines and see what's wrong with them. If it's a battery - they can charge it up. If it's more than that, they can spend many hours trying to find out what is wrong with it, but 'there's a real problem trying to get spare parts' for these. He said that for most general-purpose bikes costing up to $2000 you can get any part you need online from Melbourne. But if the bike costs more than $2000, it is likely they will need specialist parts that are only available through the manufacturer, like other high-end bikes.

Peter Hague from Biomechanics, is a highly skilled repairer working in a specialist bike repair and sales store. He emphasised that the difficulties repairing most bikes have been greatly compounded by manufacturers producing 'literally hundreds, if not thousands, of different components'. This was also emphasised by Alfie Lem and Reb Rowe from the Adelaide Bike Kitchen (ABK). Peter Hague's workshop at Bio-Mechanics is one of the few in Adelaide able to modify or make custom parts to increase the longevity and efficiency of existing components. However, he said that for most businesses this doesn't make economic sense.

There is a constant push from manufacturers to create new standards of components, simply to have something to sell. 'You end up with bikes which have proprietary parts and components; once they wear out, you can only replace them with very specific parts from that manufacturer. In some cases, you end up having to get rid of an entire frame because the manufacturer has stopped making a particular part. It's completely unnecessary, frustrating, and wasteful.'

> There is a constant push from manufacturers to create new standards of components, simply to have something to sell.

For example, Peugeot make bicycles with slightly different size tubing. As Alfie Lem and Reb Rowe put it, 'If you were looking for a seat post for your Peugeot bike, you'd be crossing your fingers and hoping that someone else had a

Peugeot and has their seat post here.' The point they all made was that standardized parts would ensure the repairability and longevity of most bikes, but like the manufacturers of other products, the big manufacturers are intent on encouraging riders to upgrade and not repair when anything goes wrong.

As Paul Huxtable pointed out on this issue, the problem is not so much that a product is 'cheap and nasty' (he objected to the two words being seen as equivalent), but poorly designed, often with the wrong materials or parts selected, sometimes deliberately, as in the cases described above. But sometimes this occurs unintentionally, through poor design decisions. In a range of cases he referred to, from oyster baskets to domestic fans, poor design and material choice resulted in products breaking prematurely. In his oyster basket case, he designed a new plastic basket to replace another that had broken after only a year in the water. He explained that the farm was about 700km from the nearest plastics recycler. Huxtable said that he and his partner now export the oyster basket he designed around the world. These have lasted 17 years to date at the same site.

### The Economic Context

It became apparent in our interviews that behind the problem of planned obsolescence, and so many manufacturers now designing things to break, and to be difficult or impossible to repair, lay a larger and very challenging global economic context. While many of the repairers interviewed spoke of trying to educate people on the advantages of purchasing durable and repairable, quality products, the low price of so many goods have encouraged more people to buy cheap, and then discard and buy again when these products fail. This undermines the business of repair.

Both upholstery and furniture repairers interviewed explained that cheap imported furniture was a barrier to people using their services. One upholsterer said, 'There are so many furniture stores that sell cheaply manufactured imported furniture. A lot of the time the feedback we receive after providing a quote to restore a lounge suite or make new cushions is that customers can buy cheaper new rather than restoring their existing furniture.' And large furniture chains offer interest free or buy now pay later options, which again discourages people choosing repair over replacement. Rebecca Trimmer, from Upholstered, said that the biggest barrier to her business was low cost imported furniture. For when a repair is needed it ends up costing more to fix than to buy new, since Australian labour costs are not comparable to those involved in the making of the imported furniture.

Repairers are also noticing changes in customer behaviour due to cost-of-living increases. Claire Wei, store manager at Dr Mobile Modbury said that before COVID customers had more money to spend. She has noticed that as the cost of living increased, people had less money to spend, and less than half of the customers she provided quotes to are now getting their devices repaired. Sukhvir Kaur Brar, a shoe repairer from Shoe Express, confirmed this trend, noticing that over the last 4 years there was less demand for repairing shoes, and repair itself was getting more costly. Peter Bunn from Goldline Appliances echoed these observations. He said he has seen less customers being able to afford higher-end appliance repairs. 'Nowadays people don't have the money to spend on the top end, so you've got to diversify a bit; it's all about price.'

Fouad Keddeh felt that the cost of material had become too expensive, and this limited the repairs he could undertake, especially for designer clothes. He also emphasised that the issue of the high cost of materials was a problem when making new clothes: 'Not many people like new clothes to be made like (they did) in the past, because it's expensive - in materials… Now you can buy anything online… Before you looked for a tailor to fix a top, a skirt, a shirt … I remember my father's shop- so busy. Working 12 hours a day'.

The mobile phone repairers we interviewed, similarly, found customers now prefer to purchase new and not fix their devices, even if the repair might cost between $100 and $200. Similarly, they found that when the price of the repair seemed high, they had to recommend that it wasn't worth it, despite not having new or refurbished phones to sell. The cost of device repair also differs significantly between each brand. People were more likely to spend money to repair more expensive devices such as iPhones, rather than a Samsung. Because of this they were more likely to replace a Samsung with a new one rather than repair it.

These repairers were also finding less people willing to repair their iPad, since replacing the screen had become so expensive. The price to repair a screen in later models of the iPhone has become a barrier for many who come to see them.

> 🔸🔸 Paradoxically, voluntary repair services have benefited to some extent from the cost-of-living crisis, and from the rising costs of repairing things, and not only for low-cost items but for those things of some sentimental value to their owners.

For example, replacing the screen on the iPhone 14 can cost $700 because it is very thin and has LCD display technology. Phone repairers are also finding that people will continue to use their phones when the screen is broken, if it is still functional, until it is no longer so, at which point they will repair or replace it.

Steven Brown, the horologist, confirmed that this is an issue affecting many kinds of repair: 'It can get expensive, but in the last 20 years my stuff has probably only doubled (in price), where you know a lot of things have tripled (over) the last five years, as you know with the general cost of living … so yeah, it's quite expensive.' Antiques and heirlooms have not escaped this trend. 'Only people that have really got the money and who are interested in getting their clocks and watches fixed do it' now. 'I do work for a lot of Italian families who have quite expensive clocks and … they treasure those clocks and they're antiques… They're generally handed down from family to family…'

Paradoxically, voluntary repair services have benefited to some extent from the cost-of-living crisis, and from the rising costs of repairing things, and not only for low-cost items but for those things of some sentimental value to their owners. 'People are happy to have things repaired rather than buy new when money is so tight.' As Sue Croser put it, 'Families need to be able to manage. We don't set a charge on our time or anything; if they are happy to put in a donation, if I need more supplies, that come out of the donation.' While the cost-of-living crisis has affected most repair negatively, it has driven some towards finding cheap or free repair services to avoid buying new.

However, under these circumstances, time and the availability of repairers becomes a problem for repair cafés. They lack the resources, the volunteer repairers, and the time to do what many of their visitors expect. Generally, if there is a line, some people won't wait, while others are happy to have some food or a drink, or browse other areas, such as neighbouring markets.

Sue Croser emphasised that the time allocated to the repair café is a limiting factor. For the volunteers need to pack up and be out of their building by 2pm, as they run their café in conjunction with a nearby market. This also occurs in the repair café in Clare, which is conducted in a room in the town hall adjacent to the market. Sue Croser says she would give more time to repairing, if there was more time for it.

The cost of repair, of parts and labour, most repairers considered, make people reluctant to pay for repair, or to wait for repairs, since parts must be sourced before the product can be repaired. Many products seem too cheap to repair at a business, since they have to charge for repairs, and so those wanting repair need to go to volunteer or subsidized repair services, such as repair cafés.

Repair as an option has become more expensive, and finding parts requires more time and effort. This is especially apparent in repair cafés, where people will have to order or purchase parts elsewhere, and then return to the café for the repair. In some instances, using repair cafés, volunteer bike repairers or DIY repair, people might find themselves searching for long periods for a second-hand part. This again is an issue Peter Hague noted: there are just too many proprietary parts on many bikes today, as in many other products.

Often parts for a newer product cannot be accessed by independent repairers at all. This is true not only for repair cafés but also community bike workshops. For example, the Adelaide Bike Kitchen is a community workshop that relies on donations of bikes for spare parts. They are finding that as bikes are becoming more technical and advanced, there's a lag before they can find parts for them.

'In the last five years, we've been seeing carbon bikes, and quite nice road bikes donated to us.' However, a barrier they are encountering is the difficulty of getting parts for these newer bikes, unless the part is something common such as handle bars. This issue is also apparent for new devices such as mobile phones and tablets, where if a new screen breaks, repairers are less likely to have a part available since it is 'too new'.

Added to these problems, volunteer repair organisations generally don't have much space for storage or to hold spare parts, and this is quite limiting. This is especially true for repair cafés, which may use donated space only for a few hours every week or so. 'We don't have much space, it's usually up to the individual. We have a couple of toolboxes that have some common tools, and usually the electrician guy brings a whole bunch of electrical stuff, I've got my little kit, it's got a bit of automotive stuff that I can use for small scale bits.'

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Some visitors to repair cafés won't go ahead with a repair if they need a spare part they have to source themselves, and so will just put the item into e-waste. As Patrick Kelly put it, 'If they, for example, need a spare part and they can't afford it or something, they'll just go 'Oh, yeah, I'll do that.' Then they'll walk away. But often, they will put it in Bunnings's e-waste (bin). It's usually where we recommend people take anything'.

Repair cafés not only have a problem with storage for parts and tools, but also lack any dedicated waste service or bins, since their premises are often borrowed from other organisations, operating like the Clare café only for a few hours on market days. This creates problems for the individual volunteers, who often have to bring their own tools with them, and take any parts they can access home to store them.

🥕🥕 Repair cafés not only have a problem with storage for parts and tools, but also lack any dedicated waste service or bins, since their premises are often borrowed from other organisations...

As Patrick Kelly explained, 'We are in an elder centre, a hall with kitchen facilities, we come and set up, pack up and leave. So, we don't have any fixed facilities to store the equipment. I think if you had a fixed facility, it could be handy, because I thought about whether like the Mens Sheds and the maker spaces, whether if one was attached to that where it has some space, some more larger scale tooling (could be done). Because often if we can't fix something, people will say do you want it as spare parts, and if I can use it as spare parts, I can take it home and put it in my shed and bring it next time. And (my shed) it's already at a limit.'

### Trades, skills and training

It became clear in our interviews that there has been a precipitous decline in the number and skills of repairers in many domains, with very few younger people among those we interviewed. Training in most areas of repair is not, or no longer, being provided within South Australia, and apprenticeships in repair, outside the larger automotive trades, are no longer being subsidised by government or trained locally. This means there is a lack of opportunities in repair, and this was spelt out by many of the independent repairers themselves, and by volunteers in the repair cafés. These too were concerned that many of the volunteer repairers they knew are older and retired, and there are very few younger people with repair skills offering to help them.

This may be in part a cultural issue, since with very few exceptions young people now do not experience a repair culture at home or in their community, as was the case perhaps amongst their grandparents. Closely related to this, is the challenge of rising costs faced by small businesses offering repair services. Many business owners emphasised that there were now no incentives to train or employ people in their businesses, even if they could find someone they could really use. And if this training was informal, as it might be in a repair café, it would take time, and this, they all emphasised, is now in short supply.

Steven Brown, who was trained in a 7 year apprenticeship with WOSTEP in Switzerland, and has been working in horology for over 50 years, explained: 'It's a dying trade and we don't really have any incentives to have apprenticeships these days. We are not government subsidised like a lot of trades are. If it was, it would

certainly make things a bit easier, that's for sure.' In most domains of repair, business owners echoed the same sentiment, emphasising the time it takes to train someone, especially when they are already low staffed and time poor.

Many of those who have taken on apprentices, and have tried training them, have failed for different reasons. Peter Wickes from Federation Trading has been repairing and restoring old cast iron fireplaces, doors and windows for over 40 years. He says he has taken on apprentices in the past but they just do general work, 'they all like to go on the computer now.' To train someone also required paying another wage he cannot afford, and spending the time otherwise used to run his business. 'We run a pretty tight ship'. But even with subsidies it may not be enough for businesses like his. For when he is training, he must still run his business. 'I've got messages coming through now. There will be emails arriving, I have got customers in the shop. My day is full on. So, to then train someone, well that is not easy. It's the time.'

Peter Bunn from Goldline Appliances emphasised there were a multitude of extra things to pay out if one employed apprentices, including the need for extra vehicles, phones and insurance, as well as the time it takes to train them when his business is already short-staffed. For watch repairs, Steven Brown explained, 'They've got to be in the workshop with another watch or clock maker who trains them, but there's so many of us that don't do this anymore.' He said around 40 years ago the government used to subsidise apprenticeships in his trade, but not anymore. To help now, 'The government would need to subsidise at least three quarters of the apprenticeships' wages throughout that time.'

An independent business owner from Modbury explained that they would love to become a horologist, as now they only undertake minor watch repairs at their key cutting and watch repair business. But the biggest barrier for them was that they would have to go to Sydney to train, which is impossible, since they find it difficult to even afford the rent in their current location.

It's also rare to find qualified jewellers in many jewellery shops. As Steven Brown put it, 'In England it's totally different, you can go to just about any jewellery shop throughout England and they'll have a watchmaker on the premises, and a jeweller on the premises, and that's the way it used to be in Australia and New Zealand 30-40 years ago.' This lack of support for apprenticeships and training in repair was an almost universal complaint: in most areas there were few younger repairers coming up, and finding places to train locally were either impossible or very difficult.

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Figure 10.  Restored Second-Hand leadlighting, fireplaces and doors at Federation Trading

Most of the experienced business owners interviewed were close to, or past retirement age, with many having run their own businesses for over 30 years. Many also did not take holidays or did so rarely, not because they didn't want to, but because if they were not around the jobs brought in would not get done. As they all emphasised, it's not their knowledge of one thing that is important, but of many different things in a business they might have built up over many years. Peter Wickes, for example, is 78 this year. 'I'm the man who's done it all and built it all. So… how long do I last? Maybe there's a few young people who would take it on. But I don't see it as a saleable business. I feel like it will just all get sold.'

Some of the independent repairers we met also had a language barrier, and would have found it difficult to pass on their skills even if they wanted to. They might have a spouse or someone assisting with customers who could help them with this. But they often mentioned that there are few willing to train, and many young people, including their own children, were not interested in their trades, because it would take time to train. Their skills, they added, were often undervalued.

Peter Wickes spoke of his leadlight repairer who is 94 years old, and who hasn't passed on his knowledge. He has been looking to retire and sell his business, but says that young people are not interested in it, and that trades like that, and the skills required to fix leadlight, are disappearing.

Many also stated that the young they know, even in their own families, are more interested in being on the computer, or in IT. Greg Anastasi said they could see this even in his field. 'My manager - in interviewing people - is finding more and more young people thinking of the repair of equipment as not a very good job — as a low-grade job,' whereas it's quite the opposite. 'To do my job you have to be a real generalist - one moment I'm dealing with network security and certificates and hashed algorithms etc. the next minute I have safety goggles on, and long sleeves and a hard hat, and I am using an impact drill to drill things into the ground. So, you've got to be all sorts,' he explained.

Many of the garment repairers emphasised the importance of learning young. Fouad Keddeh recalled learning from the age of twelve in his father's shops in Syria and Lebanon. At that time, children were not allowed to start tailoring until they had ironed for 3 years. He would be in his father's shop ironing and would learn from the people around him, and this became the foundation for his knowledge. But he doesn't think children want to learn these days, and also sees a lack of available training for them. 'Not many people are training to be a tailor. It's not easy to do, and you need a long time to learn.'

Some of the dressmakers interviewed spoke of even older skills they weren't taught in their training, but were now requested to perform, such as darning woollen jumpers. 'So, we are even darning a lot of jumpers, and that is an old fashioned skill…we weren't taught that at fashion school. I learnt from my mother.' They would like to see mending and repairing clothes brought back into schools.

Surprisingly, another area where we found a low rate of in-depth training is in mobile phone and tablet repair. All mobile store employees interviewed were trained on the job for basic mobile and tablet repairs (front and back screen, mobile battery, charging and cable port). However, when there were more complex issues, such as replacing an iPad battery or LCD screen, or dealing with motherboard issues, the devices would be sent away to their workshop technicians or head office - often in a different state, and often requiring time, up to 2 weeks, to repair. Again, there was no evident pathway for learning such skills in the state, even though they are so much in demand.

Most of the mobile repairers interviewed expressed an interest in further training, with one mobile repairer (anon) at Marion shopping centre explaining, 'there is no proper training in [mobile] repair anywhere in South Australia.' Furthermore, they were concerned about the lack of locally owned mobile repair services: 'They are all owned by China and Korea. If more locals got into repair businesses, it may get proper attention.' John Chen, a phone repairer from PTC Burnside Village said that their organisation had a good training process, and if there were any issues they could ask their repair manager and repair team, stating they were 'trained for technical skills to be at high level.' But again, they were not local, but based in Queensland.

Bike repairers across both independent and community repair sectors believed bicycle mechanic training could be very important for their industry. Peter Hague said that his job is currently considered on the same level as a trolley pusher, even though 'This job is highly skilled, and requires very specific technical knowledge, especially with the advent of electronic components and more.'

Community repair seemed even more vulnerable to these training issues. For many of the community repair volunteers interviewed are retirees, and many are not certain how long they can continue this work. Sue Croser is now 80 years old, and is worried that she may soon no longer able to provide her volunteering services. 'When I can no longer do this (hold pliers), and I'm a bit shaky now, I don't think there is anyone in the area who could take over.' She is also not aware of anywhere a younger person might learn jewellery repair, even if there are jewellers in Adelaide offering such training. So even where training exists, repairers like her may be unaware of their existence, suggesting a real need for some sort of directory of repair services, not just for people needing something repaired, but for the repairers themselves. They often don't know what others are doing.

..there was no evident pathway for learning such skills in the state, even though they are so much in demand.

The demand for services in repair cafés can also be varied. Sometimes there may be 5 or 6 people coming in, and at other times there may be a waiting line. Sue said, 'When I grew up, everything had to be repaired, re-purposed or discarded… (but now) Young people don't have the repair skills. So, to have things repaired by volunteers who can is something special.' She has had some interest from a younger volunteer wanting to learn, but they never came back. For Sue, who has been repairing since she was a child, now sees a lack of repair skills in the community. By contrast, 'I spent most of my school holidays repairing a pile of clothes.'

Michael Brisco also spoke about the changes in the community over the years, and said skills in bike repair and basic maintenance are declining. 'There was a lot of practical know-how on how to repair things in the 60s - now we all have a plug and play and throw-away mentality, and the skills of repair are being lost from the community. We will get people that can't do even a basic skill like pumping up their tyres. They can't operate a pump. That's a fundamental thing. When it comes to things like changing a tube they are completely lost.' Like many of the repairers interviewed, he would like to see repair being taught as a skill. 'The tinkering mentality is getting lost too. The curiosity. You've got to have time. It takes a lot of time.'

'The tinkering mentality is getting lost too. The curiosity. You've got to have time. It takes a lot of time.'

*Michael Brisco*

The volunteer repairers interviewed often spoke of a willingness, not only their own, but of those they volunteer with, to teach and support the upskilling of others. Patrick Kelly, has many repair skills he's willing to make use of to support the community. This comes not only from his day job in building design, and as a former repairer for the defence force and other groups, but also his past experience, including working 13 years in aviation repair.

Kelly said that there are many opportunities at repair cafés for people to sit in and learn how to repair. 'I think there is a missed opportunity for people who want to learn. I brought it up in my class last year, if anyone wanted to come along and just sit in… but I had no one take it up. I live in Gawler, and they live mostly around the city, so it could be an hour of travel for them just to get there. But I think there's opportunities for people to sit in.'

The community-run Adelaide Bike Kitchen runs a 10-week course in bicycle maintenance and repair. They said their course is run by Peter Good, a teacher who used to teach bicycle repair at Hamilton Senior college, which has since stopped. He is also at retiring age, and they say that 'there's no one at that level that's really a teacher. There's not anyone to fill his role when he does eventually go.' Both Adelaide Bike Kitchen repairers said they had taken the Bike SA training course, which was similar to the basic one their own organisation runs, whereas the 12-week mechanical course run by Peter Good was more technical, and more useful.

Bron McNab, coordinator of The Hut Community Repair Café thought that a couple of important roles their repair café provided was upskilling and educating people, as well as building community. 'We are forming that invisible thing called community, where we see people come back again. We recognise them, they recognise us. You know, there are lot of really healthy conversations that go on in our repair café.'

### Changing Consumer Attitudes

Most of the repairers interviewed said that their customers did not really understand repair. They either undervalued it, or were unaware of the skills, time and effort required. They also did not understand its environmental advantages, the kinds of ability needed to get repairs done, or the costs involved (especially parts and labour). Some, perhaps inspired by YouTube, even imagined it was 'easy' to repair something, and this attitude was found across garments, shoes, bikes, and mobile phones.

In garment repair, many repairers complained that online shopping and fast fashion had affected people's attitudes and behaviours. Fast fashion is 'difficult for this business because there is so much fast fashion, and they are made in other countries, so people don't realise why it takes us so long and costs what it does.' They are impatient, partly because they don't recognise how 'time consuming' repair can be. They also live with continuous, and multiple, demands on their time, and can't value something that seems to take so long, when they can so easily order a replacement online.

In garment repairs, some imagined that repairing something was just 'easy' and 'an old lady skill'. Both dressmakers at Marion were asked by some people if there was 'anyone older with more experience' in the shop. They found this offensive, since they are have years of professional experience. 'We have degrees and specialise in different things such as bridal.' Generally, they found that people are willing to pay more for a bridal repair, to repair their favourite piece, or a piece they can no longer buy.

Fast fashion is 'difficult for this business because there is so much fast fashion, and they are made in other countries, so people don't realise why it takes us so long and costs what it does.'

The Mile End dressmaker interviewed thought 'Educating people would be nice. We quite often get customers come in and say, 'oh I have got a job, it's a simple job,' and you think, 'ok, it's not that simple, or otherwise they can do it themselves'. They lack the skills and just don't want to pay for the service,' and don't recognise the skills involved: 'I feel like it is undervalued, and the skill is dying out.'

The Marion garment repairers said that people often 'don't understand that it is a real trade. It would be nice if it was treated more as a trade. Other trades get valued and paid for what they do and their time - electricians, plumbers. We don't see the same respect as other trades.' They were also concerned by the sexism evident in the industry. One worked in costume design and theatre, and was getting less for the same work that men do. 'If there are 50 women and one man going for the job, the male will get it and they will be paid more.'

The Mile End garment repairer believed people needed to learn some sewing as a life skill. 'I mean we have people who can't even sew a button on, and they would rather bin something rather than pay $8 to have a button sewn on. But they are not even appreciating that - although it seems like a simple task, it is the time you spend with the customer, taking the job, filing it out the back, getting the thread, sewing it on, texting them back. They don't really understand the process to running the business side of things. All they are thinking about is having the repair done,' and quickly.

Many phone repairers also wanted their customers to be more aware of the time and skills involved. One mobile phone repairer in Marion thought it important for them to understand the industry. 'Online repair and YouTube mislead customers, and people think that it is easy when it is difficult.' They have even found that some will try to repair a device themselves, and when they strike problems they come back to them. Some will also compare quotes with other stores, and are less likely to wait for repairs or parts. If parts are not available, they will go and check with

another store to see if they have them. 'If we do not have stock and need to order it the customer moves on.'

Many can't live or work now without their phone, and so will try to minimise the time involved, or opt for the new. After getting quotes, they will realise it is cheaper to purchase new, and this is especially true with furniture repairs and mobile phones. Some stores exploit this as well, discouraging their customers from getting their 'old' products repaired, and offering discounts or credit to persuade them to buy new.

Other repairers noted that many simply did not value what was old, or the skills involved in maintaining or fixing it, no matter how rare this item might be. Many considered this a generational problem. For example, one of Steven Brown's customers complained about the tick of an old clock, 'I just don't want that noisy bloody thing. I'll smash it'. 'They don't see the value of things like the people from my era do… To a lot of people, to them it's just noise… that's the problem'.

In community repair, repairers were generally more impressed by the appreciation of their customers after a valued item has been repaired. Sue Croser said 'If I repair something for someone, the look on their face when that treasured item is fixed is worth it for me. It's just a bit of my time. But they are delighted, as I say it's the sentiment that goes with it.' Helen Hennessy, a textile repairer at the Gawler repair café said, 'Given the reactions we get - some people are stunned that it is for free. Most people make a donation. I think there are people that genuinely need a hand to get things repaired.' Some people also come to the repair café because they don't want to throw things out, and look for a second opinion on whether or not an item can be saved.

Some customers at repair cafés, however, do not want to wait, and imagine it is a drop off service. Bron McNab of The Hut Repair Café said, 'Some people come for not quite the right reasons, and they might want to just dump their item and go off and do what they have to do and come back and get it, and are not very happy when we say, no you have to stay with your item. So sometimes they won't do that, sometimes they will go off and not bother.' As someone from the Adelaide Bike Kitchen added, 'I think people prefer being able to see it (the repair) in person and ask someone with knowledge rather than buying (another) on Gumtree. … you don't know what you're going to get. Especially if you don't know about bikes, it seems a little bit safer coming in and asking questions, and getting to see it, with like no obligation of purchase.'

One problem was people's ignorance of how to maintain what they have. Susan Lloyd said they have had people bringing in dirty clothes, full vacuum cleaners and toasters with crumbs in the trays. One visitor they had didn't even realise that there was a crumb tray! They have a policy where they ask for things to be cleaned. So if people bring in vacuum cleaners, they will ask them to clean out their vacuum, or toaster trays, at least in the bins outside.

People's expectations around time were also a challenge for voluntary repair organisations. Michael Brisco from Bikes for Refugees said some people would bring in a wreck and expect them to turn it into a working bike quickly. Others, he found,

In community repair, repairers were generally more impressed by the appreciation of their customers after a valued item has been repaired.

seemed to expect the same standards of service and warranty that they would get if they paid full commercial rates in a bike shop, even though Bikes for Refugees is a small non-profit community organisation. He even had some come back to complain to get work redone.

'When you get volunteers they are not always respected as volunteers - there's a small portion (of customers) who don't treat them with the courtesy that volunteers should be treated. That's a problem. Some people have a sense of entitlement, in the same way they go into K-Mart and want their money back.' He said they even had one volunteer who was assaulted by someone.

Nevertheless, most of their visitors to these voluntary organisations had a more positive attitude. Margaret Crohn, a textile repairer at the Gawler repair café, explained that most people appreciated that they could get their things fixed for free, have helpful, non-judgemental obligation-free advice. They enjoyed the friendly atmosphere where they could chat and make connections. Others might just be curious to see what a repair café is. She also said that over the years, they have become better organised with better advertising, and a wider variety of repairers. They no longer so reliant on repeat customers. 'Initially, I think we appealed mainly to those already involved in the environment centre etc. Now, more mainstream people seem to have heard about the repair café and are coming.'

Rosemary Cadden, Coordinator of the Payneham and Unley repair café, said that some other benefits of the repair café, apart from saving money, getting items repaired, and avoiding waste, were getting people interested in how things are repaired, and how to look after their things themselves. And there are also people who bring in something to the café that's quite precious to them, that they couldn't get fixed anywhere else.

The experts interviewed concurred with these views. In addition, several noted that it is not in the interests of many stores to encourage people to get their broken items repaired. John Gertsakis said that 'Producers, brands and retailers' tend to oppose 'the use of repair services' and this is made worse by 'government's poor understanding of the value that repair has in relation to waste prevention, circularity and consumer empowerment'. This in turn can influence consumer attitudes and behaviour. For when something breaks, they imagine they need to replace it, not repair it, and this is embodied in current regulation around faulty goods.

'When you get volunteers they are not always respected as volunteers - there's a small portion (of customers) who don't treat them with the courtesy that volunteers should be treated. That's a problem.

*Michael Brisco*

## Enablers of Repair

In every interview, repairers, volunteers and experts offered a number of more positive views they wanted to share, including solutions they had considered in response to particular problems they had identified. They all seemed to have products they highly valued, because of their durability and repairability. They referenced these as exemplary products which they routinely contrasted with the more problematic ones they either could not repair, or seemed to have been 'designed to fail'.

The repairers in particular emphasised the importance of a timely provision of spare parts, and the importance of storage for these parts, and a waste service they could use to recycle or safely dispose of broken parts they were replacing.

All of our interviewees spoke of the importance of education and training in the enabling repair, and of upskilling, training and peer learning. Most felt that basic repair skills should be taught in schools and TAFE. For instance, those working with mobile phones all said that it should not be possible to do an IT course without knowing something of repair, and learning basic repair skills.

> The repairers in particular emphasised the importance of a timely provision of spare parts, and the importance of storage for these parts, and a waste service they could use to recycle or safely dispose of broken parts they were replacing.

Most of our interviewees emphasised how important making repair more visible to the community was, and tried to suggest different ways repair businesses and volunteer organisations might promote themselves more effectively. This might involve using local newsletters to advertise their services, offering discounts or additional services. Visibility was of concern to the repairers and experts alike, who felt that many in the community were simply unaware of the repair services available.

Finally, our interviewees all spoke of repair's importance to the community, and its social, financial and environmental value, and how this is often not understood by those who come to them. Many repairers, for example, tried to advise their customers on what was a more repairable product, and what was less so. Most liked the idea of rating products for their repairability and durability, and also for providing people with subsidies to encourage them to access their services. Most of the voluntary community organisations were also committed to helping those in the community who were in real need.

The repairers we spoke to often drew attention to the stark differences in repairability between products, and their degree (or not) of obsolescence and durability. In these conversations, many returned to the more durable objects they were familiar with, and that had stood out for them. Some products, such as old clocks, cast iron fireplaces, guitars, higher-end computers, appliances and bikes, and specialist machines such as medical imaging machines, were remarkably durable, and often also designed to be repairable. These were reminders to them that more things could be 'built to last' and not just 'to break' (Slade 2006).



*Figure 11. Antique rat trap at Federation Trading*

The strength and durability of things made a long time ago were especially apparent in places like second-hand stores such as Federation Trading, and also in some repair cafés. Peter Wickes, for instance, showed off many examples of antique items in Federation Trading, which were still working or capable of being used. He referred to tiles he had on display from the 1880s-1890s, now 140 years old, and an old metal rat trap (Figure 11). 'Look at that, that's 150 years old and will last another 150 years. They were all well-made back then.'

He is especially concerned with cheap imports such as IKEA's furniture: 'We are not talking IKEA here - that's out with the hard rubbish in about 2 years… It's not worth buying. You know now at auctions, you can buy quality original furniture really cheap, the same price as IKEA furniture that is a piece of cardboard. It looks good but it is not strong, just mass produced.'

Patrick Kelly, from the Gawler café, said old mixers, particularly Kenwood mixers, were made to last and to be repairable. Some he saw were about 50 years old, and he found a number of older women bringing them in, because they were showing small signs of wear. He said most of the time these were repairable, and the only time he could not repair them was when he could not find the parts. Luckily, some of his customers have given him the mixers he could not repair for spare parts.

'I find them quite easy to work on, quite sturdy, and strongly built… the thing is cast metal, it's quite heavy, quite sturdy, like if you dropped it, you'd probably hurt your floor, not your mixer, quite hard. Like they have little lock-in bits where you click on the attachments and they're all in good condition after decades of use. I've got like a cheap blender at home, and it's started to just wear out. So, what they've chosen, the material selection has fallen away in some areas'.

Some manufacturers design their products for repairability, and this was noted especially by the repair café volunteers. This was not dependent on the original price of the item or on the brand, but on the design. This design for repairability was discussed by Paul Huxtable, himself an industrial designer with many years of experience, who emphasised that 'cheap and nasty' does not necessarily go together. He referred to the example of a simple desk fan from KMart which was well designed, and easy to repair, while another pedestal fan, from the same brand and shop, had many problems because of its poor design and poor choice of materials.

Patrick Kelly agreed with this, adding that other more expensive products might be designed in such a way as to be very difficult to repair. While he liked the way Sony products were laid out to be relatively easy to repair, he noted that Dyson vacuum cleaners, because of their patented design, could be very difficult to repair.

### The provision of parts

The provision of parts, including second-hand parts from discarded or donated and dismantled items, were widely seen to be effective enablers of repair. Two key examples of this in Adelaide were found in the Adelaide Bike Kitchen and Federation Trading. The Adelaide Bike Kitchen collects second-hand spare parts for bikes, as it has been running for 11 years, largely through word of mouth. They store a multitude of parts from donated bikes that couldn't be repaired, and so were dismantled by volunteers for parts. When people come in looking for a part, in most cases they can find one that fits and works. However, other volunteer repair groups are not so lucky, since they lack storage facilities, a critical issue for repairers, but especially volunteer groups.

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Federation Trading is a good example of a long running local business that stocks a multitude of second-hand spare parts for customers, including light fittings, doors and door handles, windows, lighting, spare rods and cast-iron fireplace inserts and other parts, as well as many timber and marble fireplaces. They have been in the central CBD for 30 years, and their business has grown by word-of-mouth. As well as selling large number of doors, windows and fireplaces, they offer restoration repair and the polishing services for furniture, timber fireplaces and other pieces.



*Figure 12 Coal scuttle at Federation Trading*

When customers come in with a damaged item they are often able to find a spare part, and so they will try to fix it for them. If the customer no longer wants this item, they will polish it up, restore it and sell it.

'We just look at every job individually, we just clean it up, oil it up.' For example, they had a 150 year old coal scuttle for a fireplace from a Victorian house (Figure 12) that just needed a bit of polishing. However, the downside of this massive storage of spare parts is their rent which, like many of the other repairers we spoke to, they have become increasingly concerned about.

### The storage of parts

Facilities for storage are an important enabler for all kinds of repair. In repair cafés this is especially pressing, since many volunteers now have to bring in parts for each session, and take them home afterwards. Having storage also allows people to leave parts and items that can not be repaired, since these can then be used for spare parts on another job.

At present, few repair cafés can offer this service. They have to request visitors to take away their items whether they have been repaired or not. This was true for most of the repair cafés we visited. One exception was the Gawler repair café, which is adjacent to the local environmental centre. This centre allowed them to store some of their equipment and parts. Helen Hennessey said that the combination of the environmental centre holding spare parts, and her having her own equipment, works well. For she is more comfortable using her own things since she knows exactly what she has on hand. She takes along a basket full of things - including woollen scraps, needles, threads and scissors. But repairers with heavier parts are often in a quandary, since they are often unable to carry much with them.

Another important enabler of repair connected to storage is on-site waste disposal: things that cannot be repaired, and scrap items, must be disposed of. But without any onsite waste system, volunteers must also take these with them. And without storage, all parts and things to be repaired must be taken home by the repairer or the owner of the product. Broken things whose parts may be useful to the repairer in the future cannot be stored for reuse later, except if stored in the repairer's home.

As Susan Lloyd, who volunteers at many of the Adelaide repair cafés, added, 'to get to a part in some items they might have to break it,' and so these often remain in disassembled pieces which the visitors or volunteers are left to dispose of. This lack of waste disposal is a problem for repair cafés and other volunteer groups, as most do not have waste disposal or recycling on site. This can become a major inconvenience. Some repair volunteers mentioned they have a convenient electronic waste disposal nearby, such as the one at the 'Nineteen on Green' Community Centre at Bowden, and this has an electronic and a 'hard to recycle' station. This becomes a special problem for those repairing electronic products, since many of these include toxic chemicals and metals.

By contrast, the Adelaide Bike Kitchen told us that their main waste streams were metal and rubber. While they were approached by someone who wanted to start a rubber reclamation process in Adelaide, when interviewed they still had a pile of waste rubber outside the workshop. This was ready to go to the tip if the reclamation process did not occur. 'We'd love for there to be … a functional way to recycle that.' They also thought that it would be good if they could find a way of reusing their metal waste, rather than just sending this to the recyclers to be melted.

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Like storage facilities for parts, waste management issues were problems shared by almost all the repairers interviewed, including professional repairers who might have to pay more for both.

*Upskilling, training and sharing knowledge and skills*
Many of the repairers interviewed confessed to being life-long 'tinkerers', most notably Peter Wickes (Federation Trading), Peter Bunn (Goldline Appliances), Greg Olson (Battery Bar), Steven Brown (Horologist), Fouad Keddeh (tailor), Brenton Lay (shoe repairer), Greg Anastasi, Patrick Kelly, and Michael Brisco (Bikes for Refugees). These were all well placed to understand the importance of training, education and upskilling, even if they themselves had begun under very different circumstances. Some, like Fouad Keddeh, began as a child apprentice in Lebanon and Syria, a long way from where he now works.

Perhaps because of their age and the once more strictly gendered nature of their work, there were few female repairers amongst the repair business owners we encountered, except in traditionally female areas of expertise, such as dress-making and garment-repair. This lack of female participation also reflects the current lack of training and educational opportunity in most areas of repair in the state, and also the lack of available apprenticeships in repair. This lack of female participation,

outside garment repair, was also evident in the volunteer sector, where older males again dominated in most 'technical' areas of repair.

Nevertheless, the volunteers interviewed had an admirable focus on upskilling, educating and empowering the community, and sharing their knowledge and skills. As Alfie and Reb from the Adelaide Bike Kitchen put it, 'We want to be able to show them what to do, if it happens again… for a bike rider, punctures are something that happens, and so we see that there's more value in upskilling, and giving people more capacity and knowledge, rather than just fixing their bikes.'

Bron McNab thought that an important role the repair café played was in upskilling and educating people, as well as building community: 'we are forming that invisible thing called community where we see people come back again. We recognise them (and) they recognise us. You know, there are lot of really healthy conversations that go on in our repair café.'

This community building and education is not only for visitors but also includes repairers themselves. A number of these spoke of learning from their fellow repairers. For example, Helen Hennessey, a textile repairer at the Gawler repair café, said she normally works alongside a jewellery repairer and beader she has learnt from, and that she learnt darning skills from another repairer, 'it's a sharing experience.' This sharing of knowledge and skill was important across the volunteer repair sector.

The Adelaide Bike Kitchen volunteers also considered the physical space where they worked important to their visitors as a place for obtaining advice, knowledge and skills, even if these seemed basic to some of the more experienced repairers. 'It can seem like you don't know who to trust or where to go to. So I think we've got a pretty good reputation of not having any agenda other than helping people to fix their bikes, and keep riding. I think people have valued that and appreciate that. That keeps them coming back.'

All bike repairers were concerned that there are no accredited training courses for bike repair in SA anymore. The Adelaide Bike Kitchen people were passionate about educating the community, and now offer 2 types of courses at low cost, a basic bike repair course that runs for 3 hours on a weekend to give people more confidence to fix their bikes, and a 10-week mechanic's course. But these courses are not accredited, since they are in a sector largely neglected by training providers and government.

Similarly, we found other common forms of repair, from shoe and watch repairs to upholstery and even mobile phones, had nowhere to go in South Australia to gain accredited training. None of the professional repairers we spoke to were able to access any subsidies for apprentices either. It became very clear speaking to them that unless more is done to revive and spread repair skills to a younger generation, these are in danger of dying out when the present generation of repairers, many of them quite elderly, finally retire.

..sharing of knowledge and skill was important across the volunteer repair sector.

Promotion of repair services was widely seen as an important enabler of repair. Most repair cafés said that promoting their café had seen visitors increase. Promotion was usually through flyers on notice boards and notes or flyers posted into letter boxes, through social media such as Instagram and Facebook, or through community centre newsletters.

Patrick Kelly from the Gawler repair café noticed a boost in numbers, and a gain in new volunteers, after a local politician came to visit and the event was written up in a local newsletter. Liaising with the local council could also work to promote repair cafés, through the council's own website and newsletters.

Despite the belief that repair has been largely forgotten or neglected by the general population, repair cafés may be playing an important role in promoting repair and changing people's attitudes. With many repair cafés becoming better organised, they are seeing not only a wider variety of repairers volunteering, but also more repeat customers, and more public acknowledgment. Margaret Crohn said 'Initially I think we appealed mainly to those already involved in the environment centre, etc. (but) now more mainstream people seem to have heard about the repair café and are coming.'

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Offering a unique service within a business could also help promote repair services. Horologist Steven Brown explained how being a mobile repairer helped his business: 'I'm busy as I'm one of the few that actually goes and picks up the work and brings it back, repairs it and then takes it back to the customer, very few do that.' He does watch repairs at his home and clock repairs in a warehouse. Many of his clients are Italian families with antique clocks they treasure. 'They're generally handed down from family to family.'

Businesses such as Bio-mechanics offer a different kind of unique service, modifying or machining custom parts to increase the longevity and efficiency of existing components in the bikes they service. This is a unique service that few other businesses offer, apart from places like the Makerspace in Adelaide.

Some repair cafés also have a unique dedicated repair service, such as The Hut repair café in Aldgate, which is the only repair café with a dedicated shed for machinery. Coordinator Bron McNab says 'We do get a lot of woodwork - upcycling things are also common, like someone brought in an old stool that they wanted made into a table because the whole top of it was damaged.' They are also looking to get a 3D printer to use for spare parts. 'I'm talking to my local council mainly because parts are unavailable (so) that's what I'm hoping might be feasible. I've now got a few repairers who possibly have the skills to design a part that we could submit to a 3D printer, so I'm just negotiating that with a couple of my repairers.'

Offering incentives to customers can also encourage the use of a repair service. Businesses see customers return if they offer them some incentives, especially if the customers have used the service previously. For example, the mobile repair company HappyTel will offer free screen repair when customers sign up to a service plan.

One tailor interviewed, who has had a shop in Adelaide CBD for 8 months, said the hardest thing for his business was rent and visibility, as they had very few walk-ins in the arcade where he has his shop. So they worked on promoting their business using 20% discount vouchers dropped off at various businesses, and they have noticed people who have picked these up bringing them in, as well as their own repeat customers.

### Repair's many social benefits

Most of the repairers understood that repair could keep things in use for longer, and were aware of the environmental benefits of this. Many were also aware of the sentimental value people attached to their favourite things, and the more social aspects of repair. Repair could enable people to care, and this was important to many, both professional and volunteer repairers.

Sue Croser thought repair cafés were important not only because they keep resources out of landfill, but because of a social dimension, and the 'sentiment' people have for their things. 'Jewellery has more than monetary value. It has sentiment. You know where you got that from, where you bought it from, who gave it to you, and you know the history. It has sentiment. And you can't put a price on that. And when it breaks, how do you fix it? If you go to a jeweller, one lady told me she paid $30 to put a little ring on the end of a chain. I do it for a donation and the money goes to running the repair café… as I say it's the sentiment that goes with it, the sentiment of having grandmother's teapot fixed, or enough to get it to be re-used, or just have it looking like what it is (supposed to look like). (For) People who bring something to a repair café, it has meaning, otherwise they would toss it.'

'I think culture is a big part of it, whether people value brand new things, whether they value their own things. A guy brought in a clock, and it was just a cheap plastic cuckoo clock. Pretty cute. A little alarm. This is the same alarm, you can buy at Jaycar. He's like, 'is it worth it?' It's up to you if it's worth it. It's not up to me to decide its value. That's all just made up. If you really liked this, and it's yours, then fix it. It's not anyone else's perception of what the current market says a plastic cuckoo clock is worth to decide the value.'

Bron McNab felt strongly about this: 'We need in Australia to change the way that we value items that we purchase. It has to be at the societal level as well as at the manufacturing level that we aim for a circular economy, and that requires education and possibly even in schools where young people grow up knowing that we don't throw things away. We have

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*Bron McNab*

to repair things.' Many spoke of the benefits of volunteer repair, since it is never focused on economic rewards, and this seemed especially important for those who perhaps could not afford to get something professionally repaired. As Michael Brisco put it, 'Rewards for people who volunteer are (in the) satisfaction of using their knowledge, satisfaction of engaging with people, and the satisfaction of helping others.'

The social dimension of repair was especially visible in community repair services such as the Adelaide Bike Kitchen, who were aware that a lot of people came into their workshop because they just liked it as a regular social space. Rosemary Cadden found around 15-20% of attendees were prioritising their repair café because of its community role, while 50% valued the social atmosphere. 'There are the people who really like to be part of the movement who just like playing a part, and they get a buzz.' As Patrick Kelly put it, 'At an environmental level it's small, like we're taking a mop to a flood. But I think at the community level it's very important to a lot of people in the community.'

As well as the friendly atmosphere in community repair spaces, where people get a chance to chat and make connections, some people are just curious to see what a repair café is, or want to sit and chat and talk about the item they have brought in, what it is and where it came from. Having recently moved to a space in a retirement social centre, the Gawler repair café is attracting people who are 70 plus, who are not so confident now, and come for the social interaction. Repairer Helen Hennessey had a sense that the repair café could be filling a gap in these people's lives. She thought they should speak to the aged care support people about this, since the repair café can only open for a limited time one morning every two months (9am - 12.30pm). A more regular presence might strengthen this bond between the café and the residents in the age care facility.

The affordability of voluntary repair was acknowledged by most volunteer repairers to be an important aspect of this community role. 'It doesn't make financial sense to fix an old bike, because you could buy one for cheaper (less) by the time (you get) everything you need for that old bike.' The Adelaide Bike Kitchen volunteers acknowledged that they were there for people as well as for bikes. And one of the volunteer electricians at the Campbelltown repair café said he was happy to come in once a month, pointing out that he was seeing things that would not be worth repairing if he was in a paid job, that is if they 'were paying for labour. In most cases, they would throw the item away and buy a new one (rather) than pay the cost to repair.'

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*Collaboration, charity and support in repair*

Bikes for Refugees is a charity bike community workshop that uses funds from bike sales to help people suffering from various forms of hardship, including newly arrived refugees, school children, and homeless people. These people are referred to them through a number of different welfare organisations such as St Vincent de Pauls, Catherine House, and even organisations such as Bike SA. They take donated bikes and spare parts from the general public, other charities or bike repair businesses such as Biomechanics. Michael Brisco, who founded Bikes for Refugees, explained that they used to be a community-based service, where people would come and borrow tools to fix their own bikes. But this role, Michael noted, had been taken over by the Adelaide Bike Kitchen, and so they can now concentrate on their role as a charity, fixing bikes quickly from donations so they can either sell them to raise funds, or to give to people who are referred to them.

Businesses such as Bio-mechanics regularly donate bikes they can't repair to The Adelaide Bike Kitchen and Bikes for Refugees, and these are then often stripped for second-hand parts. Community repairers are also likely to collaborate with more than one organisation. For example the Campbelltown repair café works with the local mens shed. The Adelaide Bike Kitchen and Bikes for Refugees also collaborate. While the Adelaide Bike Kitchen is more concerned with community engagement and teaching repair skills, Bikes for Refugees fix their bikes for charity and to raise funds. 'We used to teach people repair skills but we just don't have the time to do that anymore. People come and ask us 'can you teach us how to repair bikes?' and we say 'no, the place that does that is the ABK... I think collaboration is much more constructive, we try to help each other out.'

Adelaide Bike Kitchen also collaborates with the community through education, and have two teachers and students coming into their classes from a special access school. They say there has also been further demand from other parents and schools for educating their children, but they don't have the capacity and the time, as most of their volunteers already work other jobs. They would need more volunteers and funding support to expand their educational role. In a number of other groups collaboration in community outreach was similarly limited by the lack of available volunteers and the time to engage in these roles.

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Figure 13 Parts in storage at Federation Trading

# Discussion

Not surprisingly, our interviewees spoke of many of the barriers to repair identified in the expert literature.

## Facing up to the barriers to repair

Not surprisingly, our interviewees spoke of many of the barriers to repair identified in the expert literature. They were all concerned with the widespread, and increasing, use of planned obsolescence in the goods they repaired or had encountered. Many of the repairers interviewed were concerned with the design decisions and choice of materials that rendered so many products prematurely obsolescent, and were opposed to what they perceived to be the manufacturers' various strategies to lock out independent or DIY repair. They were also aware that some manufacturers were trying to monopolise the repair of their own products, not out of a genuine concern for the safety of the repairer and user, as they often claimed, but to make repair more expensive, difficult and unattractive, and in this way encourage those seeking repair to discard and buy new again.

## Planned obsolescence and reduced lifespans in use

The use of a number of strategies to encourage consumers to discard and replace their things was especially apparent in fast fashion and in electronic products such as phones, laptops, computers, printers, and even in other supposedly longer-lasting products such as bikes, washing machines and fridges. From redesigning formerly standardized and robust components to be unique, and more expensive, and only available through the manufacturer, to selecting parts not likely to last much beyond the warranty period, are now widespread practices. These traditional approaches to planned obsolescence are now supplemented with digital locks, component or part-pairing, and withholding the technical information, software or parts required to repair a product. The aim of all these strategies, our repairers understood, was to push people to upgrade sooner, once the possibility of repair had been dispensed with as impossible, difficult, inconvenient or expensive.

Since many products have stayed about the same relative price for a decade or more, buying a replacement rather than locating and paying for repair can now be presented as 'better value' by the seller. They can exploit the narrowing gap between the cost of repair and replacement. For example, to replace the screen or keyboard in some recent electronic products can cost as much as half or more than replacing the product. While the manufacturer might claim this is because of the complexity and expense of the replacement parts, our interviewees were well placed to understand that these items – whatever technological advantages they may seem to provide – have also been designed to be more difficult and expensive to repair.

..traditional approaches to planned obsolescence are now supplemented with digital locks, component or part-pairing, and withholding the technical information, software or parts required to repair a product.

While planned obsolescence in products made by multinational corporations may seem too difficult to challenge in South Australia, a state with only 1.8 million people, there are other, more subtle, ways to limit its continuing use that may be considered. A number of these were mentioned and discussed in the literature reviewed, and also in our interviews. These involve examining in more detail the strategies now commonly used by corporations to limit repair.

For example, a typical repair scenario might start with a screen on a mobile phone breaking. This might be made to seem too expensive to replace (in-house), or if the device is 'older' than two years, the part might be unavailable, because the product has been superceded by a newer model. Similarly, a software update might cease to work with an 'older' product, and when installed might slow its functioning. Or the part may be paired with another part digitally, forcing the user back to the manufacturer for the repair, which will then appear too expensive, compared to upgrading to the new.

A number of our experts noted that this problem could be addressed through a closer examination of the design and legal settings in which these practices occur. Paul Huxtable, an expert in design, suggested that the manufacturers could be persuaded to increase the warranty period for the product concerned, with the warranty becoming a point of competitive advantage to the seller, as has occurred to a great extent in the new car market.
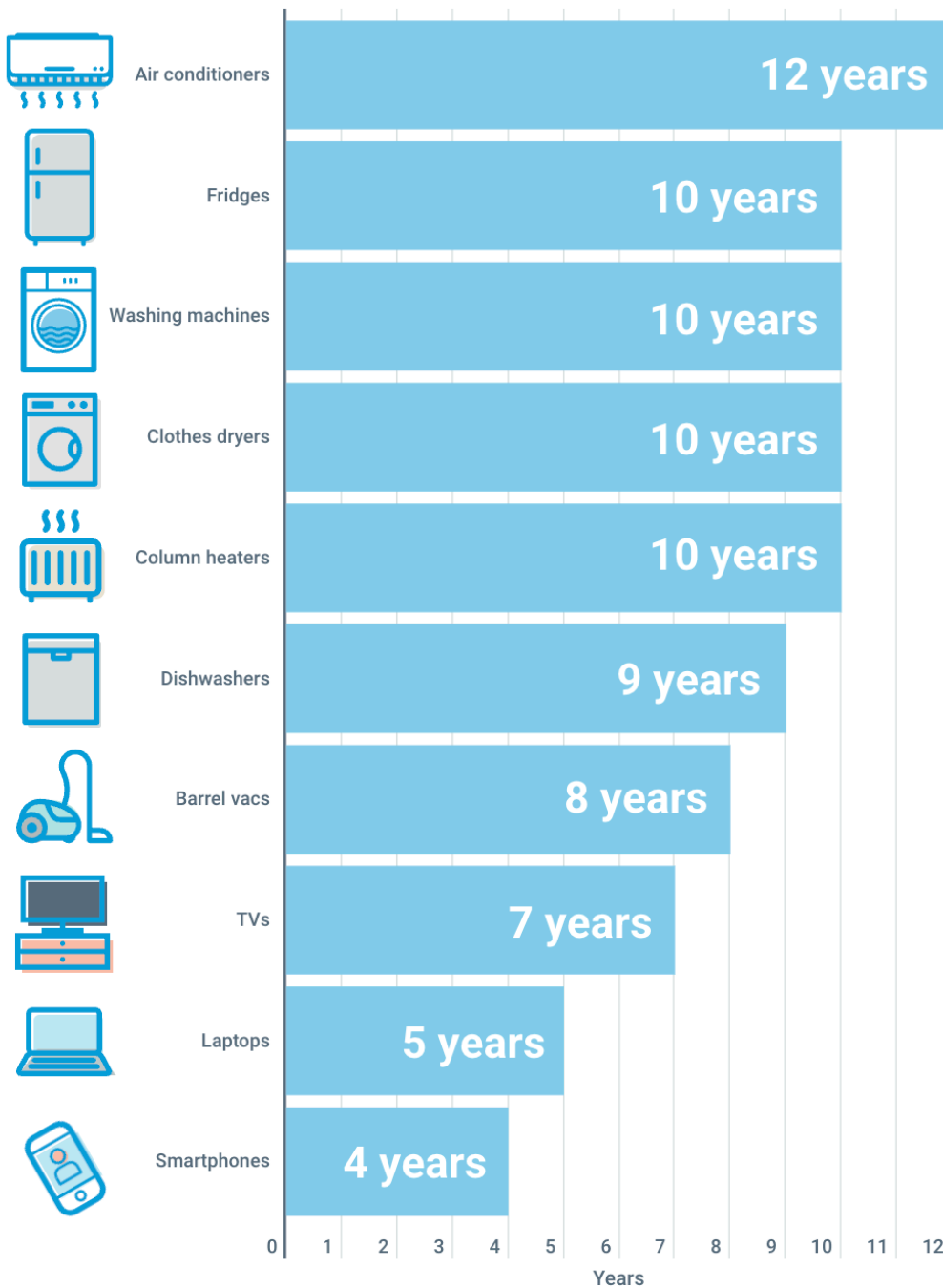
Since there is now information available on the expected lifespans in use of many household products, it may be possible to encourage manufacturers to extend the warranty period of their products up to half of their 'expected lifespan' in use.

In a recent report by Choice (2024), the Australian consumer group, the expected lifespans of a series of typical household products were calculated by considering the depreciation in a product's value over its life, and the cost of retention versus replacement, with the cost of a 'typical repair' in that product type helping to determine the most effective time for replacement. This is the 'expected' end of life identified by Choice, usually a one or two year period during which a break down may occur, when the cost of the new, relative to retention and repair, becomes an argument for replacement.

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While the chart pictured to the right cannot show the average retention rate for a particular product (some washing machines, for example, might be working for long after ten years), it does reveal the role of repair in helping determine, and potentially lengthen, an 'average' product's lifespan in use. If repairing a product could cost less, and its potential lifespan in use could be lengthened by design, with materials and parts able to be repaired more easily, the 'expected' lifespan of a product in each category could well be extended.

*Figure 14 Appliance Lifespan (based on Choice)*

# How long should your appliances last?

**Knowing roughly how long your household appliances should last can help you plan to keep them running smoothly**

| Appliance | Lifespan |
|-----------|----------|
| Air conditioners | 12 years |
| Fridges | 10 years |
| Washing machines | 10 years |
| Clothes dryers | 10 years |
| Column heaters | 10 years |
| Dishwashers | 9 years |
| Barrel vacs | 8 years |
| TVs | 7 years |
| Laptops | 5 years |
| Smartphones | 4 years |

Years

Estimates are based on our yearly member surveys and manufacturer repair data.

Share

**CHOICE**

The price of the new inevitably plays an important role here. We know from other commercial sources that at present smaller electronic devices are rarely retained for the four or five years of the 'expected lifespan' given to them by Choice, because of the issues identified here. While products such as mobile phones may fail to live up to the category's expected lifespan, many products may indeed last longer than they are 'believed' to last by their users. For example, a washing machine should be able to last ten years, but some don't, and most warranties, even for the most expensive models, fall far short of this.

Aligning the warranty period more clearly with the expected lifespan of each product, as Paul Huxtable pointed out, now occurs in the automotive industry, where a seven year warranty signals to the consumer that the warranty will cover most types of breakdown for a notional expected life of 'normal use', of the kind Choice identified. It also signals that spare parts will be available for that whole period, and that the manufacturer expects few break downs to occur until after the warranty period has ended. This gives the consumer a degree of certainty at present lacking in most other areas of household consumption.

And if every household product on Choice's list of expected lifetimes were labelled for repairability and durability, a competitive market could encourage manufacturers to extend the warranty period to align more clearly with the repairability and durability star rating of the product. This could lead consumers to choose the more repairable and durable machine, and the one with spare parts guaranteed to be available over this period. Following, but simplifying the French repairability index scheme, companies themselves could rate their own products, but as in the French system, justify this rating on their website, or face fines, and potential push back, if they misrepresent their own product's score. One of the advantages of this system is that it encourages competing manufacturers to compete on quality and not just on price, and this benefits both the consumer and the environment, since it removes the need for the kind of barriers to repair identified in this report.

Another avenue towards negating planned obsolescence could emerge from consumer protection and intellectual property law. At the moment, when patents expire, they are 'gifted' to the public for legal reproduction after a particular term. It might be possible to link this patent term more explicitly to the continuing availability of parts, so that the patents for parts could be made available for reproduction following a set period. This might mean that within five years after our washing machine was released, around the time its warranty expires, the patents for these parts could be allowed to be licensed for remanufacture by others. This could be set up in a way not dissimilar to the aftermarket for parts in the Australian automotive industry (ACCC 2024).

There is some support for legislative change along these lines in both the Productivity Commission's report on the Right to Repair (AGPC 2021), in recent regulation on the right to repair in the automotive industry mentioned above (ACCC 2024; AASRA 2024), and also in CEMAG's report on The Circular Advantage (CEMAG 2025). While instituting these changes would require federal and state government leadership and some change to some laws, this could also help support a 'repairability and durability scoring system' in Australia.

**Incentivizing repair activities**

Because the costs of repair have risen while the price of many new products have stayed relatively similar, and in some cases lower than they once were, both studies from Europe and our interviews reveal that independent repairers face an increasingly difficult economic environment. This has had a serious impact on the business of repair itself. Many new products and their parts are now made of materials that lack durability, or have been designed in such a way as to be difficult to repair, or, as in the case of fast fashion and flat-pack furniture, are of such poor quality as to be not able to be repaired at all. Some products have also been designed to fail, with several repairers complaining of defective parts being sent to them, sometimes repeatedly, by some manufacturers. This suggests some manufacturers are deliberately undermining independent repair, not only by withholding information and parts, but ensuring that when the repair is undertaken it will fail, forcing the user back to the manufacturer to buy again.

Persuaded by the media that the new is better than what they already have, and facing the complex, uncertain and often expensive business of repair, many users are now reluctant to get something repaired, especially if this repair costs more than they are willing to pay. According to Alex Bunodiere, who has been studying the economics of repair from data provided by a large store chain in Belgium, somewhat like our Harvey Norman, but one which takes back and repairs the products it has sold, most people in that country, where his study is based, are reluctant to spend more than the equivalent of $180 AUD for almost any repair in a wide range of domestic products, even for more expensive appliances, costing the equivalent of several thousand (AUD) dollars new. It seems likely that this figure is aligned to the cash these consumers have on hand. It seems likely that Australians may have a similar upper limit for repairs, although this will need to be investigated further.

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Added to the user's reluctance to pay for the full cost of some repairs, are the increasing difficulties involved in the business of repair itself, from accessing technical but proprietary information required to repair a product, to locating and buying difficult to obtain, and often proprietary, spare parts, to undertaking a repair that may be too costly in time or money for the user to accept. This drives the repairer to prioritise what can be done quickly and more cost effectively. This has resulted in more products, even larger appliances, not being repaired, since the repair might be considered too involved and expensive for the customer to accept (Laitala et al 2021). This is again an important argument for a tighter regulation of the repair economy: our environment can no longer afford prematurely discarded

bulky items like washing machines and fridges being sent to landfill, simply because manufacturers have designed them to make sure certain repairs will be impossible, difficult, expensive or time consuming.

To counter this problem, in Europe a number of jurisdictions have developed voucher schemes to artificially lower the price of many types of repair, from garments and furniture to phones and tablets. A summary of these schemes can be found on page 38 of this report. While these vary, in economic terms their role can be seen rather like that of container deposit scheme, to lower the cost of repair to counter the much larger cost to the community of discard and replacement in environmental terms.

A state-based universal voucher scheme could be trialled to increase the number of people accessing repair services in South Australia, and in this way improve the rewards of the independent repairer. For without such a scheme, many products won't be taken to be repaired, or won't be repaired because of the cost of the repair in time and parts. While such a scheme would have to be designed carefully, with payments going to the repairers without any additional administrative burdens, such a scheme could be useful in encouraging more people to access repair services, and also in allowing government to record repair data more effectively – who is repairing what, when, and for how much.

This data collected from repairers themselves through such a voucher scheme could be valuable to both state and federal governments, and also to consumers, since it could help identify the carbon and resource savings accruing through repair activities, since these extend the life of products in use. In this way the data collection could become not only a tool for persuading the community of the environmental value of repair, but as a means for calculating repair's emissions and material flow reduction impacts.

This in turn may interest manufacturers, since most are now obliged to demonstrate how they are reducing their own carbon footprints to their shareholders, governments and users. Once durability, repairability and repair itself, are understood to be an important means to this end, in-house repair could become a more viable and attractive component of corporate business models, alongside other forms of reuse such as reselling second-hand or refurbished goods through their website or other outlets. Indeed, once the economic and environmental value of repair is better understood through improved data, some market leaders may commence designing their goods to last longer, and incorporate reselling repaired or refurbished goods into a more extensive circular business model.

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## Education, training and upskilling

There has been a precipitous decline in the number of trained and skilled repairers, not only in South Australia, but across the developed world. It is not surprising there are fewer working in repair, and in many domains, and probably fewer than there have ever been (Laitala et al 2021). The economic issues referred to above are slowly killing off independent repair in many areas, and turning in-house repair services into a means for selling more new goods. This perpetuates the linear 'throwaway' economy at the heart of our environmental crisis.

One problem highlighted by the repairers we interviewed was an almost complete lack of training in repair in South Australia. Even in areas that should be economically viable, such as mobile phone, computer and tablet repairs, tertiary-level training is lacking. Educational providers are usually reactive, look at the numbers and see a decline in a 'need' for repairers, while state governments have stopped supporting apprenticeships in what seems to be shrinking, 'uneconomic' areas of activity, with upholsterers and watchmakers, for example, now having to go to Melbourne or Sydney to train.

This has led to a vicious cycle of declining numbers of repairers, shrinking support for their education and training, alongside products that are now designed to be more difficult, or impossible, to repair. For this reason most of the repairers interviewed had either trained somewhere else, or had been fortunate to have enjoyed a government supported apprenticeship many years ago. Unfortunately, rather like university courses in specialised areas where there are too few 'customers', TAFEs have responded to what their numbers are telling them 'industry needs', despite the environmental, economic and social impacts of reducing training in these areas. This situation is made worse by the fact that most household products are now imported, so having their customers access repair services is often against the interest of the retailers themselves. Most would prefer their customers to replace what they have bought with new products, rather than get their 'old' ones repaired.

This bleak picture of a repair sector without young repairers to replace the ones approaching retirement, was spelt out by many of the repairers we interviewed, both professional and volunteer. It also alarmed our experts. In both the business and volunteer sectors of repair, our interviewees remarked on a critical shortage of younger repairers and trainees, and the difficulties involved in taking on apprentices without government help. Many of our interviewees were of retirement age, with a sizeable number in their seventies, and technically 'beyond' retirement age. In repair cafés, this demographic trend was even more marked, with most being in their sixties or seventies, and some even in their eighties. These too felt that there was a serious shortage of younger people interested in repair, or willing to learn repair skills. The life of a repairer, in almost every area, outside the larger protected trades such as automotive repair, is now financially precarious, and it is not surprising that so few young people want to enter it.

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To counter this decline, governments at all levels need to consider how to incentivize repair activities and to support and train a younger generation of repairers. Incentivizing repair will release the pressure on the repairers, and supporting training will encourage a new generation of repairers to step in to replace those about to retire.

Many of the repairers and experts emphasised the value of subsidizing apprenticeship schemes and enabling in-house training opportunities, potentially justifying this expenditure through repair's environmental benefits. For if a repairer can reduce a company's or community's carbon footprint by effecting so many repairs a week, and the data from this activity can be recorded, then on-job training in repair could be understood holistically as an environmental investment yielding multiple future environmental and social benefits, rather than as a subsidized 'burden' as it is now.

### Changing consumer attitudes

Consumer attitudes were singled out by both repairers and experts as a significant barrier to repair. Many referred to the problem of advertising and social media promoting the new over the old and effectively sidelining repair. Most of the repairers interviewed felt that their customers did not really understand or appreciate what they did, or even what was involved in repair. Few were able to distinguish between a longer-lasting and more repairable product than one that might be difficult or impossible to repair. This was true for shoes, textiles, furniture and electronic products. This has turned repair into a black box in cultural terms. For most repair is carried out now on the margins of mainstream economic activity, except perhaps in the car industry where few can afford to ignore it.

The repairers we interviewed understood this problem as a persistent cultural and social issue: most people who came to them undervalued repair. They were unaware of the skills required, equating repairing to a 'low level' job. Few had any idea of the time and effort any particular repair might take, and most did not understand its environmental advantages, as opposed to recycling, which of course the manufacturers have been very happy to promote. Most also had no idea of the increasing costs involved in repair, including parts, labour, information, tools, etc. And some, misled by YouTube, even imagined it was 'easy to repair' something. This rather counter-intuitive assumption was encountered by repairers not only in domains like garment, shoe, furniture and bike repair, but also in newer areas like mobile phone and tablet repair.

In many respects, these attitudes mirror the prevalent consumer culture, and preference for the new over the old. Those who value something and want to restore it for use must be mistaken, at least from this throwaway perspective. For this reason most of the repairers we interviewed felt that the government could invest in promotional efforts to help counter consumerism, and help the community better understand the economic, social and environmental value of repair and reuse. While some suggested a simple advertising campaign, most experts felt a whole

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of government approach would be needed, in which repairability was introduced, rated and valued, and labelled, rather as energy or water efficiency has been. By subsidizing repair activities, people might be encouraged to get more of their products repaired. They also felt that repair should be taught alongside other skills in schools and colleges, and repairability prioritised in government procurement, with producers encouraged through taxation or other means to design and make more repairable and durable products.

This shift in consumer attitudes may take some years to be realised, but given the seriousness of both the waste and environmental crisis, it is certainly worthy of all governments' attention.

## Enabling a repair economy

Most of our interviewees, interestingly, agreed that the marked decline in product durability and repairability could be addressed if governments took the issue more seriously. They understood that the problem was in the use of 'strategic sabotage' (Veblen in Dillon 2025) by producers in certain categories of goods, to ensure that they would be discarded and upgraded rather than repaired. They all felt that repair, and repairability, needed more government support and a more visible profile to consumers, and one that emphasised repair's many economic, social and environmental advantages. Several of the experts interviewed made the valid point that while recycling is now widely recognised as a 'good thing' for the environment, repair and maintenance, which are so much more important for the environment from a circular economy perspective, have been neglected and consequentially their value rarely understood, overshadowed by the value advertisers and marketers have placed for so long on the new.

In response to this problem of visibility, there was considerable interest amongst both repairers and experts in the French system of indexing or 'scoring' products for repairability, in this way allowing people to judge for themselves which product could be more readily repaired. Interestingly, many repairers, whether professional or voluntary, had never heard of it, but were very interested to hear about it, since they themselves would often try and advise their customers to buy products that they knew to be more durable and easier to repair.

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Several of the experts interviewed suggested a 'star' rating system similar to that now used to rate energy and water use in appliances in Australia. They considered that this might work here because of its familiarity. This could be similar to the French one, but perhaps without the complexity of its numerical scores, since these are averages of averages, and are difficult to compare and understand. Technically, also, it might be possible for Australia to jump over France's 'second phase' in their scheme (Entreprendre 2024), and their projected 2025 introduction

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of a 'sustainability' index, when they are planning to add durability and sustainability into their existing repairability index. By including these categories in a more comprehensive star rating scheme, something approaching a complete circularity or 'green' star system could be made available to the Australian shopper.

By strengthening warranty regulation, perhaps linking this to the expected lifetime of each product as suggested above, our experts considered that a labelling scheme could benefit consumers, repairers, and even manufacturers, who would begin to see competitive value in designing, and being rewarded for, longer-lasting products. For example, a five green star washing machine could make clear on its label that its repairability was 4.5 stars with a durability and expected life of 5 stars, and this could be linked to a five year manufacturer's warranty, with availability of parts and information guaranteed for the full ten or more years of the product's expected lifespan. (This assumes that a warranty might in the future be required to match at least half the expected lifespan of the product concerned). A QR code on the label could lead the shopper to the manufacturer's website where all relevant repairability, durability and sustainability information could be found. This would have to go beyond greenwashing, with penalties devised to keep the manufacturers to the facts.

A uniform star rating system could be linked through each product's explanatory website back to a dedicated online government platform or website where information on this system, its purpose and value, could be more fully explained, and related to its overarching environmental and social value. For example, the difference between a two star product and a five star product could be explained in simple economic, social and environmental terms.

On this same platform, or linked to the website, some suggested, could be a 'directory' or map of repair and maintenance services, so that these could become visible to those looking to purchase a more repairable, more durable, product with more stars. Many of our interviewees were interested in the idea of a directory of repair or a free website, so that those seeking repair could more easily locate it, and also so they could know where other repairers were located.

A lack of information about who to refer to, if they themselves could not repair something, was also not altogether surprising, given the decline in repair services described above. It led us to conclude that a 'repair network' or organisation representing the interests of repairers could help repairers, both voluntary organisations and businesses, grow their customer base. They might also be able to join together over common causes, such as that which enabled independent car repairers to gain the attention, and action of the ACCC, to break the control of the car manufacturers and their agents over their restrictions on technical repair information. Nothing similar has occurred in the repair sector involved in electronic devices, household appliances and products or clothing and footwear, despite them often being subject to similar types of manipulative, controlling behaviour, perhaps because, until very recently there has been no voice in Australia with the widespread appeal of the Right to Repair movement in the USA or Europe discussed above (ARN 2024).

There was a lot of interest amongst our interviewees in addressing the problem of manufacturers withholding technical information (once a significant issue for independent car repairers), or charging excessively for it and any proprietary software. Related to this, there was considerable concern about their withholding parts, or inflating the prices of these for 'unauthorised' repairers. Some also noted that they could use a combination of the strategies listed above to pressure consumers to return to themselves for all repairs, and from there, when the likely expense of the repair becomes apparent, to encourage them to discard and upgrade to the new.

France has now outlawed product obsolescence, and our interviews with both repairers and experts suggested more could be done to move towards this goal, since all agreed that it was often managed in such a way as to undermine the repairability of products, had serious environmental impacts, and considerable negative social effects, particularly for more vulnerable users (ARN 2024).

Another significant theme in our interviews with repairers was the difficulty of doing business in an economic context of rising costs and, in many areas, declining rewards. Most faced high rents, and struggled to find premises where they could store their equipment and spare parts. They also found it hard to encourage people during hard times to repair for a reasonable return, especially when new products were often not so much more expensive. To address this, some suggested subsidizing at least some of their costs, whether this was through the tax system, through subsidizing the cost of repairs to encourage more to seek out their services, or subsidizing their rent in some way. A lack of visibility and rising costs were related burdens to many.

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While repair cafés and voluntary bicycle repairers to some extent have benefitted from the cost of living crisis, their problem has been their dependence on the goodwill of councils or other charities for their premises and storage needs (if these were ever met), and the failure of local and state governments to invest in such ventures long-term, despite their often outsize economic, environmental and social benefits. Most voluntary repair organisations struggled to solve their basic logistical problems, to find secure premises they can use, and where they might also store their parts and keep their equipment. It should be possible, several of our interviewees considered, to provide these groups with some kind of dedicated subsidized space, where repair services could be more easily found, with space to work and store equipment and spares, and also with proper waste services for the 'broken bits'.

An approach used in parts of Europe is to locate repairers, both paid and voluntary, in a local government, charity or non-profit -owned 'hub', where rent is either free or subsized, and where occupation is not based on short-term commercial leases, but on longer-term contracts with local government bodies or charities. This could also make the job of finding a repairer easier for many people. While we found several

repair cafés are now using local government or charity premises for their work, this relationship could well be strengthened, formalised and extended, with a space dedicated to their work, and with secure storage on site. Green Industries' recent publication, Community Circular Economy Hub Guide (GISA 2024), provides a useful summary of what could be done, and contains several valuable international cases.

A critical issue touched on throughout this report is transparency, and making the value produced by repair and reuse activities more visible. The carbon and resource savings repair makes could be made visible in dollar terms, and this would make it easier to promote the establishment of hubs to local and state government agencies, especially if the requirement to demonstrate carbon savings becomes embedded in legislation and regulation. A rent-free asset with clear community benefits, where the data from the activities it enables can be linked to carbon reduction, could be reimagined as an investment in the future, in skill development, social well-being and community health.

In terms of upskilling and training, most interviewees regarded this as a critical issue, but struggled to think of solutions that could be realised without dedicated government intervention. Most were troubled by the fact that training was unavailable or severely reduced in their own particular areas, whether this was upholstery, tailoring or shoe repairs, and that there were so few younger repairers 'coming up'. Most contrasted this to the government's treatment of other established skills, such as carpentry or nursing, where apprenticeships and on the job training were widely encouraged and subsidized. Most supported the idea that government should act to not only to promote the value of repair, but also to support the training of young repairers, and within this state, so they were not expected to travel to Melbourne or Sydney, which for most would be economically unfeasible.

While repair cafés are perhaps better placed to advocate for the promotion of repair, and the sharing or improvement of skills, their reliance on volunteers and lack of permanent or secure premises to operate, along with their financial precarity, suggests much more needs to be done to support their work by local and state governments, and to integrate what they are attempting to do within the larger repair sector.  Again, this leads to the idea of a subsidized repair 'hub', a place where repair and repair-related knowedge can be found in the community. Without such a place, on the job training also might be more difficult and more expensive in the long run.

Several of our experts suggested that repair could really benefit from a government 'czar', director or 'champion' to oversee the revival and growth of the repair sector in South Australia. This is because many of the changes that will be required may be beyond the ability of one department or group to implement, and will require a whole of government approach, spanning local, regional and state agencies, as well as federal departments. We have suggested that the promotion, planning and design of a 'repair economy' and ecology across the state could be managed from within the state government, the precise role and location to be determined.

# Conclusion

Over the last few years, the many economic, social and environmental benefits of repair have gained wider recognition across Australia, and increasing policy traction. The landmark Australian Government Productivity Commission's report on the Right to Repair (AGPC 2021), the Federal Government's more recent commitment to developing a circular economy (CEMAG 2024), and the Productivity Commission's interim report on the circular economy's likely benefits for the Australian economy (AGPC 2025), have ensured that repair and repairability are now on the agendas of both federal and state governments. Responding to the increasing expectations generated by these initiatives, some businesses have begun to reexamine their relationship to repair and repairability.

While the economic and social benefits of maintenance and repair have long been recognised in various industrial, transport and agricultural settings, repair's benefits to households have been rendered largely invisible by an expansive consumer culture that has prioritised the purchase of the new over maintaining or repairing the 'old'. This has been accompanied by a reduction in the lifespan of most common household products. Digitization has furthered this process, in some cases rendering the user's recourse to repair difficult, expensive or even impossible, in order to facilitate a more rapid cycle of production, use and discard within more households. This growth in the volumes of products sold, and shortened lifespans in use, is directly implicated in a continuing expansion in resource and energy consumption and climate and environment effecting pollution. Recent studies suggest that up to 65% of all greenhouse gas emssions can be attributed directly to household consumption (Ivanova et al. 2016).

## Policy Options

The following policy options were developed in response to both the most salient points made in the literature, including the most recent federal government reports referred to above, and the evidence presented by our interviewees. In draft form, these policy options were then presented to two workshops. The first, in late October 2024, included representatives from local and state government organisations, while the second, held online in November 2024, included a smaller group of mostly interstate experts, who had been interviewed earlier. These were more familiar than the first group with developments at a federal or interstate level, and so were especially useful on the third group of policy options listed below, which require some coordination between federal and state governments.

The policy options listed here are presented in three groups. They are not sequential, but based on how long they are likely to take to develop, and the degree of inter-governmental collaboration required. The first group is made up of seven which we regard as an immediate priority, at the state and local government level. Group 3, on the other hand, would take longer, since they would require extensive liaison between state and federal agencies.

We presented groups 1 and 2 of our policy options to the first workshop for review in October 2024, while we presented group 3 for review to the online workshop in November 2024. The feedback from both workshops was then incorporated into the final list of policy options.

The first group, below, begins with the larger issues of governance, organisation and funding, and so should be given immediate priority. The interdependence of the policy options in groups 2 and 3 are also apparent, but again require the development and implementation of group 1, which are the most important from a state government perspective.

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## Policy Option 1
### (high priority, immediate – 1-3 years)

*1. Establish a leadership team for growing repair in SA:*
Consider the establishment of a dedicated team within the South Autralian Government, dedicated to assisting the development of the repair sector in South Australia. The team could cooperate with local government and work with other state government departments to:

a.  allocate targeted funding to coordinate and grow the repair economy in SA (2)
b.  assist the establishment and development of a repair network in the state (3)
c.  identify and promote the benefits of repair to the economy (4)
d.  set up and oversee the funding of a trial incentive scheme (5)
e.  manage and oversee the development of a repair directory (6), and
f.  help coordinate and establish a repair data collection system in SA (7).

This team would likely have specific KPIs in their roles to help ensure and measure the growth of repair in SA.

*2. Establish seed funding to revive repair activities in SA:* The South Australian Government to establish funding programs to focus on assisting community groups and small repair businesses with a simplified application process and minimal paperwork.

*3. Develop a state-based repair network:* Facilitate the development of a body representing Adelaide and regional repair businesses and community repair organisations. The terms of reference for this group would need to be clearly articulated and integrated with 4, 5, 6 below.
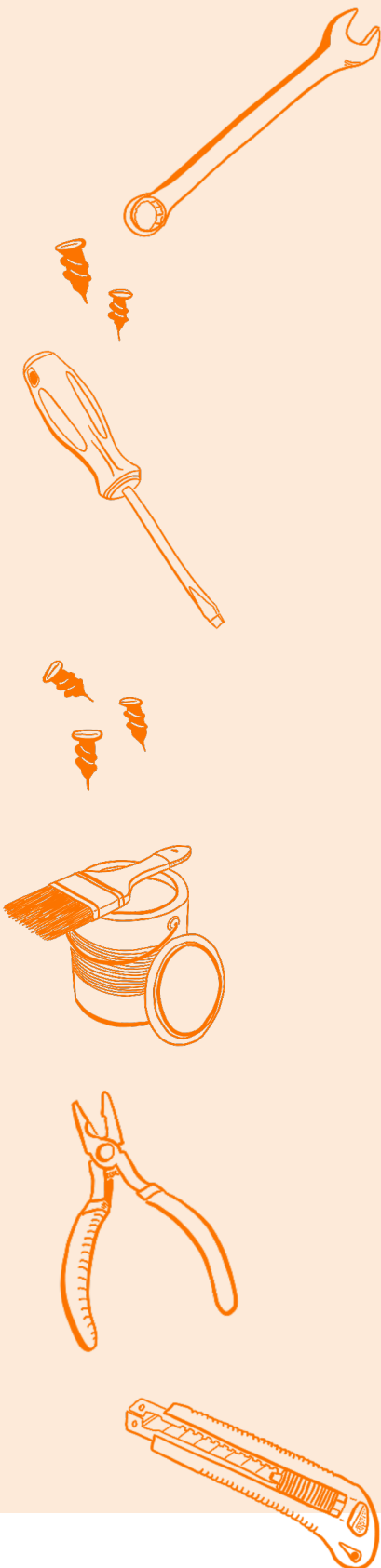
*4. Promote awareness of repair in SA:* Enable community education and awareness programs to encourage the use of repair, emphasising its many economic and environmental (and personal) benefits. This should be integrated with 5 and 6 below, and 10 in group 2 below.

*5. Trial a repair incentive scheme in SA:* Trial a time-limited incentive scheme for the community's use of repair services, such as vouchers of up to 30% of the cost of a repair, and or up to a pre-determined value on common electronic/electrical products. In not for profit repair cafes and bicycle community workshops, consider providing vouchers that refund 50% of the cost of any spare parts required for an item repaired. This could aid the revival of a repair economy envisaged in 2, 3 and 4 above, and could be based on European precendents.

*6. Establish a directory of repair and reuse services in SA:* This could be developed as an online website or publication and, if funding were available, later developed as an app. It would provide access to repair and reuse businesses for consumers and also other repairers, including availability, location, types of repair, indicative costs of common repairs, and the time taken to do these repairs. This would enable SA repairers to refer people on to other repairers or groups who might be able to help, if they were unable to. This could be linked to those selling repaired and second-hand goods, and also share economy services.

*7. Establish a repair data collection system for SA:* This would integrate data collection from repairers across the state, to support the further development of repair services and waste management, and the calculation of repair's role in reducing the environmental impacts of household products within the circular economy. This data could be used to inform government policy development within the circular economy framework, and also identify poor design and product failure issues. As Vaughan Levitzke put it, 'There needs to be recalls on consumer goods which have bad or frequently recurring faults' and a regulatory system with the 'ability to ban certain products if found to be irreparable or fundamentally flawed/faulty.' Further, businesses and consumers could be encouraged to flag these faults, so items are actually recalled.

## Policy Option 2
## (high priority, medium term – 2-5 years)

These policy options would also need cross-government state coordination and leadership (1 above).

*8. Establish mandatory extended producer responsibility,* through improved design standards and a non-acceptance of planned obsolescence nationally. The following state-based actions could support the goal of this policy option:

a.  initiating and supporting a public information campaign against obsolescence, along the lines of 'Return cheap products that fail'. Run a social marketing campaign against waste from low quality imports filling up landfills, and find ways to put the responsibility and costs back on importers and manufacturers.

b.  Encourage people to return and report products that fail quickly, or have toxic or defective parts. As the Adelaide Bike Kitchen put it, 'The responsibility or burden of cheap parts and waste should be put on the manufacturer.'

*9. Develop and help fund circular community hubs.* Assist local government in the development and funding of accessible, subsidized places for community groups such as repair cafés and bike kitchens, including sufficient accommodation and storage for professional repairers. These hubs could include some administrative and insurance support, access to second hand parts, ongoing education/ training and workshops, and also visitor support (GISA 2024).
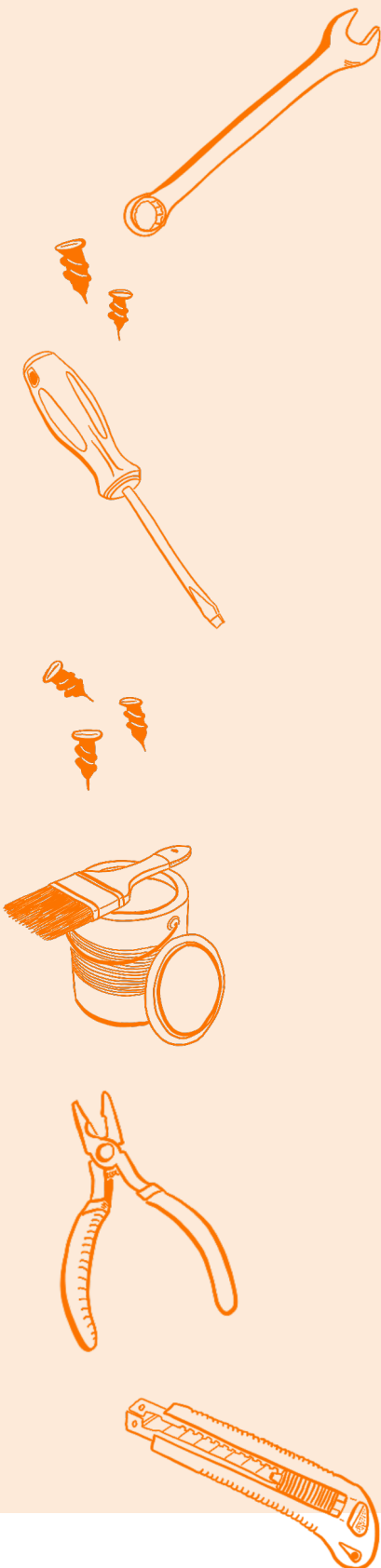
These hubs could include a 'donate and repair' second hand shop, with parts made available from items unable, for various reasons, to be repaired. Hubs could also include pathways for e-waste and parts to be stored and then dismantled for re-use, creating more jobs. If this was successful in Adelaide, this model could then be applied to regional centres as well.

*10. Expand education in the circular economy and training in repair:* Collaborate with the South Australian Government, vocational education and training sector and universities to find ways to bring repair training and skills, along with information about the circular economy, into classrooms as well as training and university courses, and to create pathways to higher repair and maintenance skills and qualifications. Ensure that all training and university IT courses include training in repair, and ways of minimizing or reusing e-waste.

*11. Develop repairability standards for government procurement:* Develop state government procurement policies, standards and guidelines to support repair and repairability, including ensuring all uniforms, products and IT services include repairability standards.  All products bought by government should be maintainable and repairable, and have extended warranties to save money and also help support the repair economy.

## Policy Option 3
## (high priority, long term - 2-7 years)

These policy options would require extensive inter-government collaboration, as outlined in the Productivity Commission Report (2021) and Circular Economy Ministerial Advisory Group Report (2024).

*12. Trial a star rating and labelling scheme for product repairability and durability,* in collaboration with federal government agencies. All manufacturers and OEMs would be given guidelines on what is repairable and durable, which could be based upon or adapted from the EU eco-design guidelines in the Australian context.

*13. Develop Australian design guidelines and strengthen warranty legislation.* Collaborate with the federal government to develop design guidelines following the EU's 'eco-design' model. All new products made here or imported into this country should have design guidelines consistent with the federal government's Circular Economy legislation and framework. These guidelines should become mandatory and be taught in all Australian design courses.

*14. Outlaw planned obsolescence and the deliberate use of ready to fail parts and components,* along with software restrictions aimed at preventing products being repaired. Modify patent law to ensure parts can be reproduced or printed locally after they are no longer available or manufactured.

*15. Develop a comprehensive educational and training program:* Introduce nationally accredited courses for repairers and subsidise apprenticeships in all common forms of repair. Currently there is no training available for niche trades or even such common forms of repair, such as appliance, phone and tablet repair, watch, jewellery, upholstery and garment repair, or shoe repair.

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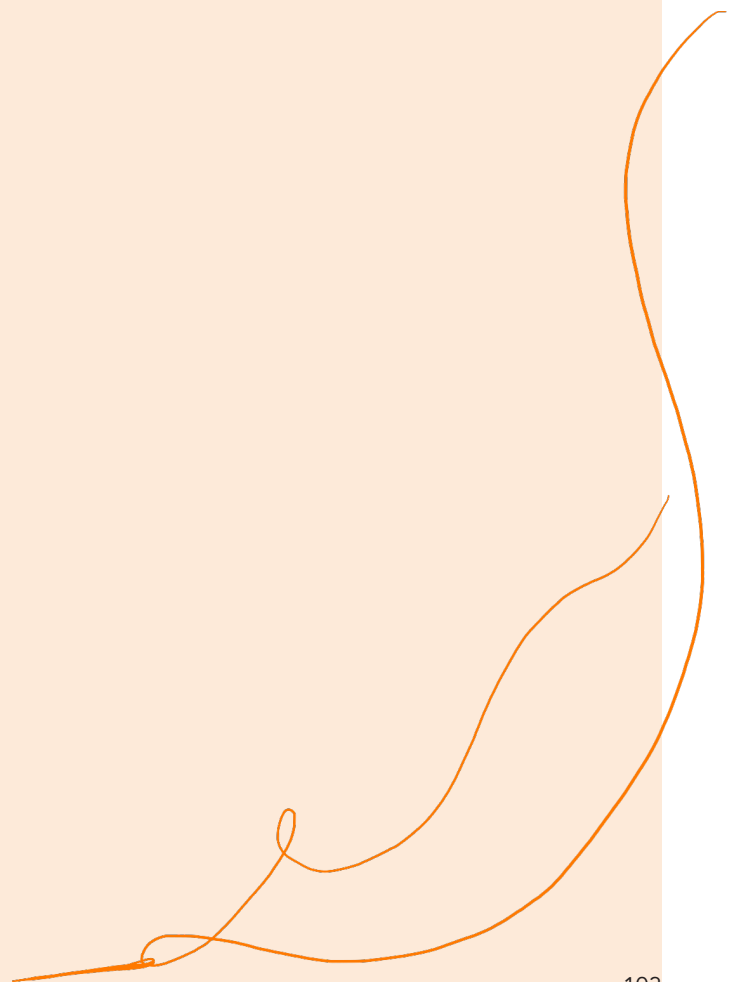
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# Appendix

# Participant Information Sheet

This research project is being conducted by researchers from Net Zero Lab, in partnership with Green Industries SA. We are looking to explore the state of repair in South Australia.

*The four primary aims of this project are:*
* To map the current state of repair
* To identify barriers discouraging repair
* To strengthen connections between those already engaged in repair
* To identify ways to support, grow and build skills in the repair sector

We invite you to participate in this project through an interview either online or in person. You will be asked to respond to questions relating to your experience of repair.

The interview will take about an hour. If you are unable to participate in an interview, but would like to contribute, you can choose to complete an online survey. The interview will be recorded, and a transcript will be used for writing a report for Green Industries SA. The full transcripts will only be available to the research team but we may use excerpts from your interview in our report. You can opt to remain anonymous if you wish.

We really appreciate your interest and participation, and look forward to meeting you, either in person or online. Please sign and return the attached consent form.

**Contacts**
Dr Robert Crocker, robert@netzerolab.org
Penny Lara, penny.lara@netzerolab.org

**Research Team/Investigators**
Dr Robert Crocker, Penny Lara, Dr Aaron Davis, Dr Niki Wallace

**netzerolab.org/**

Net Zero Lab is a team of researchers, designers and community engagement specialists focused on sustainability transitions. We use people-centred, collaborative approaches to complex problems to develop solutions that are responsive to community needs.

*This research is being conducted following guidelines from the Australian Code for Responsible Conduct of Research, to ensure rigour, quality, and integrity. Under this code, you have the right to withdraw at any time from participating in this project, without any consequences. If you do choose to withdraw, your responses will be deleted from our records. Your participation in this research is voluntary, and there will be no remuneration provided.*

# Indicative Questions (for semi-structured interviews)

The questions below guided conversations between interviewer and interviewee. Interviews lasted around 1 hour, depending on how busy the interviewee was. Some could not spare the time for face to face and wrote their responses to the questions in an email. From each interview a one-two page of notes was made. A sample of this is on the next page.

## Repairer Group (and Volunteer Organisations)
* What are the most common types of repair in your business/service?
* What products stand out in your experience, for their repairability and lack of the same?
* What are the main barriers to people getting their things repaired?
* Is the cost of a repair discouraging people from using your services?
* Does the time needed to do a repair discourage people from using your services?
* Can you locate and access information and spare parts for repairs in a timely manner?
* What happens when you are unable to repair something? What do you do?
* How do you attract customers, and do they understand and appreciate what you do?
* What changes (information, legislation, paid incentives, star ratings) would you like to see governments do to increase the use of repair?
* What else would encourage more people to use repair services such as your own?

## Expert Group (varied in response to their field)
* From your experience, how do you understand the state of repair and repair services (in SA and/or in the nation)?
* What do you consider to be the main barriers to repair and repairability today?
* In your view, what do you think discourages people using repair services (in SA)?
* Do you think enough people are aware of repair services (in SA)?
* What practical measures would you like to see to increase the use of repair services (in SA)?
* Would making repair services more visible encourage more people to use them?
* Would scoring and labelling products for repairability encourage more use of repair services?
* Would offering subsidies to users to use repair services encourage their greater use?
* Are there particular legislative, technical or regulatory barriers to repair and repairability that concern you?
* What policy and regulatory changes would you like to see to encourage greater use of re-pair?
* What further changes would you like to see?

## Sample Interview Notes (a Repair Café volunteer)

| | |
|---|---|
| **Interviewee** | Name, , Repair Cafe … |
| **Relationship to Repair** | Background of scarcity, 'low socio-economic' background, waste not want not. A long-time repairer herself. Won't do electrical. But will do anything else, including clothing, linen, teatowels (textiles). Learning from others. |
| **Importance of Repair and Repairability** | Everyone has skills, some very good skills; can be shared and watched. Repair very important for climate – waste of resources in non-useful things; throwaway society. Versus consumerism; wanting to change the economy. Wants more repairable, reusable. |
| **Particular products** | Decline in repairability of products over last twenty years or so. Earlier products more robust, more repairable (e.g. fifties appliances). Most electrical products are a problem, ie components need replacing. Bicycles are much easier, since parts usually available. Lack of generic parts or components -all designed to be supplied by company and brand. |
| **Barriers** | Not even sure if we can repair washing machines. Major barriers – obsolescence, lack of durability, and 'cultural thing'; textiles hard to repair now; but still able to be repaired. Top 3 – 1. Attitudes – 'repair too hard', 'I don't have the skills', I can 'just buy a new one'. 2. Built in Obsolescence (including parts); 3. Lack of skills – lost skills, so most cannot repair, hence focus on education in Repair Café. Also discussed problem materials (e.g. aluminium). |
| **Work of Repair Cafe** | Exists under (local environment group). Focus on textiles, electrical and bikes. Some electrical products unrepairable – repairers check; her expertise in textile repair; some repairers can just redirect customers to get their parts (e.g. hardware store). Problem of time – cannot spend long hours on a repair. Sometimes have to tell people products cannot be repaired. We keep records of all repairs (but only been going since 2019). Clients have to get own parts (e.g. bicycle parts, clothing parts, etc). |
| **Customers and information** | Network, and always open during market days, and so benefit from market. Mixed group of people – some young, some older, mostly upper middle class, and more educated, and perhaps more concerned about climate etc. Why do they value repair? Value what has broken, to be repaired. Growing awareness 'of consumerism'. 'We can only do smaller appliances' and we do 'free repair' so cost not significant issue. Lack of parts usually reason we cannot repair. Indemnity form – 'we can't be held responsible' for what is done – to make customers aware of limits (from Port Adelaide Repair Café). Have not joined repair café collective. |
| **What can the government do?** | Never heard of Europe's financial incentive schemes. But concerned about money / time and built in obsolescence. This should be outlawed. Comes back to design.<br><br>What are the challenges of Repair Café? – volunteer based, mostly retired, skill shortage looming; no home, and no income except donations – free advertising. A vulnerable organisation – in some ways scared of future, but volunteers / environment group encourages more optimism. Suggested interviewing Adelaide Library's Repair Café (supported by government). |