Made to Last:

Product life extension through emotional durability

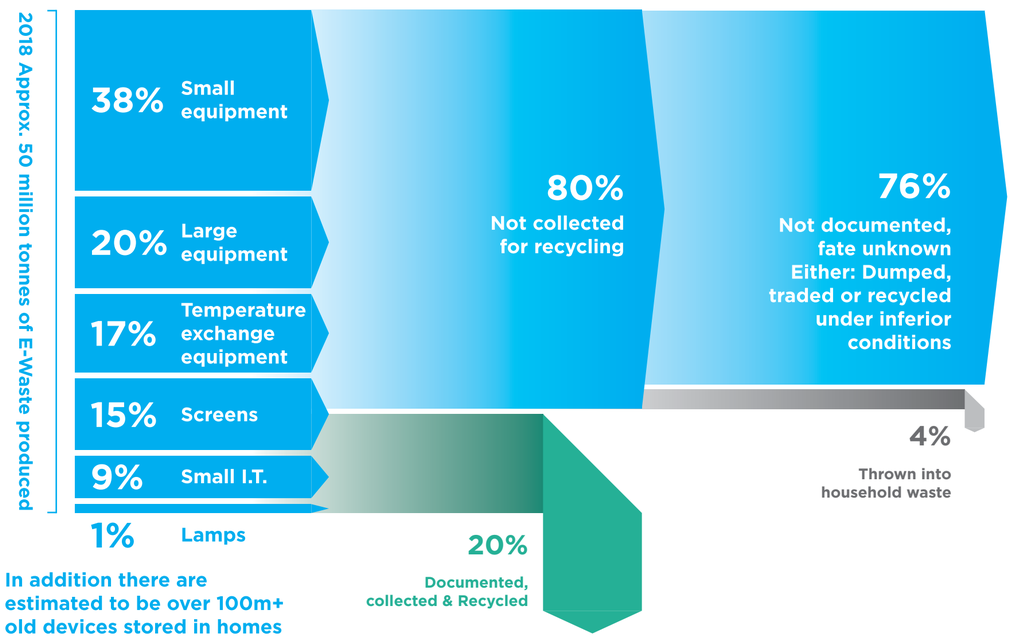
The problem of E-Waste

Confronting the climate crisis has largely focussed on adopting efficient renewable energy generation and the phasing out of fossil fuels, UKERC (2019). This research will instead focus on the embedded carbon emissions within the design of products by tackling the growing problem of electronic waste (E-Waste). E-Waste is “anything with a plug, electric cord or battery from toasters to toothbrushes, smartphones, fridges, laptops and LED televisions that has reached the end of its life.” PACE (2019). E-Waste is also known as waste electrical or electronic equipment (WEEE) HSE (2019).

WEEE is now the fastest growing waste stream in the world, United Nations University (2017). It is estimated that this waste will reach 52 million tonnes in 2021, Baldé et al. (2017). WEEE is also far more toxic for the environment as it contains harmful chemicals, printed circuit boards and metals alongside the large plastic content, PACE (2019). The recycling rate of WEEE documented to be collected and properly recycled was estimated at 20% globally in 2018, Baldé et al. (2017). The largest proportion 38% of WEEE is classed as Small Equipment, and this category is set to rise at 4% yearly up to 2020 Baldé et al. (2017). As this is the largest problem area this will form the focus of the research study as it will aim to have the largest impact.

[1.] Leeds Recycling Centre, small electronic equipment (2019) Silkstone, R.

Global E-Waste Flows

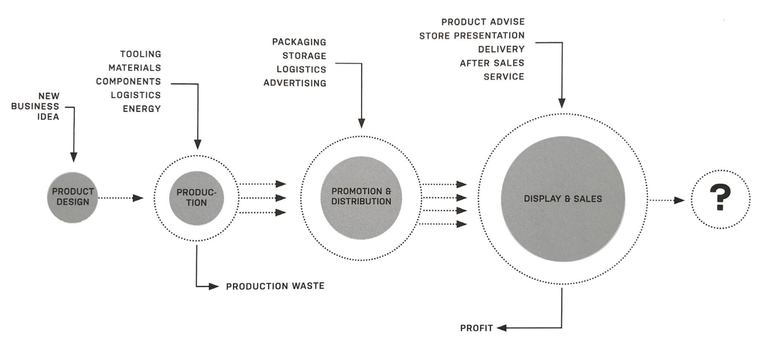


[2.] Global e-waste flows. (2017) Baldé et al.

Planned Obsolescence

Disposability was in the past used to refer to small low cost items designed for single use, however in today’s “throwaway culture” it is socially acceptable to discard anything from a hardly used laptop, microwave, or smartphone to an entire fitted kitchen or bathroom, Chapman (2008). Giving products a limited lifespan driven down by cost reductions to meet lower price points has become commonplace and has allowed for changing tastes and fashions, as a consequence it has encouraged the convenience of disposability. Chapman (2009). Chapman determines that “The design, production, and consumption of domestic electronic products is fundamentally unsustainable – new approaches are urgently needed”.

This type of production and consumption can be described in a linear economy model and does not consider the future of the product past the point of purchase. Increasing energy and resources are in-putted and value is amassed at each step of the production cycle up to the purchase point where it disappears beyond the ‘newness horizon’. Bakker et al. (2019).

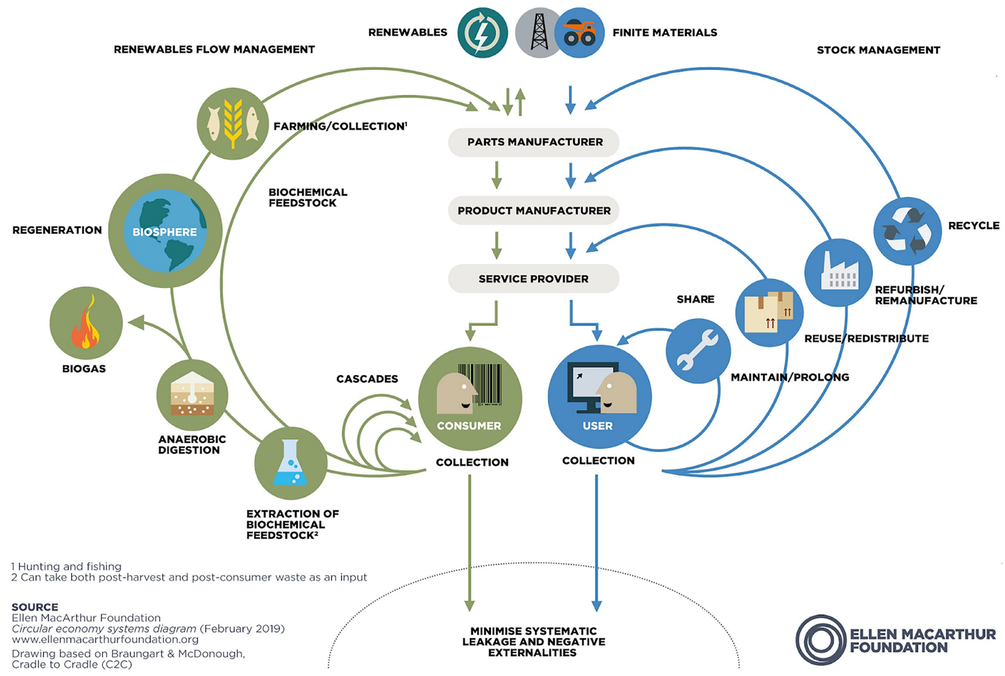


[3.] linear economy model. (2019) Bakker et al.

Circular Design

The circular economy is a systems-level approach to economic development designed to benefit businesses, society, and the environment. Technical cycles (blue) mimic nature to recover and restore products, components, and materials through strategies including reuse, repair, re-manufacture, or (in the last resort) recycling. (2019) Ellen MacArthur Foundation. Technical cycles and considerations can be better managed if implemented at the initial design phase of a product as described in Products That Last (2019) Bakker et al. 6 Strategies for Circular Product Design:

1. **Design for Product Attachment and Trust**
   Creating products that will be loved, liked or trusted longer
2. **Design for Product Durability**
   Developing products that can take wear and tear without breaking down
3. **Design for Standardization & Compatibility**
   Creating products with parts or interfaces that fit other products as well
4. **Design for Ease of Maintenance and Repair**
   Enabling products to be maintained in tip-top condition
5. **Design for Upgradability & Adaptability**
   Allowing for future expansion and modification
6. **Design for Dis- and Reassembly**
   Ensuring products and parts can be separated and reassembled easily



[4.] Circular economy systems diagram (2019) Ellen MacArthur Foundation

Emotionally Durable Design

In an effort to challenge the paradigm of consumption Chapman sets out a theory to foster greater product and user relationships. He states how we can very quickly fall out of love with a product as the novelty wears off and as a consequence seek replacement. Emotionally durable design (EDD) seeks to wean people off their desire for something new and instead design products that give better more lasting experiences and products that users will identify with and want to keep for longer, Chapman (2005).

Delaying product replacement and encouraging product longevity is dependent on the emotional bond that is created between the user and their product. Forming an attachment with a product is created over time and the longer a product is owned the more likely feelings of sentimentality and nostalgia will form, Page (2014). It is this attachment that can form between a user and their product that can be strong and meaningful enough for the user to delay or prevent product replacement.

Research Questions

What influences the significant, emotional attachments in product user interactions?

How can we use these insights to design small electronic products that people want to keep for longer?

Further Work

The MA Creative Practice research will be underpinned by EDD and qualitative mixed methodologies to uncover the reasons why people form attachments with certain products. Interviews, focus groups and questionnaires will inform the design and development of new products with the whole life cycle in mind through the consideration of materials within circular business models for long term sustainability.

Key References:

Figure 1: Leeds Recycling Centre, small electronic equipment (2019) Silkstone, R.
Figure 2: Global e-waste flows. Baldé, C. P., Forti, V., Gray, V., Kuehr, R., Stegmann, P. (2017) The Global E-waste Monitor 2017 Quantities, Flows, and Resources. Available at: http://ewastemonitor.info/
Figure 3: Linear economy model. Bakker, C., den Hollander, M., van Hinte, E., Zijlstra, Y. (2019) Products That Last: Product Design for Circular Business Models. B/S Publishers, Amsterdam.
Figure 4: Circular economy systems diagram. Ellen MacArthur Foundation. (2019) Completing the Picture: How the Circular Economy Tackles Climate Change. Available at: https://www.ellenmacarthurfoundation.org/publications

Bakker, C., den Hollander, M., van Hinte, E., Zijlstra, Y. (2019) Products That Last: Product Design for Circular Business Models. B/S Publishers, Amsterdam.
Baldé, C. P., Forti, V., Gray, V., Kuehr, R., Stegmann, P. (2017) The Global E-waste Monitor 2017 Quantities, Flows, and Resources. Available at: http://ewastemonitor.info/
Chapman, J. A. (2009) ‘Design for (Emotional) Durability.’ Design Issues, 25, 4.
Chapman, J. A. (2008) Emotionally Durable Design: Sustaining relationships between users and domestic electronic products. Doctoral thesis, University of Brighton.
Chapman, J. A. (2005) Emotionally Durable Design: Objects, Experiences and Empathy, 1st ed. Routledge: London.
Ellen MacArthur Foundation. (2019) Completing the Picture: How the Circular Economy Tackles Climate Change. Available at: https://www.ellenmacarthurfoundation.org/publications
Health and Safety Executive (HSE). (2019) Waste Electrical and Electronic Equipment recycling (WEEE). Available at: https://www.hse.gov.uk/waste/waste-electrical.htm
Page, T. (2014) ‘Product Attachment and Replacement: Implications for Sustainable Design.’ International Journal of Sustainable Design, 2, 265–282.
Platform for Accelerating the Circular Economy (PACE) (2019) A New Circular Vision for Electronics: Time for a Global Reboot. In collaboration with the United Nations E-waste Coalition. Available at: http://pacecircular.org/resources
UK Energy Research Centre (UKERC) (2019) Review of Energy Policy 2019. Available at: http://www.ukerc.ac.uk/publications/rep19.html
United Nations University. (2017) E-waste Rises 8% by Weight in 2 Years as Incomes Rise, [Press release], 14 December 2017, Available at: www.unu.edu/media-relations/releases/ewaste-rises-8-percent-by-weight-in-2-years.html

SUSTAINABLE DEVELOPMENT GOALS

3 GOOD HEALTH AND WELL-BEING
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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