Attn: Right to Repair Right to Repair Productivity Commission

Submission from Dr Guy Keulemans, Sydney, February 1st 2021.

I am a design researcher at the University of New South Wales in Sydney Australia. For a decade I have researched matters of product repair, reuse, design for sustainability and circular economy. My interest began when I was a professional designer confronted with the high levels of waste generated by my own industry.

In 2009 I was an exhibitor and keynote speaker at Platform21's 'Repairing' in Amsterdam, an initiative of Premsela, the Dutch institute for the promotion of design and fashion. This event published the Repair Manifesto, a list of objectives for the design and repair of sustainable, long-lasting products. This event inspired the first 'Repair Café' in the same year and informed the creation of the iFixit Repair Manifesto in 2010. The latter was widely influential and generated interest in 'right to repair' legislation in the US around 2012 (Rosner, 2014) I have followed these developments since and played my own part in the re-emergence of repair culture. In 2019 I was invited back to the Netherlands as speaker and exhibitor for the 10 year anniversary of 'Repairing' at the Amsterdam City Library.

In 2015 I obtained a PhD on design for sustainability with a thesis researching theoretical aspects of repair and reuse. I have published papers and article in peer-reviewed journals and conferences, exhibited practice-based research on repair and reuse in top national and international museums and curated a number of group exhibitions that expand and innovate the practice of repair and reuse for circular economy. Currently I am funded by the Australian Research Council through a Linkage Project *Designing for sustainability using a transformative repair model* in partnership with state-based organisations Australian Design Centre (NSW), Design Tasmania and JamFactory Craft and Design (South Australia).

In this submission I will, firstly, convey the significance of the waste crisis from environmental and economic perspectives and justify the importance of legislation that supports sustainable design for circular economy.

Secondly, I will comment on right to repair legislation specifically. As much as I support it, I will argue it is insufficient by itself to solve the waste crisis. Noting that product stewardship legislation is also included with the inquiry's terms of reference I will argue that product stewardship policy interrelates with right to repair legislation. I will discuss how these two legislative approaches together can comprise part of a wholistic circular economy strategy. Each type of legislation best suits a particular product, and I will propose this determination can develop a principle that may help policy makers create productive, consumer friendly and industry supported legislation.

1. The waste crisis

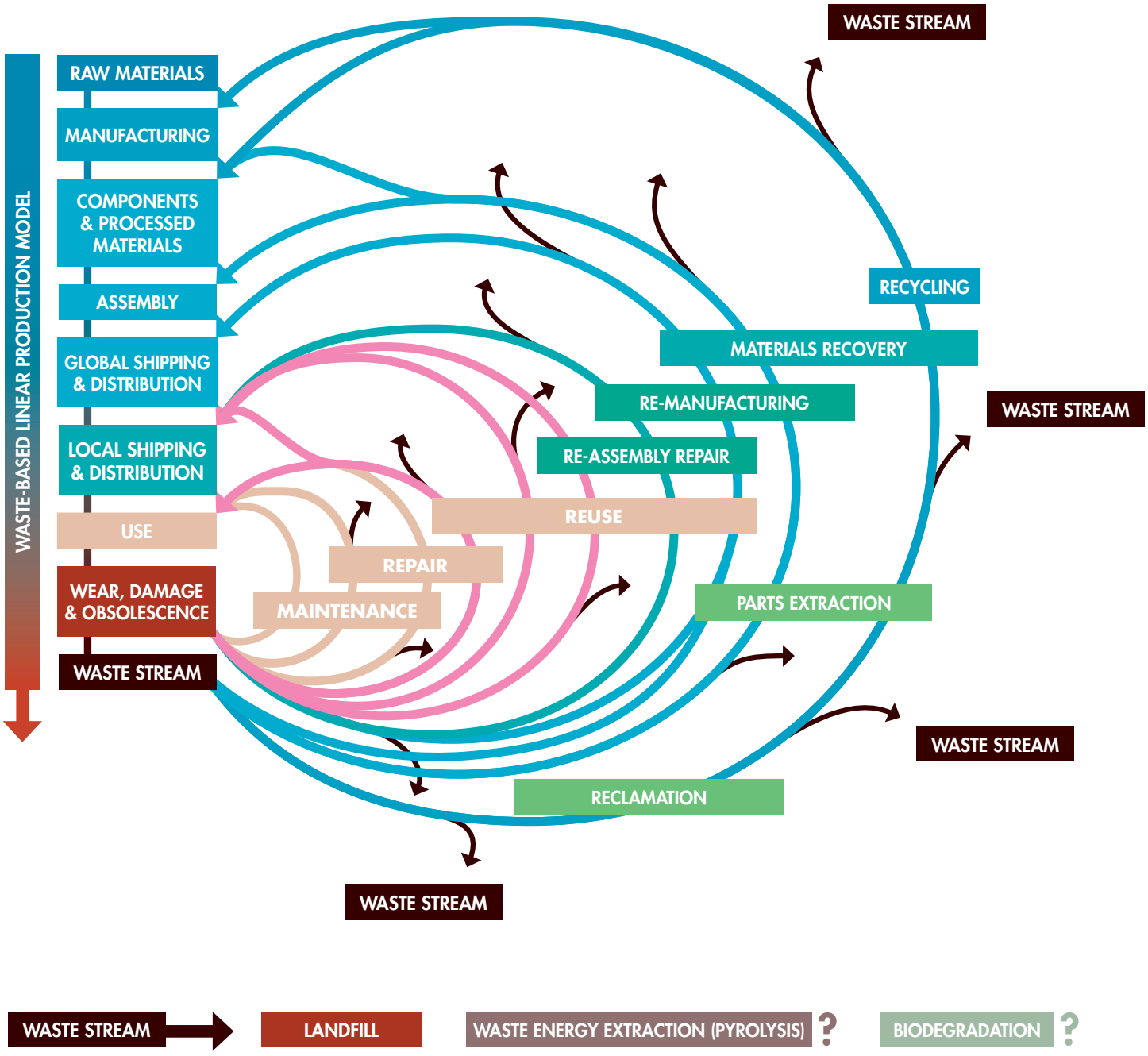
Since the mid-late 20th century, product life cycles have steadily diminished, resulting in increasing levels of consumption for products that typically end up as waste (Slade, 2007). The impact of this waste is calculated through the concept of the ecological footprint: Australia is in the top ten of highest average household ecological footprints. The biggest impact on the footprint is not direct household use of energy or water but indirect use of these via consumption (Lenzen & Murray, 2003), and a full ecological assessment documents consumer goods and services as accounting for nearly 30% of greenhouse gas emissions (ACF, 2007: 5). From 2003 to 2009 the average waste per Australian increased by 128 kilograms to over 1 ton per year (ABS, 2013). NSW, for example, is the *world's* second highest producer of waste per capita (Green, 2018: ix). For households to improve their impact on the environment, they "must go well beyond merely reducing energy and petrol use" and actively start reducing consumption (ACF, 2007: 5). Globally, pollution from excessive production is causing climate change and potentializing mass-ecological harm (IPCC, 2014). Socio-economic impacts of hyper-consumerism include financial pressures and anxiety from household debt (Ritzer, 2010).

As noted in Box 11 on page 22 of the Productivity Commission Issues Paper of December 2020 (hereafter referred to as the Issues paper) e-waste in particular is known to cause harm to humans, animals, plants and their ecologies alike, poisoning waterways, soils and people. While Australia has better managed disposal than some other countries, this is not guarantee against future contaminations problems as waste management sites themselves reach their end of life. Furthermore, there is the waste of valuable materials and elements in e-waste, some of which are known as Critical Raw Materials (CRMs). CRMs are rare materials whose supply is sensitive to geopolitical disturbance, as defined by the European Commission (Mathieux, et al. 2017). Many are mined in China. In our currently linear economy, CRMs such as cobalt, gallium, germanium, tungsten and more become locked up in products and then lost in waste, but they are valuable and rare materials whose availability may become compromised in the future.

Currently, government and industry tend to be focussed on responding to the waste crisis through large-scale industrial methods of material recycling (Slade, 2007; King et al., 2006). However, the recycling industry is largely dysfunctional, with consumers unclear how to dispose of the wide variety of mixed materials in products and councils unable to sort them. Many problems around e-waste disposal and recycling identified in the Issues paper (p. 23) are due to this problem of 'assortment'. In the consumer landscape, many thousands of products become mixed in use and disposal. Any one individual consumer may use and discard dozens of electronic products from dozens of different manufacturers. The identification of mixed, assorted products in waste stream is problematic and therefore is it difficult for waste management bodies to know their potential for reuse or recycling. Even when possible, recycling is a destructive process that requires more energy and can create more waste by-product than repair and reuse (King et al., 2006). I draw your attention to the included Design for Circular Economy Diagram (Fig. 1.) and note that the smaller the loop in circular economy, the more energy efficient the circularity. Recycling is the largest loop, maintenance and repair are the smallest. Circular economy is defined as "an industrial

Figure 1. Design for Circular Economy

Guy Keulemans 2021



economy that is restorative or regenerative by intention and design" (Ellen MacArthur Foundation, 2013).

A related problem is that broken and/or obsolete materials and objects such as clothing, electronic products, furniture, homewares, office products and textiles, are not historically designed to be suitable for recycling systems. This is largely because the entities responsible with designing products, the manufacturing companies, are not the entities held to be responsible for the product at end-of-life, so the end-of-life design is not sufficiently considered in the design phase.

Because the above circumstances have compounded into a waste crisis, I strongly disagree with this paragraph in Issues Paper:

> *Not all impediments to repair require government intervention. For instance, high repair costs may discourage some consumers from repairing their products. Similarly, consumer attitudes and preferences for new products are likely to reduce the number of repairs. But neither of these automatically imply a role for government. (p. 3)*

While both circumstances, high labour costs of repair and high demand for new products, are true and may not be easily changeable by government, both circumstances generate unacceptable external costs through unsustainable levels of waste – should nothing else change. Therefore, government should look for other options that ameliorate their effects. I would say that in regard to the relationships between the cost of repair and the cost of new replacement products, the terms of reference used in the inquiry are too limited. On competition in the repair market, even if costly repair services subsidise cheaper new products, evening out the costs to consumers (p. 12, Box 6), this speeds up consumption cycle which, in a linear waste-based economy, speeds up the generation of waste and contributes to climate change through extra energy spent in production.

There are solutions to these circumstances that are within the terms of reference however. Most visibly, consumers and secondary markets should be given the tools, information and power to conserve materials, reduce consumption and reduce waste by prolonging the lifespans of products through repair. But, this is just one strategy for achieving a circular economy, and there are others. As your Issues paper notes: "premature product obsolescence leads to inefficient resource use and environmental costs by promoting a culture of disposal and waste", so it is crucial to address the waste-based linear economy through legislation that incentivises *circularity* (p. 18, citing AELA 2020 and Giurco & Benn 2014). There are many end-of-life design strategies for circularity (Fig. 1). Just for example, 'remanufacturing', is a nascent but underdeveloped strategy for companies to rebuild new products with parts and materials extracted from old ones.

There would be costs for a manufacturer developing a viable remanufacturing stream within their traditional manufacturing activities, but there are likely to be savings in component and material costs too. Costs are, regardless, appropriate because they replace the externalities of waste currently paid by society. Nonetheless, manufacturers will need a push to develop circular lifespans for their products. As I will explain, within the inquiry's terms of reference, it is not right to repair legislation but product stewardship legislation

that has the better chance to encourage manufacturers to design products that can be remanufactured into new products.

2. Right to Repair x Product Stewardship legislation

Poor design choices made by manufacturers generate waste through obsolescence, lack of repairability, lack of capacity to be disassembled etc. Yet, the responsibility for waste is disproportionately placed on consumers and government who do not have the manufacturer's knowledge of products to know how best to circularise them. This matter is identified in the Issues paper as 'information asymmetry' (p. 3). A related term is 'blackboxing', a conceptual (sometimes literal) term for products whose inner workings are unclear or inaccessible. Product stewardship is a concept that highlights the manufacturer's responsibility over their product end of life and their capacity to 'see into' the black box they created. Good product stewardship conceptualisation should consider matters of information asymmetry, especially when it regards information about the product that the manufacturer does not want to share for intellectual property reasons or for competitive advantage.

However, the concept of product stewardship can be watered down. For example, the language used to describe the product stewardship scheme of the Government's Department of Water, Agriculture and the Environment describes the idea of 'shared' responsibility. It is a voluntary scheme that does not categorically define manufacturers as responsible for their products, but rather sharing in responsibility with consumers.[1] I don't dispute that consumers have some responsibility – they are, after all, in closest proximity to products when they break or obsolesce. Governments also take on responsibility through their provision of waste management practices. But as I discussed above, this status quo has failed because of information asymmetry and the problem of assortment.

Conversely, the language around right to repair legislation involves the responsibility of manufacturers to design for repair and release technical information and tools required for repair, but then the *responsibility* of the repair becomes implicitly tied to the *rights* to repair. It is important to recognise that while right to repair legislation is necessary for many products, it reasserts responsibility for product end-of-life back on the consumer and secondary market, not the manufacturer, so the problem of waste assortment remains, even if the asymmetry problem is lessened.

And significantly, capacity for repair in the secondary market is decreasing, not increasing. While the Issues paper note the public interest in DIY consumer repair and repair cafes (p. 1) this demand is driven by declining professional repair services. From the shoe or watch repairer, to the local seamstress, the number and presence of professionals that can viably repair our products has declined with increased labour costs in the developed world. This is why street-level repairs are so much more visible in parts of Asia, Africa and other areas of the global South; it is still economically viable. Given that labour costs will continue to trend upwards and that in an increasingly affluent and educated society there is lower demand for trade-based employment in repair services, the responsibility for repair should not be

[1] https://www.environment.gov.au/protection/waste/product-stewardship

largely laid at the hands of the consumer or secondary market. In some sense, 'right to repair' activism might even be a distraction that abrogates manufacturer responsibility for creating products that are unrepairable by design and often released into a consumer landscape without the support of viable repair services.

Notwithstanding the limits to repair in the secondary market due to labour costs, right to repair legislation demanding the use of open standards, publication of technical information and unrestricted supply of OEM or third party replacement components and tools has capacity to open up blackboxed products and encourage repair. It is important for consumer-level DIY repairs, but especially professional repair services for consumers and industry. It can help to provide competitive, unrestricted repair of products preventing the waste of their material and embodied energy. Subsidies or tax concession for repair service are also important.

The type of products for which rights to repair work well are technologically stable, meaning that major innovations in form and function have plateaued, with only minor incremental improvements from year to year. Examples include many domestic appliances, such as dishwashers or dryers, and bicycles. The bicycle industry is an especially good example of an industry that uses open standards and minimal black boxing (unlike the automotive industry) facilitating a healthy professional repair economy and home repair capacity. These are industries in which research and development of new features has relatively less impact on product demand than research and development on quality improvements.

But right to repair is not the best solution for all products. As noted in the Issues paper, some manufacturers object to the use of open standards and publicly available technical information. They say it may infringe on their intellectual property, encourage copycat products or limit competitive advantage borne from investment in research and development. These are serious concerns due to their potential impact on product innovation. But the status quo, in which repair of technologically sophisticated products is untenable when they break due to complexity or cost, cannot continue because of the environmental damage they cause (especially e-waste). In such cases, manufacturers should be compelled to take stewardship of their broken or obsolete products, reclaim the product components and materials and be incentivised to repair or remanufacture it themselves (in full possession of the technical knowledge and resources to do so).

The product stewardship approach may be resisted by industry because of the expense in incurs. While some manufacturers offer it as an enticement to sustainability-minded consumers ('Patagonia' clothing brand is a notable example), its uptake is limited by lack of competitive advantage. This is why it must be legislated to place all manufacturers on a level playing field. Such legislation would then have the advantage of incentivising innovation and efficiency in production stewardship techniques. This is by no means trivial as there are many complexities to retrieving broken or obsolete product from the consumer landscape; the must be identified, collected, sorted, disassembled with parts allocated for repair, reuse, remanufacturing or recycling into new products. Systems for tracking products in the consumer landscape (for example, through digital product registration) or financially motivating consumers to return broken and obsolete products may be needed, but these have precedent. Making stewardship a requirement for any and all products that cannot be

easily repaired by third party professional repair services, for whatever reason, should however, encourage innovation in circular economy and remanufacturing. Examples of product types that fit well to the stewardship model are products that are technologically complex and still innovating, for example, computer devices, mobile phones and electric vehicles.

Together then, the 'right to repair' legislation and 'product stewardship' define an axis of responsibility on which every manufacturer must sit. Don't want to release all your technical manuals and use open standards? Fine, then you are responsible for the costs of collecting and remanufacturing your product when it breaks. Don't want your business to have responsibility for taking care of your products after use (beyond existing obligations under Australian Consumer Law)? Fine, then publish all your technical documentation and provide OEM components and tools, or allow third party companies to do so).

It is worth pointing out that how much a manufacturer has retained their stewardship may be determined as a consequence of complementary legislation. Legislation that requires the determination and publication of a "reparability rating" (such as in EU ecodesign regulations) is a proxy for stewardship determination because products with poor repairability can be considered still within the stewardship of the manufacturer. In other words, relinquishing stewardship can be a privilege earned by proper design and support for consumer repairability.[2]

Therefore, product stewardship and rights to repair legislation sit on an axis of product lifespan responsibility, and I encourage the Productivity Commission to examine them together in relation. *How* the two approaches may sit together on this axis is a question for industry and policymakers. Can manufacturers choose elements of both for their products, a hybrid approach? I have no doubt that manufacturers should provide one or other, or both together, in complete measure, because the environmental and economic cost of generating waste is now far too great to ignore.

In many respects, the 20th century was an era of great innovation in the human *safety* of products; manufacturing toxins were regulated and many dangerous products were improved so as not to electrocute, catch fire or harm their users. The 21st century is now the time for innovation in *environmental* safety and material sustainability through the efficient, sophisticated circularity of products.

[2] As a side note, the positive economic consequences of such legislation become very interesting when considering the impacts on international imports. Since the 90s it has been the prevailing political consensus that tariffs are largely undesirable for most consumer products because they stifle innovation, a policy that has seen a decline in Australian-made product as local manufacturers unsuccessfully compete with international imports made in economies with cheaper labour costs. The implementation of product stewardship legislation could be done in a way that advantages and incentives innovation among local manufacturers, redresses lack of tariffs, and requires foreign manufacturers to take responsibility for the external costs their product waste generates for Australia.

REFERENCES

Slade, G. (2006). *Made to break: technology and obsolescence in America*. Cambridge, Mass: Harvard University Press.

Lenzen, M. & Murray, S.A. (2003).The Ecological Footprint – Issues and Trends, *Integrated Sustainability Analysis Research Paper* 01-03, The University of Sydney.

ACF (Australian Conservation Fund). (2007). Consuming Australia: Main Findings. A report based on data collected and analysed by the Centre for Integrated Sustainability Analysis at the University of Sydney.

ABS (Australian Bureau of Statistics). (2013). Measures of Australia's Progress, 14/11/2013.

AELA (Australian Earth Laws Alliance) 2020, *Challenging Consumption & Planned Obsolescence,* www.earthlaws.org.au/our-programs/challenging-consumption/planned-ob/ (accessed 1 October 2020).

Ellen MacArthur Foundation (2015). Towards a circular economy: Business rationale for an accelerated transition. Ellen MacArthur Foundation.

Green, P. (2018). 'Energy from waste' technology. New South Wales. Parliament. Legislative Council. Portfolio Committee No. 6 – Planning and Environment [Sydney, N.S.W.]. 223 pages.

Giurco, D. and Benn, S. 2014, 'Explainer: what is the circular economy?', *The Conversation*, 25 February.

IPCC. (2014). Climate Change 2014: Synthesis Report. *Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Switzerland, 151pp.

Ritzer, G (2010). Enchanting a disenchanted world: Revolutionizing the means of consumption. Thousand Oaks: Pine Forge Press.

King, A.M, Burgess S.C., Ijomah W., McMahon C.A. (2006). "Reducing waste: repair, recondition, remanufacture or recycle?" *Sustainable Development,* 14 (4) (2006), pp. 257-267. DOI: 10.1002/sd.271

Mathieux, F., Ardente, F., Bobba, S., Nuss, P., Blengini, G., Alves Dias, P., Blagoeva, D.,

Torres De Matos, C., Wittmer, D., Pavel, C., Hamor, T., Saveyn, H., Gawlik, B., Orveillon, G., Huygens, D., Garbarino, E., Tzimas, E., Bouraoui, F. and Solar, S., *Critical Raw Materials and the Circular Economy – Background report.* JRC Science-for-policy report, EUR 28832 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-74282-8 doi:10.2760/378123 JRC108710. Accessed from: https://www.researchgate.net/profile/Bernd_Gawlik/publication/321998000_Critical_raw_materials_and_the_circular_economy/links/5a3ce345458515f7ea5416c0/Critical-raw-materials-and-the-circular-economy.pdf