

BEAN TO BIN AND BEYOND

White Paper on Circular Economy
Progress, Barriers and Opportunities
in the UK Coffee Industry



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SECTION 1: EXECUTIVE SUMMARY

This paper has been developed by the British Coffee Association (BCA) with the objective of increasing an understanding of how the UK coffee industry is supporting and driving a circular economy throughout the supply chain, from 'Bean to Bin and Beyond'. In the course of this analysis, we highlight some of the key initiatives that are already taking place in enhancing circular economy principles, identifying key aims and ambitions that the UK coffee industry must work towards, and highlighting where key challenges still exist for us to overcome collectively.

Through the analysis in 'Bean to Bin and Beyond' the BCA has proposed a Coffee Circularity Index (CCI) which is used as a high-level evaluation tool with key findings recommended for further detailed analysis. Using this, it is clear that circular economy principles are already well underway:

- In the **recycling and re-use sector**, companies such as Bio-Bean have transformed products such as used coffee grounds, previously thought of as waste and created value through circular models around the creation of biofuels and clean energy products.
- **New waste streams** have been identified and created by coffee retailers through the collection and capture of disposable cups that can be recycled when reaching the right processing plants.
- **Internationally supported schemes** such as Aluminium Stewardship Initiative, which drives the responsible and traceable sourcing of aluminium for sustainable production and environmental performance, are being implemented in the coffee sector.
- Green energy commitments are being introduced as many companies move towards using 100% renewable energy.
- In countries of origin, coffee farming practices are being encouraged to drive circularity and sustainability through initiatives such as carbon off-setting (e.g. planting trees) and re-use of cherry pulps, one of the main by-products at the coffee farm level.

Although strong signs of innovation exist, it is clear that much more needs to be done as the benefits of a circular economy become more apparent. Many challenges ahead require synergy beyond the individual company; so, collaboration will be vital for the sector to realise the ambitions set out in this report.

This report concludes with the identification of seven goals for a Sustainable Circular Coffee Economy, for BCA members and the UK coffee industry, in supporting and driving the circular economy. These goals are by no means prescriptive but rather are meant to act as a framework and a guideline to enable the UK coffee industry to achieve its sustainability ambitions with regard to the circular economy:

BCA'S INDUSTRY GOALS FOR A SUSTAINABLE CIRCULAR COFFEE ECONOMY

1. **Zero-waste packaging by 2025** – aim to switch to 100% recyclable or re-usable packaging across all products within the next seven years with 0% of waste going to landfill.
2. **Support the BCA in encouraging the UK Government to expand investment in recycling and waste management infrastructure**, including investment in composting facilities and the improvement of waste collection infrastructure across Local Authorities and individual household.
3. **Responsible sourcing of all packaging materials** - including plastic, paper, cardboard, and aluminium through enhanced supply chain transparency, traceability and investment in technologies that reduce waste to landfill.
4. **UK coffee companies to conduct lifecycle assessments (LCA's)** across their supply chains to identify opportunities to create efficiencies, minimise waste and potential to improve circularity.
5. **Evidenced industry commitment to creating initiatives that help consumers understand how and where to recycle used coffee products and materials** – including education through best practice examples and recommendations.

This can be supported by improved transparency in labelling and on-pack recycling information as well as the creation of digital technology such as recycling apps and other tools that will help educate as well as inspire consumers to change their behaviour around the use, re-use and recycling of materials in their daily coffee products.
6. **Optimal transportation routes to be viewed and reviewed by all UK coffee companies with sharing of best practice** - across supply chains both within the UK and globally, companies should look to minimise carbon usage through transportation and drive adoption of green technology through their transportation networks.
7. **Encouraging the adoption of the circular economy principles in the production and processing stages at origin** – this represents a way of supporting coffee producers' efforts to adapt to and mitigate the negative impacts of climate change while helping to reduce the environmental impact of coffee farming.

There are a great number of opportunities to be harnessed and an equal number of challenges to be overcome in order to achieve a sustainable circular economy. The BCA exists for members to work collaboratively, bringing together organisations from across the supply chain, to achieve consensus around these challenges and opportunities whilst working towards a circular economy.

The BCA supports individual members in their own efforts to drive sustainability in order to protect the needs and interest of people and the environment throughout supply chains to enable a thriving and sustainable coffee industry, both now and for the future.

SECTION 2: INTRODUCTION

BCA VISION: 'BEAN TO BIN AND BEYOND'

The British Coffee Association (BCA) recognises that the UK coffee sector must move past the traditional economic model of 'take-make-dispose' which is inherent in the industry's current paradigm of 'bean to cup to bin'. There is an increasing awareness of looking beyond end-of-life disposal and reviewing the whole life-cycle, from production to end-of-use and reuse. The UK coffee industry has an imperative to embrace the idea of thinking about our supply chain from 'Bean to Bin and Beyond'.

In January 2018, the UK Government published its 25-year Environmental Plan, which sets out an important vision of reducing waste and our environmental impact; the UK coffee industry is well placed to be one of the first industries to put the circular economy and its principles at the heart of its operation and create fully circular supply chains. A circular economy approach requires designing products with reuse in mind, driving efficiencies in the consumption of raw materials, water and energy and reducing environmental impacts along the entire supply chain.

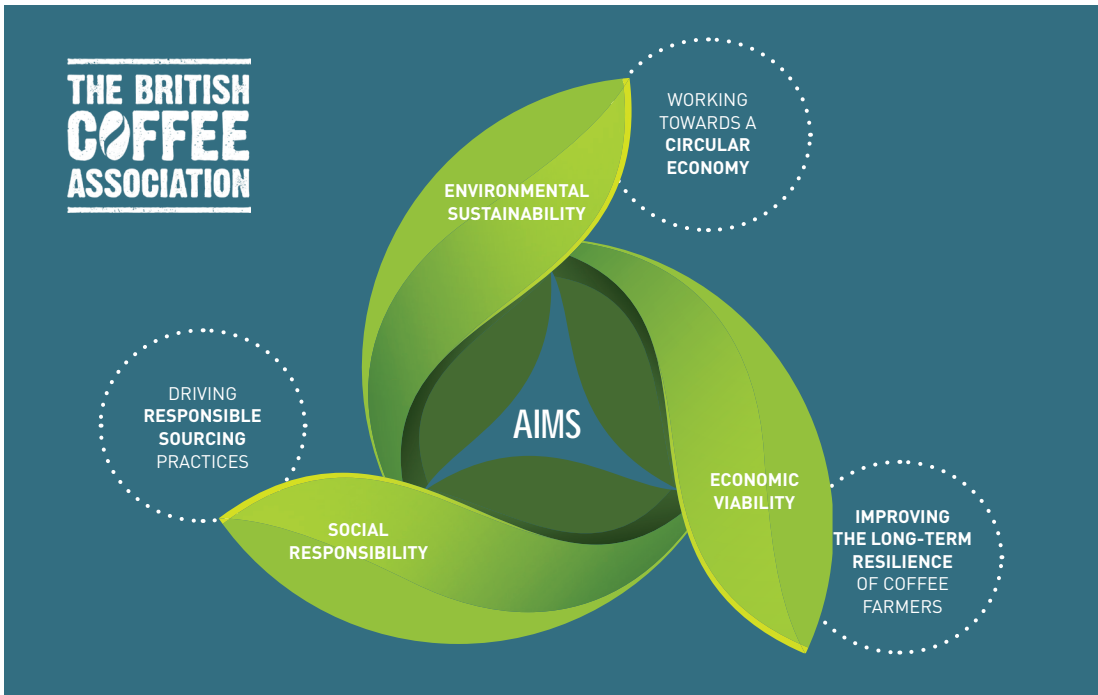
The recent BCA Sustainability Mission and Objectives, published in September 2017, set three key objectives for the UK coffee sector in making progress towards a circular economy. These were:

- Create greater resource efficiency (in water, energy and raw material usage) and move away from reliance on non-renewable sources.
- Take a full life-cycle view of all products from design, through production, sourcing, manufacture and consumption, to end-of-life.
- Reduce waste, encourage reuse and increase recycling within the coffee industry.

This '**Bean to Bin and Beyond**' paper aims to provide evidence of these objectives for the circular economy and is the first report on the three strategic pillars of the published BCA Sustainability Mission document as shown in Figure 1, namely:

1. Working towards a Circular Economy;
2. Driving responsible sourcing practices; and
3. Improving the long-term Resilience of Coffee Farming.

Figure 1: British Coffee Association sustainability mission strategic pillars

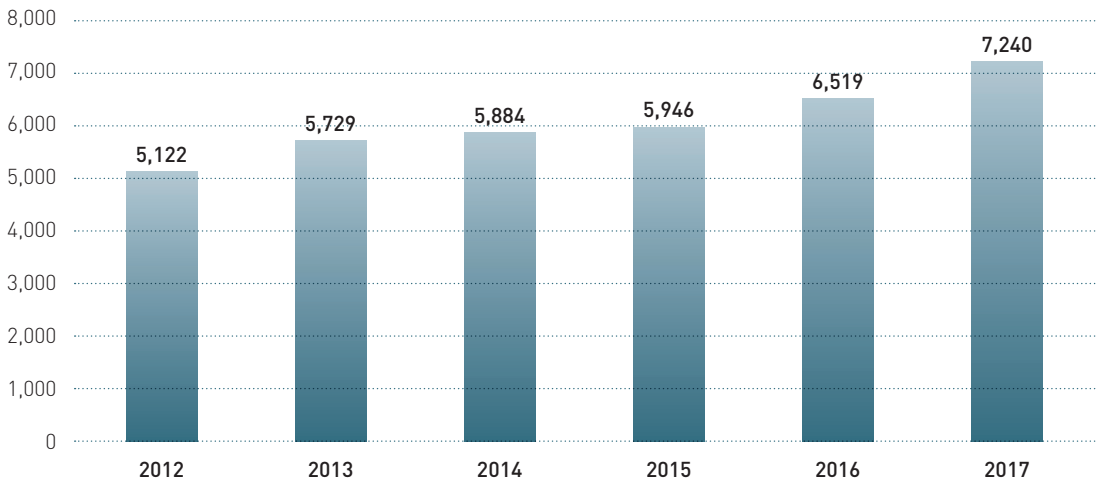


The backdrop to this report, within the coffee sector, is one of continuing growth in both spending and consumption (see Figure 2). In the UK specifically, direct turnover across the entire industry has grown to £7.2 billion in 2017, representing an annual average growth of 7 per cent in the 2012-2017 period.¹

On average there are now 95 million cups of coffee consumed each day in the UK, total consumption both in and out of the home, and has grown from 70 million cups per day in 2007.^{1,2}

Figure 2: Estimated turnover of coffee products in the UK, 2012 - 17

(Source: ONS Annual Business Survey/ Euromonitor International, coffee market 2012-17, Cebr analysis - April 2018)



1 CEBR – The UK coffee market and its impact on the economy, April 2018

2 Mintel, Coffee UK, 2008 Report

This continued growth and demand for coffee has been driven by various factors in recent years, most notably the strong growth of single-serve coffee machines and capsules. Out of home, on-the-go coffee has also increased dramatically over the last few years which has shaped the tastes of consumers and fuelled growth of single-serve coffee machines as consumers look to replicate barista-style coffee in their homes.

The growing and changing nature of the UK and global coffee market highlights the rapid innovation which is happening in-step with consumer demands, around quality, home consumption, on-the-go products, and variety of instant and ground options.

As the industry grows and consumer demand continues to increase, the sector must ensure that circularity of material use and re-use is central to the development of coffee supply chain strategies.

SECTION 3: CIRCULAR ECONOMY

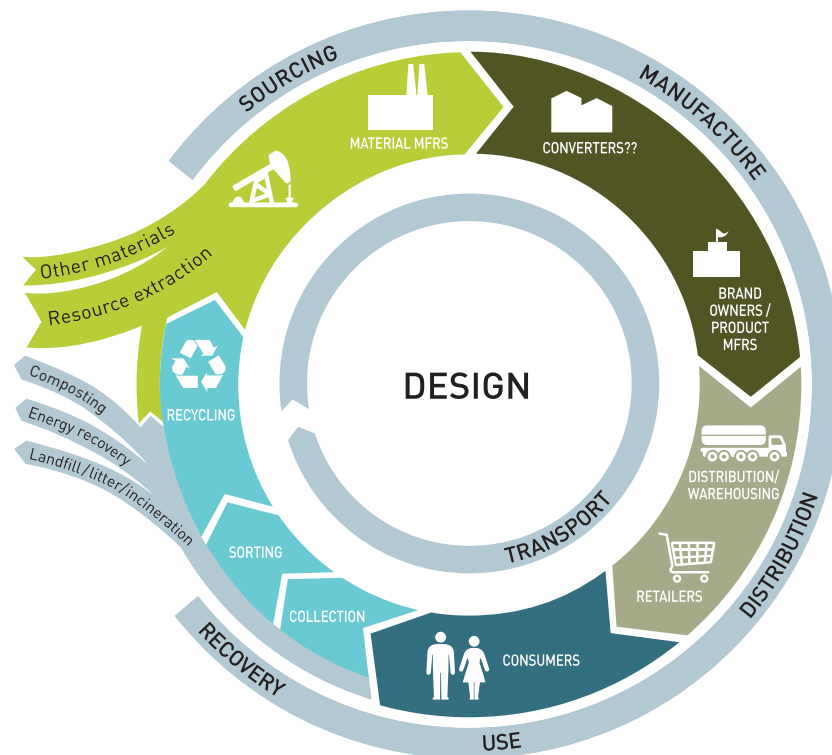
Having its conceptual foundations stretching back to the 1960s and operationalisation in the 1980s and early 1990s;³ the notion of circular economy sits within the field of environmental economics and focuses on the long-term sustainability of human systems with nature. Such works suggested that an open-ended, or linear, economy had no built-in capacity to recycle, and consequently, natural ecosystems were treated as waste reservoirs. However, early 'circular economy' thinkers started to view the earth as a closed economic system where the economy and environment had a circular relationship.⁴

The Ellen McArthur Foundation frames the circular economy as looking beyond the current take-make-dispose extractive industrial model, and aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system.⁵ Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles:

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

Within a circular economy, several new opportunities to create value exist, on which new business models can be based. For this purpose, it is necessary to redefine the concept of value creation and to use the power of cycles, as shown in Figure 3.

Figure 3: Idealised circular economy model centred around design (Source: ecorglobal, 2018)



3 Stahl & Reday-Mulvey (1981) 'Jobs for tomorrow, the potential for substituting manpower for energy' New York, NY: Vantage Press

4 Boulding (1966) 'The economics of the coming space ship earth. In H.Jarret (Ed.), Environmental quality in a growing economy' (pp. 3-14).Baltimore: John Hopkins Press.

5 Ellen McArthur Foundation 'Circular economy overview': www.ellenmacarthurfoundation.org/circular-economy/overview/concept

In order to capture circular value, it is important to consider the entire supply chain. This includes the value proposition (the product), the management of the supply chain, the interaction with the user and the business model. Although making a profit is an important goal of companies, it can disregard the opportunity to embed sustainability as a value creation practice. Conventional business models, historically, have not captured the 'value' of social and environmental benefits, nor have they encouraged the development of business models that focus on sustainability issues, even though this may lead to new business opportunities. More recently however there has been a growing number of companies and collaborative partnerships who are Creating Shared Value, which puts society and environment at the heart of their business strategies.

BARRIERS TO IMPLEMENTATION

In spite of the logic and rationale underpinning the notion of transitioning from a linear to circular economic model, a number of key barriers to implementation can be highlighted. These include:

1. Lock-in to resource-intensive infrastructure and development models
2. Political obstacles to putting an appropriate price on resource use
3. High up-front costs
4. Complex international supply chains
5. Lack of consumer awareness and demand
6. Challenges for company-to-company cooperation
7. The innovation challenge

One of the repeated barriers to developing the circular economy is translating the practicality for different businesses and organisations. The terminology can be a challenge and the concept as a whole is somewhat cumbersome due to the scope and level of ambition required to enable wholesale sectoral change.^{6,7,8,9}

6 https://ec.europa.eu/growth/content/regulatory-barriers-circular-economy-lessons-ten-case-studies-1_en

7 <https://www2.deloitte.com/nl/nl/pages/risk/articles/breaking-the-barriers-to-the-circular-economy.html>

8 <https://www.businessgreen.com/bg/feature/3017369/on-circles-and-barriers>

9 <http://www.wrap.org.uk/content/how-wrap-supports-circular-economy>

SECTION 4: SCOPE

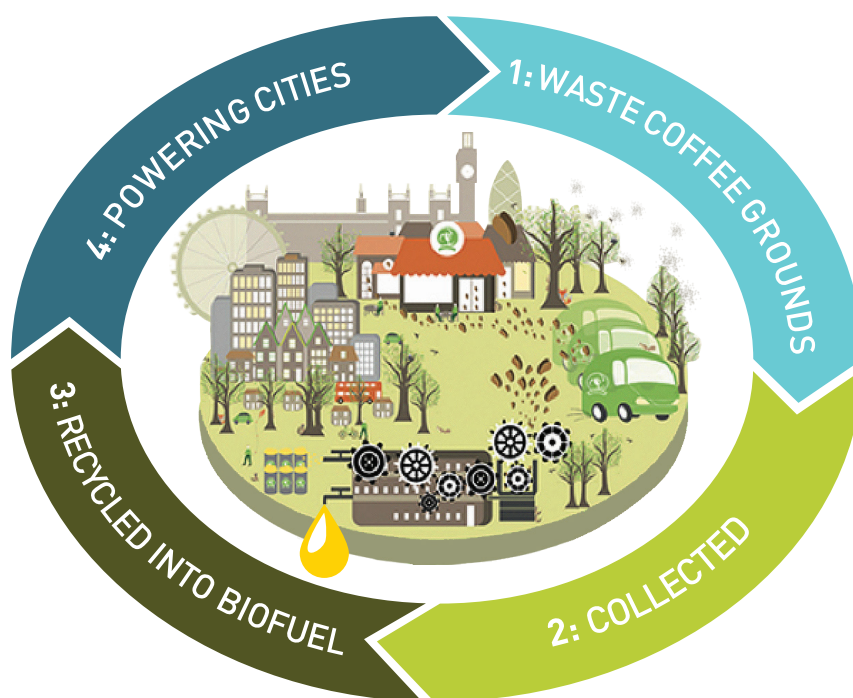
CIRCULAR ECONOMY OPPORTUNITIES IN THE UK COFFEE SUPPLY CHAIN

A broad review of the UK coffee supply chain demonstrates that action is being taken at various stages to address issues associated with inefficiencies and negative impacts within that system. There is strong evidence of innovation around reducing waste and increasing material re-use throughout the supply chain. For example; the upstream use of organic by-products at the farm level, such as using the cherry pulp as soil enriching fertilizers which reduce the need for synthetic fertilisers (Sustainable Harvest) through to the downstream use of coffee grounds to produce 'logs' for energy production (Bio-bean), as shown in Figure 4.

Aside from such evidence, the coffee sector faces challenges in adopting truly circular models and preserving value within cycles due to the fundamental nature of the product, coffee beans. Similar to other primary products, the majority of value is added to the coffee bean in the latter stages of the supply chain. The coffee bean is a 'vehicle' to produce a stimulating, flavoursome and aromatic product which is in ever increasingly high demand.

Figure 4: Circular economy business model for waste coffee grounds

[Source: cafésplaces, 2017]



Value can also become embedded within the ancillary products, e.g. machinery both for commercial and domestic users and point of sale packaging which can be fundamental for brand identification and differentiation.

The complexity of the supply chain can add stages between producer and consumer, thus squeezing margins, often disproportionately impacting farmers and processors with least scope to protect their value. Paradoxically, such arrangements may be the impetus for some of the more radical circular ideas currently in evidence, such as the proliferation of different versions of 'direct trade' and 'relationship coffee' models and other business models focused on simplifying and shortening the coffee value chain.

ECONOMIC CONSIDERATIONS

Fundamentally, making a sound business case for adopting the circular economy principles and investing effort in developing new circular business models, is essential. This white paper disassembles the coffee supply chain to explore where economic opportunity has been realised in monetary terms and how these may manifest at scale within each stage of the supply chain.

ENVIRONMENTAL CONSIDERATIONS

While important, the principles of the circular economy go beyond pure monetary considerations and explore value-based judgements about the importance of resource savings from a natural capital viewpoint. These will focus on the areas of: emissions reductions, land and soil productivity, and reduction in pollution, namely air, water and removing solid waste sinks.

SOCIAL CONSIDERATIONS

In alignment with the BCA's Mission and overarching objectives, the implications of moving towards a circular economy within the coffee supply chain will also be explored in relation to the social capital potential within the supply chain. For example; in relation to opportunities for job creation, including conditions reflecting all of the UN Sustainable Development Goals – SDG's, particularly SDG 12 which focuses on consumption and production, as well as opportunity and incentives for innovation.

SECTION 5: EVALUATING ALIGNMENT WITH THE CIRCULAR ECONOMY

In the following section of the white paper we will look at each of the key steps in the UK coffee industry's supply chain and evaluate the following:

- Current progress
- Barriers and obstacles to change
- Opportunities, ambitions and goals

In order to do this, the BCA proposes the following framework, or Coffee Circularity Index (CCI), to help guide its evaluation of current progress, identification of barriers, and assessment of opportunities and aspirations for the sector.

To ensure this BCA approach is aligned with circular economy research and commercial application, leading analytical models developed by the Circular Economy Club as well as the Circular Economy Toolkit; developed at Cambridge University; are used for both guidance and to rationalise the proposed CCI. For the purposes of this paper, the CCI is used as a high-level evaluation tool with key findings recommended for further detailed analysis to establish a robust evidence base.

Such a framework represents a means by which each of these three elements can be assessed. For the purposes of this white paper, the framework is applied to each element of the supply chain to determine circularity at each stage (see Table 1).

Table 1: BCA proposed Coffee Circularity Index (CCI) for qualitative evaluation of sector initiatives

INDEX VALUE	DESCRIPTION OF CIRCULARITY EVALUATION CRITERIA
7	Fully circular (evidence of collaboration outside the organisation)
6	High symbiosis (evidence of new business models supported)
5	Some evidence of symbiosis (resource efficient & strategic plan)
4	Strong evidence of implementing resource efficiency
3	Evidence of reuse and resource efficiency
2	Changed recycling behaviour, early resource efficiency changes
1	Minimal evidence of waste management changes, some reductions
0	No evidence of change from linear model

The CCI gives a value between 0 and 7 where higher values indicate a higher circularity.

The three fundamental principles of the Cambridge University toolkit are considered as the primary evaluation framework, namely:

- Reduction in material inputs
- Optimisation of required material inputs
- The extent to which industrial symbiosis has been/can be achieved given the limitations of production and material availability

This primary framework is then supported in relation to the following inputs, used as qualitative evaluation criteria within the CCI, namely:

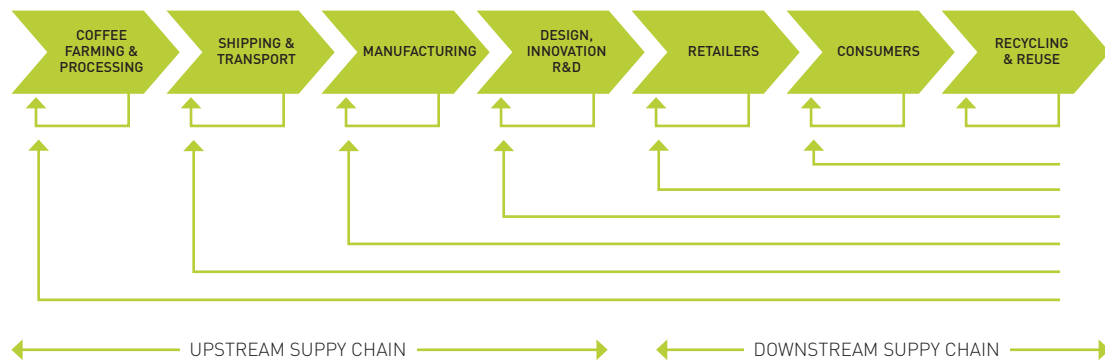
1. Production inputs: The proportion of inputs from virgin and recycling, as well as reused, materials.
2. Utility of inputs: How long and intensely is the product used compared to an industry average product of similar type? This takes into account increased durability of products, but also repair / maintenance and shared consumption business models.
3. End-of-life management: The quantities of materials and consumables going to each stage of the waste hierarchy (e.g. reuse through to landfill).
4. Secondary materials efficiency: The efficiencies of secondary materials channels for recycling, recovery and new production cycles.

SECTION 6: THE COFFEE SUPPLY CHAIN

The coffee supply chain can be broadly split into two main sections:

- Upstream supply chain considerations, which include farming and growing, warehousing and storage, processing, shipping, manufacturing and packaging.
- Downstream supply chain considerations, which include the post-production stages of retail, consumer use and end-of-life.

This section of 'Bean to Bin and Beyond' will look at each step of the coffee supply chain and consider the progress being made towards a circular economy, identify the remaining challenges, and articulate ambitions for the UK coffee industry at every step.

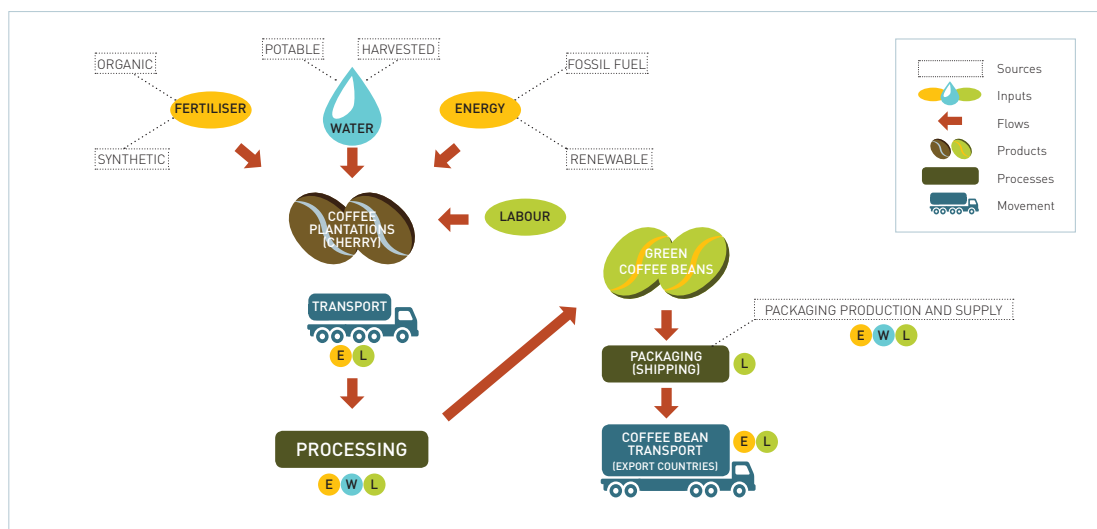


UPSTREAM SUPPLY CHAIN: POTENTIAL TO ALIGN WITH THE CIRCULAR ECONOMY

1: COFFEE FARMERS AND PROCESSORS

Coffee production and processing (sorting, pulping, washing, drying) produces significant amounts of organic material (e.g. cherry pulp, husks, honey water). These materials contain residual nutrients including phosphorous, potassium, and nitrogen, which, when composted and/or spread directly onto the soil, break down, releasing these nutrients for uptake by the coffee plants themselves. Innovation at this stage of the supply chain is often driven by pragmatic considerations around cost savings. Nonetheless, novel conceptualisations are being introduced within coffee farming.

Figure 7: Production relationships in the coffee sector model





THE CIRCULAR ECONOMY IN ACTION

Coffee processing by-products

The pulp of the coffee fruit and the honey water (water-based by-product of washed coffee process), typically waste products, are increasingly being used in a variety of innovative ways. The most common practice at the farm level is to compost the used cherry pulp to create organic fertiliser that can be re-circulated back to the farm to increase the nutrient content of the soil. Other forms of using the coffee cherry pulp as raw materials create products that are suitable for human consumption. These include the drying of cherry pulp to make 'cascara tea' (a fruity infusion with notes of sweat molasses). Some companies in the sector have used the cherry pulp to create 'coffee flour' that can be used as a gluten-free alternative to regular, grain-based flours. Other initiatives include the transformation of the 'honey water' into consumable sweet syrup often referred to as 'coffee honey'. There are also initiatives that convert the husks (the dry parchment that sits between the coffee bean and the fruity pulp layer) into coffee cups (Huskee Cup)

Carbon in-setting

Implementation of carbon in-setting programmes allows companies to build resiliency in their supply chains and help restore the ecosystems on which the crops and their grower's livelihood depend. In-setting programmes have the potential to create a 'virtuous cycle' between improving the quality of the ecosystem and the quality of life and/or livelihood potential of the people living those ecosystems.

The most common in-setting programmes tend to focus on indigenous tree planting projects as tree planting has some clear ecological benefits such as reduction of soil erosion and soil degradation as well as water shed management and microclimate regulation. However, impacts of in-setting initiatives can reach far beyond the direct ecological benefits. Tree planting initiatives are often combined with the implementation of projects that reduce the need for fuel wood consumption at household level (e.g. via the promotion of fuel-efficient cook stoves) thus reducing the overall carbon emission of the landscape as well as creating a potential for smallholder communities and individuals to improve their livelihoods. This in turn can have wider positive implications on the broader socio-economic landscape. For example, by helping farmers to increase revenues, coffee farming can be made more appealing to the next generation of coffee farmers hence addressing another key social sustainability issue within the coffee industry, the aging farming populations.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Production	Recycling	Coffee husks, cherry pulp and other materials generated during the various coffee processing stages can be composted / fermented / treated / dried etc. and either be recirculated into the production cycle (as fertilisers) or turned into alternative products used at the consumer level (e.g. coffee husk-based coffee cups or honey-water based sweet syrups etc.)	4
Production	Resource Efficiency	Rainwater harvesting, waste water treatment and general best practice water management practices can all form the part of a broader resource efficiency programme that can be supported through certification schemes or direct investment from roasters and/or retailer's own value chain investment schemes.	5
Manufacturing	Product or service provision	Upgrading processing equipment, new equipment purchases are deferred for leasing/service model options.	5

AMBITIONS FOR THE UK COFFEE INDUSTRY

Working closely with producers on projects that address the economic, social and environmental needs of coffee growing communities and landscapes can be an area of opportunity to add value while also providing an opportunity to engage consumers around sustainability issues within coffee origins. Development of different circular economy models within the supply chain also has the potential to increase business collaboration and represents an opportunity to significantly improve the efficiency and profitability of coffee production and processing while simultaneously improving the livelihood opportunities of coffee producers and the quality of life within coffee growing communities.

As an ambition for the industry the BCA encourages the adoption of circular economy principles in the production and processing stages at origin as a way of supporting coffee producers' efforts to adapt to and mitigate the negative impacts of climate change while helping to reduce the environmental impact of coffee farming. Considering the potentials within the futures market, UK business engaged in futures trading also have an opportunity to support producers in exploring whether the engagement with the futures market could provide additional revenues that could in turn be re-invested in circular practices at farm level and improve the quality of life and livelihood potential of coffee growing communities and individuals.

2: SHIPPING AND TRANSPORT

Logistics and shipping partners can play a crucial role in reducing the overall impact of food miles (or coffee miles) and therefore on environmental sustainability of the coffee industry. Since the 1970s shipping and related road/rail haulage has been continually transforming and optimising to be one of the most competitive business sectors globally. The introduction of the shipping container and subsequent developments around port, rail and road freight handling, has allowed greater flexibility in the options available within the global coffee supply chain.

THE CIRCULAR ECONOMY IN ACTION



There are a number of concerns that relate to the sustainability and 'circularity' of packing materials used for the storage of raw coffee parchment or green beans. These include initiatives that focus on re-introducing jute sacks as well as biodegradable sacks for shipping green coffee beans. These considerations, however, must also be set against the need to protect the quality and integrity of the product, with water and odour barrier as significant drivers for innovation. Examples of this include the GrainPro system, which supports organic, chemical-free procedures in storing, drying, and transporting agricultural commodities, and specifically the Ultra-Hermetic™ bags which provide a unique atmospheric barrier solution.

Figure 6: Typical logistics and shipping operations in primary producing countries



Warehousing efficiency

A number of coffee companies have undergone rigorous reviews of the efficiency of warehousing for coffee beans in their supply chains. It has been shown that consolidation, or reduction in the number of operational warehouses, can be an effective way to increase overall efficiency, whilst also reducing waste associated with a smaller 'carbon footprint'.

Enhancing sustainability through consolidated / combined transport

Transportation of coffee goods in the UK and Europe often consists of road travel as the most direct method of transportation. However, multi-modal transport (road, rail and sea) can offer more fuel-efficient and therefore less polluting and less wasteful alternatives. Improved due diligence around supply chain assessments can be an effective mechanism to make the most of such logistical opportunities.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Bulk shipping	Resource Efficiency	Optimisation and stacking options within containers/holds can protect the load integrity	5
		Vacuum packing, water and odour barrier systems can reduce loss of product quality, reducing need for quality claims and delays.	4
		Due diligence and supply chain assessments into 'combined transportation' modes e.g. rail and road or road and sea, can support reduced fuel use, reduce carbon emissions and minimise waste.	3/4
Production	Recycling	Use of the most appropriate type of packaging to protect the integrity of coffee products at each stage of the life-cycle, whilst ensuring packaging can be captured and recycled.	3
Warehousing	Resource Efficiency	Consolidation of warehousing to increase efficiency and reduce waste through reduction of footprint.	3/4

Despite these opportunities, a number of challenges persist in terms of embedding circular business models in relation to shipping and transportation. First mile and last mile (FMLM) issues are increasingly being framed as obstacles requiring solutions which are both innovative and cost-effective. As with logistics operations in general, within the coffee sector the 'first mile' is not optimised, often treated as invisible (externalised) and inherently inefficient. In addition, while 'last mile' solutions are very well developed in getting products to point of sale (POS) the concept is increasingly being applied to post-consumer stages of the supply chain.¹⁰

AMBITIONS FOR THE UK COFFEE INDUSTRY

Retailers in the UK are increasingly adopting best practices, such as those outlined by the Green Coffee Association. Particular areas of focus relate to minimising exceptions; due diligence and upstream data reporting, which can all help identify efficient practices and limit waste.

Rail and shipping credentials must also be responsibly managed and assessed in line with the principles of the circular economy. The BCA believes that all companies should review their transportation routes both within the UK and Europe, as well as globally, harness rail and sea networks where appropriate; and identify opportunities for multi-modal transport solutions.

Assessing the sustainability of their warehousing needs and processes provides a systemic approach with significant potential to improve efficiency and reduce costs and waste (of resources, materials, time and energy).

3: MANUFACTURING

A circular economy perspective offers manufacturers the opportunity to look at cost savings, additional revenues and enhanced sustainability both within their supply chains as well as operations. As with other forms of manufacturing, coffee manufacturers are increasingly automating their processes to drive efficiency savings around energy and water inputs as well as reducing waste from the associated manufacturing process.



THE CIRCULAR ECONOMY IN ACTION

Machine design

Manufacturing machines that are designed for re-use at end of life, for example, steel from redundant industrial machinery can be recycled into more contemporary products such as cars or white goods. Also, recycling some materials, like metals, saves energy (and reduces carbon emissions) since it requires less energy to re-melt scrap than it does to produce new metal from primary resources.

Metals from machinery are infinitely recyclable, and thus the benefits include:

- Reducing waste, i.e. diverting waste from landfill
- Saving primary resources, i.e. substituting primary production
- Saving energy and associated greenhouse gas emissions through less energy intensive re-processing.

Green energy

Coffee manufacturers are increasingly turning to renewable energy sources to power their roasters and/or their whole factories, with some companies having already moved to 100% renewable energy sources. This has been a driver to encourage smaller companies to follow suit and switch to green energy sources such as wind and solar.

¹⁰ <https://www.thefirstmile.co.uk/coffee-recycling-businesses>

Later in this paper, the positive impacts of using coffee grounds for green energy will be explored in full, some companies have already started to use this green energy source to power their roasteries, while other coffee companies are experimenting with treating waste coffee grounds with biomass in order to create methane. This process has the potential to yield sufficient energy to power a factory and on-site operations.

Coffee sack re-use

Coffee sacks are by-products within the manufacturing sector that traditionally (and needlessly) been sent to landfill. However, many coffee manufacturers across the industry have stopped this practice and have started to re-purpose the coffee sack materials into second-life products (for example, tote shopping bags).

These are not only examples of assets being re-used in different ways but they also have the potential to provide direct and indirect opportunities for job creation across different industries. Identifying opportunities for circularity across companies and industries can present unique opportunities for reducing waste and support targets on achieving zero waste to landfill across industry.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Roasting	Business Models	Explore leasing options for new equipment. Switch to renewable energy (e.g. biomass from locally sourced wood/sawmill residues).	6/7
		Life cycle assessments (LCAs) conducted across machinery and supply chain.	4/5
Capsule manufacturing	Upcycling (added value)	Aluminium used in capsule manufacturing is inherently reusable if it can be economically recovered. Need to develop innovative collection models, deposit return/take back schemes etc.	4
Machinery manufacturing	Product as service	New machine sales come with maintenance packages included with coffee machines (e.g. take back, leasing discount, refurbish options).	6

AMBITIONS FOR THE UK COFFEE INDUSTRY

Coffee manufacturers are well placed to meet the ambition of zero packaging waste by 2025 and diversion of all waste from landfill. To enable this ambition, manufacturers and roasters could choose to embed Life Cycle Assessment (LCA) tools, using best practise standards such as ISO14040, across their machinery and supply chain. This could provide an opportunity for embedding circularity into their supply chains and operations, particularly around valuable resources such as metals.

Opportunities for innovation in machinery for commercial and domestic users are prime candidates for material substitution, designing for disassembly and component modularisation. Furthermore, developing novel service and leasing models could provide a significant opportunity to add value. Perhaps more so than other areas within the coffee supply chain, manufacturing - working in parallel with R&D and sustainability functions - can benefit from circular economy innovations in numerous ways.

4: DESIGN INNOVATION, RESEARCH AND DEVELOPMENT

Innovation in product design and investment in R&D are key contributors towards the long-term sustainability of any economic sector or business. Innovation in product design can help address some aspects of raw material risks and address some key technological challenges. Innovation in its broader sense can also provide a mechanism for developing new revenue streams and brand differentiation, while demonstrating that a business can adapt to customer expectations.

The coffee sector has demonstrated considerable levels of creativity and responsiveness to customer demands. For example, the shift away from instant coffee towards roast and ground products, new home brewing techniques including the introduction of single-serve capsules. While some of these formats have invited new challenges and often much criticism regarding their impact on the environment, these changes have also driven innovation around the types of materials used with deeper consideration about their recyclability and their environmental impacts.



THE CIRCULAR ECONOMY IN ACTION

Aluminium Stewardship

The Aluminium Stewardship Initiative (ASI) offers a gold standard for coffee companies to follow and sets criteria to drive responsible environmental and social performance, and business ethics across the entire aluminium supply chain. Aluminium used in the packaging of some coffee products (capsules in particular) can help increase shelf life and protect the quality of the coffee, however, it can also contribute to the waste generated through increased capsules consumption therefore, ensuring responsible sourcing, use and disposal of aluminium-based coffee pods is paramount to supporting efforts to achieve a circular economy in the coffee industry.

Recyclable and compostable coffee capsules

Recyclability and compostability of capsules have been an area of design innovation that is attracting increasing attention within the industry, both in the UK and globally. The creation of new material designs have enabled many coffee companies to support the decreased reliance on plastics and aluminium based products. For example, some new capsules use natural fibres, including bamboo and paper many of which claim to degrade within 90 days. While other companies are moving towards a target of recycling 100% of the aluminium that is collected and using this to re-make capsules so that there is circularity in this material usage.

It should be noted, however, that in the UK, industrial-scale composting would require greater investment in infrastructure in order to allow these solutions to be effective at a larger scale.

Compostable materials have to be collected and routed to industrial composting facilities, many of which are not yet able to accept the increasing volumes of materials flowing in. As new packaging innovations and compostable solutions become more readily available, it is important to keep in touch with and drive innovation in other related industries such as the waste collection and recycling sector. Waste and collection services in the UK now face an innovation challenge in being able to the increasing volume and different types of compostable waste at scale. Inter-sector collaboration is likely to be a major focus for the coffee and waste collection industries, alongside Local Authorities.

Light weighting - reducing use of packaging

Innovation is also evident where companies have reduced the overall packaging and packaging weight that their products are designed to use. Examples include the switching from glass jars to recyclable packaging or the reduction in the weight and thickness of coffee films. While these forms of material reduction solutions can lower costs and increase production efficiencies, while reducing the volume of waste sent to landfills, they may not be the ultimate solution when it comes to reaching targets around plastic use.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Packaging (capsules)	Recycling	Aluminium stewardship could be extended into the capsule market with collection/take back schemes. This could include kerbside recycling of aluminium and the opportunity of making it easier for consumers to access.	5
		Biodegradable and compostable pods and capsules are providing an end-use option for retailers and consumers at home, needs scaling.	3
Capsule production	Recovery (composting/energy)	Market entry and maturation for bio-degradable and compostable capsules offers the opportunity to place materials into home composting. There is also a significant opportunity to reduce the number of capsules and pods going to landfill through introducing kerbside recycling via Local Authorities.	3
Packaging	Resource efficiency	Changes to weight, size and material type (e.g. pouches replacing glass) reduces raw material inputs as well as transport fuel usage (emissions)	4
Packaging (plastics)	Prevention	Research funding starting to be channelled into area, space for bioplastics or full substitution if food safety issues can be addressed.	3
Packaging	Upcycling (added value)	Regulatory pressure increases recycled material content, high fibre (paper and card) usage is a material reservoir (technical challenge).	5
Manufacturer	Product as service	New machine sales come with maintenance packages included with coffee machines (e.g. take back, leasing discount, refurbished options).	5/6

There are a number of challenges that are relevant to R&D and innovation within the coffee sector, including access to finance outside of strategic business planning processes, aligning call for environmentally responsible packaging with customer expectations around shelf life, product quality, integrity and convenience of use. There is both a need and aspiration to drive innovation around circular economy in coffee packaging and design solutions. While there is still a long way to go before we can call the industry truly 'circular' and 'sustainable', the numerous examples for individual as well as collaborative efforts to find solutions to these sector-wide challenges, give reason for hope.

AMBITIONS FOR THE UK COFFEE INDUSTRY

It is essential that all coffee companies, particularly those with coffee pod and capsule products, move towards 100% recyclable and/or compostable solutions in their product design and supply chain by 2025. This will enhance transparency and reduce waste to landfill.

Life Cycle Assessments (LCAs) that connect with product design can support the development of new packaging materials that can be recycled and/or composted. However, collaboration across different sectors (coffee, waste collection, recycling etc) and working together with Local Authorities on improving the waste collection and recycling infrastructure will be critical if solutions are to be achieved as a national scale. These measures are more likely to ensure that new materials that are designed and introduced into the supply chain fulfil requirements of a circular economy.

For example, the replacement of synthetic plastics with bio-plastics which simplify plastic materials used in coffee pods and capsules.

R&D is a key function in meeting the BCA's overarching goal of creating zero-waste packaging by 2025, with all packaging material recyclable or re-usable. New products developed such as recyclable and compostable capsules will continue to drive the elimination of non-recyclable plastics and encourage the use of plastics with better recycling/composting rates.

DOWNSTREAM SUPPLY CHAIN: POTENTIAL TO ALIGN WITH THE CIRCULAR ECONOMY

5: RETAILERS

Retailers - which include supermarkets, coffee shops and any other out-of-home coffee selling establishments - have one of the most influential roles within the circular economy. Not only as an outcome of placing their products onto the market for consumers to purchase but also within their range of supporting structures in the supply chain, for example buying, procurement, third party logistics, warehousing and compliance. Of particular importance from an environmental impact perspective is the role of packaging and specifically how it is captured, collected and re-used.

Producers of goods for the retail sector and those that sell them share a legal responsibility for what happens to the packaging that gets those products safely to market. In law, 'packaging' is any material used to hold, protect, handle, deliver and present goods, and it covers the entire packaging supply chain.

A wide swathe of the retail sector must meet legal obligations around sustainability. Due to increasingly strict packaging waste regulations and requirements around ethical responsibility towards producers and workers within global supply chains, there are a number of material considerations for retailers within the coffee sector to consider. The EU Circular Economy Package sets out targets on the reduction of waste landfill to be reduced to 10% whilst increasing the amount of waste packaging that is re-used; these are likely to be applicable in the coming years - it is worth noting that EU environmental legislation receives parallel regulations in the UK to align trading relations.



THE CIRCULAR ECONOMY IN ACTION

Onsite disposable cup recycling

Disposable paper cups are another example of a waste product produced by retailers on-the-go beverage offering to customers. It has been well documented that paper cups are difficult to recycle because they are lined with a polyethylene plastic which is difficult to separate. However, paper cups can be fully recycled, provided they reach specialist recycling locations in the UK. The challenge for retailers, therefore, is now focussed on the capture of disposable paper cups and directing these materials to economically viable recycling facilities.

Several major high street coffee shops have successfully launched in-store recycling streams, using logistics backhaul so that paper cups can be captured and processed accordingly. Additionally, some high street retailers are incentivising the waste industry to collect cups by subsidising the cost per tonne. These innovations have seen the creation of a new recycling waste stream for disposable cups, and is collected by waste processing companies nationwide, such as Veolia and Simply Cups.

Incentivising re-useable cups

In addition to driving innovation in making disposable paper cups easier to capture for recycling, UK coffee retailers have also been encouraging the use of re-usable cups that customers can use in-store, supporting waste minimisation. Most coffee chains now offer incentives to customers, such as discounts on the costs of a beverage and loyalty card rewards in order to increase for the use of re-usable cups and drive down the consumption of single use take-away paper cups.

Retailers have seen slight increases in the number of customers bringing re-usable cups when they come to get their daily coffee in coffee shops. This is a proactive mechanism that can help reduce the number of single-use disposable cups. Some re-usable cup manufacturers have created business models where disposable paper cups are an input to their production processes, thereby demonstrating the role of circular thinking within their business planning.

Compostable cups

Another area of innovation has seen the creation of biodegradable and compostable cups, which some smaller retailers have already switched to in the UK. However, despite a strong move from a material perspective, the UK currently lacks capacity to be able to collect and process them in industrial composting. This is why many of the larger coffee chains have not switched to compostable or biodegradable cups because the current lack of supporting infrastructure and inadequate composting facilities means that they will, unfortunately, unlikely be processed.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Retail	Resource efficiency	In-store reduction measures around water, energy and solid waste generation (e.g. single-use coffee cups. Reduced packaging weight across supply chain (emissions reduction)	4
Retail	Upcycling (added value)	Redirect waste coffee grounds, and by-products to innovative solutions (furniture, etc)	5
Retail	Product as service	Lighting systems and equipment deals based on leasing models and lifecycle assessments	7

Retailers in the UK still face a number of challenges when it comes to finding solutions to circular economy challenges. A key struggle for re-processors, re-manufacturers, recyclers and refurbishment companies is that they lack access to the adequate alternative resources i.e. the products at their end-of-life stage – otherwise referred to as ‘waste’. Circular economy models are particularly relevant to retailers because they play a key role in the reverse logistics network, taking back products at their end-of-life stage to re-use them. Investment in infrastructure that will allow this waste to be captured and subsequently re-used in the most efficient means possible must be a priority both from retailers and the waste sector, but also, fundamentally, from the UK Government.

AMBITIONS FOR THE UK COFFEE INDUSTRY

Consistent with other supply chain stages in this report, all retailers should conduct life cycle assessments as a standard operating procedure, to assess how their products and processes impact the environment at every step of the supply chain and to better understand opportunities for cost-savings, efficiency and circularity. Having these assessments in place and connecting them with business-wide sustainability goals must be an imperative for all UK coffee companies and retailers.

Closer collaboration and working with local authorities and waste partners is also an imperative for the industry as we move forward in scaling innovations in disposable cup recycling. Office and supermarkets could be an obvious next step in terms of where waste segregation for disposable cups could exist so that cup recycling is as easy as possible for consumers.

Wider industry engagement in using waste coffee grounds and diverting this sustainable fuel away from landfill, must be an ambition for the industry. The opportunity with waste grounds represents a true circular economy model and if this continues to scale will provide efficient fuels for many of our living functions, including transportation.

Overall, retailers can play an important role in meeting our overarching goal of **100% waste recycled over the next decade**, creating zero waste to landfill across the industry.

6: CONSUMERS

In the UK there is currently a disconnect between what is expected of consumers, the education and consistency of information that is provided to inform them, and – as noted in the previous section – the recycling infrastructure that is currently available for them to use.

Consumer trends within the coffee sector suggest growing consumer demand for more sophisticated types of coffee both in- and out-of-home. For example, whilst instant coffee is still the biggest selling type of coffee overall, consumer tastes have been growing in exploring roast and ground, home coffee brewing, and coffee pods that offer 'barista-style coffee at home. At the same time, convenient, on-the-go, coffee from high street retailers has also significantly increased in recent years.



THE CIRCULAR ECONOMY IN ACTION

Consumer education

There is currently a lack of clarity and consistency in terms of what materials are recyclable, and how and where they can be recycled. Across all food and drink sectors there is an imperative to collaborate and develop more consistent and easier to understand educational messages for consumers, combined with initiatives to inspire consumers to change behaviour around recycling and re-use.

Recent work by the Waste and Resources Action Programme (WRAP) highlights that a lack of consumer education is a key barrier to recycling and is currently working on simplifying educational messages to enable recycling behaviour. Additionally, more tools such as 'traffic light' systems on packaging to highlight whether items are recyclable or not, and mobile apps that help consumers identify and locate recycling services are being developed and made available.

Until better messaging and, as noted in the previous section, adequate investment in infrastructure and Local Authority waste services, the BCA does not believe that consumers should be taxed. Only after educational initiatives have been put in place and the infrastructure has been developed should taxes be considered as an additional approach to encourage behaviour change.

Collection and recycling of coffee pods

Innovation around the capture and recycling of single-serve coffee pods has been a growing area of focus for the UK coffee industry. Consumers already have options for recycling pods at home. A coffee pod manufacturer in the UK, for example, offers all of its customers a simple solution to recycle their pods. This includes the collection of used capsules, from homes or collection points, for recycling and has already generated the capacity to recycle 100% of all capsules sold. Another pod manufacturer proactively partners with Terracycle to offer a recycling programme which includes a network of public drop-off locations that send capsules to Terracycle in much larger and more environmentally-friendly shipments for recycling.

Waste coffee grounds at home

The growing popularity of roast and ground and whole bean coffee (as opposed to instant coffee), means consumers are increasingly aware of re-using waste coffee grounds at home. Being high in nutrients, waste coffee grounds can be used as garden fertiliser for plants and flowers, producing excellent 'green' matter for composting. Although much smaller in scale than the more commercial waste coffee ground re-use, such as Bio-bean, the action of individuals is critical in producing long-term changes in behaviour.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Consumption	Recycling	On the go recycling solutions aligned with messages around waste collection and recycling locations could open up potential for further collaboration with councils and waste management	3
Consumption	Resource efficiency	Coffee machines and single-serve capsules reduce the amount of energy & water usage, could be used as an indexation metric for such inputs with similarities for POS retailers (baristas)	4
Consumption	Recovery (composting)	Home composting schemes for spent coffee and biodegradable capsules incentivised towards a target % uptake	2
Consumption	Prevention	Drop off points for household coffee grounds similar to batteries, etc	2
Consumption	Upcycling (added value)	Deposit return scheme for disposable cups but also home coffee machines (the European Union's Waste Electrical and Electronic Equipment Regulations)	5

While many of these initiatives do make significant impact on the ground, the coffee sector faces significant challenges in terms of levels of investment required to further develop and scale these initiatives. However, as new technologies are embraced in supply chains such as the 'Internet of Things', machine learning, and technology such as blockchain, they can be used to encourage and enable consumers to take greater responsibility for the use, re-use and re-cycling of their everyday products, such as coffee.

AMBITIONS FOR THE UK COFFEE INDUSTRY

The UK coffee industry must **evidence industry commitment to creating educational initiatives for consumers** that help them understand how and where to recycle coffee products and materials. Industry transparency and labelling and on-pack information will be an important way to achieve this. Some of the current work undertaken by WRAP will be vital in creating more consistent and easier to understand messages for consumers.

For products such as single-serve coffee pods, the BCA recognises and supports the importance of minimising the environmental impact of coffee pods and capsules. Educational initiatives that drive greater understanding around compostability vs biodegradability, for example, are vital and have the potential to encourage consumers to take proactive steps in segregating and minimising waste entering landfill.

7: RECYCLING AND REUSE

The reduction of waste, increasing recycling and re-use of materials is the central pillar to driving a circular economy. Material value can be retained, preserved and even created through effective recycling practices that drive the re-use of materials. This is a concept that is aligned with the 2018 Industrial Strategy from the UK Government, identifying 'Clean Growth' as one of the 'Grand Challenges' in putting the UK at the forefront of the industries of the future.¹¹

The need to reduce environmental impacts associated with patterns of consumption and resource use is therefore a material consideration. The types of materials provided to consumers must be carefully considered when exploring transitioning towards a circular economy model. It is also central to the recently published 25 year environment plan by the UK Government. This plan includes specific objectives around resource productivity, namely maximising the value and benefits we get from our resources, doubling resource productivity by 2050, and will frame the planned publication of a new Resources and Waste Strategy later in 2018.



THE CIRCULAR ECONOMY IN ACTION

Bio-bean and waste coffee grounds

UK coffee shops produce a significant amount of waste coffee grounds on a daily basis. This by-product used to go to landfill, producing methane and CO₂. Over the last few years, however, the coffee industry has seen a significant innovation step in driving the circular economy through capturing waste coffee grounds and turning them into bio-fuels. Bio-bean, a company at the forefront of this development, collects waste coffee grounds at every scale, from independent cafés to major coffee chains and from universities to instant coffee factories. It can process up to 50,000 tonnes of waste coffee per year, purportedly saving 6.8 tonnes of CO₂ emissions for every tonne re-cycled.

Through working with energy providers such as Shell, Bio-bean now hopes to create other biofuels, such as biodiesel made of used coffee grounds, that can power transport systems and will eventually power our cities. This innovation has been a much lauded and a significant step in circularity and in diverting waste products from landfill to be used as green energy.

Terracycle

Another innovation within the recycling sector has seen Terracycle support the recycling of otherwise 'hard-to-recycle' waste. Materials from coffee products such as jar lids, refill bags, coffee bags, and coffee sticks can all be collected by Terracycle to undergo additional processing into recycled products¹². This diverts and prevents recyclable materials from going to landfill and provides an extended lifecycle to plastic-based coffee packaging.

Waste streaming

The streaming of waste in the UK has lagged behind northern European countries for a number of years. The European Circular Economy Package predicts plastic recycling rates will be at 55% by 2025. In contrast, the UK's plastic recycling rate was 46% in 2016, suggesting a 2% per annum increase in plastic recycling is needed for the next decade to stay on target.

There is an urgent and significant need for investment in commercial recycling and recycling collection infrastructure. For commercial organisations dealing with high volumes of waste, baling machinery is a must. Any organisation that is producing waste in excess of two tonnes per week should be using suitable machinery to deal with this waste in an efficient manner.

¹¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

¹² https://www.terracycle.co.uk/en-GB/zero_waste_boxes/coffee-bags

Across the UK there is considerable variance within recycling schemes, waste collection and waste processing services that are offered by Local Authorities. Some reports suggest over 300 different recycling schemes that exist across Local Authorities in the UK. This position contributes to consumer confusion as to what materials can be recycled (explored in the 'Consumer' stage of this report) and hampers progress in increasing overall recycling rates.

In addition to the investment in recycling services, the UK needs substantial expansion of composting services. Some Local Authorities do offer this stream of waste collection and processing of organic waste. Compostable take-away cups are an example of a consumer product that can be composted in some parts of the UK. However, these services currently operate at nowhere near sufficient levels and do not cover much of the UK, so scaling these up will be an important next step.

The coffee industry has also created a new recycling stream through initiating the capturing of disposable cups from coffee shops. Many of the large coffee chains have created in-store recycling streams to capture disposable cups after they have been used. Specific waste and recycling services are able to upcycle these cups into paper and save them from landfill and incineration.

Deposit return schemes are another initiative being introduced by the UK Government, specifically for plastic, glass and metal containers. Despite many of these materials being easily recyclable, the UK recycling rates for them remains low, only around 60% of glass is currently recycled for instance.

Summary and alignment to the Coffee Circular Index

SUPPLY CHAIN STAGE	INITIATIVE TYPE	OPPORTUNITY	CCI INDEX
Shipping and transport	Resource efficiency	Centralising logistics operations	5
		Fuel efficiency upgrades	
		Route optimisation options and 'just-in-time' (JIT) approaches to reduce storage need	
		Biodiesel from coffee waste	6
Shipping and transport	Resource efficiency	Spent grounds from multi-chains and high-volume outlets in high density areas collected and returned to facilities for secondary processing	5
Retailer	Upcycling (added value)	Residuals used for soil nutrient supplements, compost, or energy generation	6
Retailer	Recovery (composting/energy)	Spent grounds are collected on site, bagged and given away to customers as plant nutrient (with education and awareness programme)	2
Manufacturer	Product as service	New machine sales come with maintenance packages included with coffee machines, e.g. take back, leasing discount, refurbished options	7

A number of challenges persist for the coffee sector around embedding circular economy principles and circular business models in relation to recycling and reuse opportunities. Firstly, conceptualising waste materials as having latent value which is not only retrievable but beneficial, takes practice and can most successfully be achieved in organisational situations where product designers, sustainability experts, buyers, finance teams and decision-makers work closely during the development and implementation stages of the product life-cycle. If embedded in this way, there can be dual benefits in terms of preventing materials and input wastage (including labour and R&D time) and the opportunity for new relationships to be formed either within the organisation or as symbiotic business relationships.

Another challenge is the need for barrier layers in packaging such as coffee pods and coffee films / paper bags, which ensure that the coffee inside is kept fresh, in line with food safety legislation and requirements. Until new material technologies are created there will be limitations on the specific materials that can be used in packaging to ensure that products such as coffee pods are kept air tight and safe to consume.

AMBITIONS FOR THE UK COFFEE INDUSTRY

The BCA's central ambition is for the UK coffee industry to have **zero-waste packaging by 2025**, so that all coffee product packaging in the UK should become recyclable or re-usable within this timeframe and create a zero impact on UK landfill. This can be achieved through the elimination of non-recyclable plastics in products, encouraging use of plastics that allow better recycling rates, and eliminating or changing complex combinations of packaging materials. Much of this will be driven by research and development (R&D) within companies, but this commitment from industry will drive adoption of the circular economy model and improve sustainability.

Such an ambition requires a positive combination of both **industry collaboration and government commitment** (at national and local levels) to invest and expand recycling infrastructure in the UK. Consistency in material recycling across local authorities is urgently needed to provide easy to follow guidance for all consumers. The expansion of material segregation and waste streaming through deposit return schemes and capturing and recycling of disposable paper cups will support material re-use within the coffee industry. Industry must examine supply chains to assess waste reduction and circularity opportunities, while committing to offer sustainable alternatives; such as plastic-free products and bins for specific packaging types, as seen with disposable cups

SECTION 7: KEY RECOMMENDATIONS AND INDUSTRY COMMITMENTS

In developing this 'Bean to Bin and Beyond' paper, the BCA has reviewed the breadth and depth of existing initiatives addressing various aspects of circular economy within the UK coffee industry, proposed a Coffee Circularity Index (CCI) as an evaluation tool, acknowledged progress to date and has identified the key opportunities and challenges that still lie ahead. In order to overcome these challenges, collaboration both within and beyond the industry will be crucial.

Based on this research, the BCA proposes seven goals for a Sustainable Circular Coffee Economy, with the deliberate intention to encourage its members and the wider UK coffee industry to take pro-active steps towards creating a truly circular coffee economy. These goals are by no means prescriptive but rather are meant to act as a framework and a guideline to enable the UK coffee industry to achieve its sustainability ambitions with regard to the circular economy:

BCA'S INDUSTRY GOALS FOR A SUSTAINABLE CIRCULAR COFFEE ECONOMY

1. **Zero-waste packaging by 2025** – aim to switch to 100% recyclable or re-usable packaging across all products within the next seven years with 0% of waste going to landfill.
2. **Support the BCA in encouraging the UK Government to expand investment in recycling and waste management infrastructure**, including investment in composting facilities and the improvement of waste collection infrastructure across Local Authorities and individual household.
3. **Responsible sourcing of all packaging materials** – including plastic, paper, cardboard, and aluminium through enhanced supply chain transparency, traceability and investment in technologies that reduce waste to landfill.
4. **UK coffee companies to conduct lifecycle assessments (LCA's)** across their supply chains to identify opportunities to create efficiencies, minimise waste and potential to improve circularity.
5. **Evidenced industry commitment to creating initiatives that help consumers understand how and where to recycle used coffee products and materials** – including education through best practice examples and recommendations. This can be supported by improved transparency in labelling and on-pack recycling information as well as the creation of digital technology such as recycling apps and other tools that will help educate as well as inspire consumers to change their behaviour around the use, re-use and recycling of materials in their daily coffee products.
6. **Optimal transportation routes to be viewed and reviewed by all UK coffee companies with sharing of best practice** – across supply chains both within the UK and globally, companies should look to minimise carbon usage through transportation and drive adoption of green technology through their transportation networks.
7. **Encouraging the adoption of the circular economy principles in the production and processing stages at origin** – this represents a way of supporting coffee producers' efforts to adapt to and mitigate the negative impacts of climate change while helping to reduce the environmental impact of coffee farming.

Through working towards these goals, the BCA aims to support individual members in their efforts to drive sustainability to protect the needs and interest of people and the environment throughout their supply chains and contribute to a thriving and sustainable coffee industry, both now and far into the future.

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