

Changing behaviours to seek a better outcome for economies and societies

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SEEKING SUSTAINABILITY IN THE COFFEE SHOP INDUSTRY: INNOVATIONS IN THE CIRCULAR ECONOMY

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The circular economy has been heralded as a key instrument for addressing the challenge of climate change, with its efforts to reduce greenhouse gas emissions, and reduce, reuse and recycle waste products. The coffee and coffee shop industries are acutely aware of the potential impacts of climate change given the base of their industries is a crop that is highly vulnerable to shifts in global temperatures. There is great potential for these industries to make efforts to reduce emissions, energy consumption and contribute to the circular economy, moving towards a more sustainable approach for the future. Many actions are being taken by individuals and organisations in the coffee shop industry to find ways to utilise the growing consumption of coffee and use of coffee shops to engage in the circular economy, and create more sustainable business models.

This paper outlines the principles of the circular economy, to explore why it is relevant for the coffee shop industry. It presents examples of innovations from those involved in different ways with the coffee shop industry in order to engage in a more circular economy, and presents a case for further research.

Introduction

The coffee and coffee shop industries are vulnerable to the challenges presented by climate change. Efforts are being made to explore the potential impacts of climate change on the coffee and coffee shop industries along with mitigation and adaptation strategies. The circular economy has been heralded as a key instrument for addressing climate change challenges, in particular reducing greenhouse gas emissions, with its efforts to reduce, reuse and recycle. There is the potential for the coffee and coffee shop industries to promote the principles of the circular economy across the coffee supply chain from the point of creation to after the coffee has been consumed.

This paper outlines the principles of the circular economy, to explore why it is relevant for the coffee shop industry, highlighting that further research to focus on the circular economy and the coffee shop industry is needed. It presents examples of innovations that are taking place utilising resources within the coffee shop industry, engaging in circular economy practices in different ways.

The Circular Economy

The circular economy is “an industrial economy that is restorative or regenerative by intention and by design” (Ellen MacArthur Foundation, 2013). It is an economy which works on different principles, by seeking to minimise environmental impact while maximising the potential economic, social and environmental benefits. Moving towards a circular economy has the

Key Principles of the circular economy

- **Designing out waste:** Everything that is biological material can be composted and everything that is technical man-made waste can be reused in the development of new products
- **Building resilience through diversity:** Build resilient and diverse systems which can withstand external shocks and survive in fast-moving society.
- **Working towards using energy from renewable sources:** Wherever possible, obtain all power sources from systems that utilize energy from renewable sources.
- **Think in systems:** Think about context and environment – how things influence each other and can work harmoniously. Systems should be interdependent and reflect the realities of society.
- **Think in cascades:** Consider the manner in which waste can be cascaded and transferred down or through the chain to benefit the continuous flow and natural development.

Source: Adapted from the Ellen MacArthur Foundation (2013:22-24).

potential to play a vital role in achieving some of the goals of the Paris Climate Agreement, with research suggesting that movement towards a circular economy is an important mechanism for reducing greenhouse gas emissions and climate change mitigation (Deloitte, 2016; SITRA/European Climate Foundation, 2018).

Adopting a circular economy model involves examining the different components of an industry's supply chain, to in an effort to reduce the amount of new material that is used, reduce the amount of waste produced, and reuse waste products where possible.

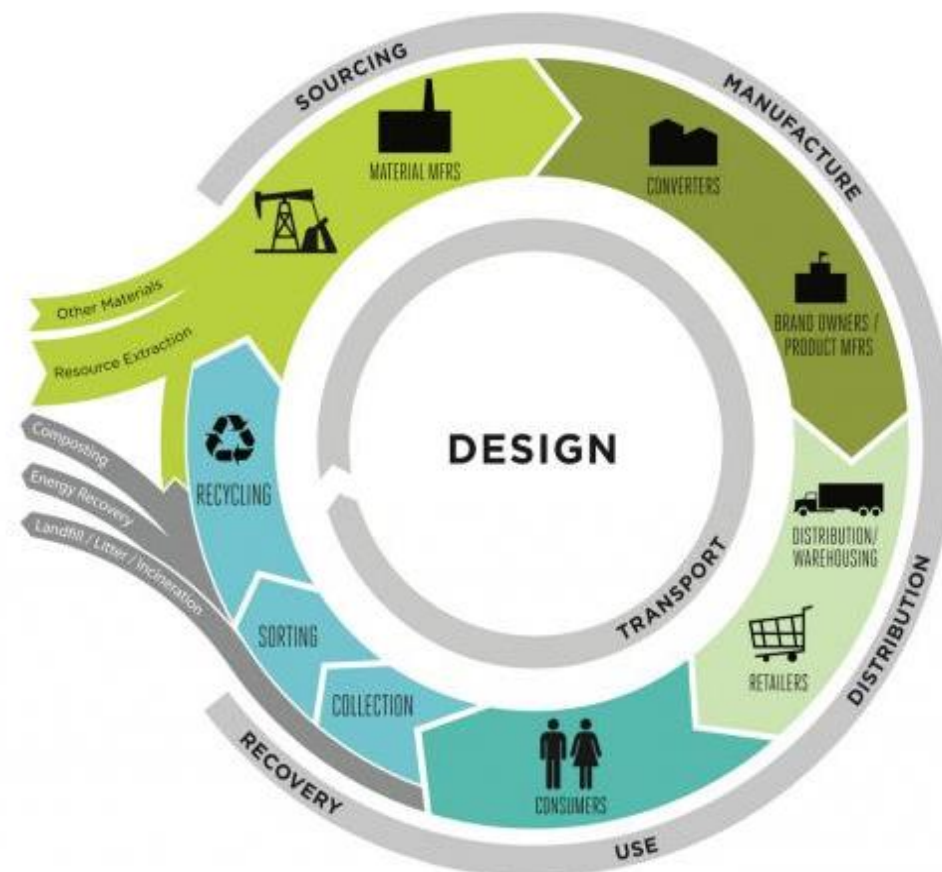


Figure 1: The Circular Economy

Source: Sustainable Packaging Design

The movement towards a more circular economy has the potential to deliver opportunities across various dimensions, including: **reduced pressure on the environment; enhanced security of supply of raw materials; increased competitiveness; innovation; growth and jobs**. However, there are several challenges for the adoption of a circular economy model, including: 'financing; key economic growth enablers; skills; consumer behaviour and business models; and multilevel governance' (European Parliament, 2016).

Further research into how the circular economy can be applied to different industries is needed. While much of the existing research into the circular economy focuses on large scale industrial processes, more attention is needed to explore how the principles of the circular

economy can be translated into action for a variety of industries at a range of scales to maximise impact. Given the global scale of the coffee industry and the wealth of stakeholders and processes involved, from the farmer to the consumer, there are a range of opportunities for the industry to engage in the circular economy.

Circular Economy Practices in the Coffee Shop Industry

There are several examples where stakeholders in the coffee shop industry, mostly at the consumer end of the supply chain, are already engaging in circular economy practices.

Recycling Coffee Cups

It is estimated in the UK that 2.5 billion disposable coffee cups are thrown away each year, with rapid growth in volume following the growing numbers of coffee shops (EAC, 2018). The issue of the number of disposable coffee cups reaching landfill has been widely discussed in the popular media. The rising popularity of coffee and coffee shops has led to an increase in waste packaging produced, with the disposable cup being one of the most visible elements of this (Ferreira, 2018). In response to calls to address this issue various cup recycling schemes have been established at different scales, from the Square Mile Challenge tackling recycling in an area of central London, to nationwide schemes established by large coffee shop chains such as Costa Coffee (Hubbub, 2017).

There have been other schemes which attempt to tackle this issue through the deployment of reusable coffee cups. In Freiburg (Germany) consumers can obtain a reusable cup for a deposit of €1 which can be used and deposited in a number of retailers. A similar cup sharing scheme – Re-Cup – has been adopted in a number of German cities. Re-Cup is linked to an app which shows users where the coffee cups can be deposited and obtained.



Figure 2: Coffee Cup Recycling
Source: Authors



Figure 3: Cup Club cups
Source: CupClub

A more data-focused trackable reusable cup subscription service, Cup Club, has been launched in London (CupClub, 2018). This operates on a pay-per-drink model, where the cups are seen more as a service.

Other innovations around coffee cups have focused on repurposing the material. James Cropper, a specialty paper producer based in the UK, created CupCycling a process to turn disposable coffee cups into high quality paper-based materials. This has become popular with many brands seeking to obtain more environmental sustainable packaging options including Lush, the cosmetics retailer, which uses some of its packaging made from 100% coffee cup fibre (Corbin, 2017).

Coffee cups are just one piece of packaging involved in the coffee supply chain. There is the potential for packaging at different stages of the coffee supply chain to be considered in order to engage in more circular economy practices. One recent example from Square Mile Coffee Roasters in the UK highlights how the use of cardboard can be reduced, by reusing particular types of packaging for shipping coffee to customers. The company have recently adopted 'Notboxes' a collapsible, reusable and rugged alternative to their cardboard boxes (made with polyester and low-density fibreboard), for use with some of their wholesale customers (Square Mile, 2018).

Recycling Coffee Grounds

Another consequence of the growing consumption of coffee in many countries is the increase in waste coffee grounds produced. Much of this coffee ends up in landfill, where it decomposes and releases methane, a powerful greenhouse gas. It is estimated that for every tonne of coffee waste that decomposes, 340m³ of methane are released into the environment. The various alternative uses of coffee grounds developed demonstrate several ways organisations have been able to engage in the circular economy.

Many coffee shops offer coffee grounds to consumers for use in the garden as fertiliser, for example. On a more commercial scale, waste coffee grounds have been used to establish mushroom farms. GroCycle, a social enterprise based in the UK, has been growing oyster mushrooms from waste coffee grounds since 2011 (GroCycle, 2018). The company started collecting coffee grounds from cafes in Plymouth and have continued to expand their operations with a mushroom farm which supplies mushrooms to restaurants and businesses, producing home growing kits, as well as developing education activities to help others start their own mushroom farm. Similar initiatives can be found in other countries too. In France, a Paris based organisation called Upcycle uses waste coffee grounds from automatic coffee machines to grow mushrooms, with left over materials being used as compost by local farmers.



Figure 4: Coffee grounds for consumers

Source: Authors



Figure 5: GroCycle mushroom growing box

Source: Authors

In Taiwan there has even been an organisation which has sought to make clothes and other products out of coffee grounds. Singtex has developed a process for turning coffee waste and plastic bottles into fabric. Roasted coffee grounds are mixed with polyester to create a coffee yarn. The company's clients include large brands such as Patagonia, North Face, Timberland, Adidas, American Eagle and Victoria's Secret (Wei, 2016). The company collects and uses around 500kg of coffee grounds a day. The company has also found use for other by-products from the coffee grounds: coffee oil is extracted from the leftover coffee and sold to cosmetic and soap companies.



Figure 5: Coffee yarn

Source: Clarissa Wei/Munchies



Figure 6: Coffee oil

Source: Clarissa Wei/Munchies

Singtex has inspired others to consider ways to use coffee ground waste. Similar schemes to use coffee grounds in textiles have emerged in Colombia. The Colombian Federation of Coffee farmers invited the CEO of Singtex, Jason Chen, to help them create textiles using 100% Colombian coffee. The team partnered with Café Buendia in Colombia, which was incinerating up to 25 tons of coffee grounds a day. With Chen's help, they were able to extract coffee oil

and use the solids to create textiles. The clothes were then sold to the local market by coffee shops owned by the coffee farmers (Wei, 2016).

On a smaller scale there are various companies which have developed innovative ways to use waste produced from coffee to create other products. For example, Huskee Cup have created a range of cups that use the coffee husks in the creation of coffee cups (Huskee, 2017), and jewellery designer Rosalie McMillan has created a collection of jewellery using coffee grounds (McMillan, 2017).



Figure 7: Jewellery made from recycled coffee
Source: Authors



Figure 8: Huskee Cups
Source: Huskee Cup

A different business model for the use of coffee grounds has been developed by the Dutch company Rotterzwam, which created an initiative called 'Coffee as a service', currently being tested with businesses based in Rotterdam. Customers lease roasted coffee from the company to use it, then Rotterzwam collect the waste coffee grounds for use in various products, such as mushroom growing kits and bioplastics (Brown, 2018).

Another use for coffee grounds has been to generate energy: on a much larger scale in the UK, the company Bio-bean, established in 2014, has pioneered the process of recycling waste coffee grounds into biofuels and biochemicals. The company collects waste coffee grounds from coffee shops, offices, transport hubs and coffee factories and recycles them into biofuels and chemicals for consumer-focused coffee logs (to be used in stoves), biomass pellets (for heating buildings), biodiesel and biochemicals (Bio-bean, 2018).

There are also a growing number of companies that are seeking to use the coffee grounds for other purposes. Kaffe Bueno is a coffee start-up business based in Copenhagen which sells coffee and recycles it by using it in natural cosmetics. They trade directly with organic micro-lots in Colombia and take that coffee to offices in Copenhagen. Oils are extracted from the waste coffee grounds using emission free biotechnology, and this oil is then used as an active ingredient for natural skincare care products (Kaffe Bueno, 2018). Revive Eco an environmental start-up based in the UK also focuses on extracting coffee oils from the grounds that can be used in a range of products, and some of which have the potential to be used as an alternative to palm oil (Black, 2019; Revive Eco, 2019).

Considering Energy and Waste

There have also been efforts to address energy consumption in the coffee shop industry. Costa Coffee in the UK designed an eco-pod café that was marketed as the UK's first 'zero energy' coffee shop. Zero energy is achieved through passive ventilation and innovative construction techniques which mean that the energy required to heat and cool the building is minimised and that the low amount of energy that is required for building temperature control will come from solar PV cells embedded in the specially curved roof, balancing out overall (Edie, 2015). The company also opened a new roastery in 2017 (Europe's biggest coffee roastery), designed to ensure zero waste sent to landfill and use renewable energy systems, as well as harvest rainwater for its operations.

Another approach to the circular economy has been to try and produce very little waste and reuse goods where possible. There have been a number of zero waste cafes developed where sustainability is a core focus of the business. Silo Café in Melbourne, for example, used to adopt a number of green initiatives which meant it produced little waste including: a waste dehydration machine to produce compost (given to local growers), beverages served in terracotta cups, locally sourced products, no use of cardboard cartons or milk bottles, deliveries in reusable plastic crates, and a water reuse system (Snedden, 2014).

Conclusion: Opportunities and a Case for Research

The examples introduced here are indicative of how the coffee shop industry can engage with the circular economy, at or after the point of coffee consumption. However, the global coffee supply chain involves many different stages, processes and organisations that have the potential to develop their practices to engage in the circular economy, contributing to reduced resource consumption and reduced waste.

For businesses there are several advantages for engaging in the circular economy, including: the optimisation of use of materials; realisation of new revenue streams; enhancing stakeholder relationships and mitigating risk from future policy and industry shocks. Although

there are challenges too for adopting circular economy practices as highlighted earlier in this document.

Many of the existing studies on the importance of the circular economy have focused on heavy industrial processes involving products such as steel, cement, aluminium and plastics. Given the global span of the coffee shop supply chain and various stages in the production, processing, transportation, and consumption of coffee there are multiple opportunities for organisations to engage in the circular economy. Further research is needed to explore how organisations in the coffee shop industry can engage in the circular economy and the potential impact this could have on economies, societies and the environment.

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Through understanding the impact of organisations' activities, behaviours and policies, our research seeks to promote responsibility and to change behaviours for the benefit of economies and societies.

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Our research teams are (a) examining sustainable production and ethical consumption, which underpin the new circular economy; (b) searching for durable and inclusive economic growth and development models, which promote new partnerships between state, economy and society; (c) exploring at the national, organisational and individual level the economic and social impacts of the financial crisis and post-financialisation, with a focus on responsible personal finance and debt; and (d) addressing the implications of the digital era and big data for business and society, notably regarding the strategy, use, privacy and security of data in organisations and society.

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