

THE NEXUS NETWORK

new connections in food, energy, water and the environment
An ESRC investment

Fast-Moving Circular Goods 2025

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Nexus Network think piece Series, Paper 006 (July 2015)



About the Nexus Network think piece series

Funded by the ESRC, the Nexus Network is a collaboration between the University of Sussex, the STEPs Centre, the University of East Anglia, and the Cambridge Institute for Sustainability Leadership. The Nexus Network brings together researchers, policy makers, business leaders and civil society to develop collaborative projects and improve decision making on food, energy, water and the environment. In July 2014, the Nexus Network commissioned a number of think pieces with the remit of scoping and defining nexus approaches, and stimulating debate across the linked domains of food, energy, water and the environment.

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Fast-Moving Circular Goods 2025

Summary

The aim of this project is to develop a vision for the future of the Fast-moving Consumer Goods (FMCG) industry in a circular economy and through the creation of a set of provocative, compelling stories encourage a shift from incremental to transformational conversations about the future. A qualitative scenario development methodology, involving the participation of circular economy and FMCG industry experts in workshops and interviews, was utilised. During the process current trends were analysed and six themes were identified and informed the creation of a set of four stories of the future. The four stories are titled: Connected Communities, Let's Get Personal, The Circular Supermarket and Packaging Reinvented. The stories are not intended to be prescriptive, but rather give an indication of what the transition to a circular economy could hold for the FMCG industry. It is hoped that the stories will provide the catalyst for the further research, conversations and collaborations necessary to drive us towards a circular future.

1. Introduction

The linear economic model of extracting raw materials and manufacturing goods to be sold, used and disposed of has dominated the industrial scene for the last 150 years. While this model has been hugely successful for profit generation, it is putting immense strain on the Nexus of natural resources and generates vast quantities of waste.

Fast-Moving Consumer Goods (FMCG) include food, beverages, clothing and packaging: goods which are bought more often, have a lower unit cost and have a much shorter service life than durable goods. Food, beverages, clothing and packaging account for about 35% of materials used, but these products are often not recycled: around 80% of the materials used for FMCG end up in landfills, incinerators or wastewater. There is a significant need to re-think the ways in which consumer goods are delivered, used and ultimately re-captured so that valuable resources can be retained within a circular economy. While this need has been identified, the lack of innovative models, and awareness of those models that do exist, makes it difficult for both businesses and consumers to imagine what a Fast Moving Circular Goods future might look like. This paper uses a futures studies approach to envision the future of the fast-moving consumer goods industry in a circular economy. **Section one** is an extended introduction, containing a literature review, which identifies the context and intended impact

of the research by examining the impact of futures studies and storytelling. **Section two** outlines the methodology employed by the study and the scenarios and stories are described in **section three**. A detailed discussion of the implications of this vision is presented in **section four** along with the limitations of the study and recommendations for future research.

The circular economy and the nexus

The circular economy is an economic model that stands in opposition to the model that largely dominates the current system, the linear economy, in which resources are extracted, converted into usable products, used and disposed of¹. The difference between the two systems is that in the circular model waste does not exist. Rather, what is considered to be waste in the linear economy is designed to be fed back into the system as a resource either through reuse, remanufacture or recycling, thus closing the loop on the flow of materials². The roots of the circular economy cannot be traced to specific author or date², but since the late 1970's a small number of academics and businesses have contributed to the subject. Stahel and Reday envisioned an economy of loops in their report *The Potential for Substituting Manpower for energy*³ and John Lyle established the Lyle Center for Regenerative Studies that challenged students to envision a community that lived within its resource limits⁴.

The nexus is a framework that has emerged over the past five years for viewing the interdependencies between food, water and energy security in the context of wider environmental change. Nexus thinking highlights the need to work across these domains, moving beyond the traditional silo. This shift in approach aligns with circular economy principle of *thinking in systems* – the ability to understand the relationship of the whole to the parts and how the parts themselves influence one another. The majority of real-world systems can be characterised as non-linear, feedback-rich and interdependent, necessitating the need for the systems-level interconnected approach of both the nexus and circular economy.

The Ellen MacArthur Foundation defines the circular economy as “an industrial system that is restorative or regenerative by intention and design”⁵. Following on from the work of Michael Braungart and William McDonough⁶, the Foundation developed the butterfly diagram (Figure 1) to visualise the concept of materials cycling through the system, both technical and biological. The Foundation² identifies four levers of value creation in the circular economy, all of which can be visualised using the butterfly diagram:

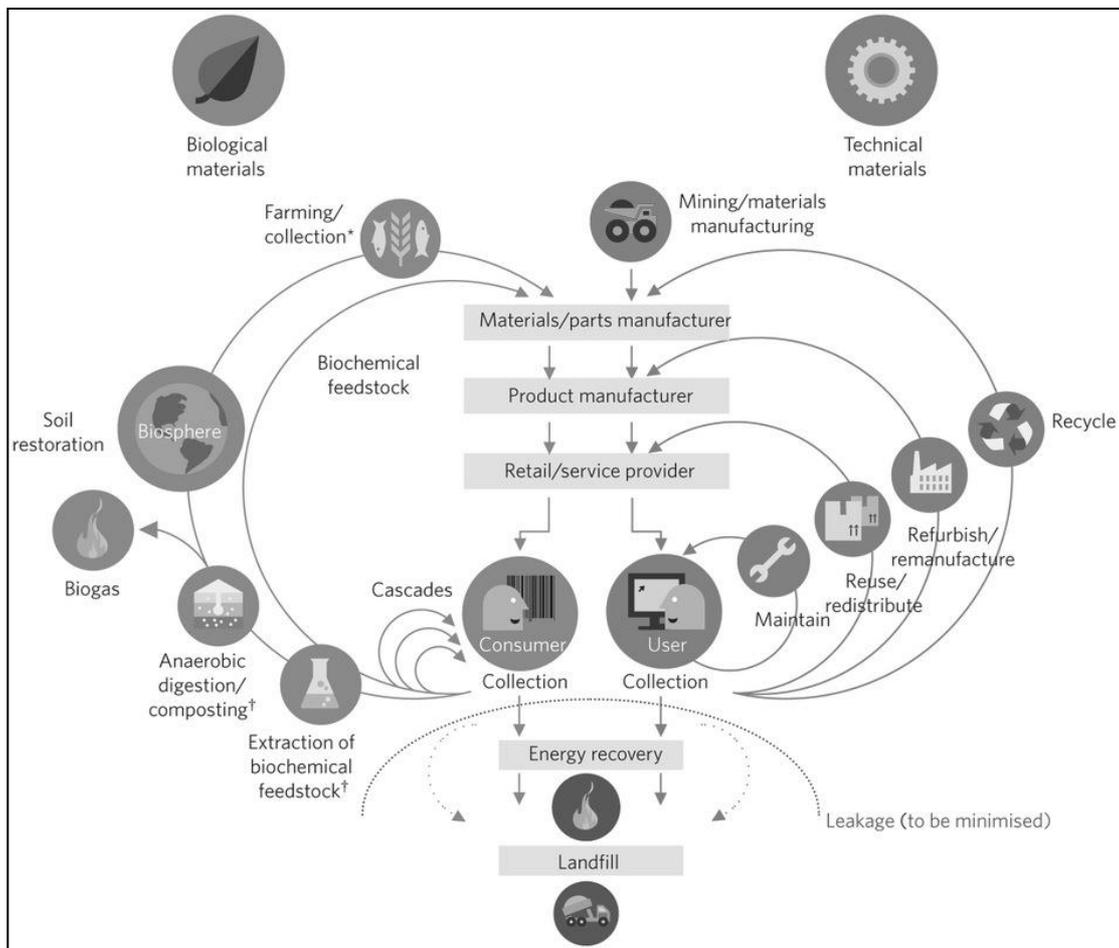


Figure 1: Butterfly Diagram (Ellen MacArthur Foundation, 2013a)

Power of the inner circle: The first lever speaks to the idea that the tighter the circle (for example, reuse versus recycling), the more value can be created. This value can be derived from increased savings in embedded labour, material and energy costs and externalities such as toxic substances, water and greenhouse gas emissions.

Power of circling longer: This lever concerns the value of keeping products, and the components and materials they contain, in use for longer. This can be achieved either by extending the life of a product, or by putting it through consecutive cycles through the system, or example: refurbishing an engine core multiple times. These activities substitute the inflow of virgin material into the system, an attractive idea given rising resource prices⁷.

Power of cascaded use and inbound material/product substitution: In addition to cycling identical products and materials through the system, there is also opportunity to cascade products or materials across different product categories such as turning cotton clothing into furniture stuffing and later into insulation before returning it to the biosphere as a biological

nutrient. In this case value is derived from the marginal cost of cascading the material, again substituting virgin material inflow and the associated costs and externalities.

Power of pure, non-toxic inputs and designs: The fourth lever is an enhancement of the other three levers. In order to maximise value creation a certain purity of material and product quality is required. Increased purity in materials and post-consumption material streams translate to reduced reverse cycle costs such as material separation and improve the ability to maintain quality as products are cycled through the system, extending longevity and resource productivity.

Both the nexus and the circular economy are frameworks for understanding the interdependencies that exist between and within real-world systems. This paper employs a circular economy lens to envision the future of the FMCG industry, which has the potential to significantly impact on the focus areas of the nexus.

Fast-moving consumer goods

The fast-moving consumer goods (FMCG) industry covers a wide variety of, typically non-durable, products including food and beverages, household care and personal care products. The industry is characterised by high sales volumes and relatively low prices⁸. These characteristics, coupled with the typically short lifespan of FMCG products give the impression that it is more difficult to adopt circular economy principles in the FMCG industry than in other sectors⁸. There is, however, significant need to shift away from the wasteful current system and tremendous potential value in making that shift to a circular economy.

The FMCG sector is responsible for 75% of municipal solid waste generation⁸. The Waste and Resource Action Program (WRAP) found that 7 million tonnes of food and drink waste was generated in UK households in 2012⁹, 19% by weight of the amount brought into the home. Increased consumption rates, as a result of the predicted rise in the global middle class¹⁰ will not only increase waste levels, but will lead to increased material use, rising input costs and commodity volatility⁸.

The opportunities for the FMCG sector in a circular economy are considerable. The Ellen MacArthur Foundation⁸ maintain that actions such as the creation of new business models, changes to product and packaging design and closing the loop on material flows will create significant value for companies, economies, consumers and the environment.

Having said that, there appears to be very little research into the nexus of the FMCG industry and the concept of a circular economy indicating a knowledge gap in dire need of filling.

The impact of futures studies

The formal practice of futures studies is over 50 years old and encompasses a range of activities including scenario planning, foresight and horizon scanning¹¹ with projects ranging from creative, philosophical visions of the future to quantitative socio-economic analyses¹². Futures studies projects are undertaken for a variety of purposes by different organisations including as a strategic thinking tool for corporations¹³, by governments looking to inform public policy^{12, 14} and within research institutions seeking to advance the field itself. The value that can be derived from futures studies activities is as broad as the range of projects. Rohrbeck and Schwarz¹⁵, in an analysis of 77 companies that have employed futures studies in their work, derived a comprehensive list of the potential value contributions of the projects. These included: increased insights into the changing environment, fostering conversations about company strategy and shaping the creation of the future through the influencing of other parties such as policy-makers and other companies. Beyond the value found by Rohrbeck and Schwarz, futures studies is also utilised as a means of changing organisational culture, a critical requirement for an FMCG industry facing a rapidly changing environment. Korte and Chermack¹⁶ note that scenario planning, one of the tools in the future studies arsenal¹⁷, has the potential to develop an organisational culture that fosters adaptability and dynamism.

In driving towards a circular economy we are not concerned with simply reacting to a future we have no control over, but rather seeking to create a preferable future. Futures studies gives us the means to create our own future by identifying and acting on opportunities we might otherwise miss if we were simply to react to external change¹⁸. Speaking on this concept of enactment, Weick¹⁹ posits that the enactment of people can bend the external environment. The volume of research documenting the potential impact of futures studies work coupled with the lack of research concerning either the future of the FMCG industry or the circular economy indicate that there is significant value in conducting a study into the future of FMCG in a circular economy.

The power of storytelling

Envisioning and planning for the future is a valuable activity, but the communication of that vision is equally important in order to fully capture that value²⁰. The power and impact of storytelling is the subject of a wide range of research²¹ and include the ability of stories to

maintain the thrust of an initiative²², increase commitment to policies²³ and to inspire and influence change²⁴. In an attempt to understand why some scenario planning activities fail and others succeed Bowman *et al.*²⁰ examined the role of storytelling in the scenario method employed. Their study found that emotive, meaningful stories are more effective than well written and reasoned reports. Furthermore, they found that involving participants in the creation of the stories was critical to their success. Stories have the power to memorably and meaningfully communicate and simplify complex concepts according to James and Minnis²⁴ who go on to state that they are “one of the most time-tested motivational tools known to man”. Good stories are able to tap into the emotions and intellect of their audience²⁵.

Having conducted a review of existing literature it is apparent that there is a lack of research into the opportunities that exist for the FMCG industry within a circular economy. The aim of this paper is to use a futures studies approach to envision the future of the fast-moving consumer goods industry in a circular economy. Coupled with the power of storytelling to inspire and influence change, this study seeks to initiate a paradigm shift in the FMCG industry, from a linear to a circular system, by provoking stakeholders to move from incremental to transformational conversations about the future.

2. Methodology

In order to meet the aim of this study the following objectives were developed:

- Identify the need for, and potential impact of, a vision of the FMCG industry.

Work with stakeholders to:

- Identify current innovative practices across the industry;
- Develop themes as a springboard for the exploration of future models;
- Develop innovative scenarios for the future of FMCG;
- Create a set of stories to communicate the vision to a range of audiences.

This section describes the methodology employed to meet these objectives.

Scope: The term “fast-moving consumer goods” is used to describe an extremely broad set of sectors including food, beverages, household care products, personal care products, clothing and occasionally even electronics. This study is limited to four of these sectors: food, beverages, household and personal care products.

Scenario development

Over its 50-plus year history¹¹ the field of scenario development has diversified into a number of different methods and applications. The van Notten typology, developed by van Notten and his colleagues²⁶ and shown in Figure 2, established an overview of the state-of-the art in the field and is useful for describing the approach taken in this study. The typology classifies scenarios using three themes: (A) The goal of the project, (B) the process design and (C) the scenario content. Each theme then has associated characteristics that provide additional detail.

<i>Overarching themes</i>	<i>Scenario</i>	<i>characteristics</i>
A Project goal: exploration vs decision support	I.	Inclusion of norms? : descriptive vs normative
	II.	Vantage point: forecasting vs backcasting
	III.	Subject: issue-based, area-based, institution-based
	IV.	Time scale: long term vs short term
	V.	Spatial scale: global/supranational vs national/local
B Process design: intuitive vs formal	VI.	Data: qualitative vs quantitative
	VII.	Method of data collection: participatory vs desk research
	VIII.	Resources: extensive vs limited
	IX.	Institutional conditions: open vs constrained
C Scenario content: complex vs simple	X.	Temporal nature: claim vs snapshot
	XI.	Variables: heterogeneous vs homogenous
	XII.	Dynamics: peripheral vs trend
	XIII.	Level of deviation: alternative vs conventional
	XIV.	Level of integration: high vs low

Figure 2: Scenario Development Typology (van Notten *et al.*, 2003)

The aim of this study is to provoke transformational conversations about the future, placing it firmly within the domain of an exploratory study. It is important to note that van Notten *et al.*²⁶ comment that in exploratory studies, the process is often as important as the scenarios themselves. With a time scale of 10 years this study can be considered a short-term projection. The process followed in this study focuses on qualitative insights and knowledge for the creation of its scenarios complemented by the use of narratives for communication. These characteristics place it on the intuitive end of the spectrum between formal and intuitive processes²⁶.

An additional process characteristic worth exploring is the selection of a participatory rather than desk-based approach. Rotmans *et al.*²⁷ advocate the participatory approach as the diverse knowledge and perspective of the participants adds to the richness of the scenarios. This study involved a core group of 10 participants from academia, the FMCG industry and a circular

economy advocacy group who were involved throughout the process. This core group was supplemented with additional participants during select activities.

The final theme on the van Notten typology is the scenario content, which can range from complex to simple. The scenarios developed in this study fall somewhere in the middle of the spectrum. On one hand the FMCG 2025 scenarios offer a snapshot of the industry 10 years from now, rather than a complex path of development. On the other, the broad scope of the study, encompassing nearly an entire industry with all of its associated actors and variables, increases the complexity of the scenarios.

The van Notten typology is a useful mechanism for describing the scenario development process employed, effectively capturing the “why”, “how” and “what”²⁸ of the scenarios. In this vein, the FMCG 2025 process is a short-term, exploratory study employing an intuitive, participatory approach to develop a set of snapshot scenarios of the complex FMCG industry.

FMCG 2025 process

Figure 3 below is a visualisation of the four-stage process employed during this project.

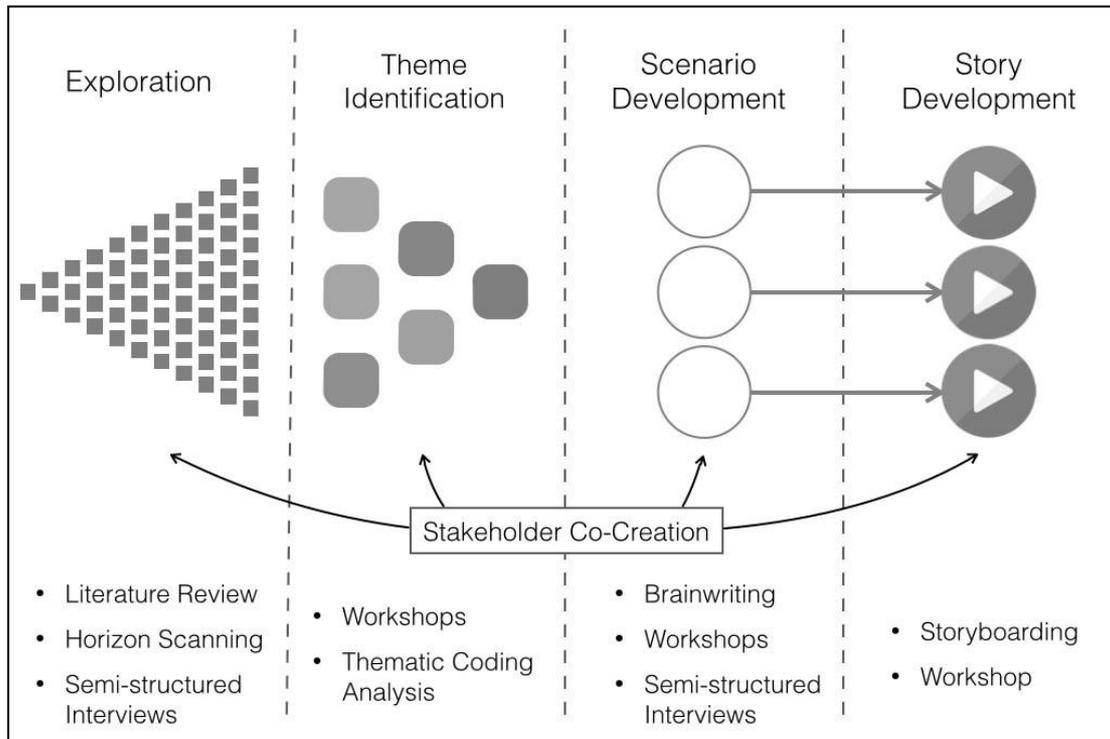


Figure 3: FMCG 2025 Methodology Diagram

Stage one – exploration: The first stage of the process was a web-based horizon scanning activity²⁹ aimed at identifying current trends and innovative practices both within and beyond the FMCG industry. The scan involved monitoring numerous online sources including social media, blogs, trend reports and news outlets. This web-based approach was complemented with insights gathered through semi-structured interviews³⁰ with industry experts from a number of global FMCG companies. These interviews were used to directly identify current trends and practices and to lead the researcher to appropriate sources for the web-based scan. The output of this stage was a collection of 56 examples of innovative practices and insights. These were communicated using a set of cards to be used in the following stage of the project. Figure 4 below shows two examples of these cards.



Figure 4: Example Cards

Stage two - theme identification: The second stage of the project was the identification of themes, to be used as the basis for the development of the scenarios. The participatory nature of workshops, advocated by Börjeson *et al.*³¹ in their user's guide to scenario techniques, can increase the acceptance of the final scenarios by the stakeholders. For this reason they were used on multiple occasions during this study.

During the first workshop, involving the core participant group, the card set developed in the exploration phase was used as visual stimulus³⁰ during the session. In the ensuing discussion participants identified both the positive and negative characteristics of the collection of examples, as applied to the principles of the circular economy. Additionally, participants identified 12 trends within the presented examples to serve as further stimulus in the development of the scenarios. Figure 5 shows the participants interacting with the cards.



Figure 5: Theme Identification Workshop

Themes were arrived at using a process of thematic coding analysis³⁰. The positive and negative characteristics identified by the participants were analysed and collated. Thematic maps were developed (Figure 6) and ultimately six overarching themes were identified. Robson³⁰ discusses the need to constantly refine the thematic analysis and a second workshop was held for this purpose.

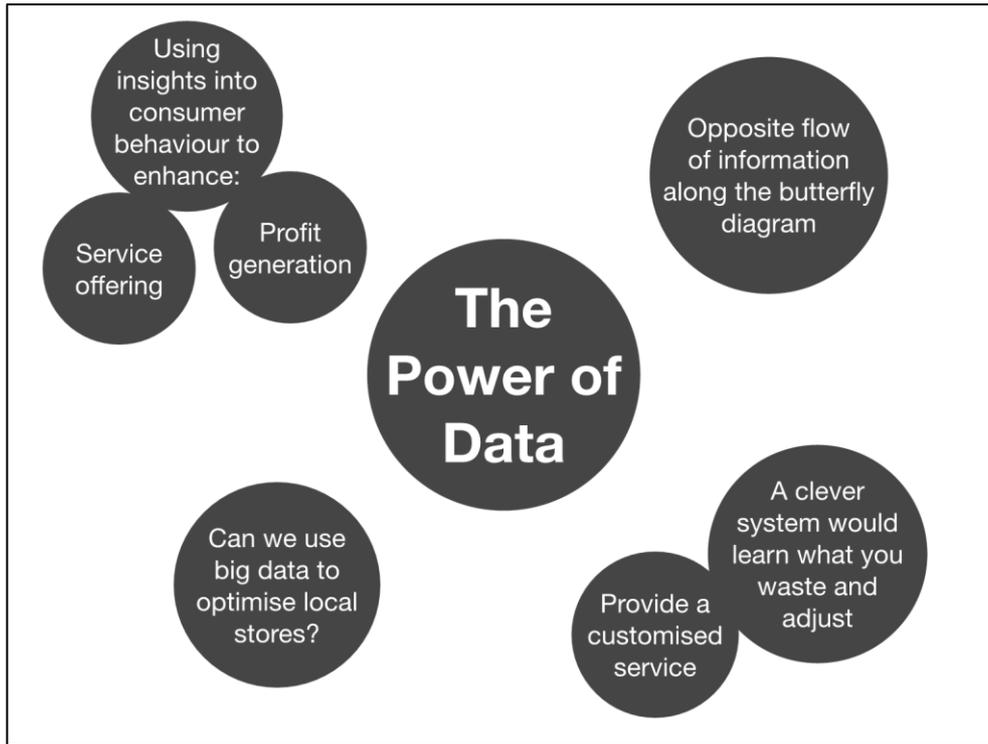


Figure 6: Thematic Map Example

The second workshop involved a group of ten design masters students, in an effort to further expand the perspective of the study²⁷. In particular, the students would approach the idea generation activity without any of the preconceived biases of the FMCG industry, which may be held by the core participant group as industry experts. Participants were given a short presentation on the principles of the circular economy and the FMCG industry. They were then split into three groups and assigned one of three FMCG sectors: food and beverages, household care, and personal care. Each group was asked to undertake a brainstorming activity to generate ideas for products or services that might exist in their sector in 2025. The generated ideas were analysed by the researcher, in conjunction with the previously identified themes to further refine the themes.

Stage three - scenario development: The process of developing the scenarios involved a number of activities including semi-structured interviews with stakeholders, using the themes as stimulus, followed by two workshops. The first workshop again involved the core participant group. The aim of the workshop was to generate granular ideas that could be synthesised to form the final scenarios. Participants were briefed on the six themes identified in the previous stage and a brainwriting³² activity, developed to mitigate groupthink and other weaknesses of brainstorming, was utilised to generate the ideas. The brainwriting process

involved advancing systematically through the six themes with participants given approximately 10 minutes to generate ideas for FMCG products, services or business models. Ideas were generated in silence and captured on sticky-notes. Following the 10 minute writing period ideas were shared with the group and discussed for a further 20 minutes, capturing any new ideas. At the conclusion of the workshop a total of 120 ideas were captured. Similar to the identification of themes, a thematic coding analysis³⁰ process was undertaken to group the generated ideas into scenarios. Ideas were coded with a variety of keywords and grouped according to various permutations of keyword combinations. An initial set of four scenarios was developed through this process. In order to refine and validate the scenarios a second workshop was held at the offices of the circular economy advocacy group. The four scenarios were presented to the group of circular economy experts who gave feedback and added additional ideas of their own. A fifth scenario was added during this refinement process.

Stage four – story development: The final stage of the process was the creation of the stories to communicate the scenarios. The aim was to make the scenarios accessible to a wide range of audiences, enhancing their potential reach and impact. Animated videos were selected as the medium of communication. For each scenario a narrative storyline was developed making use of personas and tangible experiences that an audience could relate to. These narratives were then translated into a set of storyboards to be used in the creation of the animated videos. A final editorial meeting was held with members of the core group in order to finalise the content of the stories prior to video production.

3. Results

The trends, themes, scenarios and stories developed during this study are presented below.

Trends

During the theme identification workshop 12 trends were identified among the collection of innovative practices that were collected during the horizon scanning activity. The trends are presented in Table 1. The trends were not identified for their circularity, but rather to ensure that the scenarios created accurately reflect and build upon the current activities of the FMCG industry.

Table 1: Trends

Trend	Description	Examples	Source
Take-Back Systems	Encompasses various models for the recovery of products after use.	Back to Mac	(M.A.C. Cosmetics, No Date)
		Aveda Take-Back	(Aveda , No Date)
		Terracycle	(Terracycle, No Date)
		Beijing Subway Bottle Recycling	(Watts, 2012)
		Coca-Cola Bottle Cap Phone Booth	(Lum, 2014)
		Gumdrop	(Gumdrop, 2014)
Leasing/Product-Service Systems	Business models whereby customers pay for the use of a product rather than ownership of the product itself.	Turntoo	(Turntoo, 2013)
		Philips Pay-per-Lux	(Philips, 2014)
		Bundles Washing Machine Subscription	(Schiller, 2014)
Reusable Packaging	Business models involving the use of packaging designed to be used multiple times.	Good to Go Cup	(Good To Go, 2014)
		Mitchell's Beer Refill	(Mitchell's Brewery, 2014)
		Splosh	(Splosh, 2012)
		SAB Bottle Return	(The South African Breweries, 2014)
		Milkman	(Wikipedia, 2014)
		Aveda Holiday Gift Sets	(Dionysus Salon, 2005)
		Robust Supermarket	(Kennett, 2014)
Traditional Retail	Physical retail stores.	Sainsbury's	(Sainsbury's, 2014)
Delivery Systems/Subscriptions	Subscription based business models and the delivery of goods directly to customers.	Barkbox	(Barkbox, 2011)
		Graze	(Graze, 2014)
		Turntable kitchen	(Turntable Kitchen, No Date)

		Birchbox	(Birchbox, 2014)
		Kiwi Crate	(Kiwi Crate, 2014)
		Original Stitch	(Original Stitch, 2014)
		Dollar Shave Club	(Dollar Shave Club, 2014)
		Riverford Organic Farm	(Riverford Organic Farms, 2014)
		Tesco Home Delivery	(Tesco, 2014)
		Google Shopping Express	(Google, 2014)
		Amazon Fresh	(Amazon, 2014)
Vending Machines/Dispensers	The use of a vending machine or dispenser system to provide customers with the product.	Coca-Cola Freestyle	(Coca-Cola, 2014)
		Farmer's Fridge Kiosk	(Farmer's Fridge, 2014)
		Chef's Farm Vending Machine	(Merchant, 2010)
Biological Cascades	Biological cascades is the term given to those systems where biological waste is used for another purpose rather than simply disposed of, such as coffee grounds to grow mushrooms.	Coffee Flour	(Coffee Flour, 2014)
		Back to the Roots	(Back to the Roots, 2014)
		Kromkommer	(Kromkommer, 2014)
		Snact	(Snact, 2014)
Urban Closed Loop	Urban Closed Loop involves the integration of numerous waste to input streams in a closed system often in an urban environment.	The Plant - Chicago	(The Plant, 2014)
		Growup Urban Farm	(GrowUp Urban Farms, 2014)
Positive Impact	Business models with the primary purpose of positively impacting either their customers or the environment.	Quitbit	(Quitbit, 2014)
		Common Threads	(eBay, 2014)
		The Daily Table	(Reeves, 2013)
		Catalytic Clothing	(Catalytic Clothing, 2012)
Community/Collaboration	This trend speaks to the increase of community-based services including the rise of the sharing economy. These examples made use of local produce or skills	Johnson & Johnson Project Phoenix	(Johnson & Johnson, 2010)
		Cropmobster	(Cropmobster Community Exchange,

	rather than large-scale centralised systems.		2014)
		Wikihow	(WikiHow, 2014)
		Floow2	(Floow2, 2014)
		Taskrabbit	(Taskrabbit, 2014)
		AirBnB Shared City	(Chesky, 2014)
		Rentez-Vouz	(Rentez-Vous, 2014)
		Pley	(Pley, 2014)
Late Differentiation	Products designed to prolong the ultimate customer decision (on flavour, volume etc.) until as late as possible.	Nespresso	(Nespresso, 2014)
		Perfect Draft Mini Kegs	(Perfect Draft Beer Kegs, 2014)
		Sodastream	(Sodastream, 2014)
		Grande Yoghurt Powder	(Grande - Custom Ingredients Group, 2014)
Gimmicks	Products that do not exhibit true innovation that enhances their offering, but rather a simple and potentially short-lived gimmick.	Nescafe Alarm Cap	(NESCAFE Mex, 2014)
		Clever Caps	(Clever Pack, No Date)
		Petomato	(Jewell, 2014)

Themes

The outcome of the second stage of the study is a set of six overarching themes. The purpose of these themes is to be the guide by which the scenarios are developed. They are the highest level of abstraction in the scenario development process, with the scenarios digging down into tangible ideas and concepts and the stories presenting granular examples that an audience can relate to. The themes are presented in Figure 7 and elaborated on thereafter.



Figure 7: Themes

Retail becomes two-way: This theme refers to the relationship that exists between the retailer and the customer. In the current paradigm this is a linear, one-way relationship with products transferred from the retailer to the consumer who is then responsible for their disposal. In a circular future this needs to be a two-way relationship with products, and the materials contained within, flowing back to the retailer from the customer. The theme encompasses the growth of the relationship between the retailer and consumer in a mutually beneficial manner. The customer still receives products from the retailer, but the materials (currently seen as waste) are then returned to the retailer who is in a position to make maximum use of the value still embedded in the material.

The power of data: The role of information technology has to be considered in any future thinking activity. The Power of Data theme captures this role and seeks to apply it to the

industry of FMCG in a circular future. The circular economy Butterfly Diagram represents the cycling of resources through the system, but is it missing the flow of information in the opposite direction? Data can be used not only to enhance service offerings, but also to maximise the effective use of resources. Services could be tailored to individual needs and behaviours, adapting to minimise waste creation.

The world doesn't reward oversupply: In our current system there are numerous mechanisms through which oversupply is rewarded, for manufacturers, retailers and consumers. An example mechanism is the reduction of unit costs with the increased size of the purchase, which creates a constant loop of oversupply and overconsumption. Manufacturers are rewarded for increasing their volumes. Retailers, seeking to shift these volumes, then reduce the price of the product to appeal to customers who do not necessarily need the additional products. As manufacturers continue to seek the growth needed in a linear economy, the effect compounds with all parties rewarded for the overproduction and overconsumption of the product. These mechanisms, which reward oversupply cannot be a feature of the FMCG industry in a circular future, particularly in the food and beverage sectors where products are perishable and, not able to be consumed fast enough, lead to increased food waste.

Personalisation of everyday products: Many FMCG products are almost considered commodity items, purchased frequently, used and disposed of. This theme relates to bringing a sense of personalisation to these products, designing them to be emotionally durable so that people will think twice about just tossing them in the garbage and possibly reuse them. The innermost, and highest value, circle on the Butterfly Diagram is reuse by the consumer, so if we can design products, or packaging, that people want to reuse we can derive the most value from the resource.

Community level solutions: Community Level Solutions can be seen as a theme with two parts. The first relates to the use of local resources or labour for activities such as the creation of goods or the management of waste. It includes the concept of collaborative consumption and the sharing of products and services amongst members of the community. The second part refers to the idea that any solution needs to be developed to suit the local conditions in which it is intended to operate. What works in one geographic or economic location may not work in another. Systems need to be developed to suit the local conditions rather than manipulating the conditions to meet the system requirements.

Whole system solutions: The final theme, Whole System Solutions, acknowledges the fact that surrounding every product or service there is an extremely complex, far-reaching system.

Solutions cannot be designed in isolation, but rather need to be designed with the entire system in mind. The entire product lifecycle and all stakeholders need to be considered. This theme also incorporates the idea that collaboration, across industries and between competitors, is key to achieving a circular future. The role of policymakers and legislation in driving change must also be taken into account.

The six overarching themes that were developed during the study are intended to permeate through the entire vision, rather than relate specifically to one scenario or the other. Neither are the themes intended to complement one another. In many ways they are complementary, but in certain instances they appear to contradict one another. What is important is that, taken as a set or independently, and considered alongside the principles of the circular economy these themes are the lens through which the future of FMCG should be approached.

Scenarios

The five scenarios for the future of the FMCG industry in a circular economy are presented below.

Rinse and Reuse: Single-use packaging has been effectively phased out and replaced with reusable packaging, for business-to-business trade, transportation and in consumer-facing applications. Packaging is designed to be reused either by customers themselves or is cycled back through to the product manufacturer and retailer for reuse. This shift has seen innovations in reusable packaging technology such as the development of new materials, new reverse logistics models and service systems for packaging reconditioning to ensure they meet food hygiene standards. In an effort to maintain competitive advantage brands have developed new methods of differentiating themselves from the competition that do not rely on the use of spurious packaging such as innovative shelf displays.

The Cycling of Pure Materials: Advances in materials technology have led to the development of palettes of non-toxic materials that can be infinitely cycled through the system. Packaging remains single-use from the user's perspective, but through comprehensive collection and processing systems the material is remade into new packaging. Materials that cannot be collected and remade have been designed to feed into the biological cycle without causing damage, both to human health and the environment, possibly even having a positive effect. This palette of materials has been developed to fit into local systems. For example, materials used in India have been developed for their local collection, recycling and manufacturing systems and are completely different materials to those found in the United Kingdom.

The Rise of the Circular Retailer: Retail stores have undergone dramatic changes in the last 10 years as the world has gone circular. What was once a one-way flow of products from retailer to consumer has now become a two-way relationship. Customers not only purchase products from the store, they return waste, both organic and otherwise, to the store. Packaging is either reconditioned for reuse or sent for recycling and organic waste is fed into the anaerobic digesters that power the store. Dispenser systems mean customers can purchase exact quantities and allow products to be shipped to stores in concentrate form for on-site reconstitution, reducing transport costs and emissions. The store has also become a hub for the local community, supporting local growers and selling their produce in the allotment aisle. Loyalty programs for customers offer rewards based on what they use, not simply what they buy, analysing the waste they return to store to build insights into their habits.

A World Without Supermarkets: The increase of product service systems has largely resulted in the demise of the traditional supermarket that has long dominated the FMCG scene. Manufacturers provide their products directly to customers through tailored services designed to meet people's unique food, household care and personal care needs. Big data analytics are used to build a picture of the unique needs of individual customers so that the service can be personalised to their needs, providing the perfect products, in exact quantities, right when they are needed. Leasing and subscription business models mean that customers no longer need to retain ownership of the products they require, but rather pay for the benefit the product brings. Coupled with advances in reverse logistics systems, manufacturers retain ownership of their non-consumable materials that they can reuse or recycle.

Connected Living: The world is more connected now than ever before. Communities, people, businesses, appliances and products are all connected to one another. These connections have allowed the creation of tailor-made services, dynamic logistics systems, intelligent homes and smart packaging. Packaging is now so much more than simply a container for products. The inclusion of sensor and connectivity technologies enable you to track the provenance of the product inside, extend the shelf-life of products and even communicate with other products to maintain an inventory of stock levels in your home which can be used by service providers to tailor their service to the individual customer. Smart appliances within homes are connected to each other and to us and can actively manage this household inventory and control their use of consumables. Increased connectivity between people has seen the rise of collaborative community marketplaces. Applications allow people to trade and share with one another; sharing foodstuff that they are unable to use before the use-by date or selling their homemade produce and products to people in their community.

Stories

In order to communicate the scenarios to as broad an audience as possible the following four stories were developed. The stories draw upon the content of all of the scenarios and do not relate specifically to one or another.

Connected Communities: Mobile Marketplace - The Mobile Marketplace connects micro-producers to a network of other producers and customers in their local area. The Marketplace empowers local entrepreneurs, strengthens community ties and maximises the use of local resources.

Joseph lives in a small village outside Mombasa and began growing vegetables to sell five years ago when he lost his job in one of the hotels in the city. Every Saturday he would leave home before sunrise to travel 10 miles to the nearest market, returning home late that night often without selling everything. The Mobile Marketplace changed everything for Joseph when he joined two years ago. He now connects and sells directly to buyers in his local area, saving him the long journey to the market each week. Payments are made through the secure Mobile channel; a far safer process than carrying cash and Joseph has been able to steadily grow his business as his network expands. For Joseph's customers the Mobile Marketplace means that they no longer have to travel to the market, or carry cash, either. They are able to buy all of their produce from local producers, supporting their community in the process. Recently, Joseph partnered with a nearby chicken farmer that he connected to through the Marketplace. Together they have purchased a motorbike, using micro-financing secured through the Marketplace, and will begin making deliveries to local hotels and supermarkets looking to provide their guests and customers with locally sourced produce.

The growing network of producers and customers and easy access to financial tools, all provided by the Mobile Marketplace, are empowering entrepreneurs like Joseph across the country and maximising the use of local resources.

Let's Get Personal: "U" – Personal Concierge - "U" is a premium subscription service making life easier for its users by providing them with personal and home care products tailored to meet their unique needs. The precision targeting of the service significantly reduces packaging requirements and waste creation.

Martha signed up for the U-Family package last year. Tired of having to search through supermarkets to find the products that suit everyone in the family, she decided to give the service a try, and she hasn't looked back since. The initial sign-up process required Martha to

enter all of the family's details, including ages, health conditions, skin-types and personal preferences. Since then "U" has kept the family fully stocked with products perfect for them; adapting as they have grown and their needs have changed. 17-year-old Sarah receives hair-care products that suit her hair type and cosmetics to match her style preferences. Her younger brother Max plays for his school's cricket team and, with his fair skin, is prone to sunburn. Aware of this, as well as his zinc-oxide allergy, "U" keeps him protected with their zinc-free sunscreen. Martha also opted to link U-Family to their intelligent washing machine. The machine analyses the dirt levels, fabric type and water quality to dispense exactly the right amount of detergent per wash and reduce energy and water use. The machine notifies "U" when the detergent is running low and they include a refilled cartridge of hard-water detergent in their next delivery. Thanks to "U", the Harris family's unique personal and home care needs are taken care of, leaving them free to enjoy the sunshine.

The Circular Supermarket: Local Hubs - Local Hubs can be found at the heart of local communities across the UK. The innovative services they offer, such as same-day delivery and waste collection, as well as their key locations have changed the way neighbourhoods interact with their local grocery store.

Tim has been using his Local Hub since he moved into the neighbourhood 4 years ago, making full use of the variety of services they offer to members of the local community. All of Tim's commodity items, the products he purchases frequently with very little variation, are delivered to his door every week. When the delivery is made, the Hub vehicle collects all of Tim's rubbish, having taken over from the council service a few years ago. All of the organic waste collected by the delivery van goes towards feeding the Hub's anaerobic digesters, which power the entire store. Tim likes to stop in at the Hub on the way home from work, preferring to choose his own fresh produce. He picks up his fruit and vegetables from the local aisle, where everything is grown on local farms and allotments. The reusable containers he fills will be collected along with his rubbish. Everything is paid for using his Hub Loyalty Card, which he prepays at the beginning of each month. Hub Rewards are based on the waste collected, as well as what is purchased, and Tim receives extra rewards for choosing to use reusable containers. Last week Tim generated no waste at all and earned maximum rewards. Unfortunately this week he bought a few too many tomatoes and had to throw some away so he won't be rewarded as highly.

Local Hubs are part of your community and have been making grocery shopping easier for people like Tim for nearly a decade.

Packaging Reinvented: Packserve - Packserve is a global packaging service provider committed to making packaging cheaper, smarter and more effective. Smart, reusable containers from Packserve are helping manufacturers to better manage their supply chains and increase transparency, tracking the location and contents of their products at all times. This same technology facilitates the recovery of packaging for reuse or recycling. In those cases where reusable packaging is not appropriate the expertise of Packserve helps to develop toxin-free packaging that can be recycled countless times or safely absorbed into the biological system, depending on the application. The combination of these capabilities has drastically changed the impact of packaging. No longer do vast amounts of waste packaging pile up in the world's landfills and oceans. Instead, containers are reused and material is recycled or biodegraded, allowing their value to be captured again and again. These packaging solutions are provided as a service by Packserve, who retain ownership and bear the cost of the materials. This reduces costs to manufacturers and retailers, and consumers don't end up paying for packaging at all!

Packserve are helping large and small business owners to get the most value out of an intelligent packaging solution developed specifically for their operation. Whether you are Mitchell's Microbrewery in Surrey or global giant Coca-Cola, there's a packaging solution for your business.

4. Discussion

The results of the study are discussed in this section. The potential implications of the scenarios on stakeholders, including actors within the FMCG industry and the principles of the circular economy, will be critically analysed. The value of conducting a futures studies project to initiate transformational conversations about the future, in line with the aims of this research, will then be considered along with the limitations of the study and suggestions for further research. The potential implications of the scenarios are far-reaching, affecting a number of stakeholders including manufacturers, retailers and customers. Additionally, the scenarios have implications for the shift towards a circular economy and give an indication of the benefits that the envisioned changes could bring to the system.

Implications for the FMCG industry

The potential implications for stakeholders within the FMCG industry range from improved customer relationships and brand loyalty for manufacturers and retailers to cost savings brought about by changes to packaging design and manufacturing processes.

Changes to the approach taken to packaging may bring a number of potential benefits. Among these is the potential for packaging services, in which the packaging manufacturer retains ownership of the materials, to decouple product and packaging costs bringing savings to manufacturers, retailers and consumers alike. Knowing that they will recover the value in the packaging material the packaging manufacturer need not pass the material cost on to the product manufacturer and ultimately the consumer does not have to bear the cost, paying only for the product inside the packaging.

Packaging developed to be completely free of toxins would bring about cost savings for manufacturers too as they would no longer have to pay for personal protective equipment for employees or bear the rising health care costs³³ of experience by the manufacturing industry. The use of product-service systems³⁴ is widespread in the presented scenarios. By providing their products directly to end-users as a service that meets their needs, manufacturers stand to benefit by cutting retailers out of the process entirely. In doing so they have the ability to build a relationship directly with the consumer, building brand awareness in the process. The Ellen MacArthur Foundation² has identified product-service systems as a particular method by which businesses can retain ownership of resources and increase recovery rates. These scenarios present ideas on how these services may work in the FMCG industry and the additional value they could bring to the businesses.

Advances in technology, the use of reusable packaging and product-service systems also give manufacturers the opportunity to improve control of their supply chains and the flow of resources. Packaging, including transit containers, with embedded tracking technology would allow companies to monitor their stock at all times. Additionally it increases their ability to recover the material at the end of the product's life, whether for reuse or recycling. The implications discussed here are in no way exhaustive, but give a sense of some of the ways in which stakeholders in the FMCG industry stand to benefit from making the transition to the circular economy.

Accelerating the transition to a circular economy

In discussing the implications for the shift to a circular economy it is useful to think in terms of the butterfly diagram (Figure 1) and four levers of value creation developed by the Ellen MacArthur Foundation² and first introduced at the beginning of this paper.

The uptake of reusable packaging presented in the scenarios represents movement from the outer circle of the technical cycle, recycling, towards the inner circles of reuse and

maintenance, thereby creating more value. Additionally, the idea of infinite material recyclability presented in the Cycling of Pure Materials scenario is derived from the value of circling longer through the system, the second lever of value creation.

A common characteristic of the scenarios is the provision of products as a service, in volumes perfectly suited to the customer's requirements. This is important for biological products such as foodstuffs that have a limited shelf life. Supplying only what a person can consume means a reduction in food waste, an issue that plagues the current FMCG industry⁹. The end result of all of this is an overall reduction in biological and technical waste being sent to landfills and incinerators, or finding its way into the oceans. Instead materials are either kept within the technical cycle, their value cycling through the system endlessly, or find their way back into the biological cycle, either through cascaded use, anaerobic digestion or simply absorbed harmlessly into the biosphere.

In some way or form scenarios present concepts and ideas that derive value from the all four of the value creation levers. However, the scenarios do not represent complete circularity and there is undoubtedly significant room for improvement. They do, however, capture a number of mechanisms by which the FMCG industry can become a more circular system.

The value of the futures approach

The primary goal of this research is to provoke transformational conversations about the future of FMCG in a circular economy. While conducting the study it was observed that simply being involved in the process of creating the scenarios opened up the conversation among the participant group. Very early on in the process the topic brought out strong views from the participants. Even if people vehemently disagreed with what was being proposed, they usually followed up with their own views, which is exactly what the research is aiming to do. This observation supports the findings of the literature review conducted at the commencement of the study. A similar project involving the creation of scenarios for human extinction found that although it was incredibly difficult to develop the scenarios themselves, the process and conversation was “useful, engaging and important”³⁵.

It is too early at this stage to report on the success of the scenarios presented in this study, as they have not yet been distributed beyond the research participants. It is hoped that this work opens the eyes of those within the industry to the potential value that exists in making the shift to the circular economy and what that future may look like. The conversations that have already occurred during the course of the study make one optimistic that the scenarios will

have the desired effect, but only time will tell. Bowman *et al.*²⁰ identified that successful communication is crucial in order to fully capture the value of scenarios. The four stories that have been developed are the mechanism through which this vision will be communicated and will be converted into animated videos for wider distribution. In order to enhance the provocative nature of the stories and maximise their impact the stories have been linked to existing global, recognisable brands that the audience can relate to.

The power of scenarios to catalyse action is perhaps best captured by Bishop *et al.* in the following statement: “A good scenario grabs us by the collar and says, ‘Take a good look at this future. This could be your future. Are you going to be ready?’”³⁶. It is hoped that this is the effect that this vision will have on stakeholders within the FMCG industry. By presenting a provocative, compelling vision for the future of the industry, they may be spurred into taking the action necessary to make that future a reality.

Limitations of the study

Involving key stakeholders in the scenario development process is crucial to the success of the study²⁷, but it brings with it a number of challenges. A particular difficulty encountered by the researcher was securing the involvement of the participant group in all of the workshops. As senior employees in their respective organisations it was often difficult just to secure a time in their calendar, let alone a time suitable for the entire group to participate in a workshop. As a result the workshops rarely involved the full group and provision had to be made for some participants to engage remotely through web or teleconferencing services. These challenges were compounded by the short time available for the study.

A further challenge of the participatory process was faced in the creation of the scenarios themselves. The intention of the participatory process was to engage the core group in the actual, iterative development of the scenarios. However, when each working draft of the scenarios was distributed to the group to comment and build upon responses tended to simply be acceptance or rejection them as the final scenarios and failed to voice their comments or build on the scenarios. This particular challenge has been faced by researchers in previous participatory scenario development projects³⁷ and was attributed by a failure to clarify roles at the beginning of the process, as is likely the case in this project.

The concept of a circular economy is a complex, systems level idea covering our entire economic model. It is simply not possible for this study, with limited time and resources, to capture all aspects of either the circular economy or the equally complex FMCG industry as a

whole. As such, there are numerous opportunities for future research and industrial projects to expand upon this work.

Due to the time constraints of this study the scenarios and stories have not yet been distributed further than the core participant group so it is not possible to determine the success of the stories in provoking debate. However, as previously discussed, the mere mention of the ideas contained within the scenarios encouraged conversation amongst the members of the participant group. This observation, and findings from the initial review of literature on the impact of futures studies, points to the likelihood that the stories will inspire conversation and debate on the future of the FMCG industry.

Finally, it is important to note that scenario development, and this study in particular, does not attempt to make predictions of the future. Instead they present a projection of what the future could possibly look like²⁷. The scenarios presented in the vision may or may not come to pass, but that is not important. It is the conversations that took place during the study and those that will take place when the stories are shared that hold the most value.

Suggestions for future work

The scope of this study is limited to four sectors of the FMCG industry and involved the participation of a select group of industry experts. The vision could be expanded upon by considering those sectors of the industry that were not within the scope of this study such as clothing and electronic goods. The research would also benefit if it were to include other industry stakeholders such as retailers, who are key players in the FMCG industry and notable in their absence from this study.

Another crucial stakeholder in the future of the FMCG industry is the customer or consumer. A key factor raised over the course of the project is the understanding that all of the scenarios impact significantly on the behaviour of consumers and rely even more so on their uptake. It is crucial therefore that the voice of the consumer be brought into the discussion, as any venture is doomed to fail if it cannot win over the customer. Research focussed on the role of the consumer in the future of the FMCG industry would be tremendously valuable as companies seek to modify their business models and interactions with consumers to drive towards a circular economy.

The scenarios presented represent snapshots of the future of the industry in a circular economy, but do not cover the path to get there. The next step should be to develop a

comprehensive roadmap to the future. Once the route to the future has been laid out the industry can begin taking the necessary steps to get there. This study has focussed on the use of a qualitative process drawing on the expertise of industry and circular economy stakeholder to create the scenarios and discuss their potential implications. Going forward it is recommended that the feasibility and potential impacts of the scenarios be rigorously assessed. Those concepts and models found to be of highest value could then begin to be implemented by the industry as the first real steps towards the envisioned circular future.

Conclusions

To meet the aim of developing a vision for the future of the fast-moving consumer goods industry in a circular economy, this study has presented five scenarios: (a) Rinse and Reuse, (b) The Cycling of Pure Materials, (c) The Rise of the Circular Retailer, (d) A World Without Supermarkets and (e) Connected Living. In order to communicate the scenarios to a wider audience a set of four stories, comprising granular details drawn from the scenarios was created. The participatory approach taken to develop the scenarios involved members of the FMCG industry, circular economy experts and academics. The process involved the identification of trends and the development of six overarching themes that guided the creation of the scenarios: (1) Retail Becomes Two-way, (2) The Power of Data, (3) The World Doesn't Reward Oversupply, (4) Community-level Solutions, (5) Personalisation of Everyday Products and (6) Whole System Solutions.

As we approach the envisioned circular future it is these themes, rather than the scenarios themselves, that should guide decision makers. The scenarios, presented as snapshots of what the future may look like, will in time be proved accurate or not. The themes, however, are enduring and are not subject to external influences. Rather, they should be the models through which the future is influenced in order to reach a circular future. It is hoped that this vision, the first to combine the FMCG industry and the concept of a circular economy, serves as a catalyst for further conversations on the future of FMCG and what the transition to a circular economy means for the industry. Not only will the FMCG industry be affected by significant changes to our economic system, it has the ability to effect the change itself. Exercises such as this are important and useful tools for accelerating the transition towards a circular economy and understanding the impacts on the nexus of food, water, energy, and the environment.

Bibliography

1. Schulte, U.G. New Business Models for a Radical Change in Resource Efficiency. *Environmental Innovation and Societal Transitions* 2013, 9:43-47. doi: 10.1016/j.eist.2013.09.006
2. Ellen MacArthur Foundation. *Towards the Circular Economy: Economic and business rationale for an accelerated transition*. Cowes, UK, 2013
3. Stahel, W. and Reday, G. *The Potential for Substituting Manpower for Energy*. Brussels: Commission of the European Communities 1976.
4. Lyle, J. *Regenerative Design for Sustainable Development*. John Wiley & Sons, New York, 1996.
5. Reference 2, p. 7
6. Braungart, M. and McDonough, W. *Cradle to Cradle: Remaking the Way We Make Things*. Vintage, London, 2009.
7. Dobbs, R., Oppenheim, J., Thompson, F., Brinkman and M., Zornes, M. *Resource Revolution: Meeting the world's energy, materials, food and water needs*. McKinsey & Company, 2011
8. Ellen MacArthur Foundation. *Towards the Circular Economy: Opportunities for the consumer goods sector*. Cowes, UK, 2013
9. Waste and Resources Action Programme. *Household Food and Drink Waste in the United Kingdom 2012*. Banbury, 2012
10. Organisation for Economic Co-operation and Development. *Perspectives on Global Development 2012: Social cohesion in a shifting world*. Paris, 2011
11. Sardar, Z. The Namesake: Future; futures studies; futurology; futuristic; foresight - What's in a name?. *Futures* 2010, 42(3): 177-84. doi: 10.1016/j.futures.2009.11.001
12. Khakee, A. Relationship Between Futures Studies and Planning. *European Journal of Operational Research* 1988. 33: 200-11.
13. Moyer, K. Scenario Planning at British Airways - A case study. *Long Range Planning* 1996. 29(2): 172-81. doi: 10.1016/0024-6301(96)00005-2
14. Mareuge, C. Futures Studies and Public Advisory Work in Ireland. *Foresight* 2006. 8(4): 55-61.
15. Rohrbeck, R. and Schwarz, J.O. The Value Contribution of Strategic Foresight: Insights from an empirical study of large European companies. *Technological Forecasting and Social Change* 2013. 80:1593-606.
16. Korte, R.F. and Chermack, T.J. Changing Organizational Culture with Scenario Planning. *Futures* 2007. 39:645-56. doi: 10.1016/j.futures.2006.11.001
17. Marien, M. Futures Studies in the 21st Century: a reality based view. *Futures* 2002. 34:261-81.
18. Tevis, R. Creating the Future: Goal-oriented scenario planning. *Futures* 2010, 42(4):337-44. doi: 10.1016/j.futures.2009.11.019
19. Weick, K. *The Social Psychology of Organizing*. McGraw-Hill, New York, 1979

20. Bowman, G., MacKay, R.B., Masrani, S. and McKiernan, P. Storytelling and the Scenario Process: Understanding success and failure. *Technological Forecasting and Social Change* 2013. 80:735-48.
21. Brown, A.D., Gabriel, Y. and Gherardi, S. Storytelling and Change: an unfolding story. *Organization* 2009, 16(3):323-33.
22. Llewellyn, N. The Role of Storytelling and Narrative in a Modernisation Initiative. *Local Government Studies* 2001. 27(4):35-58.
23. Taylor, S.S., Fisher, D. and Dufresne, R.L. The Aesthetics of Management Storytelling: A key to organizational learning. *Management Learning* 2002. 33(3):313-30.
24. James, C.H. and Minnis, W.C. Organizational Storytelling: It makes sense. *Business Horizons* 2004. 47(4):23-32.
25. Kaye, B. and Jacobson, B. True Tales and Tall Tales: The power of organizational storytelling. *Training and Development* 1999. 53(3):44-52.
26. van Notten, P., Rotmans, J., van Asselt, M. and Rothman, D. An Updated Scenario Typology. *Futures* 2003. 35(5):423-43. doi: 10.1016/S0016-3287(02)00090-3
27. Rotmans, J., van Asselt, M., Anastasi, C., Greeuw, S., Mellors, J., Peters, S., Rothman, D. and Rijkens, N. Visions for a Sustainable Europe. *Futures* 2000. 32(9-10):809-31. doi: 10.1016/S0016-3287(00)00033-1
28. Bishop, P., Hines, A. and Collins, T. The Current State of Scenario Development: An overview of techniques. *Foresight* 2007. 9(1):5-25. doi: 10.1108/14636680710727516
29. Palomino, M., Bardsley, S., Bown, K., De Lurio, J., Ellwood, P., Holland-Smith, D., Huggins, B., Vincenti, A., Woodroof, H. and Owen, R. Web-based Horizon Scanning: Concepts and practice. *Foresight* 2012. 14(5):355-73. doi: 10.1108/14636681211269851
30. Robson, C. *Real World Research: a resource for users of social research methods in applied settings*. 3rd ed. Wiley, Chichester, 2011
31. Börjesson, L., Höjer, M., Dreborg, K.H., Ekvall, T. and Finnveden, G. Scenario Types and Techniques: Towards a user's guide. *Futures* 2006. 38(7):723-39. doi: 10.1016/j.futures.2005.12.002
32. Paulus, P. and Huei-Chuan, Y. Idea Generation in Groups: A basis for creativity in organizations. *Organizational Behaviour and Human Decision Processes* 2000. 82(1):76-87.
33. <http://www.industryweek.com/public-policy/manufacturers-cite-health-care-top-concern-namindustryweek-survey> (Accessed 5 Sep 2014).
34. Mont, O.K. Clarifying the Concept of Product-Service System. *Journal of Cleaner Production* 2002. 10(3):237-45.
35. Lopes, T., Chermack, T.J., Demers, D., Kari, M., Kasshanna, B. and Payne, T. Human Extinction Scenario Frameworks. *Futures* 2009. 41(10):731-37. doi: 10.1016/j.futures.2009.07.006
36. Reference 28, p. 5

37. Higdem, U. The Co-creation of Regional Futures: Facilitating action research in regional foresight. *Futures* 2014. 57:41-50.

Web-Based Horizon Scan Sources

Amazon (2014) *Amazon Fresh*. [Online] Available at: fresh.amazon.com [Accessed 23 May 2014].

Aveda (No Date) *Full Circle*. [Online] Available at: https://www.aveda.com/cms/discover_aveda/bethechange/popup_recycling.tmpl [Accessed 12 May 2014].

Back to the Roots (2014) *About Us*. [Online] Available at: <https://www.backtotheroots.com/about-us> [Accessed 14 May 2014].

Barkbox (2011) *Barkbox - Home*. [Online] Available at: <https://barkbox.com/> [Accessed 28 May 2014].

Birchbox (2014) *Birchbox*. [Online] Available at: <https://birchbox.co.uk/> [Accessed 15 May 2014].

Catalytic Clothing (2012) *Catalytic Clothing - Home*. [Online] Available at: <http://catalytic-clothing.org/home.html> [Accessed 20 May 2014].

Chesky, B. (2014) 'Shared City' [Blog] *Medium - Brian Chesky* 26 March. Available at: <https://medium.com/@bchesky/shared-city-db9746750a3a> [Accessed 14 May 2014].

Clever Pack (No Date) *Clever Caps*. [Online] Available at: <http://www.cleverpack.com.br/clever-caps/en/index.html> [Accessed 30 May 2014].

Coca-Cola (2014) *About the Soda Fountain*. [Online] Available at: <https://www.coca-colafreestyle.com/#!/about-the-soda-fountain/> [Accessed 27 May 2014].

Coffee Flour (2014) *Coffee Flour - Home*. [Online] Available at: <http://www.coffeeflour.com/#home> [Accessed 12 May 2014].

Cropmobster Community Exchange (2014) *Home*. [Online] Available at: <http://sfbay.cropmobster.com/> [Accessed 19 May 2014].

Dionysus Salon (2005) *AVEDA Holiday Gift Sets*. [Online] Available at: <http://www.dionysussalon.net/aveda-holiday.php> [Accessed 16 May 2014].

Dollar Shave Club (2014) *Dollar shave Club*. [Online] Available at: <https://www.dollarshaveclub.com/> [Accessed 12 May 2014].

eBay (2014) *Patagonia Common Threads Partnership*. [Online] Available at: <http://campaigns.ebay.co.uk/patagonia/> [Accessed 14 May 2014].

Farmer's Fridge (2014) *The Kiosk*. [Online] Available at: <http://www.farmersfridge.com/#!our-kiosk/c16tz> [Accessed 28 May 2014].

Floow2 (2014) *Sharing Marketplace*. [Online] Available at: <http://www.floow2.nl/sharing-marketplace.html> [Accessed 13 May 2014].

Good To Go (2014) *Good to Go*. [Online] Available at: <http://www.goodtogocup.com/> [Accessed 26 May 2014].

- Google (2014) *Shopping Express*. [Online] Available at: <https://www.google.com/shopping/express/> [Accessed 23 May 2014].
- Grande - Custom Ingredients Group (2014) *Grande Grade A Yogurt Powder*. [Online] Available at: <http://www.grandecig.com/products/yogurtpowder/> [Accessed 30 May 2014].
- Graze (2014) *Graze - Snacking Reinvented*. [Online] Available at: <https://barkbox.com/> [Accessed 26 May 2014].
- GrowUp Urban Farms, (2014) *Our Story*. [Online] Available at: <http://www.growup.org.uk/> [Accessed 14 May 2014].
- Gumdrop (2014) *Gumdrop*. [Online] Available at: <http://gumdropltd.com/> [Accessed 21 May 2014].
- Jewell, N. (2014) *Petomato Bottle Caps Convert Plastic Bottles into Tiny Hydroponic Gardens*. [Online] Available at: <http://inhabitat.com/petomato-bottle-caps-convert-plastic-bottles-into-tiny-hydroponic-gardens/> [Accessed 19 May 2014].
- Johnson & Johnson (2010) *A Better Standard of Living*. [Online] Available at: <http://www.investor.jnj.com/2009sustainabilityreport/economic/living.html> [Accessed 30 May 2014].
- Kennett, S. (2014) *Zero-waste supermarket to sell food products without plastic packaging*. [Online] Available at: <https://www.2degreesnetwork.com/groups/2degrees-community/resources/zero-waste-supermarket-sell-food-products-without-plastic-packaging/> [Accessed 24 May 2014].
- Kiwi Crate (2014) *Kiwi Crate*. [Online] Available at: <http://www.kiwicrate.com/> [Accessed 22 May 2014].
- Kromkommer (2014) *Kromkommer*. [Online] Available at: <http://www.kromkommer.com/> [Accessed 29 May 2014].
- Lum, R. (2014) *Coca-Cola Phone Booth Turns Bottle Caps Into Currency*. [Online] Available at: <http://www.creativeguerrillamarketing.com/guerrilla-marketing/coca-cola-phone-booth-turns-bottle-caps-currency/> [Accessed 14 May 2014].
- M.A.C. Cosmetics (No Date) *Back to M.A.C.* [Online] Available at: http://www.maccosmetics.com/giving_back/back_to_mac.tmpl [Accessed 20 May 2014].
- Merchant, B. (2010) *Vending Machine Grows 20,000 Heads of Lettuce a Year Without Sunlight*. [Online] Available at: <http://www.treehugger.com/green-food/vending-machine-grows-20000-heads-of-lettuce-a-year-without-sunlight.html> [Accessed 21 May 2014].
- Mitchell's Brewery (2014) *Home*. [Online] Available at: <http://www.mitchellsbrewing.com/> [Accessed 27 May 2014].
- NESCAFÉ Mex (2014) *NESCAFÉ Alarm Clock*. [Video] Available at: <https://www.youtube.com/watch?v=8ZohB3q7rJo> [Accessed 27 May 2014].
- Nespresso (2014) *Nespresso - Home*. [Online] Available at: <http://www.nespresso.com/uk/en> [Accessed 13 May 2014].
- Original Stitch (2014) *Original Stitch*. [Online] Available at: <https://originalstitch.com/> [Accessed 29 May 2014].

Perfect Draft Beer Kegs (2014) *Home*. [Online] Available at: <http://www.perfectdraftbeerkegs.co.uk/> [Accessed 29 May 2014].

Philips (2014) *RAU Architects*. [Online] Available at: <http://www.lighting.philips.com/main/projects/rau.wpd> [Accessed 16 May 2014].

Pley (2014) *Pley - Home*. [Online] Available at: <https://www.pley.com/> [Accessed 23 May 2014].

Quitbit (2014) *Quitbit*. [Online] Available at: <http://quitbitlighter.com/> [Accessed 27 May 2014].

Reeves, H. (2013) *'In the Old Days, You'd Smell the Milk' Doug Rauch Wants to Sell Outdated Food at Junk-Food Prices*. [Online] Available at: http://www.nytimes.com/2013/11/10/magazine/doug-rauch-wants-to-sell-outdated-food-at-junk-food-prices.html?_r=0 [Accessed 16 May 2014].

Rendez-Vous (2014) *Rendez-Vous*. [Online] Available at: <http://rendez-vous.com/> [Accessed 20 May 2014].

Riverford Organic Farms (2014) *Riverford Organic Farms*. [Online] Available at: <http://www.riverford.co.uk/> [Accessed 13 May 2014].

Sainsbury's (2014) *Sainsbury's - Home*. [Online] Available at: <http://www.sainsburys.co.uk/sol/index.jsp> [Accessed 30 May 2014].

Schiller, B. (2014) *The Newest Piece Of The Sharing Economy: A Subscription Service For Washing Machines*. [Online] Available at: <http://www.fastcoexist.com/3029726/the-newest-piece-of-the-sharing-economy-a-subscription-service-for-washing-machines> [Accessed 13 May 2014].

Snact (2014) *Snact - Home*. [Online] Available at: <http://www.snact.co.uk/> [Accessed 21 May 2014].

Sodastream (2014) *Sodastream USA*. [Online] Available at: <http://www.sodastreamusa.com/> [Accessed 22 May 2014].

Splosh (2012) *Splosh*. [Online] Available at: <http://www.splosh.com/> [Accessed 14 May 2014].

Taskrabbitt (2014) *Taskrabbitt*. [Online] Available at: <https://www.taskrabbitt.co.uk/> [Accessed 15 May 2014].

Terracycle (No Date) *Terracycle - Outsmart Waste*. [Online] Available at: <http://www.terracecycle.com/en-US> [Accessed 14 May 2014].

Tesco (2014) *Groceries*. [Online] Available at: <http://www.tesco.com/groceries/> [Accessed 19 May 2014].

The Plant (2014) *The Plant Chicago*. [Online] Available at: <http://www.plantchicago.com/> [Accessed 23 May 2014].

The South African Breweries (2014) *Sustainable Development*. [Online] Available at: <http://www.sab.co.za/sablimited/content/en/sustainable-development> [Accessed 13 May 2014].

Turntable Kitchen (No Date) *Pairings Box*. [Online] Available at: <http://www.turntablekitchen.com/pairings-box/> [Accessed 27 May 2014].

Turntoo (2013) *Segments Turntoo Services*. [Online] Available at: <http://turntoo.com/en/in-practice/segments/> [Accessed 12 May 2014].

Watts, J. (2012) *Beijing introduces recycling banks that pay subway credits for bottles*. [Online] Available at: <http://www.theguardian.com/environment/2012/jul/04/beijing-recycling-banks-subway-bottles> [Accessed 20 May 2014].

WikiHow (2014) 'How to Make Non Toxic Body Wash'. [Wiki] *WikiHow* Available at: <http://www.wikihow.com/Make-Non-Toxic-Body-Wash> [Accessed 22 May 2014].

Wikipedia (2014) 'Milkman' [Wiki] *Wikipedia* Available at: <http://en.wikipedia.org/wiki/Milkman> [Accessed 14 May 2014]

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