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An Investigation into How Designers, in Wales and Europe, are
Now Focusing on the Concept of Sustainability and the
Circular Economy to Overcome the Problem of Waste Within
the Design Industry.

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Summary of topic

This independent inquiry will focus on how designers are using the concepts of sustainability and the circular economy model to overcome the problem of waste within the design industry. By including the ideas from the likes of Alister Fuad-Luke, Stuart Walker and Richard Buchanan, it will specifically look at the current implications of designing sustainably. It will explore “wicked problems” (Rittel and Weber, 1973; Hendericks, 2003; Buchannan, 1992) and the movements and organisations that currently have solutions in place.

Introduction

Design is everywhere, from the clothes you are wearing to the furniture you sit on, but as Alice Fisher says, “[Design] could also save the planet if we find the right sustainable practice” (2019). This Independent Inquiry will focus on the implications of sustainability within design. Through my University experiences and research, I have discovered that the design industry has many “wicked problems” (Rittel and Weber, 1973; Hendericks, 2003; Buchanan, 1992), most prominent the disposing of waste sustainably. My second year of university enabled me to take part in a project focusing only on waste with a furniture company from Wales. As a part of the brief, I was only allowed to design from the waste created from their factory. This introduced me to the massive reoccurring problem of waste within the design industry. Such a visit led me to undertake an investigation looking in to how designers are now focusing on the concept of sustainability and the circular economy to overcome the problem of waste within the design industry. In most cases textile waste is currently disposed of in the general waste stream or incinerated. This is quite clearly problematic for the environment. Such a problem led me to investigate into other more environmental ways of disposing textile waste.

Going into my third year of university I am focusing on how I can be a responsible sustainable designer once I graduate and to ensure I can somewhat decrease my contribution to the waste stream. Focusing on the problems associated with being a sustainable designer will lead to exploring the current solutions that have already been devised. Chapter 1 will discuss the implications of sustainability as a word and concept, focusing on how designers tackle the “wicked problems” of sustainability within design. It will also look into the environmental problems and the reasons they are around today. The focal point throughout my project will be based on the ideas from the work of Alister Faud-Luke, Stuart Walker, Brain Lawson and Richard Buchanan. Chapter 2 which looks at the waste issues within the sustainability challenge. It will explore the solutions already in use by focusing on the movements and organisations already in place that encourage ways towards a sustainable future. Chapter 3 focuses on the circular economy model and how businesses in Wales and Europe are using the model to plan for a sustainable future. My case study of work carried out at Orangebox will also be outlined and analysed in chapter 3.

Chapter 1

The implications of “sustainability” as a word and concept is dangerous because of the ongoing environmental pressures on the planet as a living organism (Lovelock, 1979). This current moment of pressure puts designers in a pivotal position to work sustainably by becoming “design activists” (Fuad-Luke, 2009). In his book, *Design Activism (2009)* Fuad-Luke showcases a range of co-design approaches to Design which includes the planet as a key stakeholder. Design activists are encouraged to use their talents as designers to create a positive impact on the world. It is about understanding the problem in depth and using design knowledge to challenge the problem and achieve a better alternative. “Design activism is design thinking, imagination and practice applied knowingly or unknowingly to create a counter-narrative aimed at generating and balancing positive and social, institutional, environmental and or economic change.” (Fuad-Luke, 2009, p. 27). In order to create a positive impact, you would need to focus on balancing these important factors i.e. environmental and socio-economic factors and challenge them to create positive design outcomes. By considering these factors in depth, it will allow designers to input their ideas into the current sustainability challenge. Design activists can use their designs carefully in ways that circulate their positive ideas.

Defining sustainability is not easy as there are so many understandings of the term. One definition is “the avoidance of depletion of natural resources in order to maintain an ecological balance” (OED, 2019). This definition explains how the idea of sustainability is to maintain resources at a reliable rate to ensure they are available for future generations. In the *Craftsman*, Richard Sennet also suggests that sustainability involves finding the correct consumption balance to maintain resources, it states “Sustainability suggests living in more at one with nature, [. . .] establishing an equilibrium between ourselves and the resources of earth” (Sennet, 2009 , p. 12). This is implying we should have a better relationship with the environment in order to find a steady balance between resources and consumption. An article shows how the IPPC suggest the ideas of only having ‘12 years left’ before the most devastating impacts of climate change are irreversible (Watts, 2019). This means it is most definitely time for change. However, sustainability is all about keeping everything the same,

sustaining what we have already got or making sure we can keep using everything reasonably to always ensure it is there. Hence, there needs to be changes made to the amount of consumption used before the ideas of sustainability can be met and kept the same.

Fuad-Luke's definition of sustainability is a lot more in depth than others, he believes that it can be defined by ensuring there is a balance of three interdependent elements,

- (1) protection and enhancement of natural ecosystems and resources;
- (2) economic productivity; and
- (3) provision of social infrastructure such as jobs, housing, education, medical care and cultural opportunities (Fuad-Luke, 2009, p. 23).

In order to protect the world for our future generations we will need to look after these three key ideas suggested by Fuad-Luke. We need to make sure that we do not use all-natural resources, we need to keep an eye on the economic productivity as well as looking after the key social problems in order to keep everything running sustainably. By controlling the levels of pollution and resources is crucial to achieve a sustainable future. Sustainability within design focuses on reducing the negative impacts on the current environment without harming the environment for the future.

Despite the fact that we should supposedly be looking after our consumption of resources in order to be sustainable, we need to limit the use in order to prevent the environmental problems discussed below. The ever-growing population plays a crucial part in the amount of resources being used. Tony Fry explains that, "As the number of people on Earth ever increases so does post-industrial cultures appetite for resources and energy" (Fry, 1994, p. 9). The ever-growing population is a problem, without consumers then putting pressure on industries to keep producing more in order to match rapid growth patterns. The book referenced below highlights and explains how something must be done quickly by us as a population in order to save valuable resources. It states that "We may have reached a stage where pollution and environmental degradation have become so widespread that the industry must now reproduce the conditions and resources which were previously considered part of nature and therefore free" (Parlyn, 2016, p. 6). This suggests that effects of the population now being so widespread has caused large scale environmental problems.

Something has to be done urgently to ensure change can happen effectively and efficiently. It is time for designers to step in and really focus on environmental needs of the planet.

A system-oriented design usually focuses on problems within the environment. Systems thinking allows people to understand how one thing will lead to influence another, usually within a type of flow. An efficient system, involving sustainability, will be needed to allow regeneration of resources in order to sustain and develop for the future. It states that “Sustainability is grounded in ecological praxis and systems thinking. It challenges the capitalist system of production and consumption that assumes unlimited growth” (Faud-Luke, 2009, p. 23). To stop us as designers and the general public thinking that the supply and growth of resources are unlimited it suggests we need to think about the term sustainable development (Brundtland), however how can you sustain something but still develop it at the same time? Boenhert argues this, she said “Sustaining or increasing levels of consumption with more people wanting to consume more resource intensive stuff on a diminishing resource base cannot happen indefinitely.” (2018, p. 76). Boenhert explains that the idea of sustainable development isn’t realistic in the long term. Development is usually linked to growth so there has been a lot of controversy on how a word like “sustainable” can be linked to development. How can something which is meant to last a long time at a similar pace, also be developing which means constant growth?

Sustainable development as a strategy was first highlighted in the Brundtland report (1987). The report mainly focused on how environmental problems globally were the result of the poverty from the South and the unsustainable amount of consumption and production caused by the North. Gro Harlem Brundtland came up with a sustainable development strategy in order to improve these environmental problems. It stated that, “Sustainable development is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs” (Brundtland, 1987). This suggests that even back in 1987, people realised that there were environmental problems that needed to be addressed imminently without sacrificing future generations. People need to be careful of their everyday uses of materials effecting valuable resources and nutrients needed for years to come.

One environmental problem that was critical back in 2000 was the large amount of natural and man-made resources that were being used. The graph below illustrates that the highest amount of total resources being used was around the year 2000, just 20 years after the Brundtland report. It is clear that he realised this was the worst it had ever been and needed to prevent it from increasing in the future. Since then, the amount of total resources used has slowly decreased, suggesting that the Brundtland report introduced and highlighted to people a growing problem at a very crucial time, where people started to listen.



Fig 1 – Graph of Raw Material Consumption.

Figure 1 can suggest that sustainability is much more prominent now in the 21st century than in any previous period. This can be said as the graph shows that the number of resources being used has decreased to almost in half since 1985. These figures could be as a result of the prominence of sustainability in society today. Since the Brundtland report was released, people have been trying to improve their contribution to the world's global warming problem. Campaigns are now used to highlight the importance of recycling and

being mindful of your waste will help reduce greenhouse gas emissions. By making new products out of old recycled materials means there is no need to extract from virgin natural materials / resources which is where the greenhouse gas emissions originate from.

Walker believes we have still only touched the surface of this “wicked problem” (Rittel and Weber, 1973; Hendericks, 2003; Buchanan, 1992). In the book *Sustainable by Design*, Walker says “Sustainable design is a vast subject that we have barely begun to tackle and so it would be unwise to attempt to definitive a solution.” (Walker, 2006, p. 3). This suggests that designers are still not achieving the ideas of sustainability. Designers are supposed to challenge these problems to come up with a range of new innovative ideas for the future. However, these problems are difficult to address as they are most likely associated as “wicked problems”, defined as “a social or cultural issue or concern that is difficult to explain and inherently impossible to solve. Examples of wicked problems in today’s society include things like income disparity, poverty, hunger, health care, obesity and terrorism.” (Hendericks, 2003). Some wicked problems are constantly changing under circumstances that are often too difficult to predict. This is making it harder to sustainably to design for the future as no one really knows what is going to happen, Brexit is one example of this. Similarly, Climate change impacts and effects designers as its unpredictability is problematic for designers in the future. Designers are expected to design for the future even though they do not know how it will affect them in five years’ time.

Richard Buchanan highlights that it is a designer’s job to tackle these “wicked problems”. When talking about wicked problems he states, “The designer’s task is to identify those conditions precisely then calculate a solution” (Buchanan ,1992, p. 15). This explains how designers are always encouraged to push boundaries and explore new areas of design that have never been touched before. Even if they seem impossible to overcome it is still their task to create solutions.

Similarly, Lawson believes that designers are better known when they have come up with solutions. He says, “Designers are traditionally identified not so much by the kinds of problems they tackle as by the kinds of solutions they produce.” (Lawson, 1998, p. 51). This statement is important to designers in order to make their work memorable especially if

they've come up with a solution to a problem. As mentioned above, Fraud-Luke (2009) similarly suggests that designers should use their talents to create a positive impact on the world through design activism. So, your role and task as a designer would be to challenge the problems within sustainability challenge to creative positive outcomes.

However, it can be argued that the design industry primarily focuses on the economic side of design, ensuring they can achieve a design in the most economical way. This encourages designers to focus more on the consumer's needs rather than problems within design, for example, not considering how a design will affect the environment. Boehnert recognises that "Many designers are motivated to use their skills to address social and environmental problems they see proliferating around them. The design industry, on the other hand, operates according to the logic of capitalism, that is, oriented towards the economic profit." (2018, p. 38). This is frustrating as designers are taught to use their skills to address social and environmental problems but encouraged by the industry just to focus on the economics. Clifford also observed similar points that "[. . .] Designers have often been guilty of feeding on consumer wants rather than working to satisfy the basic needs of the global population" (2009, p. 144). This is because the design industry mainly focuses on what designs sell and the needs of a certain product rather than the problems they need to solve. As these environmental problems are getting worse, designers cannot afford to ignore them anymore.

Chapter 2

Chapter 2 will concentrate on the waste issues within the “sustainability challenge”. It will also explore the ideas, movements and organisations it should give an idea of the types of solutions around. A number of movements and organisations are trying to push for the population as a whole to be sustainable.

The concept of waste elimination sounds beneficial however, it is argued that it will never be achieved in these current times of pressure on the planet. “The imperative of waste elimination cannot come to the fore within this burgeoning industry”. (Fry, 1996, p. 11). Here Fry explains how waste elimination is such an essential solution needed but not achievable due to the current effect of pressures on industries. The production industry is growing rapidly as a result of the amount of consumer demands. As stated above, the pressures to create enough products to keep up with the rapid population growth simply means industries are not focusing on the most sustainable way to do things. They should want to produce products, quickly and efficiently, in the most environmental way but in most instances, this is not the case.

In most cases, textile and furniture waste is currently disposed of in landfill sites or being incinerated. In the book *Cradle to Cradle* (2009) it is highlighted that people, especially in Britain, believe that incineration is a good solution to waste reduction. McDonough and Banghart question ‘Are we too quick to embrace some “solutions”? Britain has planned to build a hundred more waste incinerators – why? Through incineration you lose all the nutrients which should go back into the technical and biological cycle.’ (2009, p. 5). Here the quote explains how people genuinely believe that incineration will reduce waste. Yes, incineration quickly gets rid of the waste, however, people believe it is a good thing because once the waste is out of sight, it is out of people’s minds.

An article by Tom Bawden explains how the United Kingdom will be investing in more incineration plants, it states that “Incineration will soon account for more than half of all waste disposal [. . .] Sixteen new incinerators are under construction, which will increase burning capacity by more than a third. A further 45 incinerators have been approved but

haven't started building and 40 more are at planning stages." (Inews.co.uk, 2019). This also suggests that people do consider incineration to be a quick, easy and good way to disposing of waste. There are some advantages to waste incineration; it allows production of heat and power while eliminating harmful germs and chemicals. It also saves the transportation of waste, usually incineration plants are near big cities, so waste does not have to travel as far as it would normally to be dumped in a landfill site. Compared to a landfill site, incineration produces less of a smell as all the waste gets burnt. However, incinerators are harmful to the environment as they produce poisonous gases such as nitrogen oxide. The possibility that incinerating waste as a solution will work in long-term is slim. Incineration simply does not encourage waste reduction, if anything it encourages people to produce more waste as it can be burned and forgotten about so easily.

Waste is not just a problem within the textile industry, waste is everywhere. People create waste without even realising it. "Waste is made by mind and action, these two sites of its creation and decay both have become registrations of an unthinking." (Fry, 1996, p. 14). Here Fry explains how people throw away products without the consideration of the consequences they will create afterwards. People are quick to throw items in landfill sites and incineration plants without considering the other options that are available, for example recycling.

People are encouraged to rethink whether their waste is reusable. Currently, in the United Kingdom the three R's, "Reduce, Reuse and Recycle" are a common approach to overcome waste within the textile industry. The aim of it is to ensure that the maximum use of the product is fulfilled, whether it is reusing the whole product again, reusing parts, or extending its life enabling it to be used for a longer period of time. In most cases people know how to recycle their clothes, as it is the easiest option within recycling textiles as most people can take items to the charity shop. However, it is not so easy when it comes to recycling home-wear and textile objects. WRAP, a UK government run organisation helps delivery waste prevention strategies. WRAP focuses on all types of recycling, they have statistics on how much different types of waste effects the UK. They suggest solutions for you to help improve your contribution to waste. Their website defines textile waste as: -

With non-clothing textiles making up **19% of all bulky waste in the UK**, WRAP's work on sustainable textiles doesn't focus solely on our work around fashion and clothing. As part of this research, WRAP has closely examined how **sustainable principles and practices can be applied to non-clothing textiles** from both the household and wider-industry. (Wrap.org.uk, 2019).

This is helpful to people who are considering recycling textile waste because it doesn't just mention clothing, it also focuses on the other side of textile waste, the household items. Most people do not even consider recycling such as carpets and mattresses, they in are most likely to be thrown away without consideration.

WRAP Cymru is the same organisation but Focuses their strategies of waste reduction specifically in Wales. It has achieved a certification of its design development, management and delivery of programmes and projects which provide resource sustainable solutions. WRAP's main vision is that globally resources are used sustainably (WRAP, 2019). They believe that be re-inventing how people design, produce and sell products and re-thinking how people then use and consume products possibly through re-using or recycling will accelerate a move to a more sustainable planet.

Another government run act in Wales that encourages change for the better, is the Future Generations Act 2015. It requires public bodies in Wales to think about the long-term impact on their decisions, to work better with people and the environment.

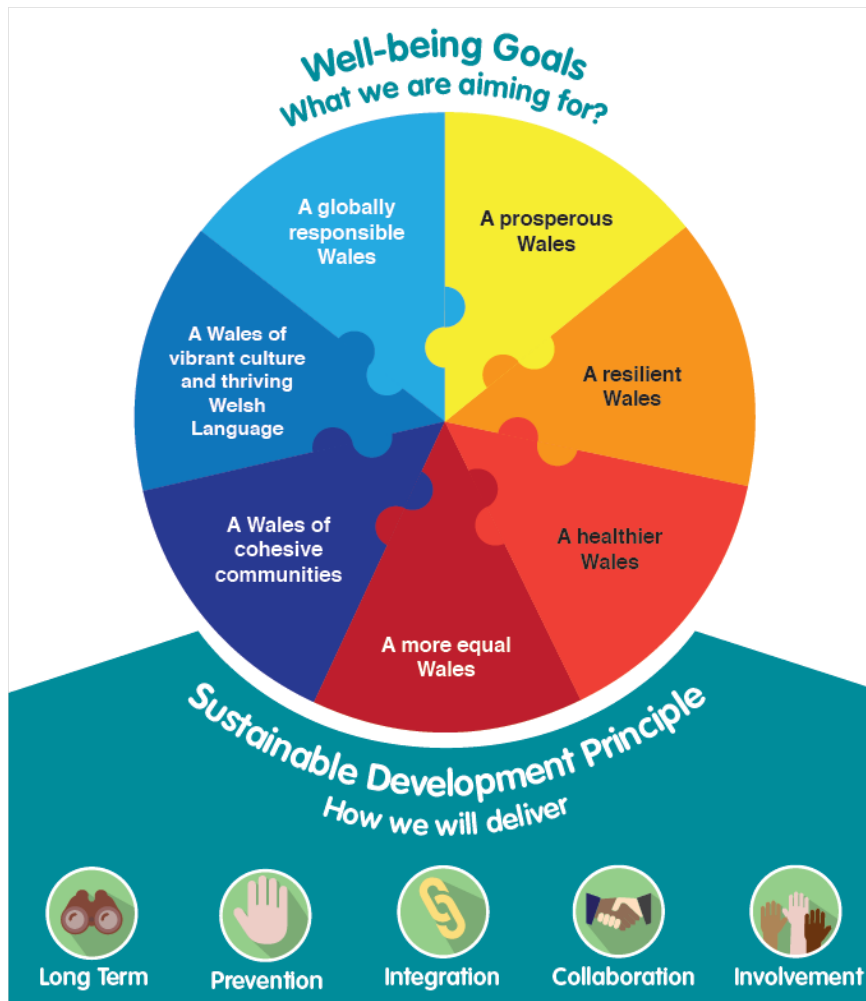


Figure 2 – Future Generations Act campaign poster.

Figure 2 is a campaign poster for The Well-being Future Generations act 2015. The act seeks to improve social, economic, environmental wellbeing of Wales. They encourage people to think about the long-term effects of what they do in order to create a Wales that we want to live in now and to ensure its okay for the next generations.

On a global level, the United Nations have published the Millennium Development Goals in 2000. These focus on goals to help the meet the needs of various problems within the world. “Goal 7a- Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources.” (Un.org, 2019). It suggests that even on a global level, it is recognised that something needs to change, in order to prevent and reverse the impacts on the environment.

All of these acts and organisations are currently helpful to overcoming the Sustainability challenge. They encourage not only designers, but everyday people to consider the consequences of their actions on the environment. However, it is clear to see that these ideas need to be pushed further in order for beneficial results. There needs to be more acts like the Future Generations Act (2015) produced by governments worldwide, to educate and encourage the whole population. The growing population needs to be aware of their everyday impacts effecting the future generations.

Chapter 3

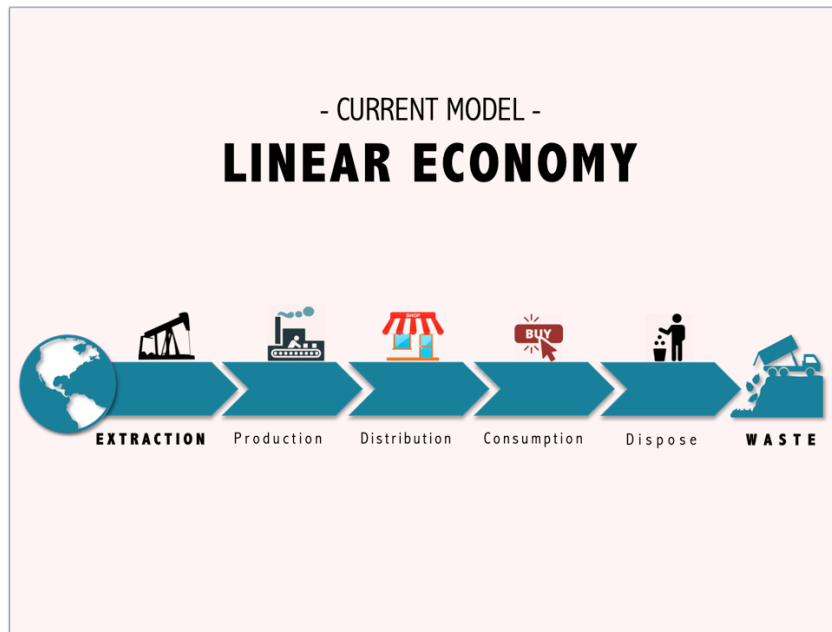


Figure 3– the current linear model used when producing and consuming.

The above figure (shows the current economic consumption and production patterns in the United Kingdom, we are relying on a linear flow. The flow usually involves taking, making and disposing of resources and products at the end of their lives. This then results to starting back down the line again, extracting new resources to produce more. This is stated in the book *Design, Ecology, Politics: towards the ecocene*, it states ‘The economic system currently depends on a continuous linear flow of natural resources, extracted from the earth then moving through industrial production, consumption and disposal processes, resulting in various types of pollution.’ (Boehnert ,2018, p. 89). Boehnert suggests that depending on a continuous linear flow, which uses natural resources and disposes of them, causes many environmental problems. She only states the impact of pollution here, but there are a lot more problems than aren’t explored. For example, the continuous over use of natural resources without replenishing them causing resource depletion. In other words, humans are consuming much faster than the earth can replenish and recover. This suggests a new model of a less destructive but with a more efficient use of planetary resources is essential.

Whilst researching what companies have been achieving to ensure they are being sustainable, a key idea that keeps reoccurring was the Circular economy model. “A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.” (Wrap, 2019). This model is the opposite to the linear model and the main focus is to prevent disposal at the end of the product’s life. It suggests, we reuse or recycle parts of the already made products instead of starting again to create new. This then enables a continual circle, allowing a system that keeps running long term instead of a dead end. By using this model, it will ensure that we can eliminate waste and pollution while maintaining sustainable products and resources.

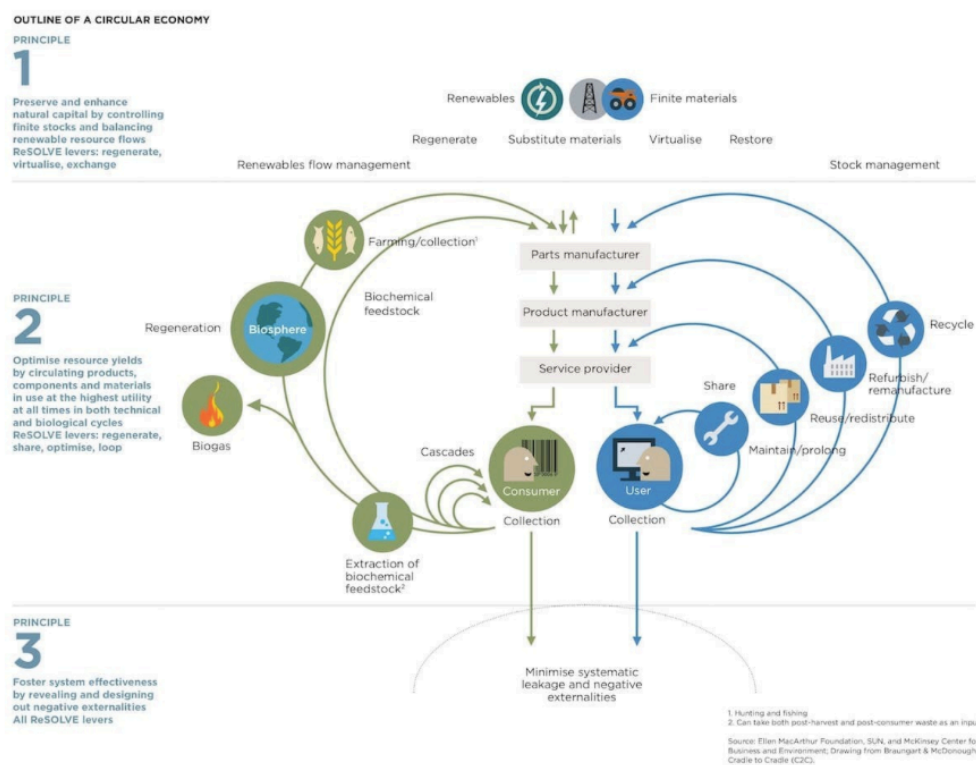


Figure 4 – Ellen Macarthur’s Circular Economy Model

The figure above shows the Ellen Macarthur’s (2019) circular economy model. The model aims to stop the linear flow production system and instead focuses on fulfilling a continuous circle within production and consumption. It intends to redefine growth by regenerating

natural cycles. It also aims to monitor the amount of consumption on resources used. It will require the decoupling of economic growth, this allows the economy to grow without increases in environmental pressures. The outcomes of this model should ensure we can keep products in use for the future. Most importantly, this model hopes to gradually eliminate waste and pollution out of the whole design system. There are several principles within the model that are suggested to help businesses foster a circular economy (British Standard, 2017), these are shown below.

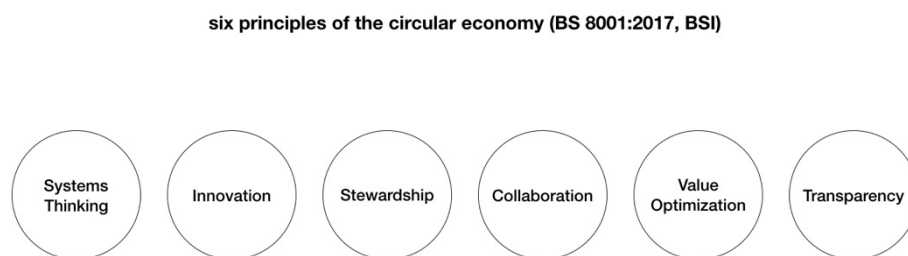


Figure 5 – Principles within the circular economy.

As seen above, one of the six principles of a circular economy are collaboration, this suggests it is unlikely that companies are going to adapt to a circular economy model on their own. Within design it is encouraged to collaborate with cross disciplinary design fields, in order to create something innovative and unique. Savvy, a creative agency that helps organisations build and grown explains how “Design collaboration puts those minds together, combining their separate, specialized expertise to create solutions that tackle all aspects of a shared goal.” (Savvy Apps, 2019) This proves that the idea of two professionals from different design fields working together on a set idea will result in a successful collaboration. For example, I recently collaborated with Orangebox, an office furniture company from Wales. They are researching solutions to make their office furniture

production target a circular economy and needed new innovative design ideas to help reinvent their waste. As a surface pattern designer, I was able to give a different design point of view on their work which resulted in something quite unique.

Despite the efforts being made by Orangebox, they are still creating masses of waste each day, 50 tonnes a week go into the incinerator (Orangebox Project Pack, 2019). They are currently investigating ways that they could dispose of textile waste in a way that does not impact the environment. Orangebox believe in a no landfill waste policy and sort their waste by diverting it to the relevant recycling streams. Despite their aim to recycle waste properly, they were still not happy with how much textile waste they were producing and their only current way of disposing of it was through incineration.

Orangebox invited students to try and reinvent their waste fabric offcuts to create new design ideas to upholster one of their products, the Skomer Stool. The brief was to produce innovative textile ideas while sticking to the concepts of the 'circular economy' and meeting the needs of contemporary office spaces (Orangebox Project Pack, 2019).

I came up with a design solution that fosters the ideas of a circular economy. It focuses on reimagining and designing from waste material so it can prevent itself from entering the waste system. Instead by using the waste material, it allows it to go back into the income stream so it does not affect resource depletion: the consumption of resources faster than it can be replenished. The brief encouraged making the most out of the waste material. The big off-cuts were used to screen print on and little sections to cut and to collage. Therefore, all pieces big and small are valuable to a designer. From one day alone, we received a bale of waste fabric that included 46 varieties of upholstery material (Orangebox Project Pack, 2019). This was one day's waste from the factory. The bale of fabric weighed approximately 150kg.

When receiving the 46 different types of fabrics from Orangebox, it was hard to distinguish what fabric you were actually using. Steve Whitehall, an Orangebox representative explained how the project revealed this problem, he stated "[the project] highlighted some issues within their production process that could be addressed to help achieve a circular

economy, such as the loss of information about the fabric when it is cut which means the composition of the offcuts is unknown. If that information could be kept, it would make re-use much easier. “(Whitehall, 2019). Knowing what fabrics is being used plays a crucial part within print design as only certain processes work on certain fibres i.e. natural or synthetic. Before the fabrics were used, a number of tests had to be carried out in order to determine what fibres they were made up of. For example, by burn testing the different fabrics it allows you to detect what fibres are involved, this is from the type of flame produced, the smell it creates and how quick it burns. However, if Orangebox could ensure that the fibre information of the fabric is kept when transporting the material to designers it would be save time and be easier for them make the most of the waste.



Figure 6 - My stool created for the Orangebox circular economy project.

Above is the reinvented Orangebox ‘Skomer Stool’ that was created entirely out of Orangebox’s waste. The waste used to create this product would usually be incinerated at the end of the day; however, I was able to create a whole new product without using any

new materials. Admittedly, the grey fabrics used for this was actually a pink and green stripy pattern, but by using the plain inner side of the fabric I could overcome this.

Orangebox did not expect their everyday pieces of waste to become one of their own products redesigned as pieces of art. Cath Hammerton, Lecture in Surface Pattern Design stated “The project has been a brilliant experience and learning curve for our students; working directly with a global furniture brand to address real world problems surrounding the circular economy. The work produced tackles the issue of textile waste head on, offering sound solutions for future product development and scaled production” (UWTSD, 2019). By collaborating with Orangebox we had the opportunity to overcome, on small scale, such a massive problem of waste in the design industry. This has encouraged all of those who took part to be more cautious with waste.

Whitehall also explains how the collaboration was valuable to Orangebox and Students involved, he states “The project [...] particularly addressed the principles of ‘innovation’, ‘collaboration’ and ‘value optimism’. So not only did the project provide some excellent and impressive work, which Orangebox were extremely pleased with, it also showed how firms can (and need to) look outside of their own organisations to work out ways to address the circular economy.” (Whitehall, 2019). As mentioned earlier, Whitehall picks up on the point that the project highlighted how businesses need to focus on collaborating outside of their normal fields in order to achieve ideas within the circular economy. By collaborating with Orangebox, it introduced a different design perspective to their everyday waste. Not only did 28 students manage to create the stool cover they asked for, completely out of waste, we also created new innovative design ideas by making the waste look individual. In the end it was a successful project.

Orangebox take environmental responsibility seriously. A majority of their furniture pieces are designed so they be reused at the end of its first life. They encourage people to send back their chairs so they can keep certain components to recycle or remanufacture as good as new. This is known as their 'remade model'. For example, they can keep the legs/frames of the chairs and change the seats. "When chairs reach the end of the 'first life', we aim to wherever possible to upcycle, remanufacture or repair them to their original condition." (Orangebox.com, 2019)

However, no matter how recyclable Orangebox make their products, at the end of the products' life it is down to the consumer how they dispose of it. As mentioned above, Fry (2009) believes consumers are always going to be a problem, as a designer could use lots of recycled materials in order for it to be used again but the consumer could just throw it straight in a landfill sight.

Similarly, Wehlers, a furniture company in Denmark are introducing buy back schemes. This encourages people to give the furniture back to them in order from them to use the waste sustainably. It's a constant battle for orangebox but they do believe that their business model now fits a circular economy, along as the consumer plays their part.

Wehlers in Denmark are also coming up with solutions to help encourage sustainability. They are another furniture design company that are trying to prevent single use furniture, with another separate aim to prevent plastic from re-entering the ocean. They believe their designs also foster a circular economy as they always design with recycling in mind, from the start, to the end of the product's life. The furniture is designed in a way that it can be reused at any given point of the future i.e. The legs of the chair can be melted back down to create more.

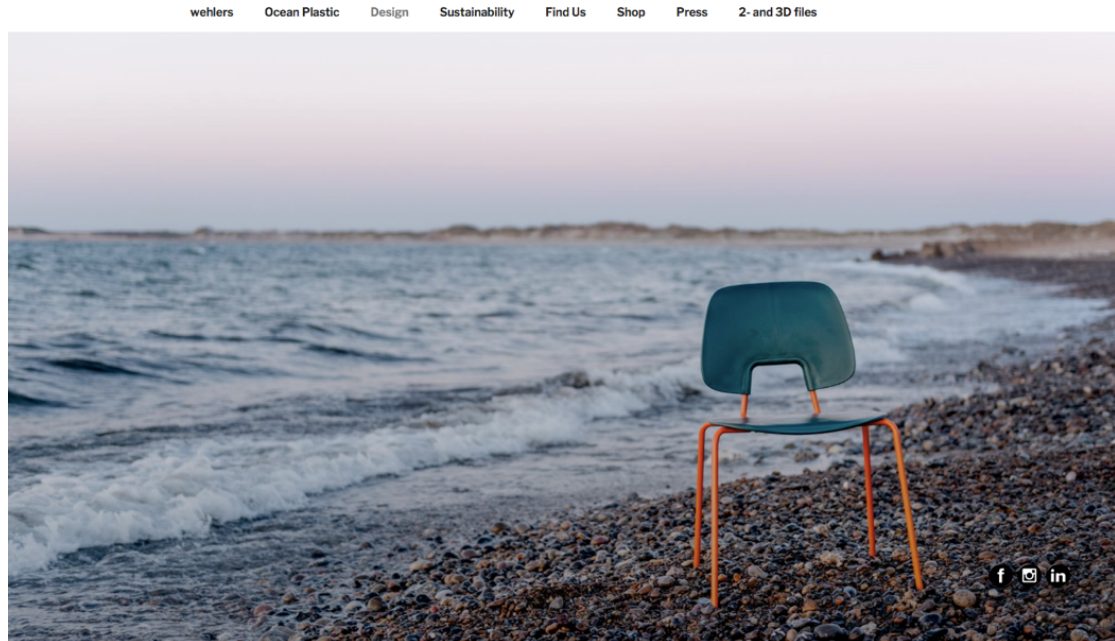


Figure 7 – Wehlers product made entirely from recycled materials.

The photo above shows one of Wehlers furniture designs. Similarly, to orange box, whelers circular economy design strategy is to:

- 1.Start with the design
- 2.Source materials locally
- 3.Manufacture by recycled items
- 4.Market – Good Price with buy-back option at the end of the product.

By adding a buy-back option at the end of the products life may encourage consumers to undertake this option instead of just disposing of it. More companies need to offer options like these as it is likely to appeal more to the general public. The most way prominent way to dispose of a chair would most likely be taking it to a waste site as the general public know of no other way of where to take it. At least the buy-back option showcases a way that allows the public to know they can send it straight back to the producer when they are finished with it.

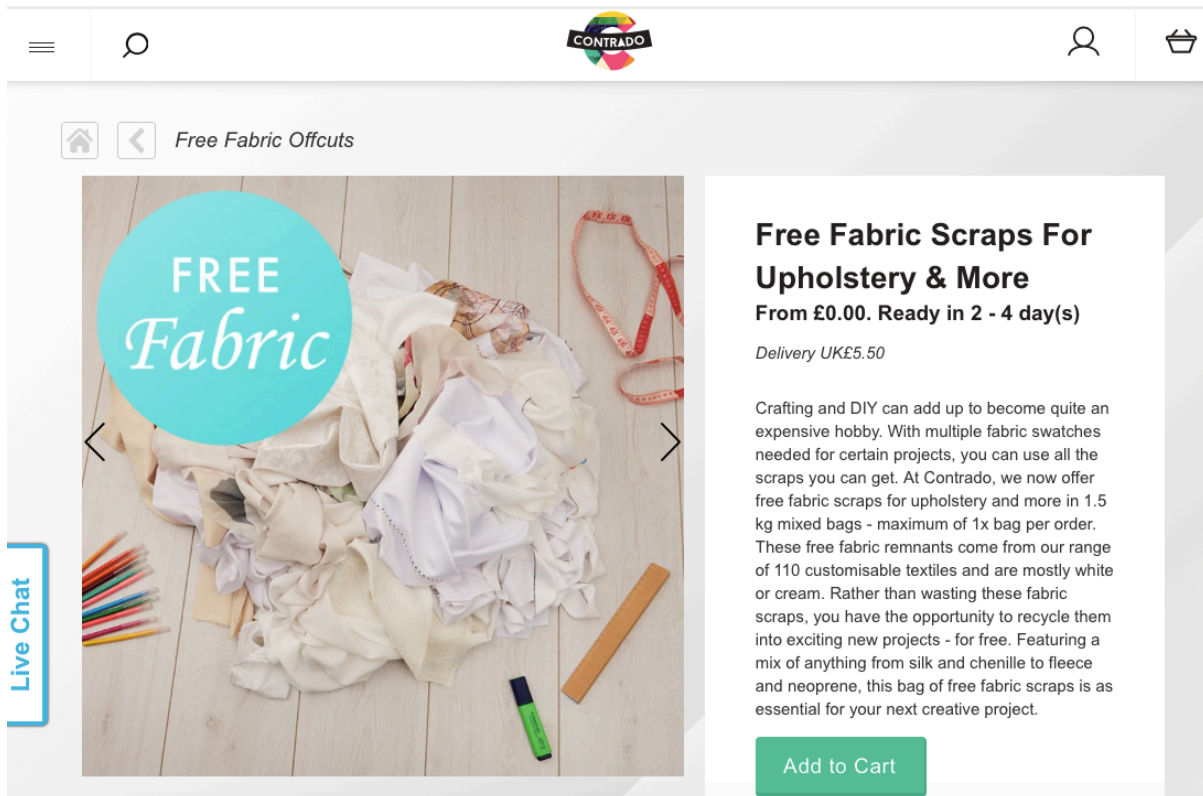


Figure 8- Contrado free waste fabric

The figure above shows the website of Contrado (2019), an online printing company where designers can upload their designs to be digitally printed on a variety of fabrics, wallpapers and home accessories. As the figure explains, Contrado are giving their offcut material piece's away instead of considering the material as waste. This then encourages designers to buy this 'free fabric' as you only have to pay for delivery. This is a really good idea that many printing companies should consider doing as, many designers would be more than happy receive offcuts of fabric they can use for testing purposes and reuse while creating sustainable designs.

Unfortunately, there is a negative side to the use of sustainability within businesses. The ideas within sustainability can be used for the wrong reasons. It can be considered simply as a tick box concept, where companies' sustainable ideas are used simply to tick a box that they have considered something environmentally but actually have not done anything with it. In some cases, it is more about the words than the actions. A brand can say they have considered sustainability but have never incorporated it into their work. Some companies like the idea of sustainability within their designs as it perceives them as more

environmentally friendly, this is known as “Green Washing” (Westervelt, 1986). It is suggested that “Since marketing a product or process as sustainable is easier than actually creating sustainable products and brands have an interest in portraying a green image, the idea of ‘sustainability’ is used to reassure consumers that conspicuous consumption and business as usual is morally acceptable.” (Boehnert, 2018, p. 77). She highlights how sustainability can be used for the wrong reasons as some companies have no intentions of becoming any way shape or form sustainable, they just like the idea of it.

Conclusion

It is clear that designers need to focus on the environmental needs of the planet to ensure change can happen quickly and efficiently. The current levels of consumption within production industries needs to rapidly reduce. The ever-growing population is largely responsible for the high amounts of resources being used. Such an increase in population puts pressure on industries to produce more in order to keep up with the rapid growth pattern and demand. Despite the pressures, using such large amounts of natural and man-made resources, simply will not allow the environment to improve. Controlling levels of pollution and resources is crucial to create a sustainable planet. As mentioned above, the idea of only having '12 years left' (IPCC) before the most devastating impacts of climate change are irreversible surely puts designers in a state of panic and therefore should encourage change. Designers need to fully focus on how they can be sustainable, from the resources and materials they use, to how recyclable their product can be at the end of its life. Encouraging focus on sustainability within the design industry will attempt to improve negative impacts on the environment without harming its future generations. The design industry will need to stop focusing on consumer's needs before the ideas of sustainability can be met.

However, this is not just a problem within the design industry, waste is a problem everywhere. More acts like, the Future Generations Act (2015), should be introduced worldwide, to encourage the whole population to consider their consequences on the future planet. Although majority of the pressure is put mainly on designers to produce sustainable products, it is simply down to the population of consumers how they dispose of it. There should be more organisations like WRAP (2019) that highlight the simple ways people can reuse, reduce and recycle the majority of what they would consider to be 'waste'. People need to stop considering landfill site the first option when it comes to disposing of waste, they need to be encouraged to consider the more environmental problems first.

The more beneficial way to encourage designers to work more sustainably is to just throw them into the problem, let them see what is happening first hand. This is the reason I am now so conscious and passionate about the problem of waste within the design industry. I worked with a company first hand which introduced the problem I simply could not ignore. This has introduced me to be mindful for every piece of material I use. In conclusion, more companies should collaborate with designers as it's a win-win solution. In most cases, companies have to pay to get rid of waste so it makes sense to give the fabric to designers who willingly want it for free. The companies waste will not be disposed of in a landfill site and designers get free fabric that literally would have gone to waste otherwise. Waste is classed as resource to designers.

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