Perceptions of risk for UK SME manufacturing businesses in transitioning to a circular economy

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ABSTRACT

The concept of a circular economy is embedded in policy as the solution to addressing global environmental and sustainable development issues. Manufacturing businesses are expected to make a major contribution by developing and implementing circular business models. In the UK, most manufacturing businesses are small and medium sized enterprises (SMEs) working within existing linear economy-based supply chains. This thesis identifies and explains perceptions of risk for established UK SMEs and the conditions necessary to encourage better engagement of SMEs in transitioning to a circular economy. A relational theory of risk perspective has been adopted and the discourse of risk investigated through the development and application of a critical realist critical discursive psychology methodological strategy and framework. The findings are based on data collected from 13 in-depth semi-structured interviews, two short focused-question interviews, two researcher orchestrated peer-to-peer workshops, attendance at 12 open forum events and 70 published documents. Seven shared discursive repertoires were identified, of which three that incorporated conflicting interpretations that can co-exist were analysed in detail. The analysed repertoires demonstrated the existence and influence of power and relationship dynamics, values and ideology and trust and truth causal mechanisms on perceptions of risk.

The analysis demonstrates how gaining and maintaining preferred supplier or strategic partnership status is what is of value and at stake for established SMEs in evaluations of risk. Understandings of how political ideology and moral responsibility are enacted in society are shown to have a major influence on perceptions of uncertainty of the value of adopting circular business models for SMEs and their customers. Furthermore, differing perceptions of consequences are shown to exist between expert and lay knowledge exacerbated by a lack of coherence on the circular economy concept. These differences are associated with conflicting interpretations of trust in and truth of customers' discourse and practices and the cost-benefits of utilisation of waste or sustainable materials in circular business model products.

Overall, this thesis contributes methodologically, theoretically, and empirically to understandings of the conditions necessary for established manufacturing SMEs in the UK to engage more actively with transitioning to a circular economy.

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LIST OF ABBREVIATIONS

B2B	Business to Business transactions
BSI	British Standards Institute
CBM	Circular Business Model
CDP	Critical Discursive Psychology
CE	Circular Economy
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CR	Critical Realist
CSR	Corporate Social Responsibility
DA	Discourse Analysis
DBE	Drivers, Barriers & Enablers
EMF	Ellen MacArthur Foundation
EPR	Extended Producer Responsibility
EPSRC	Engineering and Physical Sciences Research Council
ESD	Environment and Sustainable Development
EU	European Union
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
Gt	Gigatonnes
GT	Grounded Theory
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
MNE	Multinational Enterprise
Mtoe	Million tonnes of oil equivalent
NGO	Non-Governmental Organisation
OEM	Original Equipment Manufacturer
R&D	Research and Development
SME	Small or Medium sized Enterprise

GLOSSARY

A priori: Reasoning or knowledge which proceeds empirical work.

CO_{2eq}: A proxy indicator of the environmental impact of one tonne of a greenhouse gas in comparison to the impact of one tonne of CO_2.

Corporate Social Responsibility (CSR): Self-regulating model of organisations demonstrating how they are managing their environmental, social and economic responsibilities to reduce negative effects of their operations.

Ecological modernisation: Represents a "technology-based and innovation-oriented approach to environmental policy" that focuses on changing the behaviours and actions of industry (Jänicke, 2008).

Extended Producer Responsibility (EPR): A policy instrument that places financial and/or physical responsibility on producers of products for the treatment and disposal of products at the end of a products life.

GDP: The total economic value of goods produced and services provided per year for a country.

Global warming: The increase in the Earths average surface temperature over the past century due to human activities.

Greenhouse Gas (GHG): The main greenhouse gases of concern are carbon dioxide CO_2, methane CH_4, ozone O_3, nitrous oxide N_2O and chlorofluorocarbons CFCs.

ISO9001/14001: Internationally recognised quality management/ environmental management standard

Mtoe: Unit of energy used to describe the energy content of all fuels.

Planned obsolescence: positions businesses as actively designing products to break quickly or become quickly unable to function to generate increasing volume of sales *(EMF, 2017)*.

Rebound effect: As products become more energy or material efficient and prices reduce, changes in behaviour that result in increased quantities of products being purchased and use more frequently results in worse environmental consequences.

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INTRODUCTION

1 Introduction and context

This chapter provides an account of the context of this thesis and presents the research questions. Following an overview of the relationship between climate change and material and energy use, the concept of the circular economy (CE) is introduced as the frame of investigation. Transitioning to a CE has gained traction in the political arena as the answer to addressing waste and wider environmental, social and material use problems associated with the existing system of production and consumption of materials and products. Given the centrality of manufacturing in the existing system there are expectations for businesses to provide the solutions to how transitioning to a CE is to be achieved. Consequently, what transitioning to a CE means in decision-making for established businesses is important in understanding why business will or won't, do or don't, engage with the concept of the CE. On this basis this thesis investigates perceptions of risks for manufacturing businesses in the UK of transitioning to a CE, with a focus on small and medium sized enterprises (SMEs), and what this could mean for CE aspirations.

1.1 Climate change, materials and energy use

There is wide consensus that anthropogenic climate change due to increasing *greenhouse gas*[1] (GHG) emissions is the largest global threat for our planet in the 21st century. The most recent Intergovernmental Panel on Climate Change (IPCC) report highlights that human activities since the mid-1900s are "extremely likely" to have been the dominant cause of GHG emissions leading to *global warming*, the main contributor of climate change *(IPCC, 2014)*[2].

This rise in global GHG emissions is being driven by growing global energy and material resource consumption fuelled by changing lifestyles and population growth *(IPCC, 2018)*. Access to and use of low cost abundant energy and material resources has historically played an important role in the emancipation of people, the development of societies globally, and in achieving social and economic progress, growth and justice *(Willis & Eyre, 2011)*. However, the drive to meet the needs of growing global populations has resulted in the industrialization of the production and consumption of goods and products, constantly increasing demands for natural material resources and energy to deliver ever faster economic growth, resulting in significantly increasing GHG emissions and waste *(Gutowski et al., 2017)*.

Global energy demand is estimated to increase by three percent between 2020 and 2050 as the worlds' population and economies grow and all existing stated energy policies around the world are implemented *(IEA, 2021)*. Under these conditions global fossil fuel share of the

[1] Terms in italics included in glossary
[2] The next report is due June 2022

energy supply would be around 13,000*Mtoe* (72% of total) in 2040. Under a sustainable development scenario where all "net zero" 2050 pledges were met in full this is predicted to reduce to 8,000 Mtoe, or 62% of the total *(IEA, 2020)*. The "net zero" pledges scenario leaves 22Gt of CO_2 emissions globally in 2050, compared to the 36Gt if the existing policies scenario prevailed *(IEA, 2021)*. Over half of GHG emissions relate to materials management activities with global primary materials extraction projected to double from 79Gt in 2011 to 167Gt in 2060 whilst material intensity declines *(OECD, 2018)*. A third of all the world's energy has been suggested as being used in manufacturing supply chains to make the materials and products that support everyday life in the UK today *(Norman et al., 2015)*. Data produced by the UK Government shows that of the 850 million tonnes of CO_{2eq} emissions attributable to UK households in 2015, 83% (704 million tonnes CO_{2eq}) are due to the embedded energy in the products and services used by UK households, compared to the 142 million tonnes generated from transport and household direct use of energy *(Defra, 2018d)*. Direct energy use by UK industry is recorded in national accounts as reducing over the last 40 years, mainly due to declining UK manufacturing and reliance on imported goods. However, indirect emissions associated with UK manufacturing continues to rise as the energy embedded in imported materials, parts and components outweighs the benefits of reductions in domestic emissions, due to the less efficient and more fossil fuel intensive processes in countries the UK imports from *(Willis & Eyre, 2011)*.

In addition to GHG emissions, continued and growing extraction of natural resources has also been shown to have significant detrimental environmental impacts in terms of air, land and water pollution and loss of habitats and biodiversity and social impacts in the short and long term *(OECD, 2015)*. As demand for materials increases, resources are becoming scarcer with access to materials becoming more politically unstable and controlled by a few large nations resulting in competition for valuable resources, increasing price volatility and increased threats of confrontation and conflict between nations *(EEF, 2014; P. Jones & Comfort, 2017; B. Lee et al., 2012; Lieder & Rashid, 2016; Preston, 2012).* This is coupled with increasing quantities and complexity of waste being produced throughout the production and consumption system to such an extent that the management of waste has become one of the largest and fastest growing environmental and political challenges emerging alongside global development *(Nichols & Smith, 2019)*. Many countries, including the UK, have become reliant on the export of municipal type wastes, particularly plastics, electronics and difficult to recycle products to other countries for disposal such as incineration or recycling *(E. M. Jones & Tansey, 2015)*. In the UK it is estimated that annually over 610,000 tonnes of plastic is exported to Asia *(BBC, 2019)*, 3.2 million tonnes of refuse derived fuel (RDF) is exported for incineration in mainland Europe *(Defra, 2018b)* and one in eight pieces of electronic waste may be being illegally exported to Africa *(Puckett et al., 2018)*. However, as countries such as China, Thailand, Vietnam, Malaysia and the Philippines took action to ban the import of such materials, waste

has become an increasingly political issue, as demonstrated by the setting up of a government inquiry into UK e-waste *(Commons Select Committee, 2019)*.

Given the relationship between material and energy production and consumption, GHG emissions, climate change and waste, it is recognised that sustained action is needed involving major changes in the way we produce and use materials and energy to reduce negative environmental and social impacts *(Pidgeon, 2012a)*.

1.2 From a linear to a circular economy

Over the last century the way we produce and consume materials and products has been built on a model of constant extraction of natural materials that are transformed into new materials and products, used or sold, and then thrown away as waste when they are deemed to have no more value *(EMF, 2013a)*. This system of production and consumption has become popularly known as the "linear economy*"* in policy and research circles, through the writings of proponents of the CE concept *(de Wit et al., 2018; Murray et al., 2017)*.The linear economy model has become hardwired into a global economic system in which government, businesses and society work together in producing and consuming increasing quantities of resources, goods and services as a means of achieving economic growth *(Lieder & Rashid, 2016)*.

However, particularly over the last three decades, the production and consumption of energy, materials, and products, have become highly salient concerns for many nations and its citizens. A wide lexicon of concepts, such as waste minimisation, resource efficiency, material efficiency, green economy, green growth, circular economy, sharing economy and performance economy have had various degrees of dominance in research and policy over the last 30 years, all with a purported aim of addressing the environmental sustainability of material and energy consumption *(Kirchherr et al., 2017)*. Although all these concepts can be understood to be related by virtue of a connection to waste and material resources, the concept that has gained traction in discourse in recent times is that of the circular economy.

It is argued that the ideas behind a circular economy have existed since the 1840s, particularly production and consumption being part of an ecological system and the industrial exchange of "waste" as a feedstock *(Murray et al., 2017)*. As Murray et al. outline, the concept of "industrial symbiosis" to describe this exchange appeared in literature by 1930, although others argue that the coining of the term "industrial symbiosis" began to be recognised as a valuable mechanism for building resilience in local economies and reducing environmental burdens as part of an "industrial ecosystem" in the 1980s *(Chertow, 2000)*. What is not questioned is that the principles underpinning production and consumption as part of an industrial ecological system and "an economy in loops", as are commonly understood to define a circular economy today, started to garner interest in the mid-1970's, with the production of a research report for the European Commission by researcher Stahel published in 1982 *(The*

Product Life Institute, 2019). Here concepts of selling utilisation instead of products, recycling loops and reconditioning loops and "cradle to cradle" were embedded conceptualisations. This built upon earlier arguments by Boulding *(1966)* of the earth having limited available resources such that there is need to move from an "open to the closed earth" economic model of material, energy and information exchange that is in entropic and thermodynamic equilibrium. The concept of sustainable, complex industrial ecosystems underpins the field of "industrial ecology" that began to grow in the 1980s bringing together the afore-mentioned concepts. Here, the need for industrial systems to mimic "closed loop" biological ecosystems and achieve stable, steady state and parsimonious use of resources operating within material entropy and thermodynamic limits in a complex "web of connections" were positioned as of paramount importance *(Ehrenfeld, 2000)*. Lovins' et al. *(1999)* positioned how this could be achieved by rethinking business models that result in nothing being wasted and existing ecosystems being restored, and adopting an innovation-focused "natural capitalism" perspective where the economy continues to grow and wealth increases by using fewer resources. This conceptualisation builds on thoughts being developed throughout the 1970s, in the field of "ecological economics", that focused on managing environmental issues to achieve economic growth. Again, such conceptualisations are inherent features of the modern-day CE concept.

CE discourse, that builds upon these antecedents, has been "trending" in the recent decade and being promoted by policy-makers, policy delivery organisations and organisations set up specifically to promote the CE concept *(Garcés-Ayerbe et al., 2019).* As interest in transitioning to a CE has grown, so has the range of descriptions of the functioning and action needed to move to a CE from a wide range of different stakeholders. Reviews of the CE concept conclude that few academic articles on the topic explicitly define what a CE is *(Korhonen, Nuur, et al., 2018; Prieto-Sandoval, Jaca, et al., 2018)*. As Bocken et al. *(2016)* argue, rather than moving towards a consensus, discourse of the CE is currently diverging. However, where descriptions are provided, these often build upon literature from the Ellen MacArthur Foundation *(EMF, 2013b, 2013a, 2015a, 2019)*. EMF is seen as having a key role in engaging businesses and policy-makers with the concept *(Bocken, Olivetti, et al., 2017)*.

Furthermore, reviewers of the conceptualisation of a CE often looked to create new definitions to fit a particular perspective, such as ecological economics *(Korhonen, Honkasalo, et al., 2018)*, business ethics *(Murray et al., 2017)*, cleaner production *(Geissdoerfer et al., 2017)* or eco-innovation *(Prieto-Sandoval, Jaca, et al., 2018)*. As Blomsma *(2016)* outlines there is also debate as to whether the CE offers anything different from what has gone before. Therefore, there remains a wide range of interpretations of what transitioning to a CE means. In addition, the concept is often positioned as having brought together earlier ideas under one master umbrella concept *(e.g. Blomsma et al., 2019; Friant et al., 2020; Homrich et al., 2018),* acting

as a means of grouping the variety of earlier ideas and concepts together through shared features *(Hirsch & Levin, 1999)*. As an umbrella concept, a diversity of interpretations of what a CE is and how to get there could be understood to make sense *(Blomsma, 2018; Blomsma & Brennan, 2017; Korhonen, Nuur, et al., 2018)*.

On this basis the CE can be understood to be a contested concept given a diversity of contrasting and contradictory interpretations of what a CE means *(Flynn & Hacking, 2019; Korhonen, Honkasalo, et al., 2018; Lazarevic & Valve, 2017)*. However, common to all interpretations of the concept is the discursive positioning of the CE as a practical industrial model that addresses global sustainable development problems and inequalities through development of "closed loop" circular business models (CBMs) by businesses, building on the EMF literature *(EMF, 2013a)*.

Irrespective of the potentially different perspectives on the CE, fundamentally the CE is promoted and understood by researchers and policy makers as an alternative industrial system. This alternative system providing economic, material and utility benefits for businesses and society whilst addressing environmental and sustainable development (ESD) issues, and replacing the existing linear economy based industrial system. Although CE discourse in research literature positions the CE as necessitating a "holistic" approach to transition *(e.g. CIRAIG, 2015; Kirchherr et al., 2017; Korhonen, Nuur, et al., 2018)*, the majority of CE policy and CE proponent interventionist literature is aimed at addressing one half of the system, i.e., production, and one group of actors, i.e., businesses. This is illustrated by the focus on demonstrating the scale of economic opportunity that is open to businesses. The omnipresent use of EMF and McKinsey claims of trillions of dollars global opportunities for businesses in published reports is interpreted in this thesis as placing an emphasis on production and the role and function of manufacturing businesses *(e.g. BSI, 2016; EMF, 2013a, 2014, 2015a; McKinsey & Company, 2016; UK Parliament, 2016)*. The expectation being for manufacturing businesses to change what they do and proactively develop innovative and technologically enabled CBMs, as depicted in the much-used EMF conceptual diagram of a CE reproduced in Figure 1.

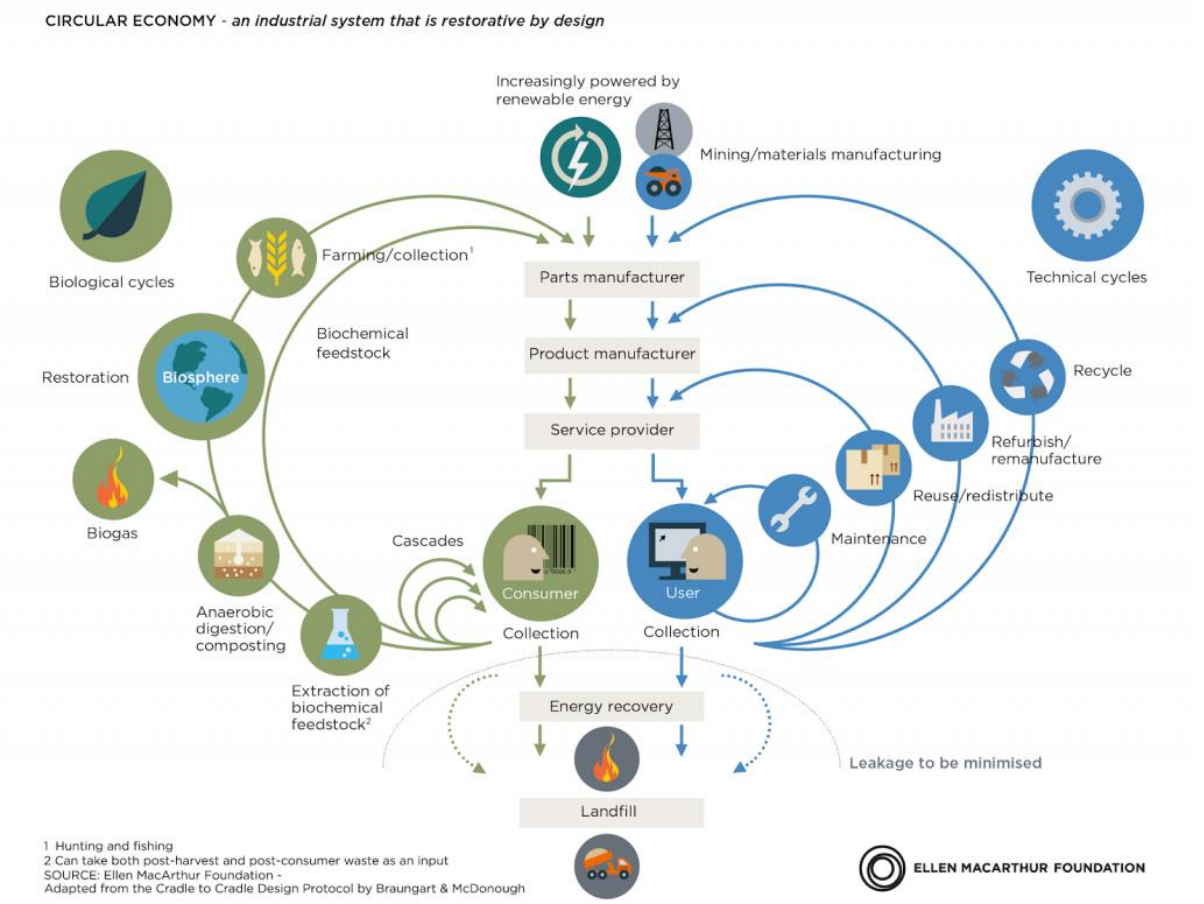

Figure 1: EMF circular economy conceptualisation

Due to the focus on changing business activities, this thesis takes the collective group of manufacturing businesses as the unit of analysis. The implications of this choice are reflected upon in Chapter 10.

Given that there is a diversity of interpretations of the CE in policy and research, it seems likely that there will exist a diversity of interpretations of what the development of CBMs means in practice for businesses who are currently part of the established linear economy system. As Stewart and Niero *(2018)* state, little research has been carried out on how established manufacturing businesses understand, conceptualise, position, assess and practice CE activities. Where research has been carried out, most research and wider support on sustainability related issues, supply chains and changing business practices focuses on large, often multi-national, globally-connected "exemplar" businesses *(Conway, 2015; Oelze & Habisch, 2018)*. Furthermore, a number of researchers highlight that there have been very few investigations of how transitioning to a CE is understood by established businesses who are embedded in existing production value chain networks and who are not sustainability driven entrepreneurial-oriented businesses or actively engaged with funded support services *(Garcés-Ayerbe et al., 2019; Gusmerotti et al., 2019; Homrich et al., 2018; Masi et al., 2018; Rauter et al., 2017; Ritzén & Sandström, 2017; Werning & Spinler, 2020)*. Importantly, the institutional context of being an incumbent embedded in existing production value chain

networks working within the linear economy system has had very little study, even though existing socio-cultural and political factors are deemed to have a major influence *(Miras-Rodríguez et al., 2018; Ranta et al., 2017)*. By gaining a deeper understanding of the situational context of manufacturing businesses, insights can be gained on how transitioning to a CE can be approached more holistically.

Overall, there is a gap in the literature on what is understood of the risks by and for established manufacturing businesses in developing CBMs and what this may mean for policy aspirations to transition to a CE. This thesis aims to contribute to filling this gap.

1.3 The role of businesses in transitioning from a linear to a circular economy

Although all members of society are complicit in maintaining the existing linear economy system, businesses are perceived to be responsible for the environmental and social damage caused, and hence are the main focus of policy and research *(Weerts et al., 2018)*. This builds on historically embedded understandings of industrialism[3]-based production practices linked to pollution, degradation of nature and environmental issues such as acid rain and ozone layer depletion *(Cudworth, 2002)*. This positioning of responsibility is exacerbated by normative beliefs that businesses actively adopt *planned obsolescence* strategies that force increased consumption practices *(Cerulli-Harms et al., 2018; EMF, 2017)*. Not only are businesses perceived to be the problem but are also viewed as providers of solutions. This is on the basis that they are understood to have the ability to readily innovate and change what and how materials and energy are used, and how products are designed, produced and provided in society *(Prieto-Sandoval, Jaca, et al., 2018; Prieto-Sandoval, Ormazabal, et al., 2018)*.

Furthermore, given the emphasis on the CE as an industrial system, manufacturing businesses are deemed key actors in aspirations to transition to a CE. As introduced in Section 1.2, the development of CBMs is positioned in discourse as essential to addressing global sustainability problems. According to Lieder and Rashid *(2016)* such a transition from a linear industrial system to a circular industrial system is seen by researchers as desired by society. What this means is that businesses are expected to be innovators and change their current business model(s). However, evidence of significant engagement of manufacturing businesses with CBMs, especially smaller businesses in business-to-business "B2B"[4] relationships, beyond niche applications or markets, is understood to be limited or fragmented *(Kirchherr & van Santen, 2019; Ormazabal et al., 2016; Ritzén & Sandström, 2017)*. Therefore, a key element of this thesis is to help explain why established manufacturing businesses are,

[3] Industrialism being the result of the Industrial Revolution in Britain in the late 18th and early 19th centuries associated with social, political, cultural and economic modernisation of society

[4] This includes provision of products and services to organisations not classed as businesses, including public sector bodies, not for profit organisations etc.

or are not, will or won't, engage with CBMs, within the context of being embedded in the current linear economy system, requiring an investigation of how changing business models are perceived to affect existing businesses.

Large companies are frequently perceived to be more responsible for driving climate change and resource depletion *(Sáez-Martínez et al., 2016a)*. As outlined in Section 1.2, research and support focuses on bigger businesses. However, in line with the rest of Europe and globally large businesses are minority entities in the UK *(e.g. Jansson et al., 2017; Ormazabal et al., 2016; Quintás et al., 2018)*. Companies employing over 250 people account for less than one percent of all businesses manufacturing in the UK *(BEIS, 2019)*.

The term SME (Small and Medium-sized Enterprise) is in common usage to denote a group of businesses that have a specific maximum number of employees and scale of assets and turnover, although the definition varies by institution and country *(Gibson & Vaart, 2008)*. The term SMEs is used loosely in this thesis to represent businesses employing less than 250 people in line with EU policy definitions *(EC, 2020c)*. In this thesis a distinction is made between the use of the term SME as an established business and start-up/entrepreneur business, even though the term SME is often conflagrated with the term entrepreneur.

Due to the large number of established SMEs, they are positioned as being collectively responsible for significant levels of detrimental environmental impact *(Katz-Gerro & López Sintas, 2019; Miller et al., 2011; Quintás et al., 2018; Sáez-Martínez et al., 2016a)*. However, individual impacts are perceived to be small by SMEs themselves *(Brammer et al., 2012)*. SMEs are also positioned as a major source of entrepreneurial skills and innovation with an ability to respond quickly to change due to a lack of bureaucracy in decision-making processes and practice and short communication, decision and learning chains *(Brammer et al., 2012; Conway, 2015; Del Brío & Junquera, 2003; Sullivan-Taylor & Branicki, 2011; Walpole & Renfrew, 2018)*. Furthermore, SMEs as a collective have been characterised as "the backbone of the European economy" or the "engine of the European economy", having the potential to increase jobs and economic growth and spread innovative practices *(EC, 2020a, 2020c; Gibson & Vaart, 2008)*. Such understandings position existing SMEs as a major entity in industrial systems and therefore, what is understood of the role and characteristics of being an established manufacturing SME is considered in this thesis to be a major aspect in explaining how they respond to the CE concept. However, the majority of SME research on the CE takes a systems-level perspective and, as stated in Section 1.2, is rarely carried out from the established SME-level perspective *(Garcés-Ayerbe et al., 2019; Gusmerotti et al., 2019; Homrich et al., 2018; Masi et al., 2018; Ritzén & Sandström, 2017; Werning & Spinler, 2020)*.

1.4 Changing business models

The concept of a business model has become a dominant discursive device since the 1990s, as a short cut for expressing the complexity of how a business functions *(Geissdoerfer, Vladimirova, et al., 2018)*. In this thesis, the term business model is used to describe an interconnected framework incorporating value proposition, value creation and value capture associated with an individual business within a value chain network. The value proposition defines what a business is providing of value to users of their products and services in the value chain network, creation describes how the business delivers the proposition and capture represents why the business does what it does *(Bocken et al., 2016, 2014; Nußholz, 2017; Oghazi & Mostaghel, 2018; Urbinati et al., 2017)*. This conceptualisation of a business model derives from the work of Porter *(1985)* on how businesses gain competitive advantage in their role in a value chain network. A value chain represents the discrete activities in the design, production, marketing and distribution of a particular product category. Therefore, in line with stakeholder theory, a business model is a practice engaged in by a business that provides something of value to a wide range of actors including the business itself, within a specific value chain network *(Quintás et al., 2018)*. As stakeholder theory defines, the choice of business model keeps the interests of different stakeholders in balance *(Schwarzkopf, 2006)*.

Most business models have been designed and optimised to fit the linear economic industrial system. In this thesis, the linear economy is conceptualised as an overarching socio-technical-economic-political system that has evolved over decades. The aim being to serve a range of material, economic, utility and symbolic requirements of society encompassing a diversity of production and consumption value chain networks *(Cherp et al., 2018; Geels et al., 2017)*. Inspired by Geels et al. *(2017)* approach, my interpretation of a simplified representation of the linear economy industrial system is provided in Figure 2. This highlights the role of businesses in the production stages (materials, manufacturing and products) and the interconnectedness of the different elements of the overall system that have been created to uphold the linear economy model. As outlined in Section 1.2, in this thesis I am focusing on the collective group of businesses involved in the production stages.

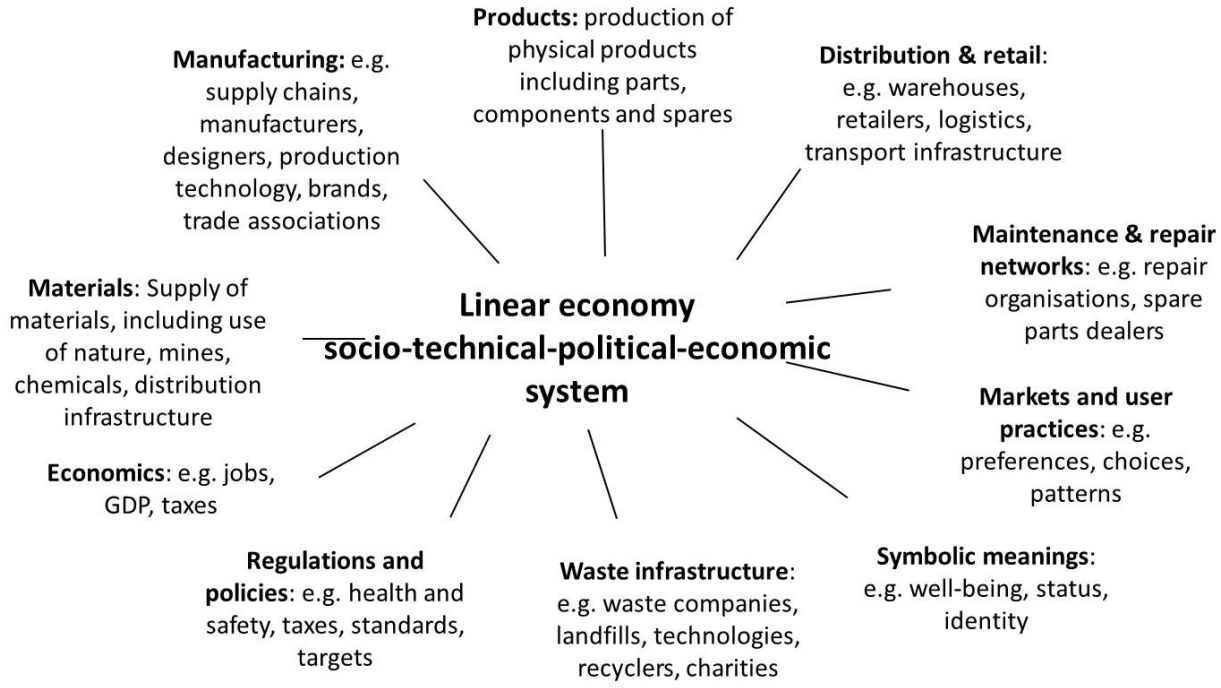

Figure 2: Simplified schematic of linear economy system

The system can be seen to be reliant on inter-related and inter-dependent networks of actors (individuals, businesses, organisations, groups), institutional arrangements (rules and regulations, policy, standards of practice, social and technical norms, discourses, meanings), material and technological artefacts, infrastructure, value chain networks, economics, markets and knowledge *(Geels, 2004; Markard et al., 2012)*. This interconnectedness supports calls for transitioning to a CE to be approached holistically. However, any one change in the system can have a potential effect upon all the other entities, including what is deemed to be of value and at stake for each actor in maintaining or changing the system. Value and stake are key elements of the concept of risk, discussed further in Section 2.3 *(Boholm, 2003)*. Therefore, to understand established manufacturing SMEs' responses to the calls to develop CBMs, understanding perceptions of risk for SMEs in changing business models and how this relates to the existing entities, structures and political, social, economic and material "norms" of the linear economy system is a crucial step in being able to approach transition holistically.

In this thesis, borrowing from transitions theory, the term "manufacturing regime" is used to represent the set of "deep structured" formal and informal institutionalised sets of rules, practices, norms, values and knowledge etc. that stabilise entities and their structures underpinning the existing system *(Cherp et al., 2018; Clausen et al., 2017; Geels, 2012)*. The manufacturing regime influences perceptions and activities of actors in the system that guide what is deemed to be of value and at stake for each actor in a value chain network in maintaining or changing the system *(Fuenfschilling & Truffer, 2014)*.

Advocates of the CE position transitioning to a CE industrial system as being a fundamental transformation of the way that the industrial system delivers value to society *(Kern, 2011)*. Therefore, transitioning from a linear economy system would require changes to the institutionalised entities, structures and the manufacturing regime that uphold the system *(Geels, 2018; Whalen & Whalen, 2018)*. As Stern *(2000)* highlights, understanding a situation from the perspective of those who are expected to change their practices is a fundamental principle of determining effective interventions aimed at changing pro-environmental behaviours and practices. Furthermore, as Schwarzkoft *(2006)* outlines, in accordance with the core principles of stakeholder theory, business decision-makers will evaluate change taking account of views of risk of important stakeholders for their business.

Therefore, in this thesis, I focus on exploring the existence and effect of entities and their structures and the manufacturing regime, developed as part of the linear economy system, on perceptions of risk. My aim being to identify the contingent arrangement of conditions for established manufacturing SMEs that may slow down, prevent or support change *(Cherp et al., 2018)*. This is on the basis that the focus of CE discourse by proponents of the CE is on how businesses involved in production can change their business models as discussed in Section 1.3. However, decisions involving change involves an evaluation of the uncertainties and consequences of action in relation to what is of value and at stake for the business and the stakeholders they serve. My theoretical underpinnings and approach to investigating perceptions of risk are reviewed in Chapter 2. The focus on perceptions of risk is important in that beyond drivers, barriers and enablers research, reviewed in Chapter 3, there has been scant attention to perceptions of risk for established manufacturing SMEs. This thesis aims to fill this gap.

1.5 Research questions

The aim of this research is to provide a critical perspective on research of the CE and SMEs to better inform policy decision-making on the engagement of established manufacturing SMEs with CBMs. As argued in this chapter, the influence of existing institutionalised entities and their structures and the manufacturing regime on what is to be understood of SMEs, CBMs and risk in production value chain networks that have been developed to deliver a linear economy system will affect how incumbent SMEs respond to calls to engage with CBMs. Without understanding the institutional context of manufacturing SMEs, the opportunity to approach transitioning to a CE more holistically may be missed. For these reasons, this thesis explores:

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A critical discursive psychology approach, as described in Chapter 4, adopting a relational theory of risk perspective described in Chapter 2, was used to address the following Research Questions:

1. What is understood of SMEs and their decision-making when part of existing production value chain networks regarding transitioning to a CE?
2. What is understood of the CE and development of circular business models?
3. What is understood of risks for SMEs in actively adopting circular business models?
4. What are the implications for intervention and support for established manufacturing SMEs in engaging with the concept of the CE?

For questions one to three the following were analysed:

   a. How are these understandings constructed in discourse and for what purpose?
   b. What entities, structures and aspects of the manufacturing regime are called upon in these constructions?
   c. Why do such understandings exist?

1.6 Structure of the thesis

This thesis is structured in four parts.

Part 1: the rationale for the research, explains the logic and theoretical underpinnings of the scope and nature of the thesis. To give meaning to the findings of this thesis, how the objects of study are conceptualised within the thesis is clarified in Chapter 2. A literature review is provided in Chapter 3, including an analysis of research on SMEs engagement with the concept of the CE, a review of CE discourse research and an account of differing CE discourses circulating in research.

Part 2: methodological strategy, data and methods, details what information was collected, how and for what purpose. The methodological strategy and theoretical underpinnings of the choice of adoption of a Critical Discursive Psychology methodological approach working within a grounded theory analytical framework is explained in Chapter 4. The details of the research strategy and associated information collection and management activities to create data for analysis are provided in Chapter 5.

Part 3: analysis and results, covers four chapters. Chapter 6 details how the analytical framework has been implemented. In Chapters 7 to 9 the results of the detailed analysis of three repertoires relating to the research questions are provided. Interpretative theories of how these repertoires relate to the historically embedded social, political and cultural institutionalised entities, structures and norms embedded in production and consumption are also provided.

In ***Part 4: discussion and conclusions***, the overall findings are discussed more broadly in Chapter 10 in terms of the implications for engaging established SMEs in the development of CBMs. The chapter concludes by revisiting the research questions, the methodological strategy adopted and discussions of the findings to highlight the new contributions of this thesis. The implications for future research on SMEs, risk and the CE are then discussed including questions still to be answered and the nature of research carried out.

PART 1: THE RATIONALE FOR THE RESEARCH

2 Underpinnings of the research

The concept of the circular economy (CE) and decision-making have been and continue to be topics of research in a wide range of disciplines and from an equally wide range of philosophical and theoretical perspectives. Furthermore, as an active agent in research, the researcher has choice in what *a priori* theory and knowledge they bring to research, what the focus of the research is to be and the scope, source and nature of data to use and the analytical framework to adopt. In this chapter the theoretical and conceptual underpinnings adopted in the research are presented. The rationale is provided for attending to perceptions of risk through analysis of discourse, adopting a relational theory of risk perspective and a critical realist ontological perspective.

2.1 Researcher as an active agent

What theoretical assumptions and the way a researcher defines a problem act to frame what is to be understood of the object of the research and what is to be considered relevant or not *(Henwood et al., 2008)*. Therefore, to make sense of the outcomes presented in this thesis it is necessary to be clear on what assumptions and experiences I bring that has influenced the scope and nature of the research. My motivation for carrying out this research is in understanding if there can be a different way of making significant changes in how environmental problems are resolved. This is on the basis that, fundamentally, increasing material and energy consumption to support economic growth and production of waste embedded in material, social, cultural and political systems, structures, practices, decision-making and psychologies will influence how environmental problems are addressed.

2.2 Politics and a critical realist informed ontology

The goal of this thesis is to produce credible results to inform practical recommendations for policy on how established UK SMEs can be supported, encouraged or made to take action to reduce material use and mitigate climate change. Although not political in the sense of party politics and governance of a country, these beliefs are political in the wider sense of my being an environmentalist looking to influence UK Government. Acknowledging these political levers means that I have adopted a pragmatist philosophical position, where the value of theoretical perspectives and methods has been evaluated in terms of realising meaningful results that can be used to influence policy.

On the question of ontology and epistemology, I have undertaken this research from a Critical Realist (CR) perspective. As such, recognition of the influence of institutionalised entities and their structures and the manufacturing regime, as part of the situational context of a decision, is deemed paramount in helping explain perceptions of risk for SMEs and the actions of members of production value chain networks regarding transitioning to a CE. A CR

perspective is used particularly where the purpose of the research is for future action to be instigated *(Georgaca & Avdi, 2011)*. It is seen to be of most value when researching organisations *(Fairclough, 2005)*.

However, recognising that this way of thinking about the world influences the choice and use of the methodological strategy and methods of data collection and analysis, elaboration is provided here on my interpretation and adoption of a CR perspective. This is not to say that other perspectives are any less or more valid in providing insights, but that recognising my choices helps explain why other researchers may provide different interpretations of perceptions of risk in transitioning to a CE.

This thesis is founded upon a belief that entities and associated structures and embedded norms exist and have real effects, whether purposefully interacted with by an individual or by the fact that they exist *(Easton, 2010)*. This is irrespective of individuals' perceptions, theories, knowledge, discourses and constructions of the entities and their structures and the manufacturing regime or the presence of researchers. This is because entities, structures and the manufacturing regime include enduring (but not permanent) features of the world existing before or during an individual's life *(P. K. Edwards et al., 2014; Maxwell, 2012; Meyer & Rowan, 1977; David Scott, 2005)*. I have assumed in this thesis that the interconnectivity of entities, structures and the manufacturing regime supporting the linear economy system has created and reinforce lock-ins, or path dependencies*. "*Path dependencies" can act to negate moves to change *(Cherp et al., 2018; Clausen et al., 2017; Geels, 2012)*.

On this basis, an ontological realism perspective underpins this research. However, although entities and their structures and the regime exist, I consider peoples' perceptions, knowledge, interaction and constructions of them as being relative *(Easton, 2010)*. What is perceived or known of each of these and their relationships, how that knowledge has come about or is constructed and used in discourse, or not, and called upon in decisions can vary in relation to the interests and agency of the individual *(Fletcher, 2016)*.

By adopting this position, I accept that human knowledge of entities and their structures and the regime are socially, historically, politically and culturally produced, mediated through individuals' perspectives, experiences and agency. Therefore, I acknowledge that knowledge is transient, fallible, historically situated and socially constructed resulting in people having different views of the same reality *(Belfrage & Hauf, 2017; Maxwell, 2012; Sorrell, 2018)*. In this way my beliefs align with a post structuralist/ modernist perspective where history and culture incorporate biases and misrepresentations. Thus, different understandings of reality can mutually co-exist subject to an individuals' position in society and personal history *(Kilduff & Tsai, 2012)*. Such an approach fits an epistemological relativism perspective. This ontological realist and epistemological relativist perspective is fundamental to a CR

perspective in which entities and their structures and the regime are taken to have inherent "causal powers and liabilities" that enable or constrain them from having an effect in a particular way *(Fletcher, 2016)*. However, the effect that is achieved is conditioned by interaction with other entities and structures, and is therefore always contingent, with these contingent combinations acting as "causal mechanisms" *(Elder-Vass, 2012)*. A primary aim of CR informed research is the identification of such mechanisms (incorporating the discursive and extra discursive), i.e., the arrangement of entities and their structures and rules of the regime that can explain why an event occurs or not. In this case the engagement by established SMEs in transitioning to a CE, and not just showing a correlation between entities and their structures or the regime and transition activities. As highlighted in Section 1.4, I believe it is important that I explain why such a relationship exists and what conditions need to exist from the SMEs' perspective to make that event possible *(Bunt, 2016; Easton, 2010)*. This is on the basis that the combination of causal powers and liabilities that form the institutionalised situational context of a decision that are beyond the individual, can be strongly positive or negative in compelling or prohibiting changing practices, irrespective of individuals personal attitudes *(Stern, 2000)*. Therefore, in line with a post structuralist perspective, to understand causal mechanisms and their influence, I deemed it necessary to study what is understood of the entities, structures and "rules"[5] of the manufacturing regime that combine as causal mechanisms and how such knowledge has come about.

Different causal mechanisms can have the same effect and one or more mechanisms may be at work at any one time with the situational context of a decision being a fundamental aspect of determining how a mechanism manifests itself empirically. However, an important component of the situational context of a decision is the individual and their role in production value chain networks. As Stern *(2000)* explains pro-environmental intent varying greatly depending upon arrangements of established norms, agency of the individual and the external conditions of the situational context. The actions carried out by individuals in their production value chain network role when they interact with entities, structures and the manufacturing regime that combine as causal mechanisms incorporates rational preferences, i.e., "judgemental rationalism*"* as put forward by Roy Bhaskar *(JCGOSJ, 2019; Sorrell, 2018)*. Judgemental rationalism accepts that there is a rational basis for individuals accepting or using selected knowledge or theories and engaging with mechanisms.

The adoption of this standpoint in this thesis means that I agree that there is no universal or absolute truth about the explanation of a phenomena or the effect of a causal mechanism. For me, explanations are always a product of combinations of external conditions, the situational context, agency and judgment, but I accept that a "less false" explanation is possible *(Ezzy,*

[5] The term rule or rules in relation to the manufacturing regime is used to depict the taken for granted norms, expectations, beliefs, practices and rules etc. that are deemed right.

2002, p. 30). Therefore, the explanations put forward are my interpretative theories. As Fletcher *(2016)* highlights, the search for causal mechanisms is an important aspect in the ability for researchers to put forward practical policy recommendations to address social and environmental problems. As explained above my motivation to influence change and feed into policy recommendations on how to address environmental issues through reducing material consumption is an important aspect of this thesis. Therefore, the identification of causal mechanisms, that when interacted with, influence perceptions of risks for established SMEs is paramount.

2.3 Decision-making

I have built this thesis upon an understanding that transitioning to a CE gives rise to "ideological dilemmas" for individuals, as defined by Billig et al. *(1988)*. Ideological dilemmas recognise the influence of historic political and current situational preconditional "contrary maxims", i.e., conflicting and concurring interpretations of entities and their structures and rules, that create difficulty for people when faced with a dilemmatic choice. Thus, decision-making can be understood to involve argumentation and reasoning and be influenced by preconditions of the decision. Such preconditions combine as causal mechanisms. Therefore, decisions require actors to make a judgement on which entities and structures of entities, knowledge and rules embedded in the regime for example, they call upon to rationalise their choice, in line with the concept of judgemental rationalism. On this basis in this thesis I take "facts" as being created as part of a process of knowledge production, influenced by perceptions of reality, theory, ideology and values and therefore have a subjective dimension *(Billig et al., 1988)*.

In this thesis, the situational context of an individual being part of existing institutionalised production value chain networks is taken as having a significant influence on what is deemed to be a rational decision. Hence, decisions are influenced by everyday interactions, preferences, ways of living and doing, trust dynamics, commitments and relationships, socio-political-economic constraints, cognitive effective connections (e.g. values, beliefs, feelings, knowledge, experience, control) and heuristic "common sense reasoning" *(Alriksson & Filipsson, 2017; Horlick-Jones & Prades, 2009; Renn & Benighaus, 2013)*. However, in line with institutional and role theories, I believe that the act of being a decision-maker in a particular situational context, for example an established manufacturing SME business or policy-maker in an existing production value chain network, potentially bounds what is to be deemed as a rational judgement and the choices available. I agree with Andreouli *(2010)* in that this is influenced by the associated "rights and duties" of the position, including expectations on the rules to adopt and "facts" to call upon that are embedded in the manufacturing regime for a particular decision. Furthermore, in line with social representation theory, I have assumed such networks have shared systems of beliefs, knowledge,

established truths, values, interests and preferences, powers, resources and social relations that affect what makes sense in a decision *(Rateau et al., 2012)*. This context influences individuals' understanding of choice and the outcomes of a decision and what can then be understood to be a rational decision *(Geels et al., 2017; Korhonen, Nuur, et al., 2018)*. On this basis, I accept that what is deemed rational in decision-making incorporates subjective evaluations and reactions. Here, rationality is influenced by the agency and role of the individual, choice evaluations and ideological dilemmas and importantly the situational context *(Billig et al., 1988; Boholm et al., 2013; Langley et al., 1995; More, 1982; Oliveira, 2007; Slovic et al., 2004)*. In this case, being a member of production value chain networks. Therefore, the manufacturing regime and engagement with the causal powers and liabilities of entities and their structures external to the organisation, that exist to support existing production and consumption value chain networks, have a major influence. Such subjective evaluations are assumed in this thesis to be informed by, and inform, people's perceptions. Therefore, what is perceived of risk in a decision may be seen differently by different people, or differently by the same person in a different context or be shared depending upon activation of causal mechanisms. What is perceived as important influences all decisions people make and consequent actions, and therefore people's perceptions were taken to be of primary importance in this thesis *(Robbins & Judge, 2008)*. Studying perceptions of risk provide insights into what is important to people *(Renn & Benighaus, 2013)*.

2.3.1 Conceptualising perceptions

Perceptions are generally understood to be a psychological entity, bound up with physiology and mechanical processes with much research on perceptions centring on cognitive-behavioural theories *(Potter & Hepburn, 2007)*. This approach is built upon an understanding that mental or cognitive processes hidden internal to an individual determines people's behaviours and continues to be a mainstay of much psychology research. Attribution theory is a primary theory underpinning such approaches, in that internal cognitive, i.e., beliefs, attitudes, perceptions are constructed as being associated with individual characteristics, e.g. gender, race, age and positioned as explaining particular behaviours *(Pashler, 2013 pp.83-85)*. Through this lens, perceptions, attitudes and beliefs are taken to be specific fixed features of the individual and therefore expressions of such phenomena are conceptualised as a reflection of the mental content of an individual. Such research places an emphasis on changing groups of people's cognitive characteristics to change behaviour by providing those groups with the "right" knowledge or ways to think. However, as argued by Stern *(2000)* reliance on educational or moral approaches to behaviour change have limited effect on their own, as such an approach fails to account for the agency of the individual or the context of interaction.

This lack of account of agency and situational context and the context of knowledge production or conceptualisation of entities came under growing criticism throughout the 1970s, during a period known as the European "crisis in social psychology" *(Potter, 2012; Wiggins, 2017)*. The crisis revolved around questions about the practices of social psychology researchers who were focussed on experimentation and quantification, and the domination of cognitive-behavioural theories and individualistic ideology of USA psychology in setting the research agenda *(S. Brown & Locke, 2008)*. Against this approach, more interactionist and constructivist approaches and theoretical perspectives to investigating psychological phenomena began to take centre stage in arguments on the appropriateness of the methods and validity of social psychology research findings. Through this lens perceptions, attitudes and beliefs are sophisticated, flexible, dynamic, negotiated, interactional performances in a particular situational context and are therefore transient entities. These social interactional and constructivist theories put the individual centre stage in having agency. According to Wittmayer et al. *(2017)* these theories recognise that performances call upon particular rules that are historically, socially, politically and culturally situated and potentially bound the right and wrong act to undertake. Such rules are associated with political ideology that link patterned ideas and truth claims regarding right and wrong, good and bad with practice, encouraging and simultaneously constraining types of actions in people and their identity *(Steger, 2015)*. For example, individuals' perceptions of their own position and others in networks are important influences on action and whether a stabilised network or system can change *(Kilduff & Tsai, 2012)*. These distinctions have a major role in framing how we can analyse perceptions.

In this thesis, perceptions are not a fixed entity of individuals but are performed in interaction and influenced by the situational context, the role and agency of the individual and interaction with the production and consumption social network, in alignment with a social interaction theory perspective.

2.3.2 Conceptualising risk

In the study of and management of business risk, risks are often conceptualised as being able to be identified, quantified and measured objectively and therefore rationally managed, in line with risk management theory *(Hardy & Maguire, 2016b, 2016a; Maguire & Hardy, 2013; Nyberg & Wright, 2016)*. From this perspective, risk is portrayed as fact and "out there" in line with a realist ontology *(Easton, 2010; Slovic, 1992)*. This risk management theory approach requiring measurement, management and reduction has placed an emphasis on evaluating the mathematics of risk for businesses, particularly economic and probability factors to enable comparison of risk and determination of blame *(Boholm, 2003; Nyberg & Wright, 2016; Power, 1994; Vasvári, 2015)*. Such an approach also underpins an ecological modernisation perspective on how to address environmental problems as outlined in Section 1.2.

There are suggestions that there is a move away from the dominant risk management theory approach of understanding risk as negative and an objective product of probability of occurrence and severity of consequence in the business risk management field *(Hillson & Murray-Webster, 2004; Lark & Nikonov, 2015)*. As demonstrated in the risk management standard ISO 31000:2018, the risk management industry is looking to risk being presented as relating to the situational context of the business, defined as the "effect of uncertainty on objectives" of the individual business *(ISO, 2018b; Lark & Nikonov, 2015)*. Uncertainty is positioned as a lack of knowledge of events, sources of risk, circumstances and consequences. In this way consequences can now be both positive and negative depending upon the situational context of the organisation. In accordance with the theories of Boholm *(2003)*, uncertainty concerns the future and recognises that things are changeable.

In this thesis I consider it a positive move that risk management standards now recognise the situational context and extent of uncertainties and there being positive and negative consequences *(ISO, 2018a)*. However, this move continues to work with the conceptualisation of risk as an objective entity that can be known and predicted and therefore controlled through better access to information, management and governance (e.g. see the guidance for SMEs on the ISO31000:2018 standard: *Lark & Nikonov, 2015)*. Furthermore, this approach also aligns with the cognitive-behavioural theories of decision-making discussed in Section 2.3.1. As such, the subjective judgement and agency of the individual remain unacknowledged. Furthermore, the potential influences of being part of a wide range of networks including the production value chain networks influenced by existing entities, structures and the manufacturing regime, remain unaccounted for in how decisions involving evaluation of business risks are made.

On the question of subjectivity, this has been incorporated into social psychology research on evaluations of risk, building predominantly on the work of Slovic and Fischhoff as part of the "psychometric approach to risk" *(Slovic et al., 1981)*. This approach recognises that individuals are influenced by a wide range of entities and associated structures and therefore make subjective judgements. This includes the social, institutional, cultural, political and psychological entities, structures and rules of the manufacturing regime. Therefore, as Pidgeon et al *(1998)* demonstrate, evaluating risk in decisions is a complex process involving reference to accepted knowledge, science and facts, and contestation of such facts and values. For example, as Kasperson et al. *(1988)* point out, perceptions of risk in the general public differs significantly from "experts". However, although the assessments are recognised as subjective, as presented by Slovic *(1992)* this approach positions that responses to "risk" are systematic and predictable and can be determined by measurement of psychological factors of the individual. Such an approach has gained traction in social psychology research on risk. However, as Boholm *(2003)* explains, this approach continues to work within a

cognitive-behavioural theory domain to understanding psychological phenomena, such that the complexity of evaluation of risk is reduced to simplistic models focussing on economic rationality or modelling of attitudes and behaviours.

The efficacy of this psychometric approach to risk theory has been questioned. Criticism is based on measures of risk aversion having been shown to vary in and between individuals depending upon the context of the decision and perceptions of the outcomes and responsibilities *(Hillson & Murray-Webster, 2004; Weber & Betz, 2002)*. The psychometric approach to risk theory works with a risk management theory understanding of risk being objective and measurable and neglects agency of the individual and the situational complexity of a decision and the decision-maker. It also fails to account for how people come to interpret and evaluate risk for different situations or the same situation in a different context *(Horlick-Jones & Prades, 2009; Renn & Benighaus, 2013)*. However, the psychometric approach maintains that by being able to identify, measure and quantify cognitive entities (e.g., knowledge, attitudes, perceptions) associated with individual characteristic factors (e.g., age, gender, political association, geography), risks can be managed through improving access to the right knowledge by the right people *(Bradbury, 2009)*.

An alternative “cultural theory of risk” perspective, attributed to Mary Douglas and Aaron Wildavsky *(1983)*, puts forward that what is understood of risk is historically embedded cultural and social “collective constructs” of individual and collective thought and processes and therefore are wholly subjective and culturally determined *(Boholm, 2003)*. This perspective positions that risk depends entirely on shared knowledge and constructions of institutions, social structures, values, beliefs, history, individual and collective identities within a culture. Therefore, people within a culture will make the same decision for the same situation *(Boholm & Corvellec, 2011)*. Hence, the production value chain networks working within the linear economy system could in effect be classed as a culture, or a collection of different cultures. Whilst quantitative studies can often find some significant differences between characteristics of a culture, correlations are often weak and only explain small amounts of variations on views on risk *(Pidgeon, 1998)*. Furthermore, in cross culture studies of specific phenomena, understandings of risk have been found to be both variable and uniform within and across cultures *(Boholm, 2003)*.

Although each of these approaches have their merits, in this thesis I use the concept of risk as a cognitive frame. Adopting this approach means risk is a discursive term that enables people to construct a causal and contingent relationship between two entities, one which is understood to have the ability to harm and one that has human value and to be protected from harm *(Boholm & Corvellec, 2011)*. As such risk is not an intrinsic property of entities. It is understood and defined by the individual in line with a relativist epistemological perspective. Therefore perceptions of risk are influenced by social relationships, power relationships and

hierarchies, knowledge and understandings (concrete, familiar, conceptual, abstract and distant), trust, cultural beliefs, discourses, practices, collective memories, personal histories, functional position in a culture or network and many other aspects of the situational context of the individual *(Boholm, 2003; Boholm & Corvellec, 2011; Boholm et al., 2012)*. Such an approach aligns with research on business managers carried out by Helliar et al. *(2001)* where risk was found to be a multi-dimensional concept that could not be condensed into a single value.

In alignment with my ontological perspective as discussed in Section 2.2, I believe that there is no universal simple "cause" of what can be understood of the concept of risk. Understandings of risk can have objective, subjective, cultural and a wider array of influencing dimensions *(Brivot et al., 2017; Hillson & Murray-Webster, 2004)*. I consider the situational context in which and for which a decision is made is of primary importance. As Henwood et al. *(2008)* have found, this is because the situational context will have an effect on what is to be perceived as a risk, how risk is to be interpreted and what is to be deemed a rational decision. However, regarding institutional arrangements, such as being part of production value chain networks, how risks and rationality are framed are political and potentially controversial. As explained in Section 2.2, people have diverging interests, values and concerns whilst being potentially bound to the existing entities and structures of production value chain networks and the manufacturing regime and expectations of their role. Therefore, individuals engage in judgemental rationalism by understanding and judging risk in relation to these influences, with what is positioned as risk acting to define what the problems and solutions are to be and who is responsible *(Boholm, 2003)*. Crucially, entities and their structures and rules of the manufacturing regime that combine as causal mechanisms are expected to influence freedoms and constraints on members of networks. However, I accept that members decide how to interpret and negotiate such freedoms and constraints. Therefore, I recognise that people engage with risk issues from a perspective of their function and responsibilities embedded in the practical, everyday activities of the institutional context, in this case being a member of production value chain networks *(Boholm et al., 2012)*. This aligns with Meyer and Rowan's *(1977)* institutional theory, where to be seen as a legitimate entity and survive, decision-makers conform to the prevailing rules and belief systems.

Adopting this relational theory of risk perspective, following the arguments of Boholm and Covellec *(1998, 2003; 2011, 2015; 2013)*, I use the concept of risk as a framing device in this thesis. Therefore, risk links what people subjectively judge to be of value to the organisation or themselves and at stake in decisions regarding being a member of a production value chain network, and the situational uncertainties of a decision in terms of consequences and likelihood of a "risk object" of the decision causing harm to the "objects at risk" that are judged to have business value. If there is nothing at stake and the outcome is certain there is no risk

(Rosa, 1998). Such objects can also have multiple meanings and realities given to them by the same actor *(Mol, 1999)*. They can also be interpreted differently by different people and used in different ways whilst maintaining a common identity *(Leigh-Star, 2010)*. However, meanings given to objects influence how risk is defined, what is the priority and how risk is to be governed *(Boholm et al., 2012)*.

This theoretical approach, adopted in this thesis, recognises that decision-making is a social practice, in line with social practice theory, where individuals are active agents. Decisions involving risk evaluations are therefore taken to be neither simply objective nor subjective. They are unpredictable and highly complex and cannot be understood as something separate from what individuals perceive of entities and their structures and rules of the manufacturing regime *(Boholm, 2003)*. By adopting this theoretical position, I can look to answer what, why and how something is identified as a risk. Such an approach also enables insights to be developed into what is valued and at stake within a particular context at a particular time and space, by whom or what *(Boholm & Corvellec, 2011)*. The importance of understanding the construction of relationships between risk objects and objects at risk is paramount, as such relationships bound decisions to act *(Luhman, 2005)*.

By applying this perspective, the focus of this thesis is the investigation of what is deemed of value and at stake for established SMEs as members of production value chain networks and the uncertainties and consequences in relation to the situational context. Importantly, how this relates to arrangements of entities and their structures and rules of the manufacturing regime embedded in production value chain networks acting as causal mechanisms is fundamental to developing a theoretically and empirically robust interpretation of why existing manufacturing SMEs do or do not, may or may not, engage in transitioning to a CE.

2.3.3 Conceptualising value

As discussed above, value and stake are key aspects of the concept of risk. Although value has been a long term subject of philosophy, in practice it is now more narrowly defined in relation to economic and financial theory *(Carney, 2020)*. From this perspective, value relates to how much an entity is judged as having good or bad material, economic, status, importance or utility worth *(Tory-Higgins, 2007)*. However, value is subjective, being specific to the situation and time *(Carney, 2020)*. In decision-making, value can therefore be understood to relate to a subjective judgement in terms of how we place “value on” an object (entity), that is influenced by “values*” (Pidgeon, 1998)*. Value and values are different entities but are related, *(Carney, 2020)*.

In this thesis I conceptualise values as abstract cognitive entities, imparted through everyday exposure, that could apply to any situational context, e.g.: ethics, morality, freedom, tradition, fairness, social justice, responsibility, loyalty, heritage, identity. Adopting Schwartz theory of

cultural values *(1999)*, people orient to and engage with values in this way when making decisions or judgements regarding people, entities and events, or when providing explanations of actions. Values in this context therefore incorporate those characteristics of an entity that may not have extrinsic or instrumental economic, material or utility value to humans, but have intrinsic immeasurable value by virtue of its existence *(Brennan et al., 2020; Zimmerman et al., 2019)*. The dominance of understandings of values being associated with intrinsic value often results in values being framed as ideals *(Demski et al., 2015)*.

Building upon this conceptualisation of values, a "value system" is the socially constituted structures and rules that establish and reinforce relationships between different values and the extrinsic and intrinsic value of an entity that define what is good, bad, desirable and of value *(Rohan, 2000; Schwartz, 1999)*. Whilst values may be considered universally recognised cognitive entities, I consider value systems as being determined by the individual or be associated with societal groups or cultures, including individual organisations *(Marginson, 2009)*. I use the term "ideology" in this thesis to represent such value systems. I conceptualise ideology as a representation of how individuals or members of a societal group, informally or formally established, are expected to order, weight or prioritise values and the intrinsic and extrinsic to place a value on entities and their structures and act accordingly. As such, I adhere to the understanding that ideology is an abstract and general concept that refers to a relatively stable, fundamental, socially shared belief system. Ideology has causal power, influencing or controlling perceptions of other socially shared beliefs about an entity. It also defines what is rationally expected to be of value to the group of actors that identify as members of an "ideological group" *(van Dijk, 2006)*. Van Dijk defines the term "ideological group" as a "collectivity" of people defined primarily by their shared ideology and the social practices based on them, whether or not these are organized or institutionalized. On this basis, production value chain networks are conceptualised in this thesis as an overarching ideological group.

As argued in Sections 2.3.1 and 2.3.2 for perceptions and risk, evaluations of value and engagement with values and ideology are not carried out in a vacuum. The situational context of an evaluation of value influences which ideological group, values and ideology are called upon and prioritised in deciding actions *(Carney, 2020)*. As van Dijk *(2006)* explains, how people identify with a particular ideological group, ideology and values or other ideological groups and values and the strength of their association with such a group is not necessarily consistent. Similarly for how they discursively construct themselves or not as part of a group, and how they position others in or out of such groups explicitly or implicitly in language, so that an individual or entity can be positioned "more or less" part of a range of ideological groups in different contexts *(van Dijk, 2006)*. Therefore, how people experience the consequences of a decision, how the extrinsic and intrinsic value is evaluated in a decisions, how they orient to

entities and their structures, ideology, values and the decision-makers sense of agency and identity are assumed to influence the judgement of value and in what capacity *(Tory-Higgins, 2007)*. On this basis, in this thesis value is conceptualised as a subjective judgement influenced by experiences, personal and shared values, ideology and the identity adopted by the individual when making a decision or explaining action.

2.3.4 Conceptualising discourse

As outlined in Section 2.3.1, perceptions are a cognitive entity performed in interaction. Therefore, how we can come to investigate perceptions of risk requires interaction with individuals. A primary interactional mechanism is discursive interaction. As Schmidt *(2010)* puts forward, *w*ithout discursive interaction, we cannot know what people are thinking, what they understand of the world or rationalise why they act the way they do. However, what is achieved in discursive interaction is not guaranteed being dependent upon agency of individuals and specifically how the content of discourse is interpreted, in line with social practice theory *(Taylor, 2013a)*.

The term discourse is used in a wide range of ways in research and often assumed to have a clear unified meaning or be seen to be all-encompassing, which is not always the case *(Alvesson & Kärreman, 2000, 2011)*. Therefore, it is important to be clear on what discourse is understood to be in this thesis.

Discourse is produced and interpreted during discursive interaction. Firstly, in line with social interaction theory as outlined in Section 2.3.1, what is perceived of an entity is assumed to be fluid, in which people potentially have different or multiple accounts of the same phenomena (e.g., SME, risk, CE, policy). This is influenced by a multiplicity of interactional relationships with a wide range of other entities and their structures and regimes and as such discourse is not just a reflection of reality. This is on the basis that, in line with social practice theory, discourse itself is a social practice associated with agency of actors, being a large part of how we “do things” and a means for people to purposefully achieve an effect in others, and as such is action oriented *(Potter & Wetherell, 1987)*. Therefore, in this thesis discourse is multi-faceted, it both constructs and is constituted of reality. In addition, all discourse interrelates with other discourses, that are coherent to all parties involved in the discursive interaction *(I. Parker, 2002, Chapter 6)*. Furthermore, influential actors, such as policy-makers, are understood to incorporate argumentative discourses by individual or groups of actors to position what is “truth” and legitimise particular value systems and intervention strategies creating tensions and discursive struggles *(Phillips & Jørgensen, 2002; Dianne Scott, 2017)*. As such, Dryzek *(2005)* puts forward that discourse is also bound to power and the material world, has causal power and the ability to condition the perceptions, values and value systems of people, advancing and suppressing interests, legitimising certain knowledge and action and is used to condition responses to situations. On this basis discourse as a social practice can

then be understood to be actively performative, ideological and political. Hence discourse has the ability to redefine or specify facts, truths, rules, action, power, what is to be of value and the right knowledge and the relative importance of different actors thus presenting particular versions of the world *(Georgaca & Avdi, 2011; Nyberg & Wright, 2016; Phillips & Jørgensen, 2002; Whittle & Mueller, 2011)*.

Although it is considered that much of what is achieved in society is enabled or constrained through discourse, rarely do individuals create their own language in discursive interaction. Individuals call upon historically, socially, ideologically and culturally available discursive mechanisms and experiences and knowledge of being part of particular institutional settings, that enable the sharing of meaning for them to achieve their purpose *(Billig, 2005)*. These shared discourses influence people's interpretations of new information and concepts, risk issues and change *(Pidgeon, 2012b)*. In the context of this thesis, this would relate to being a member of production value chain networks.

In this thesis "repertoire*"* is used to represent a discursive mechanism incorporating a pattern of discourses that is familiar to and a habitual way of speaking about a phenomenon used together for a particular purpose. In this way, repertoires are taken to act to give meaning not only by what they include, but what they exclude, and positions different courses of action as possible and appropriate *(Phillips & Jørgensen, 2002)*. Repertoires can act to allow and reinforce ways of doing and the rationality of decisions, but can also result in resilience, resistance or opportunities for change, legitimizing or otherwise responses or actions by actors *(Andrews-Speed, 2016; Billig et al., 1988; Fuenfschilling & Truffer, 2014)*. However, as outlined in Section 2.2, what this means is that there is likely to be conflict and concurrence in repertoires of SMEs, CBMs and risk that call upon contrary maxims.

Arguments between and within repertoires and discourses of SMEs, the CE and risk are assumed likely to exist. This is due to the presence of a wide range of actors and their potentially different roles, interests, values, beliefs and norms in relation to production value chain networks and the differing discourses, entities and associated structures that exist and interpretations of the rules of the manufacturing regime *(Nylén & Salminen, 2019)*. Discursive institutionalism and discursive struggles and power and position of institutions and actors within production value chain networks are important components in the shaping, influencing, interpretation and acceptance of or denial of transitional changes to dominant systems *(Geels, 2018; Schmidt, 2008, 2010)*. However, although repertoires and discourses may be shared across the network and potentially look to support and value transition, they take place in the context of existing capital intensive, durable, geographically widespread material, physical, social, political, economic or institutional arrangements and rules. These existing entities can exert significant influence on current and future repertoires and discourses of how transition is conceived, valued and addressed *(Lovell et al., 2009)*. In this thesis it is recognised that

perceptions of and meanings given to SMEs, the CE and risk is made in interaction, predominantly through use of repertoires. However, specific repertoires reinforce and are reinforced by causal mechanisms where discourse is also considered to influence the meanings, interpretations and value given to the entities of interest *(Sims-Schouten et al., 2007)*. On this basis, investigating both the content of repertoires and their situatedness in terms of relationship to entities and associated structures of production value chain networks and the manufacturing regime was important in this thesis. On this basis, discourse analysis is central to this thesis as detailed in Chapter 4.

2.4 Summary: theoretical and conceptual underpinnings

In this chapter the influence of the researcher and the choice of theoretical and conceptual underpinnings informing the development of this thesis are presented. In summary, the assumptions listed in Table 1 are to be recognised as influencing the literature review presented in the next chapter and adoption of the discourse analysis methodological framework and strategy described in Chapter 4.

Theme	Assumptions
Risk	• Evaluating risk in decisions is a complex process involving reference to accepted knowledge, science and facts, and contestation of such facts and values *(Pidgeon, 1998)*. • Perceptions of risk differ between the general public and experts *(Kasperson et al., 1988)*. • Risk is a cognitive frame that enables actors to construct a causal and contingent relationship between two or more entities that have the ability to harm something of value to the actor *(Boholm & Corvellec, 2011)*. • Risk links what people subjectively judge to be of value and at stake in decisions, and the situational uncertainties of a decision in terms of consequences and likelihood of a *risk object* of the decision causing harm to the *objects at risk* that are judged to have value *(1998, 2003; 2011, 2015; 2013)*. • Understandings of relationships between risk objects and objects at risk bound decisions to act *(Luhman, 2005)*. • The situational context of a decision will have an effect on what is to be perceived as a risk, how risk is to be interpreted and what is to be deemed a rational decision *(Henwood et al., 2008)*. • Perceptions of risk can have objective, subjective, cultural and a wider array of influencing dimensions *(Brivot et al., 2017; Hillson & Murray-Webster, 2004)*. • Perceptions of risk will be variable, being influenced by the rights and duties of the actor embedded in the linear economy system and the manufacturing regime *(Boholm, 2003; Boholm & Corvellec, 2011; Boholm et al., 2012; Fuenfschilling & Truffer, 2014)*. • Perceptions of risk are unpredictable and highly complex and cannot be understood as something separate from what individuals perceive of entities, structures and rules of the manufacturing regime *(Boholm, 2003)*.

Knowledge, perceptions and decision-making	• Actors knowledge and perceptions is relative, historically situated and socially constructed and will vary in relation to the interests and agency of the institutionalised role *(Belfrage & Hauf, 2017; Fletcher, 2016; Maxwell, 2012; Sorrell, 2018)*. • "Facts" in knowledge are influenced by perceptions of reality, theory, ideology and values and have a subjective dimension *(Billig et al., 1988)*. • Different perceptions and knowledge of the same situational context and risks can mutually co-exist and are equally true and false of the situational context *(Ezzy, 2002; Kilduff & Tsai, 2012)*. • Decision-making involves dilemmatic choices where preconditional conflicting and concurring interpretations of entities and their structures and rules, "contrary maxims", can be called upon *(Billig et al., 1988)*. • Actors engage in "judgemental rationalism", calling upon selected entities, structures, rules of the manufacturing regime and contrary maxims when rationalising decisions *(JCGOSJ, 2019; Sorrell, 2018)*. • Judgements will be bound by the "rights and duties" of the role of the actor embedded in the linear economy system *(Andreouli, 2010; Geels et al., 2017; Korhonen, Nuur, et al., 2018; Rateau et al., 2012)*. • Rationality in decision-making is influenced by the agency and role of the individual, choice evaluations, existing contrary maxims and the situational context of the decision *(Billig et al., 1988; Boholm et al., 2013; Langley et al., 1995; More, 1982; Oliveira, 2007; Slovic et al., 2004)*.

Value, values and ideology	• Value is a subjective judgement in terms of how we place value on an object (entity), that is influenced by values as is specific to the situation and time *(Carney, 2020; Pidgeon, 1998)* • Actors orient to and engage with values when discussing what is of value, when making decisions or judgements regarding people, entities and events or when providing explanations of actions *(Schwartz, 1999)*. • Values incorporate those characteristics of an entity that may not have *extrinsic* or instrumental economic, material or utility value to humans, but have *intrinsic* immeasurable value by virtue of its existence *(Brennan et al., 2020; Zimmerman et al., 2019)*. • Ideology is the socially constituted structures and rules that establish and reinforce relationships between different values and the extrinsic and intrinsic value of an entity that define what is good, bad, desirable and of value *(Rohan, 2000; Schwartz, 1999)*. • Ideology influences or controls perceptions of other socially shared beliefs about an entity, defining what is rationally expected to be of value to the group of actors that identify as members of an "ideological group" *(van Dijk, 2006)*. • The situational context of an evaluation of value influences which ideological group, values and ideology are called upon and prioritised in deciding actions *(Carney, 2020)*. • How people identify with a particular ideological group, ideology and values or other ideological groups and values and the strength of their association with such a group is not necessarily consistent *(van Dijk, 2006)*. • How people experience the consequences of a decision, how the extrinsic and intrinsic value is evaluated in a decisions, how they orient to entities and their structures, ideology, values and the decision-makers sense of agency and identity influence the judgement of value and in what capacity *(Tory-Higgins, 2007)*.
Discourse	• Discourse is a social practice, constructs and is constituted of reality and is action-oriented, being a large part of how we "do things" and a means for people to purposefully achieve an effect in others *(Potter & Wetherell, 1987)*. • Discourse is bound to power and the material world and has the ability to condition perceptions, values and ideology, advancing and suppressing interests, legitimising certain knowledge and action and is used to condition responses to situations *(Dryzek, 2005)*. • Discourse has the ability to redefine or specify facts, truths, rules, action, power, what is to be of value and the right knowledge and the relative importance of different actors, presenting particular versions of the world *(Georgaca & Avdi, 2011; Nyberg & Wright, 2016; Phillips & Jørgensen, 2002; Whittle & Mueller, 2011)*. • Actors call upon historically, socially, ideologically and culturally available repertoires, associated with a particular institutional setting, to give meaning not only by what they include, but what they exclude, and allow, legitimise and reinforce actions and the rationality of

	decisions, including resilience, resistance or opportunities for change *(Andrews-Speed, 2016; Billig, 2005; Billig et al., 1988; Fuenfschilling & Truffer, 2014; Lovell et al., 2009; Phillips & Jørgensen, 2002; Pidgeon, 2012b; Sims-Schouten et al., 2007)*. • Shared repertoires influence people's interpretations of new information and concepts, risk issues and change *(Pidgeon, 2012b)*. • What is positioned as risk in discourse acts to define what the problems and solutions are to be and who is responsible *(Boholm, 2003)*.
Situational context	• Institutionalised entities, structures and rules of the manufacturing regime exist as part of the situational context of a decision for established SMEs, irrespective of individuals' perceptions, theories, knowledge, discourses and constructions of entities, structures and the manufacturing regime *(Easton, 2010; P. K. Edwards et al., 2014; Maxwell, 2012; Meyer & Rowan, 1977; David Scott, 2005)*. • Path dependencies are created and reinforce and are reinforced by the rules of manufacturing regime that stabilise existing entities and structures supporting the linear economy system *(Cherp et al., 2018; Clausen et al., 2017; Geels, 2012)*. • Contingent arrangements of entities, structures and rules of the manufacturing regime combine to form causal mechanisms *(Elder-Vass, 2012; Fletcher, 2016)*. • Causal mechanisms influence knowledge, perceptions of risk and what is the right and wrong act to undertake in transitioning to a CE and can compel or prohibit changes in practices *(Elder-Vass, 2012; Stern, 2000; Wittmayer et al., 2017)*. • Existing entities, structures and rules of the manufacturing regime and causal mechanisms can exert significant influence on current and future repertoires and discourses of how transition is conceived, valued and addressed *(Lovell et al., 2009; Sims-Schouten et al., 2007)*.

Table 1: Summary of assumptions adopted in the thesis

3 Researching the circular economy and SMEs

This chapter aims to provide insights into contrary maxims about existing entities and associated structures, and rules of the manufacturing regime that could be called upon in discourses of being a Small and Medium-sized Enterprise (SME), development of Circular Business Models (CBMs) and risk that combine as causal mechanisms but have different effects. A critical perspective is adopted where the rationale and legitimacy of constructs of SMEs, CBMs and risk are questioned. Reviews are provided of how SMEs are characterised; SMEs drivers, barriers and enablers research; existing discourse-based studies of the circular economy (CE) and differing perspectives of the CE. The chapter concludes with an overview of the implications of existing research for this thesis that has been accounted for in the methodological strategy described in Chapter 4.

3.1 Characterisation of SMEs

Analysis of UK political manifestoes from 1964 to 2015, carried out by Wapshott and Mallett *(2018)*, found that the term SME is consistently used to position established SMEs as a homogeneous group of businesses, being characterised as having growth potential, limited access to finance and resources and over-burdened by regulation. By discursively constructing existing SMEs as a homogenous entity they are viewed as smaller versions of bigger businesses, who are also seen as a homogenous entity. Therefore, SMEs are to be subject to the same way of thinking on how bigger businesses should be managed, engage with policy or respond to change. The only difference being they have lower volumes of sales, fewer employees, smaller assets and decisions are taken by owner-managers *(Welsh & Whilte, 1981)*. Embedded constructions of SMEs, and differences to bigger businesses, can act to give meaning to what it means to be an established SME and support and reproduce entities and their structures and rules of the regime to maintain this construction of SMEs. Regarding environmental related action, since at least the 1990s, SMEs have been commonly constructed in research and policy as: having low interest, knowledge and engagement; perceiving limited benefit of environmental activities and impact being small; environmental regulation as burdensome, with environmental behaviours driven by personal choice and attitudes *(Brammer et al., 2012)*. This latter point is synonymous with the positioning of ownership-management structures being related to size, and having a major influence on engagement with environmental, sustainability and circular economy activities *(e.g. Jansson et al., 2017)*. In the Corporate Social Responsibility (CSR) literature there is growing concern on the role of ownership structures and ownership-stakeholder management in proactive activity *(Zaid et al., 2020)*. However, research in this field indicates that ownership-stakeholder management structures have an influence *(e.g. Calza et al., 2016; Elgergeni et al., 2018)*, but this is independent of size, such that size is not so influential for behaviour and ownership

structures *(Cambra-Fierro et al., 2008)*. In this way, assumptions of the influence of ownership-stakeholder management structures of SMEs, relationship to size and their differences, or not, to larger businesses has the capacity to influence discourse of risk in transitioning to a CE.

Engaging with these defined characterisations of what it means to be an SME influences how problems and solutions are defined and what interventions are needed for change to happen. The focus of much research on SMEs, particularly drivers, barriers and enablers (DBE) research (see Section 3.2), aims to correlate characterisations of SMEs to action, even though there are understandings that actions in businesses cannot be predicted by characteristics understood to relate to size, age or sector *(Elster & Phipps, 2013)*.

Constructing SMEs as a homogenous entity is positioned by critics as failing to recognise the complexity and diversity of the situational context of SMEs. This could also apply to larger businesses. This includes the variety of management structures and practices, size, skills, training and competencies, markets and value chain network relationships, history, geography and experience *(Brammer et al., 2012; Bryan, 2006; Conway, 2015; Sullivan-Taylor & Branicki, 2011; Welsh & Whilte, 1981)*. These critics argue that SMEs are part of highly fragmented industry value chain networks with high volumes of other SME and larger competitors that often use price-cutting to build revenues with short term or seasonal fluctuations in cash flow having significant effects on growth activity. In addition, the above research shows how SMEs also have high probabilities of ceasing to trade, lower business survival rates and rely heavily on external value chain network organisations to operate as a business. This situational context can act to position survival as priority over becoming future resilient as SMEs are unlikely to survive misjudgements in decision-making.

How SMEs are positioned in research, understood to be managed differently to larger businesses, and how this relates to positioning of solutions for transitioning to CE is discussed further in Section 3.2.

3.2 Research involving SMEs

As discussed in Section 1.3, SMEs are expected to play an important role in transitioning to a CE, yet rarely is CE research carried out from the established SME-level perspective *(Garcés-Ayerbe et al., 2019; Gusmerotti et al., 2019; Homrich et al., 2018; Masi et al., 2018; Ritzén & Sandström, 2017; Werning & Spinler, 2020)*. This is highlighted by research that shows advice to SMEs on the practicalities of developing CBMs is rare. Of research papers that present recommendations, Kirchherr and van Santen *(2019)* demonstrate that such recommendations are at a system level, primarily targeted at academics or policy-makers rather than businesses in existing production value chain networks. As outlined in Section 1.4, established SMEs, particularly those in business to business (B2B) relationships, are generally under-researched

in any detail. However, a large number of survey-based DBE studies, theoretical applications of CBMs and case studies of start-up businesses or niche applications exist. Discourses of DBE and case studies are embedded in research and policy on SMEs and is potentially highly influential in positioning what is to be understood of SMEs, CBMs, risks and the intervention measures needed. In this section a wide range of the existing SME research is summarised.

First of all, a high number of studies relating to established SMEs are analyses of large European-wide surveys. Investigations of such survey data aimed to describe relationships between shared characteristics of existing SMEs (mainly location, size, age, industry, R&D investment, turnover, structure) and the questions posed in the survey. Beyond the Eurobarometer studies that included a representative sample of UK businesses, most other DBE research are also surveys, either carried out outside of the UK or with large businesses, businesses already adopting CBMs or start-up/ entrepreneur enterprises, as summarised in Table 2.

Scope of study	Research
Surveys or interviews across or within sectors within a particular country or region	*(e.g. Bey et al., 2013; Ceptureanu et al., 2018; Cordeiro & Vieira, 2012; Fonseca et al., 2018; Gusmerotti et al., 2019; Jansson et al., 2017; Miras-Rodríguez et al., 2018; Murillo-Luna et al., 2011; Oelze, 2017; Quintás et al., 2018; Sebo et al., 2019; Valero-Gil et al., 2017; Zamfir et al., 2017)*
Focused on businesses already engaged with CE concepts or committed to environmental sustainability	*(e.g. Bocken et al., 2018; Bressanelli et al., 2018; P. Brown et al., 2019; Cristoni & Tonelli, 2018; de Mattos & de Albuquerque, 2018; Franco, 2017; Karvonen et al., 2017; Oelze & Habisch, 2018; Rauter et al., 2017; Rizos et al., 2016; Russell et al., 2019; Teso & Walters, 2016; Urbinati et al., 2017)*
Involving large or multi-national businesses who have developed CBMs such as remanufacturing, product service systems or industrial symbiosis	*(e.g. Abuzeinab et al., 2017; Haziri et al., 2019; Hopkinson et al., 2018; Kurilova-Palisaitiene et al., 2017; Oghazi & Mostaghel, 2018; Pajunen et al., 2012; Prosman et al., 2017; Ranta et al., 2018; Ritzén & Sandström, 2017; Shahbazi et al., 2016; Torstensson, 2016; Tura et al., 2019; Werning & Spinler, 2020)*
Reviews of existing literature	*(e.g. Araujo-Galvão et al., 2018; Del Brío & Junquera, 2003; Govindan & Hasanagic, 2018; Kleine-Moellhoff et al., 2018)*
Single cases of start-up businesses or a focus on entrepreneurship and innovation	*(e.g. Cordeiro & Vieira, 2012; Hoogendoorn et al., 2017; Klewitz & Hansen, 2014; Martinez-Conesa et al., 2017; Sáez-Martínez et al., 2016b; Ünal et al., 2019)*
Research with CE "experts" following literature reviews	*(e.g. Pacheco et al., 2018; Prieto-Sandoval et al., 2019; Prieto-Sandoval, Ormazabal, et al., 2018; Webb et al., 2006)*
Theoretical implications, taxonomies, evaluations and modelling of CBMs	*(e.g. Bakker et al., 2014; Bidmon & Knab, 2018; Blomsma et al., 2019; Bocken et al., 2016; Geissdoerfer, Morioka, et al., 2018; Genovese et al., 2015; Lewandowski, 2016; Mestre & Cooper, 2017; Moreno et al., 2017; Urbinati et al., 2017; Whalen, 2017)*
UK manufacturing SMEs as a dominant feature. Grey literature involving reviews of literature on climate change, resource efficiency, sustainability, innovation and the CE	Academic: *(Brammer et al., 2012; Conway, 2015; Kumar et al., 2019; Masi et al., 2018; Mativenga et al., 2017; Rizos et al., 2016; Teso & Walters, 2016; Walpole & Renfrew, 2018)*. Grey literature: *(Ballard et al., 2013; Elster & Phipps, 2013; EMF, 2013c; Fandrich & Kivinen, 2011; Street, 2006; Webb et al., 2006)*.

Table 2: Scope of European drivers, barriers and enablers research

Many of the DBE studies, whether interview-based, questionnaire survey or theoretical, called upon existing published DBE literature to frame questions or loci of investigation. This approach can therefore be interpreted as purposefully self-selecting to identify particular entities and associated structures or characteristics of SMEs as drivers or barriers. Thus findings primarily act to reinforce the nature of the questions asked, what it means to be an SME and what the problems and solutions or risks are for SMEs *(Fandrich & Kivinen, 2011)*.

A systematic review of 141 academic and grey DBE articles on transitioning to a CE put forward that characteristics of businesses and the situational context of a business are discursively constructed in literature as being potentially both drivers and barriers *(de Jesus & Mendonça, 2018)*. A primary characteristic of SMEs is size, which is generally positioned as related to how SMEs currently engage or can be encouraged to engage with the CE or any pro-sustainability or innovation activity, as outlined in Section 3.1. As with other characteristics, company size is not constructed unilaterally as a problem or a solution, driver or barrier, as different users of the concept may choose to present it as one or the other or both. However, there are differing perspectives on why size of business matters, in terms of how business size influences a particular event, such that size is potentially a contested factor and enables contrary maxims to be called upon (see Section 2.3.4). This is on the grounds that a multitude of contingent conditions internal and external to the business, positioned as being associated with size, are presented by researchers as being related to action covering financial, structural, operational, attitudinal, relational and technological that are interconnected and complex *(Karvonen et al., 2017; Ritzén & Sandström, 2017)*. In DBE research, the contingent entities and associated structures are usually divided into three groups – internal, situational and external, examples of each are discussed below.

Discourses of internal DBE are common features of researchers' accounts of action by SMEs, particularly aspects such as pro-environmental attitudes, knowledge, business cultures and business owner cognitive entities. They include, risk attitudes, resistance to change, values and motives, with some authors positioning cognitive characteristics of individuals as being the key influence on action *(Oelze & Habisch, 2018; Ünal et al., 2019)*. Applying a relational theory of risk perspective to DBE research (see Section 2.3), by constructing these internal characteristics of a business as being causally related to action, SMEs are positioned as risk objects in transitioning to a CE. From a business model perspective (see section 1.4), these internal characteristics are associated with value creation activities.

However, there are DBE researchers who argue that situational entities and associated structures that SMEs have limited control over due to their size are causally related to engagement with pro-environmental action, including CBMs. Situational DBE discourse calls on discourses of SMEs being locked-in low positions in production value chain networks and having low bargaining power with suppliers or B2B customers or with financial institutions

when seeking support to implement change. Here, the performance of a business is embedded within the actions of the value chain network, i.e., its suppliers and customers and existing corporate and state governance hierarchies *(Sheppard, 2011)*. The value chain network position and issues of confidentiality, trust, power dynamics and competition in the value chain network, where there is a lack of customer interest and pressure, supplier support and state control are emphasised by a number of researchers as having influence upon sustainability action in SMEs *(e.g.: Franco, 2017; Oelze & Habisch, 2018; Ormazabal et al., 2016; Ritzén & Sandström, 2017; Rizos et al., 2016; Stevenson et al., 2016)*. From a relational theory of risk perspective, situational relationship dynamics can then be understood to be the risk object in transitioning to a CE, and from a business model perspective these situational conditions are associated with the value proposition and capture domain. Situational relational conditions are more strongly associated with uncertainties, as the SME is subject to such conditions and may have limited ability to influence.

Furthermore, nearly all researchers call upon the concept of external DBE, primarily associated with legislation, governance and economic instruments. As with the situational relational DBE, external DBE are what SMEs are subjected to and relate to uncertainties for a business and are a risk object in transitioning to a CE. From a business model perspective, the external DBE, have a relationship to all aspects of the business model, creation, proposition and capture. In this thesis the DBE presented in the literature have been grouped together and categorised as entities with associated structures as described in Table 3.

The review of DBE research literature indicated that no one entity or associated structure is presented singularly as a driver, barrier or enabler, its status being determined by the focus of study. Similarly, no one entity was deemed a singular “success” factor, success being reliant on a contingent arrangement of several DBE, i.e., a causal mechanism. Given that discourse is action-oriented (see Section 2.3.4) and expected to be influenced by the existence of entities, structures and rules of the manufacturing regime, understanding to what purpose discourses of DBE were used by researchers, what contingent relationships were called on to validate arguments and where contrary maxims existed was of interest. This is on the basis that such discourses may be called upon or argued against by various actors involved in production value chain networks. In Sections 3.2.1 to 3.2.3 interpretations of a range of contingent relationships presented in DBE research and how they were used are provided.

Entities	Drivers, barriers, enablers structures
Value proposition	
Industry/ market	Type of industry, e.g.: construction, automotive, aerospace, domestic appliances, type of sector, e.g.: retail, services, manufacturing, or type of customer, i.e. Business to Business (B2B) or Business to Consumer (B2C), rules and norms of the industry, import/ export dominance
Customer-supplier relationship	Demands and expectations of customers, covering product preferences, willingness to pay, fashion, performance requirements, aesthetics, functionality, the power dynamics between the customer and supplier and expectations on the supplier such as reliability, quality, service, responsiveness
Influencer perceptions and knowledge	Customer, society, public, consumers, stakeholders and investor perceptions, attitudes and knowledge of CE, CBMs, environment, environmental products, company and product performance and costs
Value chain network configuration	Dependencies and lock-ins with suppliers and product distribution channels, type of relationship and power dynamics, responsibilities and roles, support provision, transparency, reliability and trust, design/product rights, profit/ benefit, effort and cost sharing
Incumbents	Power of influential multi-national businesses, associations and bodies and significant brands
Value creation	
Technology	Availability and access to technology, knowhow, skills and expertise, internal and external to the business
Knowledge, skills, awareness	Internal awareness, knowledge, skills, qualification levels and capabilities relating to the CE & CBMs, the environment, business environmental impacts, sustainability including benefits of action, environmental maturity, measurement
Innovation	Entrepreneurship, R&D, high growth potential, creative destruction
Process & materials	Processing flexibility, efficiency, standards and material availability (suppliers & materials), quality, quantity, performance, complexity, security, costs, volatility, infrastructure, health and safety, complexity of materials, quantity, quality, timing
Resources	Size, time, finances (e.g.: turnover, profitability, capital), number of employees, access to finance, expertise
Demographics	Geographical location and age
Business culture and structure	leadership, ownership (e.g.: family owned, shareholders), responsibilities, roles, performance measurement indicators, employee engagement, communication, training
Business strategy	Approach to change, e.g.: proactive or reactive, short term or long-term strategy orientation, formal/ informal plans, measurement of progress/ performance, understandings of relevance of CE to strategy, priorities
Attitudes & values	Individuals' personality, motives, values, ethics, morals, attitudes, and overarching business attitudes including risk and change and attitudes to the environment, growth ambitions, fear of failure, doing things right or wrong,
Support	Availability, type and relevance of external support, expertise and skills from governments, trade associations, consultants, Non-governmental organisations (NGOs) etc. and peer-to-peer networking, quality, competence, trustworthiness
Value capture	
Governance	Government, regulation, policy, incentives, politics, standards, legislative terms, e.g.: definition of waste, enforcement, scrutiny, voluntary, consistency
Economics	The economy, recession, shocks, e.g.: Brexit, Covid 19, Gross Domestic Product (GDP), jobs, costs & benefits, capital costs, effort, payback, profit, margins, economies of scale, scale up, cannibalisation of new sales, administrative requirements, e.g.: environmental reporting & management, reuse, repair, remanufacturing, industrial symbiosis logistics/ infrastructure costs and management, asset leakage
Reputation	Brand image, reputation with customers, community, society, investors, stakeholders, including recognition of environmental, sustainability or CBM action
Competition	Competitor activity

Table 3: Entities and structures associated with the drivers, barriers and enablers research

3.2.1 Internal conditions and value creation

The emphasis of much of the DBE literature is on the value creation element of business models and internal characteristics or structures of SMEs. This was dominated by two repertoires, often positioned as interconnected. Within this literature, one repertoire centres on constructing a causal relationship between action and lack of SMEs technology and innovation capability due to limited financial and human resources, often denoted by calls upon "R&D investment" *(e.g.: Bassi & Dias, 2019; Caldera et al., 2019; de Jesus & Mendonça, 2018; EMF, 2013c; Garcés-Ayerbe et al., 2019; Rizos et al., 2016)*. The establishment and availability of an ecological modernisation way of thinking about how environmental issues are to be addressed (see section 1.2) potentially explains the use of this repertoire. Especially as investment in innovation, technology and systems were positioned as requirements and enablers with an emphasis on the Government taking action to provide access to finance and support innovation activities, technology development and access to technology, tools and systems and "new" expertise and skills. The call upon discourses of SMEs' lack of resources, time, knowledge, skilled employees, number of employees and financial assets were embedded correlations in this repertoire to verify the efficacy of the approach. Therefore, understandings of how CE problems and solutions fit an ecological modernisation perspective has the capacity to influence perceptions of risk for SMEs.

The second repertoire positioned a causal relationship between action and characteristics of individuals and the owner-management structure of SMEs. On one hand this covered organisational leadership, learning, skills and knowledge, internal power relations and structures, roles and responsibilities. On the other hand, moral philosophy regarding ethics, normative beliefs, values of individuals or organisational cultures and strategies were primary characteristics *(Webb et al., 2006)*. In this way researchers engaged in subjective judgements, calling upon established "rules" of the right or wrong way of thinking and doing in business.

In the first instance, this can be understood to build upon the existence of rules about how businesses work and understandings of differences between SMEs and big businesses as outlined in Section 3.1. For example, there is an implicit rule that good management of an SME business must be "formalised" and structured in a way similar to how bigger businesses are understood to be managed, to be successful. This perspective of "organisations as machines" based on routines, well defined structures, standards, roles etc. operating under stable conditions are embedded in assumptions about how businesses should work *(E. Cameron & Green, 2009)*. The positioning of the necessity for decision-makers in SMEs to change how they manage, run and think about their business, with interventions focussed on leadership, management and employee training and recruitment strategies aligns with such thinking *(Prieto-Sandoval et al., 2019; Quintás et al., 2018; Sáez-Martínez et al., 2016a)*. As does the calls for the use and provision of formal or standardised management and reporting

tools, metrics and systems *(Bey et al., 2013; Caldera et al., 2019; Gusmerotti et al., 2019; Masi et al., 2018; Rizos et al., 2016; Walpole & Renfrew, 2018)*. Alternatively, as Cameron and Green *(2009)* elucidate, if SMEs were conceptualised as an "open system" organism or an embedded part of a complex symbiotic environment that ebbs and flows, it would be recognised that there is "no one best way" to manage a business. Instead change "emerges" as the external environment adjusts to support change. This alternative perspective can be seen to underpin DBE research that finds situational and external conditions as highly influential, as discussed in Sections 3.2.2 and 3.2.3. Therefore, differing understandings of what is the right and wrong way to run a business are likely to influence perceptions of risk.

On the second aspect, the existence of the concepts of ethics and morality are paramount to explaining arguments. Much of the research on pro-CE/ environmental and sustainable development (ESD) activity in businesses was based on businesses choosing to self-identify or being promoted as engaging with such concepts *(e.g.: Bassi & Dias, 2019; Garcés-Ayerbe et al., 2019; Oelze & Habisch, 2018; Rizos et al., 2016; Sáez-Martínez et al., 2016a)*. This choosing to be seen to be engaged with the CE and pro-ESD practices can be understood to signal an embedded understanding that there is something good and right and therefore ethical and moral about ESD practices. Therefore, when a business is seen to be doing the right thing there is an assumption that this requires decision-making individuals to hold ethical/moral attitudes, beliefs and values. Although the research by Gusmerotti et al. *(2019)* found that CE practices were not driven by decision-maker environmental values, the existence of an implicit assumption of ESD values and ideology being ethically or morally informed with expectations to value intrinsic value above extrinsic value (as explained in Section 2.3.3) reinforces a focus on individuals' values. Repertoires of the right and wrong ethical/moral ways of thinking were used to position the necessity of changing the way people think in SMEs through education, guidance, training and awareness. As outlined in Section 3.1, SMEs are conceptualised as lacking ESD values. This is often correlated to ownership structure, and can be understood to build on understandings that there is rarely separation between ownership and management of activities in SMEs *(Cambra-Fierro et al., 2008)*. However, there is research that positions SME business owners as already having positive environmental attitudes and incorporating ethical values and moral obligations to solve social issues *(e.g. Brammer et al., 2012; Jansson et al., 2017)* and wanting to "do the right thing" but communicating such information was not seen as adding value to them *(e.g. Conway, 2015; Prieto-Sandoval, Ormazabal, et al., 2018)*. In addition, there is an implicit assumption that pro-ESD values in bigger businesses are different to SMEs and similarly influence action. Therefore, contrary perspectives on ethical and moral values in practice and how they are prioritised in production and consumption systems has the potential to influence perceptions of risk for SMEs.

As outlined in Section 1.2, discourse of the CE is a relative newcomer, although entities associated with the concept have been around longer. However, a wide range of authors position that SMEs lack knowledge and understanding of such concepts. This included climate change *(Ballard et al., 2013)*, waste prevention *(Fandrich & Kivinen, 2011)*, environmental issues, impacts and sustainability *(Bey et al., 2013; Jansson et al., 2017; Street, 2006)* and the CE and related CBM concepts *(EMF, 2013c; Garcés-Ayerbe et al., 2019; Gusmerotti et al., 2019; Kumar et al., 2019; Ormazabal et al., 2016; Walpole & Renfrew, 2018)*. The discourse of a lack of knowledge is used to position the need for publicity or awareness programmes, education and academic support, and encouraging influential organisations including trade associations to engage with the concept. The lack of knowledge discourse, as with taken for granted rules about businesses and ethics and morality, can be interpreted as building upon rules of a right and wrong type of knowledge and understanding of such issues. This rule can be explained by embedded arguments of proponents of the CE that discourse of the CE, that calls upon knowledge of "experts", is the truth, even though there may be alternative interpretations (see Section 2.3.4).

Researchers have questioned these characterisations of SMEs and their business owners. For example, some have argued that these constructions of SMEs stem from the incorrect assumption that a lack of published information on target setting, environmental measurement indicators and activities by SMEs indicates a lack of pro-environmental activity, unlike that of bigger businesses. They point to research that indicates that pro-environmental and CE-related activities, such as waste prevention, resource efficiency and recycling, are carried out as business as usual in SMEs *(e.g. Bassi & Dias, 2019; Fandrich & Kivinen, 2011; Fonseca et al., 2018; Garcés-Ayerbe et al., 2019; Katz-Gerro & López Sintas, 2019; Kumar et al., 2019; Masi et al., 2018; Oelze & Habisch, 2018; Rizos et al., 2016; Walpole & Renfrew, 2018; Zamfir et al., 2017)*. Therefore, differing understandings of SME practices and what type of knowledge is truthful may influence perceptions of risk.

Although SMEs are primarily positioned as lacking knowledge, researchers also show that knowledge and interest in the CE is generally very low in all sizes of organisations. These researchers focus on the influence of the situational context such as position of the organisation, confidentiality, trust, power and competition issues in the value chain, coupled with customer interest and pressure and supplier support as discussed in Section 3.2.2.

3.2.2 Situational conditions and value proposition

Regarding value proposition discourses there was a dominance of two repertoires in the research literature, generally used together, aligning with institutional, stakeholder and change management theories. The first repertoire of customer-oriented SMEs can be interpreted as being underpinned by understandings that established SMEs are embedded in a complex

symbiotic production and consumption environment, as introduced in Section 3.2.1 *(E. Cameron & Green, 2009)*. In the use of this repertoire SMEs are positioned as primarily responding to external customer, social, market, policy pressures and preferences on a price/quality nexus in acts to secure a stable operating environment that balances actors' interests, in line with stakeholder theory *(e.g.: Fonseca et al., 2018; Quintás et al., 2018; Webb et al., 2006)*. In this repertoire, a lack of market support with high levels of uncertainty of customers valuing ESD values and CBMs without added extrinsic value dominate *(e.g.: Ballard et al., 2013; Fandrich & Kivinen, 2011; Fonseca et al., 2018; Mativenga et al., 2017; Oelze & Habisch, 2018; Ormazabal et al., 2016; Ritzén & Sandström, 2017; Rizos et al., 2016)*.

This focus on extrinsic value to customers can be understood to relate to embedded understandings of the institutional role of businesses, regarding competitive advantage *(Porter, 1985)* and the aim of the linear economy being to serve a range of material, economic, utility and symbolic requirements of society *(Cherp et al., 2018; Geels et al., 2017)*. Therefore, understandings of expectations of the role of SMEs may affect perceptions of risk for SMEs.

The second repertoire constructed size as being causally related to influence, where SMEs were positioned as lacking influence in the value chain network. This was achieved by calls upon references to size, complexity of value chain networks, SME's lowly position, the reliance of SMEs on limited number of customers and suppliers (generally bigger than them) and lack of rights over the final products. *(Ballard et al., 2013; Fandrich & Kivinen, 2011; Fonseca et al., 2018; Gusmerotti et al., 2019; Oelze & Habisch, 2018; Ormazabal et al., 2016; Rizos et al., 2016)*. The repertoire was used to position SMEs as being inhibited in proactively developing CBMs even when there was a desire to do so without existing value chain support or demand. The conditions necessary for change were presented as SMEs having product rights valued by customers and high levels of trust being in place *(Bey et al., 2013; Brammer et al., 2012; Caldera et al., 2019; Fonseca et al., 2018; Karvonen et al., 2017; Mativenga et al., 2017; Oelze & Habisch, 2018; Ünal et al., 2019)*. In all cases there is an embedded understanding that an arrangement of rights and power influences action in SMEs. However, few interventions were generally proposed regarding changing power dynamics, with interventions being limited to "greening" the value chain network through awareness raising to increase knowledge *(de Jesus & Mendonça, 2018; Gusmerotti et al., 2019; Rizos et al., 2016)*, using the power of public procurement *(Bey et al., 2013; Elster & Phipps, 2013; EMF, 2013c)* or encouraging large businesses to work with suppliers to meet certain standards or engage in voluntary schemes *(Street, 2006)*.

There was also a third discourse that has had limited investigation regarding the CE but recognised in innovation studies. This discourse constructs a relationship between sector of operation and action. Where research had been carried out, researchers argued that the development of CBMs or other pro-environmental practices are best suited to particular

industries and value chain networks, high growth businesses, medium to large businesses with a history of innovation or certain type of businesses *(Ballard et al., 2013; Elster & Phipps, 2013; EMF, 2013c; Garcés-Ayerbe et al., 2019; Oelze & Habisch, 2018; Walpole & Renfrew, 2018; Zamfir et al., 2017)*. All the repertoires can be interpreted as being underpinned by taken for granted rules that established SMEs are to be customer or market oriented *(Jansson et al., 2017)* and differentiate themselves in accordance with customer price/performance preferences *(Porter, 1985)*. Therefore, what is understood of relationships and power in production value chain networks has the capacity to influence perceptions of risk for SMEs.

3.2.3 External conditions and value capture

In the DBE research, discourses relating to value capture often overlapped with the discourse of value proposition. For example, customers driven by price considerations, that may be influenced by economic conditions, e.g.: recession, and actions of competitors were constructed as influencing the ability for a business to be competitive in their value chain network. However, the call upon external conditions can be interpreted as relating to understandings of how political and economic ideology in practice influences decision-making in SMEs. This is on the basis that the effect of external conditions was argued in relation to the role of the state, particularly the use of regulation or voluntary instruments and government intervention in market dynamics. All researchers called upon a repertoire of state intervention and incentivisation that related to understandings of the economics of engaging with CBMs and ESD values and ideology.

The economics discourse can be interpreted as being underpinned by rational choice theory in which decision-makers in SMEs are expected to make the rational decision to improve their environmental performance when presented with evidence of the ability to profit or gain from such action *(Webb et al., 2006)*. However, there were contrary maxims regarding the economics of developing CBMs, a “green premium” *(Gates, 2020; Guyader et al., 2017)*, or cost savings. Primarily, the CE and pro-environmental activity was constructed either as being associated with a green premium or lacking transaction cost benefits in relation to scale of investment costs and savings, payback timeframes and economies of scale and the influence of price sensitivity of customers *(Brammer et al., 2012; Caldera et al., 2019; Conway, 2015; de Jesus & Mendonça, 2018; Garcés-Ayerbe et al., 2019; Kumar et al., 2019; Masi et al., 2018; Ormazabal et al., 2016; Sáez-Martínez et al., 2016a)*. Studies involving CBMs also identified additional costs associated with the logistics, including timescales, of accessing materials and products for implementing CBMs in comparison to the existing linear economy system *(Haziri et al., 2019; Masi et al., 2018; Prosman et al., 2017; Werning & Spinler, 2020)*.

Where a green premium was understood to exist, two types of interventions were usually proposed, often together as push-pull mechanisms. One focused on government regulatory,

financial and policy push measures including *extended producer responsibility* (EPR) as mechanisms to overcome the linear economy system advantage and perceived lack of relevance to the business *(Ballard et al., 2013; Bassi & Dias, 2019; Conway, 2015; EMF, 2013c; Garcés-Ayerbe et al., 2019; Oelze & Habisch, 2018; Quintás et al., 2018)*. The arguments for push measures, particularly stronger regulation, built on a taken for granted understanding that legislation, regulation and enforcement has the power to force change where SMEs are understood to not go beyond regulatory requirements *(Caldera et al., 2019; de Jesus & Mendonça, 2018; Jansson et al., 2017; Rizos et al., 2016; Sáez-Martínez et al., 2016a)*. In line with taken for granted understandings that pro-environmental action has an ethical or moral dimension, as discussed in Section 3.2.1, it can be interpreted that there are understandings that ethical or moral practices are voluntary. Therefore, there are researchers who position that to address such issues everyone is to work to the same standards requiring non-negotiable interventions that enable pro-environmental action to be an everyday occurrence *(Ballard et al., 2013; Bey et al., 2013; Conway, 2015; EMF, 2013c; Fandrich & Kivinen, 2011; Mativenga et al., 2017; Quintás et al., 2018; Webb et al., 2006)*.

The second perspective focused on pull levers as voluntary "incentives" that can be understood to align with liberalism-based political and economic ideology. This included tax incentives *(EMF, 2013c; Fonseca et al., 2018)*, public procurement *(Bey et al., 2013; Elster & Phipps, 2013; EMF, 2013c)*, recognition of and promotion of exemplars *(Conway, 2015; Rizos et al., 2016; Sáez-Martínez et al., 2016a)*, awareness raising and mentoring/collaboration in the value chain network *(Elster & Phipps, 2013; Fonseca et al., 2018; Gusmerotti et al., 2019; Street, 2006; Walpole & Renfrew, 2018)*, peer to peer networking/ information sharing *(Ballard et al., 2013; EMF, 2013c; Rizos et al., 2016; Street, 2006)* and expert advice support programmes and voluntary commitment schemes including eco-labelling *(Caldera et al., 2019; Gusmerotti et al., 2019; Prieto-Sandoval et al., 2019)*. The focus on pull levers built on understandings that increasing regulation and legislation created problem for SMEs *(Caldera et al., 2019; Kumar et al., 2019)*.

Reliance on voluntary instruments as pull mechanisms has been cautioned by some authors as their effectiveness has been positioned as being highly uncertain *(Webb et al., 2006)*. For example, on the use of voluntary support programmes, there are studies that highlight SMEs look to their customers and suppliers in their value chain networks for direction, in preference to any other external body when looking to develop products and processes *(Teso & Walters, 2016; Walpole & Renfrew, 2018)*. Such accounts can be understood to align with taken for granted rules that SMEs are to be customer oriented, as outlined in Section 3.2.2. Furthermore, engagement of SMEs in support programmes is seen by a number of researchers as being limited. A relationship was constructed between engagement of SMEs and performance of the service provision, including difficulties in access, "red tape", doubts

about benefits, applicability and generic nature of support and concerns regarding competency and trustworthiness of support providers (knowledge, standards, relationships, local/ specific knowledge and expertise regarding SMEs), and the role of the Government *(Blackburn, 2002; Elster & Phipps, 2013; Fandrich & Kivinen, 2011; Street, 2006)*.

However, countering the construction of a green premium, there are studies involving SMEs that use discourses that position cost savings and operational efficiencies as resulting and enabling competitive advantage where economic benefits outweigh capital and effort costs, or when driven by customer demands and competition to reduce price to maintain existing customers *(Fandrich & Kivinen, 2011; Gusmerotti et al., 2019; Mativenga et al., 2017; Oelze & Habisch, 2018; Ormazabal et al., 2016)*. On the basis that cost savings accrue to businesses, intervention of the state is limited to awareness raising of such benefits. Therefore, differing understandings of the role of the state and efficacy of regulation and voluntary instruments and the economic value of developing CBMs is likely to influence perceptions of risk for SMEs.

3.3 Discourse analysis studies of the circular economy

There have been few discourse analysis-based investigations of the CE and businesses engagement with the concept *(Friant et al., 2020)*. The few examples have tended to focus on the policy arena, political discourses or academic literature reviews *(Friant et al., 2020; Lazarevic & Valve, 2017; Persson, 2015)*, except the study by Blomsma *(Blomsma, 2016, 2018; Blomsma & Brennan, 2017)*. The conceptualisation of waste is a fundamental component of the CE, with the framing of waste in relation to the CE also having been investigated by a small number of researchers *(Bonsu, 2020; Duygan et al., 2017; Nylén & Salminen, 2019; Perey et al., 2018; Silva et al., 2015)*

The studies suggest that discourses of the CE have been developed and interpreted in different ways by different groups of actors within production value chain networks and used or argued against for a range of purposes that align with the interests of the group. In this way a relationship is constructed between identity and role of actors and the use of discourse of the CE. This would make sense in a context where transitioning to a CE is perceived to be a risk issue for a range of actors that has to be negotiated in relation to their existing value chain network function, relationships and responsibilities in a linear economy system *(Boholm et al., 2012)*. As Friant et al. *(2020)* highlight, the economic, social or philosophical theories underpinning the CE are highly diverse, being related to difficulties in how it is to be understood and applied making it a contested concept, whilst remaining a “promising idea and ideal”. This ambiguity of meaning means that from a relational theory of risk perspective what are defined as problems and solutions, objects at risk and risk objects, consequences and uncertainties, who is to be responsible and what is to be valued, will be political and potentially controversial

and variable *(Boholm, 2003)*. This is exacerbated by CE discourse in circulation having been developed by organisations and groups with specific political, environmental, social and economic agendas *(Friant et al., 2020)*. The discourse studies are consistent in positioning a relationship between different CE and waste-related repertoires and interests of actors, social movements and ideology.

In the Lazarevic & Valve (2017) study they made explicit the relationship between choice of discourse and the interests of actor groups associated with their role in the existing system. CE proponent stakeholders used the CE narrative to place primary responsibility on businesses to work with other actors in production value chain networks to develop innovative CBMs. In comparison industry associations representing business sectors placed the emphasis on maintaining a deregulation and market forces agenda. The focus being on industry led initiatives requiring no radical changes to institutions, infrastructures, regulation and markets, that protects their existing role in production value chain networks. However, there was overarching agreement in the narratives of all actors in terms of economic growth being unquestioned and the solution to the reinvigorating the EU economy being to "decouple economic growth" from resource use. This was achieved by adopting an ecological modernisation "technology-based and innovation-oriented approach to environmental policy" that focuses on changing the behaviours and actions of industry relying on scientific and technological advances *(Jänicke, 2008)*. Perssons earlier Masters thesis in 2015, found use of similar consistent and contrasting narratives. They outlined a relationship between the role of the participants in production value chain networks, with associated institutionalised interests, values and concerns, and the use of discourses.

In contrast to the above policy and waste management focused studies, Blomsma investigated the meaning making of practitioners involved in government funded CE product innovation projects. Similar to the above studies, they found that interpretations and use of CE-related repertoires varied and were used differently subject to the role and function of actors *(Blomsma, 2016, 2018; Blomsma & Brennan, 2017)*. Whereas the policy and literature analyses discussed above focussed on value creation aspects of a CE, the problem framing for practitioners in Blomsma's work focussed on value proposition in relation to expectations and demands of customers, society and policy. However, solutions being implemented in the project related to value creation, concerning creating new materials, using existing materials in novel applications or changing material choices, within the constraints of business-as-usual product functionality, design and appearance and purpose. A relationship between customer price-performance expectations and success of CBMs can be understood to have been constructed. In the study, only one project had been implemented after 28 months with the remaining 22 projects being on-hold indefinitely, terminated or lacking progress. The reasons provided for lack of success centred on a value proposition discourse. This incorporated lack

of customer engagement or demand or commercial interest, scale of market potential, a lack of *IP*, value chain network relationships and need for further funding and success. This is consistent with the Friant et al. *(2020)* positioning of a relationship between failing to recognize the extensive socio-cultural entities and structures associated with consumption built on materialism, convenience and ownership and limited adoption of CBMs.

The effect of the ambiguity of the CE concept and use of different repertoires was also found in discourse analysis studies of the concept of waste. For example, in the Silva et al. *(2015)* study of the use of a "zero waste" repertoire where waste is a problem and a "sustainable materials management" (SMM) repertoire where waste is a resource. The study found that zero waste was interpreted as an idealist ambition, unachievable and subjective. This conceptualisation was positioned as resulting in action being limited to achieving zero waste to landfill and waste being used as a fuel in waste to energy plants. The same study found the SMM repertoire dominated by economic competitiveness and resource scarcity and security discourse. The two repertoires were used to position different problems and solutions and actions to be taken on waste. Both repertoires were interpreted as deflecting action away from reducing material use or supporting waste prevention and sustainable consumption aspirations and being used to position production of waste to be recycled being seen as being better for the environment and legitimising growing consumption as a positive environmental act *(see also Hultman & Corvellec, 2012)*. As with the CE discourse studies, the immediate interests of actors and how they saw their role in the current production value chain network were positioned as being related to the use of a particular repertoire. A similar effect of the use of a discourse of waste as a resource to argue against promoting waste reduction activity was evident in research with representatives of large Australian organisations "implementing circular flows" including waste management organisations *(Perey et al., 2018)*. In this study, the CE concept was positioned as a mechanism to alleviate tensions in definitions of waste, allowing waste to be seen both as a problem and a resource whilst validating businesses move away from waste reduction.

The study by Nylén and Salminen *(2019)* shared a common feature of the above studies regarding the transition to and use of a discourse of waste as a resource. This study demonstrated how the change of discourse from waste as a problem to emergence of the waste as a resource discourse and later a specific CE discourse was used to define solutions and serve the interests of different actors in the development and reform of a waste-related decree in Finland. The waste as a problem discourse supported strong regulation in 2006, whilst during a reform stage between 2015 and 2018, the discourse of the CE became an influencing entity. The same CE discourse was used by both regulators and the waste industry to argue contrary positions regarding downcycled use of waste.

This relationship was also found in the Duygan et al. *(2017)* study where discourses of the waste hierarchy and finite natural resources was used by all parties but constructed differently to argue for or against different types of interventions. However, all actors positioned the technical and economic feasibility of options and markets for secondary resources as problems in enabling the development of CBM-related activities.

The studies indicate that there are potentially an established set of repertoires that are used selectively, or interpreted differently, to serve the interests of different actors in relation to their role in production value chain networks. All the studies indicate that discourses of the CE and waste engaged with by actors relate to what is deemed to be of value and at stake in relation to the institutionalised functions of the actors. However, the studies indicate that there are entities and structures that are generally unquestioned in policy and practitioner discourses. This includes economic growth and an ecological modernisation approach to reducing social and environmental negative impacts of production and consumption. The reviews indicate that the CE, zero waste and sustainable material management concepts may be seen as idealised visions and ambiguous concepts in policy and manufacturing arenas.

Overall, the same discourses, alternative discourses or combinations can be called upon by actors with different interests and roles in production value chain networks to position different problems, the appropriate solutions and roles and responsibilities creating potential conflict.

3.4 Evolution of policy and regulation towards embedding the concept of a circular economy

Government policy is a powerful structure, discursively, materially, politically and socially, and can act to position what and who is deemed important, such as SMEs, and what is to be understood of SMEs, CBMs and risk and the solutions and actions to be taken *(Colombo et al., 2019; Feindt & Oels, 2005)*. Therefore, how policy positions SMEs, CBMs and risk is deemed important to include in this thesis. This is on the understanding that CE narratives and activities proposed in policy have the potential to influence how environmental issues are to be addressed and how various actors are expected to behave *(Hajer, 1995)*.

The CE concept has been a key component of national policy in China for nearly two decades *(McDowall et al., 2017)*. However, it wasn't until 2014 with the introduction of the European Union (EU) CE action plan that the term began to gain traction in policy and legislation affecting the UK, building upon earlier waste regulation and policy *(Murray et al., 2017)*. On this basis, CE policy-related documents produced from 2014 onwards, when it started to become embedded in UK policy, is included as part of the corpus of documents to be analysed in more detail in this thesis as discussed in Chapters 4 and 5. However, a brief overview of the evolution of policy in the UK from waste as a problem to embedding the concept of the CE is included here, with the detailed review provided in Appendix 1.

Throughout the 1960s to the 1990s waste policy was dominated by the conceptualisation of waste as a problem and needing to be managed better, although there was significant debate on how it was to be dealt with *(Blomsma, 2016; Blomsma & Brennan, 2017)*. During this period the concept of the "waste hierarchy" developed and action moved slowly from collection of waste and disposal to landfill to one of increasing recycling. By 1999 the link between waste and GHG emissions was embedded in policy. Over the next ten years the relationship between waste, climate change and sustainable development became more established in policy. UK policy and regulation also became strongly aligned with EU policy and focussed on meeting diversion from landfill targets through increased recycling. It was in this period that waste began to be reframed as a resource that had the potential to create jobs and create economic opportunities for businesses, although attempts to define waste and strengthen moving up the waste hierarchy created problems of ambiguity and what actions were to be prioritised. However, following the economic crisis in 2008, policy moved to a focus on growth and jobs and resource efficiency for the next five years. The zero waste from landfill concept became a key refrain in policy during this period and by 2013 the term CE was introduced in the same breath as resource efficiency. It could be argued that 2014 marked a reframing of policy from waste policy to resource and the CE policy built upon the concepts of increasing competitiveness, business opportunities, innovation and jobs whilst addressing climate change.

Overall, it is clear that the term circular economy is a relative newcomer in policy in Europe and the UK, with policy development and activities in England and Wales having closely aligned with the commitments expected of member states of the EU since the mid-1970s. As such, how waste and the concept of the CE has been, or moves to be, positioned and addressed in the UK can be understood to be historically and politically situated as part of the wider EU context. For example, the long history of following EU waste policy with its focus on recycling and targets for dealing with waste, with waste prevention focused on preventing waste to landfill, can be understood to have the potential to influence how the concept of waste, waste reduction and material use in the CE and the role of business may be perceived. Furthermore, up to this point the struggle to balance potentially competing objectives in state regulation and policy can also be understood to have influenced moves to the adoption of the CE concept. The balance being the needs of the UK economy, such as job creation and *GDP* growth and freedom of choice for consumers, competitiveness, globalisation and maintaining low prices, with protecting and enhancing social justice and equality, biodiversity, natural resources and reducing environmental impacts and waste *(Hultman & Corvellec, 2012)*.

3.5 Perspectives and critiques of the circular economy

As shown in Sections 3.2 and 3.3, how people interpret the CE concept and use it is highly variable, especially given that the concept is ambiguous with very few actors explicitly defining

a CE *(Korhonen, Nuur, et al., 2018; Prieto-Sandoval, Jaca, et al., 2018)*. In this section, an overview of different academic perspectives on the CE is provided. This covers the relationship with the linear economy, the role of waste, economic growth, environmental impact and sustainability, business models and the role of manufacturing and SMEs.

3.5.1 Paradigm shift

Discourses of the CE often construct the CE as a "paradigm shift", being intrinsically different and opposite to the existing system and the solution to overcoming negative impacts associated with the current linear economy model *(Bocken, Ritala, et al., 2017; Geissdoerfer et al., 2017; Lieder & Rashid, 2016; Murray et al., 2017; Prieto-Sandoval, Jaca, et al., 2018)*.

This paradigm shift discourse of the CE has been questioned. For example, the CE as implemented in practice has been described as an initiative that works within an overall linear economic system to better manage energy and material flows *(Korhonen, Nuur, et al., 2018)*. This is on the basis that implementation focused on production and managing flows within the existing system whilst maintaining a focus on growth and consumption is argued as inhibiting activity to reduce material consumption and energy demands in order to maintain these flows. Such a relationship is positioned as resulting in simply making the existing system more efficient. By doing so this reinforces support for the linear economy system and marginalises attention on changing the social, political, technological and economic entities and their structures that could be seen as paradigm shifts *(Charonis, 2013; Cherp et al., 2018; T. Cooper, 2000; Hobson, 2016; Homrich et al., 2018)*. Furthermore, perceptions of political unpopularity in democratic nations of appearing to prioritise ecological action over consumer choice and economic values has been positioned as being influential. Political unpopularity being argued as the reason for the failure to question and act on reducing demand, the reliance on economic growth and technological change, or changing economic and social entities and structures to limit choice and consumption *(Allwood et al., 2017; Geels et al., 2017; Kallis, 2017)*. Institutionalised political ideology has also been suggested by Johansson and Henriksson *(2020)* as influencing a transition from paradigm shift "strong" CE discourse to the embedding of technocentric "weak" CE implementation policies. As defined by Novikau *(2016)*, political ideologies are stable, complex "coherent systems of beliefs about the political, social and economic structures of a society". As Novikau *(2016)* outlines, there are a range of political ideology typologies (e.g. liberalism) that are used to simplify complexity. Each typology represents different perspectives on the role of government and society, distribution of power, wealth and resources, prioritisation of values and how change is to be determined and executed.

What is argued for by critics is for the CE to be more transformational. This is in terms of being disruptive involving fundamental socio, technical, political and economic system change,

rather than incremental technological change within the existing system *(Cherp et al., 2018; Geissdoerfer et al., 2017; Korhonen, Nuur, et al., 2018; Prieto-Sandoval, Jaca, et al., 2018)*.

3.5.2 The role of waste

As highlighted in Sections 3.2 to 3.4, interpretations of the concept of waste are highly variable. Proponents of the CE construct waste as a resource and go as far positioning there being no such concept as waste. This builds on the assumption that waste can perform as effectively and replace the need for virgin materials *(Bassi & Dias, 2019; Gregson et al., 2015; Welch et al., 2016)*. As these discourses are becoming widely reinforced in policy and practitioner discourses, a more significant move away from discourses of waste as a problem requiring prevention and reduction can be seen. Discourse of waste has shifted to one of growth in recycling, promotion of extending the use phase of resources and enhancing access to goods for more consumers *(Blomsma & Brennan, 2017; Silva et al., 2017)*.

The consensus in academic literature is that this change in discourse was intended to act as a mechanism for encouraging a move away from a focus on low value material recycling to circulating the highest embedded value of resources and materials for as long as possible. The intent being to have no net negative effect on the environment and potentially being regenerative *(Bocken, Olivetti, et al., 2017; Geissdoerfer et al., 2017; Ghisellini et al., 2016; Murray et al., 2017; Prieto-Sandoval, Jaca, et al., 2018)*. However, critics argue that moving away from strengthening waste as a problem discourse as a core tenet of the CE limits the decoupling potential. This is argued on the basis that the availability of recycling technology strengthens moves away from waste prevention and reduction options *(Fandrich & Kivinen, 2011; Hultman & Corvellec, 2012)*. This positioning is supported by researchers such as Kirchherr et al. *(2017)* who construct a relationship between the wide availability of recycling and society and businesses opting for the “path of least resistance”. Recycling enables a continuing focus on people and institutions to recycle some of their waste as a minimal requirement to be seen as part of the CE whilst justifying continued growth in consumption and production *(P. Jones & Comfort, 2017; Korhonen, Honkasalo, et al., 2018)*. Concerns have also been raised about policy that reinforces a sustainable materials management (SMM) repertoire (as discussed in Section 3.4), that calls on waste as a resource, increasing recycling, production of recycled content material or energy from waste discourses. This is on the basis that maintaining existing entities and structures that support the use of this repertoire are positioned as failing to limit waste production *(Silva et al., 2017)*. Silva et al. also question the ability to displace virgin raw materials or create a “sustainable society” due to the influence of historically embedded shared cultural and social perceptions, experiences, institutional and structural arrangements of waste and recycled materials. However, Lilja *(2009)* argues that moving from a waste prevention focused discourse to a SMM discourse has more advantages than disadvantages. The availability of the repertoire is positioned as helping to gain

commitments from a wider range of actors to promote and enact material efficiency activities, whilst recognising the inability for SMM actions to move beyond achieving relative decoupling.

3.5.3 Economic growth

Calls for ever increasing economic growth is a mainstay modern discourse throughout society. Growth is positioned as essential for wealth creation and new, better and more jobs, leading to social, economic, political and environmental progress and continuous improvements in quality of life *(Sandberg et al., 2018; Spangenberg, 2010)*. According to Dryzek *(2005)* the overarching commitment to growth and to material well-being is part of the repertoire of industrialism, where the environment is either seen as a risk to the economy or an opportunity to embed the environment into everyday practices.

In the UK, as with many other nations around the world, the discourse of industrialism is unpinned by liberalist capitalism political ideology. Here, all physical entities associated with manufacturing, e.g. natural entities and services (e.g. land, minerals, water, plants) and technology, are privately owned by individuals, groups, businesses or the state and run for economic gain, and has changed little in the 20th century *(Runciman, 1993)*. The discourses of free market economy, globalisation and consumerism are interrelated parts of the discourse of industrialism and the neoliberalist capitalism-based modernisation of society. These discourse manifest themselves in all dimensions of life, including limited intervention of the state, unfettered freedom of choice, increasing quality of life (for some) and improving equality, status, prestige and establishing identities through increasing accumulation and abundance of ownership of material entities *(Jackson, 2016; Jansiz, 2014)*. A central tenet of discourse of the CE is a relationship between transitioning to a CE and economic growth, working within the existing economic paradigm that supports industrialism, globalisation and modernisation *(Charonis, 2013)*.

In discourse of the CE a relationship between development of CBMs and the ability to decouple economic growth from increasing consumption of natural entities and services to benefit the environment and society within a capitalism-based political ideology is constructed (see section 3.3). This emphasis is argued to be the reason why the concept of the CE has gained political popularity *(Korhonen, Honkasalo, et al., 2018; Korhonen, Nuur, et al., 2018)*. It is also argued that this is why increasing numbers of larger businesses are discursively positioning themselves as part of the CE *(Bocken, Olivetti, et al., 2017; P. Jones & Comfort, 2017)*.

The concepts of economic growth and growing consumption remain generally unquestioned in discourse of the CE, as highlighted in Sections 3.3 and 3.4. “Green growth” discourse has become embedded in academic and policy sustainability and CE repertoires. This discourse acts to position a win-win scenario of protecting the environment by decoupling use of natural

entities and services from economic growth, whilst avoiding changes in consumption patterns. At the same time relying on technological and market innovation to improve production efficiencies for success *(Sandberg et al., 2018)*. However, as Sandberg et al. *(2018)* argue, the availability and use of a green growth discourse prioritises economic growth and limits environmental protection interventions to acts that comply with economic growth requirements and those aspects of natural entities and services that can be measured.

This questioning of a continued focus on economic growth and growing consumption, whether discursively constructed as green growth or not, has grown again in recent times. The rise of discourses of "steady state economics*"*, sustainable degrowth and "sufficiency*"*, and the establishment of institutions and structures in Europe looking to radically reduce and change consumption patterns demonstrates this disquiet *(Charonis, 2013; Cosme et al., 2017; Hobson, 2013; Kallis, 2017; Sandberg et al., 2018)*. Against the green growth discourse, these alternative discourses position environmental protection, human wellbeing and social equality and measures of progress beyond economics, and particularly GDP and economic wealth creation, as priorities.

In addition, there are also reviewers of the CE concept who argue that the CE cannot fit economic systems that focus on growth as the *rebound effect* and the competition in markets will inevitably lessen any benefits *(Ghisellini et al., 2016)*. Other researchers, argue that CE models of production and consumption may be "greenwash*"* that reinforces existing neo-liberalist political ideology and a focus on economic inequality *(e.g.: Hofmann, 2019)*. The term greenwash first appeared in 1983 *(Ottman, 2014b)*. It has become a cognitive shortcut to position acts of organisations that position products, ways of operating or organisational values and ideology as aligning with environmentalism ideology, as being superficial, actively misleading or lacking truth or credibility *(Chen & Chang, 2013)*.

3.5.4 Environment and sustainability

The discourse of environmentalism grew in the late 1960s and early 1970s, through radical social movements opposed to continued industrialism based political ideology. The publication of seminal works Blueprint for Survival *(Goldsmith et al., 1972)*, Small is Beautiful *(Schumacher, 1993)* and Limits to Growth *(Meadow, 1972)* and environmental activism worked together to make the environment a political priority at the time *(Dryzek, 2005; Hajer, 1995)*. This resulted in new regulatory measures to protect the environment coming into force (see Section 3.4). An ecological modernisation perspective became the dominant discourse and practice of environmentalism in policy, albeit one that was heavily critiqued in the 1990s, and having a diversity of usage and meanings *(Buttel, 2000; Hajer, 1995)*. This perspective became embedded in the concept of sustainable development *(Barnes & Hoerber, 2013; Hajer, 1995)*. The discourse of sustainable development (SD) and the establishment or otherwise of entities and associated structures, have been the subject of a number of studies

(e.g. Barnes & Hoerber, 2013; Boissière, 2009; Borne, 2013; Griffin, 2013; Kögl & Kurze, 2013; Myers & Macnaghten, 1998; Slim, 2013).

The discourse of SD emphasises a requirement for fundamental changes in the way society thinks of the relationship between economics, social structures, production and consumption and the environment *(Boissière, 2009; Myers & Macnaghten, 1998)*. However, as with the concepts of the CE and waste, discussed in Sections 3.3 and 3.5.2, the concept of sustainability is understood to be ambiguous, not being the same as SD and having a diversity of meanings being used in multiple and conflicting ways *(Borne, 2013; Griffin, 2013; Kögl & Kurze, 2013; Lankoski, 2016)*. These authors, argue that in SD discourse, the ecological modernisation perspective and action is largely unquestioned. A key underpinning of the ecological modernisation discourse has been a shift to use of discourses of eco, sustainable or green innovation in policy, with its meaning and implications contested whilst acting to place businesses as central to providing the solutions as discussed in Section 3.5.5 *(Colombo et al., 2019)*.

Discourse of the CE positions transitioning to a CE as a practical industrial model that has the causal power to address global SD problems and inequalities. In this way it fits with an ecological modernisation discourse and actions focussed on economic growth, job creation, science and technology advancement as solutions to environmental problems *(Ghisellini et al., 2016; Kirchherr et al., 2017; Korhonen, Nuur, et al., 2018; Lieder & Rashid, 2016; Murray et al., 2017; Ritzén & Sandström, 2017)*. However, the ability for CE practices to result in genuine environmental benefits, such as reductions in use of natural entities and services, waste generation, environmental and climate change impacts has come under significant scrutiny *(e.g. Hobson, 2013; Manninen et al., 2018; Murray et al., 2017; Nußholz, 2017; Zink & Geyer, 2017)*. Questions are also asked of the ability for transitioning to a CE to address global SD issues such as poverty, inequality and exploitation *(e.g. Lemille, 2016)*. The better design of products or technological improvements ability to outweigh the impacts of an absolute rise in demand for goods and services where consumption remains unabated and waste quantities and complexities continues to grow has also been questioned *(Allwood et al., 2017; Geels, 2018; Hobson, 2013; Kallis, 2017; Rogers et al., 2015)*. According to Hobson (2013), establishing the CE as the dominant discourse to addressing climate change may also side-line alternative economic discourses and other existing and new concepts that may have wider potential to reduce harm to natural entities and services and readdress past harm.

There are also those who argue that adopting CE principles can result in negative unintended consequences. This includes as increased reliance on rare earth metals or biofuel growth demand resulting in destruction of natural habitats and productive farm land and high fossil fuel energy use in production of ethanol *(e.g. Murray et al., 2017)*. Other negative consequences of the development of recycling, reuse and repair CBMs have also been

outlined by researchers. For example, a focus on increased recycling and reuse limiting displacement of the use of virgin materials (Ekvall and Finnveden 2001), and sharing models, such as car clubs resulting in increased demand for new products and lack of displacement of private ownership *(S. Cooper et al., 2016)*.

However, the main critique relates to successful CBMs resulting in a rebound effect where consumers validate consuming more in line with the *Jevons paradox (Figge & Thorpe, 2019; Hobson & Lynch, 2016; Kallis, 2017; Makov & Font Vivanco, 2018; Nußholz, 2017; Valenzuela & Böhm, 2017; Zink & Geyer, 2017)*. This criticism rests on two arguments. The first argument being that CBM products and materials have a limited ability to act as substitutes for existing products and materials. The issue put forward is that CBM products and materials are, or are perceived to be, of lower in quality and compete in different markets for different customer needs and therefore only shifts consumption. The second argument associated with the Jevons paradox, relates to market economics price effects. By either improving in-use cost efficiency or decreasing purchase price of CBM products and materials it is claimed that this results in increased use of efficient products or the purchase and consumption of additional products. The study by Junnila et al. *(2018)* of the adoption of product service systems, empirically demonstrated such an outcome, where financial savings were used on carbon-intensive services such as holidays, whilst ownership of goods resulted in more emphasis by the owners on the lifecycle performance of the products. Hobson *(2016, 2019, 2020)* also proposes that CBMs could continue to fuel “hyper consumerism” where acts once carried out as goodwill become commodified, e.g.: sharing, handing down or swapping items, enable more consumption based on desire, status and identity rather than beyond needs. It is even claimed that the CE discourse has simply been used as a narrative device for greenwashing, resulting in limited real action in businesses *(Friant et al., 2020; Korhonen, Nuur, et al., 2018; Nylén & Salminen, 2019)*. In contrast, there is also research that shows businesses engaging in “brownwash”, actively choosing not to identify themselves as operating to environmental or SD standards or having CBMs. The purpose of such acts being to avoid scrutiny by environmental activists of other practices, additional costs of proving operating to such standards, negative reactions of existing customers or not appearing to investors to be wasting money *(Coburn, 2019; Kim & Lyon, 2015; Lyon & Montgomery, 2015; Sandhu et al., 2010)*.

3.5.5 Circular business models and the role of business

The CBMs repertoire presented in the majority of research and policy on the CE can be understood to derive from the works of the EMF. The narrative positions CBMs as practical approaches to delivering the demands of society and increased profitability and competitiveness through innovation whilst doing good for the environment *(EMF, 2013a, 2015b, 2019)*. The CBMs repertoire incorporates five dominant models of production as shown in Figure 3.

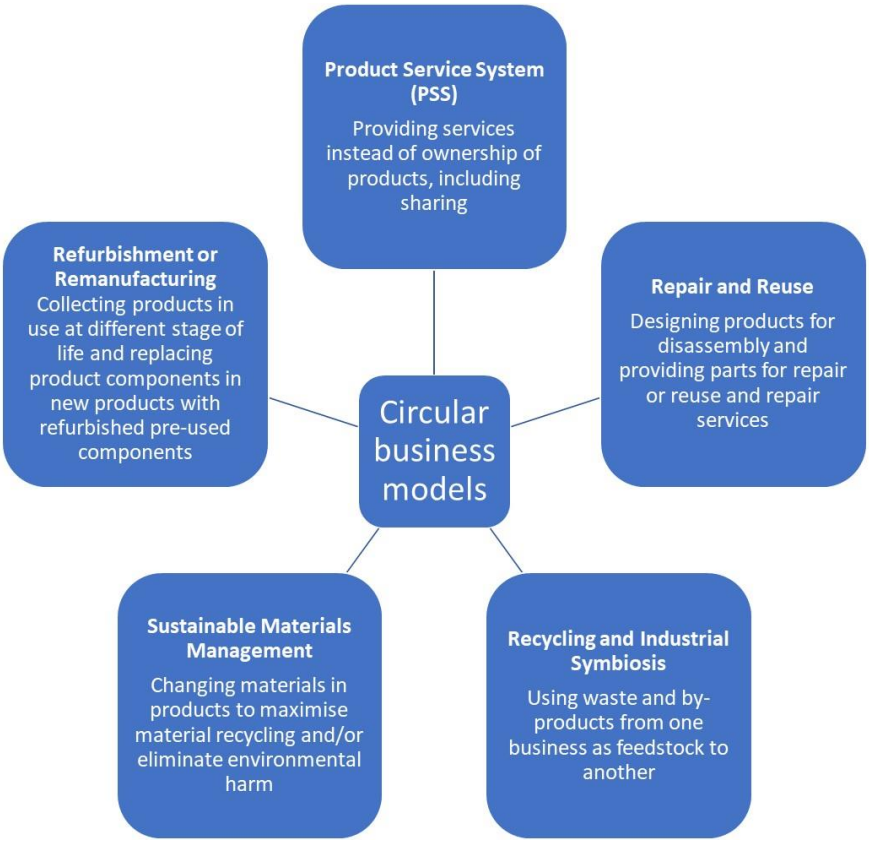

Figure 3: Circular business models

Embedding of the CBMs repertoire in policy and practice places the onus on business and positions them as having to be eco-innovators and adapt their value chain network *(Bocken et al., 2014; Genovese et al., 2015; Nußholz, 2017)*. Such positioning aligns with a theory of the firm perspective. Here the primary role for business is "to act as a vehicle for economic progress" through profit-oriented activities, innovation, entrepreneurship and pervasive competition in responding to the demands of the market *(D. Henderson, 2014)*. Such a theory is underpinned by free market economy political ideology where the social responsibility of business is to be profitable and use its resources "within the rules of the game" defined by society *(Friedman, 1970)*. Such rules incorporate those enshrined in law and the ethical and moral norms and prioritisation of values accepted, reproduced and passed on throughout society *(Carney, 2020)*. Not only is manufacturing positioned to provide the material needs and wants of society but is discursively expected to create jobs and incomes and contribute to economic growth, as highlighted in policy discussed in Section 3.4.

However, over the last century, manufacturers have been increasingly expected to carry out their activities in a way that limits health and safety risks to their workers and their communities and reduces impacts upon the environment *(D. Henderson, 2014; Kim & Lyon, 2015)*. Businesses are now expected to have higher degrees of civic responsibility and moral/ ethical obligations that serve the public good, material and well-being needs of society and the environment *(Jackson, 2016)*. The concepts of environmental/product stewardship, use of

environmental certification schemes and extended producer responsibility instruments focused on production systems and producers *(Lane & Watson, 2012)*, *Corporate Social Responsibility* (CSR) *(Wickert & Risi, 2019)* and an extensive growth in a wide range of voluntary schemes *(Hirschnitz-Garbers et al., 2015; Weiss, 2014)* have been introduced to achieve this. In policy, businesses are now positioned as having a "critical" role in protecting and enhancing the environment and are under increasing pressure to take action to mitigate climate change *(Quintás et al., 2018; Webb et al., 2006)*.

CBMs are positioned as inherently innovative as explained in Section 1.4. However, it has been argued by some researchers that existing business models are simultaneously linear and circular in terms of reducing material use to various degrees from necessity, through practices of process optimisation, efficiency, virtualisation and recycling of materials *(Ceptureanu et al., 2018)*. Furthermore, the existing linear economy-based models of production are understood to be underpinned by a priority on extrinsic utility, material and economic value to customers, businesses and governments. Proponents of the CE by contrast, expect businesses to treat environmental and societal intrinsic value as equal to utility, material and economic extrinsic value, irrespective of how society prioritises intrinsic and extrinsic value in practice *(Oghazi & Mostaghel, 2018)*.

The CBMs repertoire presents changing business models as opportunities, conceptually practical, demanded by customers and having benefits for business. This is usually in terms of increasing jobs and increasing productivity and profitability whilst protecting the environment, based predominantly on research carried out by organisations and individuals who have vested interests in promoting the CE concept *(e.g. EMF, 2013a, 2015a; Lacy & Rutqvist, 2015; McKinsey & Company, 2016; Stahel, 2016)*. Even so, evidence of the wide development of new models, beyond niche applications or markets dominated by household name large multinational enterprises (MNE), is understood to be limited or fragmented *(Kirchherr & van Santen, 2019; Quintás et al., 2018; Ritzén & Sandström, 2017)*. Of the CBMs available, review authors have found that recycling, associated with the sustainable materials model and near the bottom of the waste hierarchy, is the most commonly referred to model *(Allwood et al., 2011; Ghisellini et al., 2016; Kirchherr et al., 2017; Korhonen, Honkasalo, et al., 2018; Quintás et al., 2018)*. A possible explanation of this phenomena is provided in a study by Ranta et al. *(2017)* who compared the influence of general and region-specific institutional drivers and barriers across China, Europe and the USA. On Europe, they find that governance entities and structures that have a normative emphasis on recycling have the potential to limit development of other CBMs. This is based on there being strong regulatory/policy discursive support for CE but a normative overemphasis on rewarding recycling that can be measured, e.g., targets. Such an approach fails to address cultural-cognitive aspects, such as customer preferences for new products and low perceived role of

existing waste management companies in activities beyond recycling. The emphasis on recycling in policy is demonstrated in Section 3.4.

Beyond engaging in sending waste to be recycled, changing business models is disruptive and potentially one of the hardest things a business can do. This is not only in terms of choice of materials and products, but the legal, social, economic and technological structures, procedures and systems embedded as part of the existing linear business model that underpins business-as-usual *(Bocken et al., 2014; Ghisellini et al., 2016; Kirchherr et al., 2017; Korhonen, Nuur, et al., 2018; Lieder & Rashid, 2016; Murray et al., 2017; Ritzén & Sandström, 2017)*. However, the costs and practicalities of developing CBMs are rarely discussed *(Werning & Spinler, 2020)*.

3.6 Summary and implications for this research

The review of the characterisation of SMEs in Section 3.1 demonstrated how there are established ways influential organisations characterise SMEs as a homogenous entity in relation to their size. However, the review also identified understandings that SMEs are complex and highly heterogeneous. Therefore, what is understood of SMEs has the potential to reinforce a particular perspective on risk and how SMEs are to be encouraged to engage with the CE.

The review in this chapter also demonstrated how established manufacturing SMEs in business-to-business markets are under researched beyond DBE research. DBE research findings have the capacity to influence perceptions of SMEs and risks for them in developing CBMs. However, the review of DBE research in Section 3.2 showed how there were significantly different interpretations of what influences “successful” engagement of established SMEs with the CE. Therefore, what is understood of the primary influences on decision-making of SMEs may also act to reinforce a particular perspective on risk and what is needed to engage SMEs actively with CBMs.

Furthermore, the review of discourse studies in Section 3.3 revealed how the concept of the CE is not yet homogeneously institutionalised with different actors interpreting the concept and how transition is to proceed from their own vested interests. The investigated studies also highlighted how businesses are expected to deliver against business-as-usual product functionality, design and appearance and purpose when making changes to business models. Therefore, vested interests and understandings of how the development of CBMs affects product and service functionality can be understood to potentially influence perceptions of risk for SMEs.

The review in Section 3.3 also highlighted how the framing of waste influences perceptions of what are problems and solutions, roles and responsibilities whilst also aligning with vested interests of actors. The transition from discourse of waste as a problem to waste as a resource

and embedding of the latter into the concept of the CE in policy as overviewed in Section 3.4, reinforced the findings in Section 3.3. Therefore, what is understood of waste, roles and responsibilities has the ability to influence perceptions of risk for SMEs in transitioning to a CE.

In support of the findings in Sections 3.2 to 3.4, the review of academic perspectives and critiques of the CE presented in Section 3.5 points to a position that the CE is in discourse structuration phase with different discourse coalitions co-existing *(Hajer, 1993)*. However, the review demonstrates how different discourse coalitions can call upon the same discourse that has been shaped by the existing embedded system, yet propose alternative solutions to problems *(Lovell et al., 2009)*. The wide array of available repertoires and discourses enable conflicting arguments to be built for and against engaging with the CE concept.

Overall, as CE researchers have previously identified, the diversity of interpretations creates tensions in policy, discourse, expectations and actions *(Blomsma & Brennan, 2017; Murray et al., 2017)*. Consistent with the position presented in Section 2.3.4, what this means is that there are likely to be contrary maxims that can be called upon in constructions of risk for SMEs in discourse creating ideological dilemmas (see Section 2.3.4). In relation to the research questions being investigated in this thesis, the review indicates that contrary maxims are likely to be evident in relation to entities, structures and rules of the manufacturing regime outlined in Table 4.

In the next chapter the methodological strategy and framework developed and adopted in this thesis is described. This enabled the investigation of contrary maxims and how and why associated entities, structures and rules of the manufacturing regime influence perceptions of risk and the effect they have.

What is understood of being an SME and their decision-making as part of existing production value chain networks regarding transitioning to a CE?
• SMEs as a homogenous entity. • Rules about how successful businesses work. • Differences between SMEs and big businesses. • SME-value chain relationships, power and influence. • The influence of size. • The influence of internal characteristics and ownership-management structures of SMEs. • The influence of the situational and external context of SMEs.
What is understood of CBMs?
• Ecological modernisation way of thinking about how ESD issues are to be addressed. • The relationship between CE and ESD values and ethical and moral values. • Customer and SME values, price-performance preferences and priorities. • CBMs as innovation or business as usual. • The value of product and service rights. • Roles and responsibilities of the state, businesses and citizens.
What is understood of risk for SMEs in developing CBMs?
• The influence of existing and changing external landscape conditions. • Type of knowledge and trust and truth of knowledge. • The applicability of CBMs to different markets and sectors. • Customers' discourse and practices. • The relationship to political and economic ideology in practice. • Economics of CBMs and ESD values and ideology in practice. • The value of legislation and voluntary instruments. • Knowledge of waste. • Vested interests.

Table 4: Primary entities where contrary maxims exist identified from literature

PART 2: METHODOLOGICAL STRATEGY, DATA AND METHODS

4 Methodological strategy and framework

To answer the research questions set out in Chapter 1 requires a methodological strategy and framework that enables three overarching tasks to be completed. Firstly, there is a need to gain an understanding of how Small and Medium-sized Enterprises (SMEs), Circular Business Models (CBMs) and risk are constructed in discourse in a structured manner. Secondly, it is important to be able to analyse the discourse data interpretively in a consistent manner that can identify causal mechanisms influencing perceptions of risk and enable or constrain actions. And finally, it is necessary to enable the identification of the conditions necessary for perceptions of risk in established SMEs to be supportive of engagement with the circular economy (CE). This chapter provides the rationale for focusing on the analysis of discourses and development and use of a modified Critical Discursive Psychology (CDP) methodological approach drawing on principles of Grounded Theory Methodology (GTM).

As argued in Chapter 2, discourse analysis (DA) of talk and written text underpins this thesis. However, it is recognised by many authors on the subject of the analysis of discourse, that there is not a unified, singular approach to studying discursive phenomena (e.g. Georgaca & Avdi, 2011; Morgan, 2010; Wetherell, Taylor, & Yates, 2005). DA, due to its interdisciplinary uptake operating within a wide range of theoretical traditions, is an umbrella term associated with many forms of DA and not easily defined as there is a wide range of analytical approaches and perspectives adopted *(D. Cameron, 2001; Howarth, 2000)*. Debate on how "to do" DA is still prevalent *(Morgan, 2010)*. Doing DA means a range of different things to different people with different interpretations and a variety of rules and procedures in place *(Willig & Stainton-Rogers, 2008)*. Such debate means that the approach to doing DA is defined by the researcher's ontological perspective, assumptions about discourse and the approach to data collection and theory that the researcher chooses to adopt *(Whittle & Mueller, 2011)*.

DA of talk and written text, is traditionally associated with social constructionist approaches to research looking at how discourse as an entity defines social reality *(Bryman, 2001; Burr, 2015; Sims-Schouten & Riley, 2014; Wood & Kroger, 2000)*. The underlying tenet of constructivist approaches is that discourse does more than reflect, represent, or mirror meanings in the social world. It also shapes and constructs the social world, being both constitutive and constructive and can be understood to align with a degree of epistemological relativism adopted in this thesis. The three main approaches to DA are generally known as Foucauldian Discourse Analysis (FDA), Critical Discourse Analysis (CDA) and Discursive Psychology (DP). Given the focus on perceptions in this thesis, A DP approach has been adopted.

Traditional DP takes psychological concepts as the object of study, such as attitudes, emotions and perceptions investigating how the psychological phenomena is invoked and made consequential in terms of what is being accomplished in discursive interaction. A DP approach looks to identify sequential discursive patterns that could help explain the consequences of the psychological business being managed *(Wiggins, 2017)*. In DP, discourse is the primary mechanism where people orient to issues of self-interest and stake and construct versions of the world to support such positions *(Whittle & Mueller, 2011)*. In this way DP is useful in gaining understanding of how and which entities and associated structures and discourses are used to position subjects (e.g., SMEs, the Government, consumers, decision-makers) and entities and structures (waste, technology, policy, the environment) and for what purpose. The approach takes account of the agency of the individual in interaction, whilst recognising that interests, motives, beliefs, values etc. are not fixed inner cognitive factors or culturally specific, as argued earlier in Section 2.2.

DP studies generally focus on "naturally" occurring talk in every day social settings and builds upon conversation analysis and ethnomethodology. Analysis concentrates on the structure and function of discourse in its setting rather than looking to unearth individuals' views on a topic in interview or to understand people's mental entities *(D. Edwards, 2005; Potter & Hepburn, 2007)*.

It is assumed for this thesis that an everyday social setting associated with production value chain networks is any structure where institutional interaction occurs allowing individuals to discursively interact whilst adopting the identity of a member of the production network. This means that a setting could be the workplace, a conference or event or online forum purposefully established to allow discursive interaction for such members. However, these settings are understood to place constraints and freedoms on participants and have specific goals of interaction. Therefore, as explained in Section 2.3 interaction is bounded by the existence of institutionalised entities and their structures and the manufacturing regime *(Drew & Heritage, 1992)*.

In this thesis, the physical setting and type of interaction, e.g.: face to face or electronic, talk in the workplace, an interview, involvement in a focus group, reading or producing text or attending a conference, was not of primary importance. What mattered was that individuals orientated to the interaction as being part of the institutional context associated with being a member of the production value chain network. This approach supports identification of entities, structures and rules of the manufacturing regime that combine as causal mechanisms that maintain or otherwise disrupt the existing linear economy system. This does not mean that during interaction individuals would only call upon repertoires, discourses, rules, practices and entities or structures associated with production value chain networks. They could also

call upon experiences of a wide range of other spheres of life that could also be understood to be institutional regimes, e.g.: the home, the environmentalist, the conservative or labour voter, the local community, the politician. What was deemed of most interest for this thesis was which rules of the manufacturing regime and entities and structures and their causal powers were called upon in talk of SMEs, the CE and CBMs and risk and where coherence or conflict existed. It was also important to understand how alternative entities and associated structures, rules and discourses were managed in interaction in relation to the perceived rights and duties of the different roles of individuals and institutions in the production network *(D. Edwards, 2005)*.

Identifying conflict and concurrence and the historically constituted social, political or cultural entities, structures and rules of the manufacturing regime can be understood to align with a Critical Discursive Psychology (CDP) perspective that combines DP and critical theory.

4.1 Critical Discursive Psychology (CDP)

CDP, like DP in general, maintains a focus on everyday interaction but examines the relationship of repertoires and discourses produced with the wider situational context. This means understanding how repertoires and discourses shape or are shaped by embedded social structures and shared assumptions and rules beyond the immediate interaction, in line with a critical theory perspective. CDP can therefore be understood to combine DP and forms of FDA and CDA approaches to discourse. From this perspective, discourses are historically, socially, contextually and culturally related and variable resulting in meanings being transient, contingent and subject to change *(Billig, 2005; Phillips & Jørgensen, 2002; Potter, 2009; Taylor, 2001)*. Furthermore, in line with social identity theory, CDP is underpinned by an understanding that subject or identity positions are actively accomplished through discourses and discourses are used to do ideological work *(Wetherell & Edley, 2014)*. However, identity or subject positions are not fixed entities as individuals discursively adopt different positions in their ideological work in interaction. As such, the concept of ideological dilemmas is a primary aspect of CDP as detailed in Section 2.3 *(Billig et al., 1988)*.

The primary focus of CDP is therefore the investigation of broad patterns of both consistent and conflicting discourses, or contrary maxims, how they draw upon wider aspects of reality and relate to the historically established social, political and cultural discourses of the situational context *(Potter & Wetherell, 1987)*. CDP is a broad interpretative framework, usually using interviews and focus groups to investigate how versions of social reality are constructed, how speakers position themselves and others and what is achieved through such acts *(Seymour-Smith, 2017)*.

This approach could be argued to ignore other discursive and non-discursive entities, structures and rules that have the potential to influence how an individual structures

discourses in interaction not included in the discourse. However, this can be overcome by investigating both how language as action creates social reality and how entities and their structures, including discourse, can combine as causal mechanisms and influence discourse of social reality *(Sims-Schouten et al., 2007)* as discussed below.

The main critiques of DP have been put forward by Sims-Schouten *(2007)* and Riley *(2007)*, following arguments of Burr *(1999)* and Willig *(1999, 2000, 2013)*. The primary critique of DP is the tendency to reduce the study of a phenomena to the study of discourse. Sims-Schouten et al. *(2007)* argue that focussing solely on discursive practices positions other practices and aspects of reality, as subordinate to the discursive and in no way affecting the discursive. It is put forward that adopting this traditional DP approach results in researchers:

- failing to fully theorise why people use certain constructions and not others,
- marginalising any experiences outside of language, and
- under-theorising and ignoring how the "extra-discursive" may impact on the discursive.

Such critiques have also been discussed for other forms of discourse analysis *(Fairclough, 2005; Flatschart, 2016)*. Arguments build upon a perspective that discourse is only one aspect of social reality that mediates activity, albeit significantly in terms of sharing meaning *(Ussher, 2008)*. This is on the basis that there are a wide range of other dimensions of reality, including material, experiential and ideological structures, that have material effects in the world and the ability to influence discourse itself as discussed in Section 2.3 *(Flatschart, 2016)*. Therefore, it is necessary to look at what is absent as well as what is included in discourse. It is also important to look at how entities and their structures associated with the situational context (in this case SMEs being members of established production value chain networks) not included in discourses during the interaction relates to the discourses. For example, a discourse of waste by an individual may not call upon structures such as the waste infrastructure, waste management companies or discourses such as toxicity of materials etc. However, these structures exist ideologically, socially, physically and politically and relate to what is achieved in discursive interaction, and what is perceived to be the common-sense action to take.

The advocacy of such approaches to DA research is not without criticism. Many arguments focus on epistemological concerns of realist vs relativist stances. This includes questioning the concept of reality beyond what can be accomplished discursively and the relative importance of the discursive and extra discursive, i.e., the entities and associated structures and rules not included in discourse *(e.g. D. Edwards et al., 1995; Potter et al., 1999; Speer, 2007)*. Such debates are likely to continue unabated within academia and are beyond the scope of this thesis *(P. Thompson & Harley, 2012)*. However, another key criticism, that is taken on board in this thesis, is there being a lack of a systematic approach *(Sims-Schouten*

et al., 2007). It is acknowledged that these forms of DA are still in their infancy, with published works generally focussing on meta-theoretical debates or how such an approach could or should be applied *(e.g. Engelbert, 2012; Flatschart, 2016; J. Parker, 2003; Reed, 2000)*. Therefore, what is understood of a "systematic" approach may still require development and testing given there are limited numbers of empirical examples *(Bunt, 2016; Oliver, 2011)*. The overarching methodological approach adopted in this thesis is a synthesis of approaches adopted in a number of studies, informed strongly on the multi-level analysis approach presented by Sims-Schouten et al. *(2007)*, building on work by Willig (1999), Bhaskar (1989) and Cromby and Nightingale (1999).

To avoid limiting the analysis to what I brought as researcher *a-priori* to both the analysis and to a particular data collection method, an analytical framework that allows flexibility in choice of data and a back and forth between analysis and data was considered necessary. Therefore, principles of grounded theory methodology were drawn upon and built into my analytical framework as discussed in Section 4.2.

4.2 Grounded Theory Methodology (GTM)

GTM has become one of the most used analytical frameworks in the social sciences and when analysing discourse *(Bryant & Charmaz, 2007; Oliver, 2011)*. As Tracy*(2013)* outlines, there are estimates of 80% of articles involving qualitative research referring to using forms of GTM. This builds on the systematic but flexible nature of data collection and analysis embedded in GTM being able to be used across different epistemological and ontological perspectives. However, how it is used is delineated by the assumptions brought by researchers, how they engage with the framework and choice of data, data collection, coding and analysis methods and their logic of enquiry *(Charmaz, 2014)*. Primary principles of GTM are its iterative two-way nature, flexibility in choices of data and method for data collection and analysis and enabling research to be tied closely to social practice. As Henwood and Pidgeon *(2006)* highlight, adoption of GTM means a constant back and forth and inter-change between the data, the research design and methods and analysis. This is the first principle drawn upon in this thesis in linking choice of data, data collection, analysis and development of explanations of the existence and effect of causal mechanisms.

However, there are different "schools" of GTM. These are delineated by their conceptualisation of theory and how explanatory theories come about that "fences in the analysis" by defining how data is to be collected and the approach to coding and analysis *(Apramian et al., 2016)*. Detailed accounts of each of these schools, critiques and contestations can be found in the literature *(e.g. Allan, 2003; Allen, 2010; Apramian et al., 2016; Charmaz, 2014; Clarke & Friese, 2007; Ezzy, 2002; Glaser, 2013)*. Although there are epistemological divides and differences in approach between the schools, coding and analysis is generally carried out in

three stages for all schools: initial codes (labels for specific aspects of the data), grouping of codes into concepts and regrouping of concepts into higher level categories for analysis *(Allan, 2003)*. In this thesis, this principle of three stages of coding was adopted from creating low level thematic nodes to order the data, through second-level interpretative descriptions to analytical repertoires, namely Steps 3 to 5 defined in Section 4.3.

Regarding theory, since the 1990s an interpretative GTM perspective has become an established methodological approach when researching psychological phenomena. Studies primarily build on the active work of Henwood and Pidgeon, enabling the generation of explanatory theories when working with large quantities of ill-structured, complex qualitative data *(e,g, Charmaz & Henwood, 2017; Giles, 2002; Henwood & Pidgeon, 1992, 2003, 2006)*. Adopting this approach means accepting that theories do not emerge in isolation or are discovered, as the researcher brings pre-existing theory and influences data collection and analysis *(Charmaz, 2014)*. Therefore, in this field of application of GTM, theoretical reflection or "sensitivity", based on researchers retaining their knowledge (tacit, expert, embedded or otherwise), experience and theoretical perspectives, is considered a central component of being able to reach theoretical saturation, integration and closure *(Henwood & Pidgeon, 2003)*. Without such theoretical sensitivity a researcher could face difficulty in making their research meaningful, given that credibility of interpretation is reliant upon the researcher articulating findings using shared frames of reference *(Jaipal-Jamani, 2014)*. As discussed in Section 2.2, a central tenet of carrying out this research is explaining causal mechanisms. As such, the use of existing theory and knowledge and experience of all dimensions of reality of the situational context as a starting point for any empirical research is highly valuable *(Belfrage & Hauf, 2015, 2017)*. This perspective recognises that all theories and knowledge are equally fallible and real and some may be more correct than others. This is coupled with an understanding that all approaches to data collection and type of data have value *(Bunt, 2016; Oliver, 2011)*. These principles of maintaining theoretical sensitivity and all theories being interpretations have been adopted in this thesis.

Key benefits of drawing upon these principles of interpretative GTM are fourfold. Firstly, it provides a flexible approach to data creation. Secondly it enables engagement with existing theory and knowledge. Thirdly it provides a structured, rigorous approach to data management and the interpretation of meanings, patterns, processes providing credibility and plausibility of findings. Finally, the ability for GTM principles to be integrated with other analytical methods, such as DA, whilst being able to be used from a wide range of ontological and epistemological perspectives is seen to be of significant advantage. For example, the DA work by Willott & Griffin *(1999)* and the application of a critical perspective to GTM in a number of fields, including business, organisation and economics studies *(e.g. Belfrage & Hauf, 2015, 2017; Fendt & Sachs, 2008; F. Lee, 2012; Scheibl & Wood, 2005)*, leadership studies *(Kempster &*

Parry, 2011) and social sciences in general *(e.g. Bunt, 2016; Oliver, 2011; Redman-MacLaren & Mills, 2015)*. In addition, the ability to make use of a wide variety of information collection methods, e.g., ethnography, published texts, focus groups, interviews, enables versatility of application.

As such, the approach to investigating psychology phenomena presented by Henwood and Pidgeon has significant fit with the perspective adopted in this thesis. The major differences are integrating with DA and the making more prominent how other dimensions of the situational context, beyond the social or discursive, have a role and examining the why, the "structural roots", of similarities and contradictions of what is said and unsaid *(Oliver, 2011)*. To achieve this, different forms of reasoning are required. By using inductive and abductive reasoning and engaging in retroduction, requiring both a priori theory, knowledge and experience to be brought to the table and made explicit, new theoretical insights can be generated through cycles of reasoning. Retroduction looks to answer what conditions must be true to make a phenomenon possible and for an explanation to hold, and involves cycles of analysis to suggest a theory that has not directly been empirically deduced or induced *(P. K. Edwards et al., 2014; Glynos & Howarth, 2018; Oliver, 2011)*. Importantly, it is not enough to be able to describe a pattern, but to aim to understand the causal mechanisms associated with a pattern of discourse by remaining conscious of the situational, structural and discursive realities that influence interaction *(Bunt, 2016)*. These conceptions had important implications for the analytical framework adopted in this thesis. The examples of this type of research that draws upon GTM aim to allow iteration, a back and forth, between data, data collection and analysis methods, logics of enquiry and theory development whilst ensuring the situational context in a wide range of dimensions are centralised in theory development. Belfrage and Hauf's work, investigating the reproduction and stabilisation of "capitalist modes of production" *(2015, 2017)*, is based on ethnographic methods, semiotic analysis and use of existing scientific literature, policy and media documents. Similarly, in Kempster & Parry's research on leadership *(2011)*, they took account of interactions of leadership structures and agency and drew upon existing ideas and theories. In the work on the British brick industry *(Scheibl & Wood, 2005)* it was made clear that the researcher brought depth of knowledge from previous research. F. Lee *(2012)*embedded the concept of theoretical sensitivity and situational context in their analytical framework, putting forward a five-step approach. Such research was of value in informing the development of the framework developed in this thesis described in Section 4.3.

4.3 Analytical framework

The analytical framework used in this research was developed from the 6-step CDP approach adopted by Willott and Griffin *(1999)*. It was adapted to incorporate different forms of reasoning and draw upon principles of GTM embedded in research carried out from a CR perspective

highlighted in Section 4.2 *(e.g. Kempster & Parry, 2011; F. Lee, 2012; Scheibl & Wood, 2005)*. The analytical framework is an iterative process as represented in Figure 4 and is not to be construed as a linear progression. The steps of the framework are summarised in Table 5.

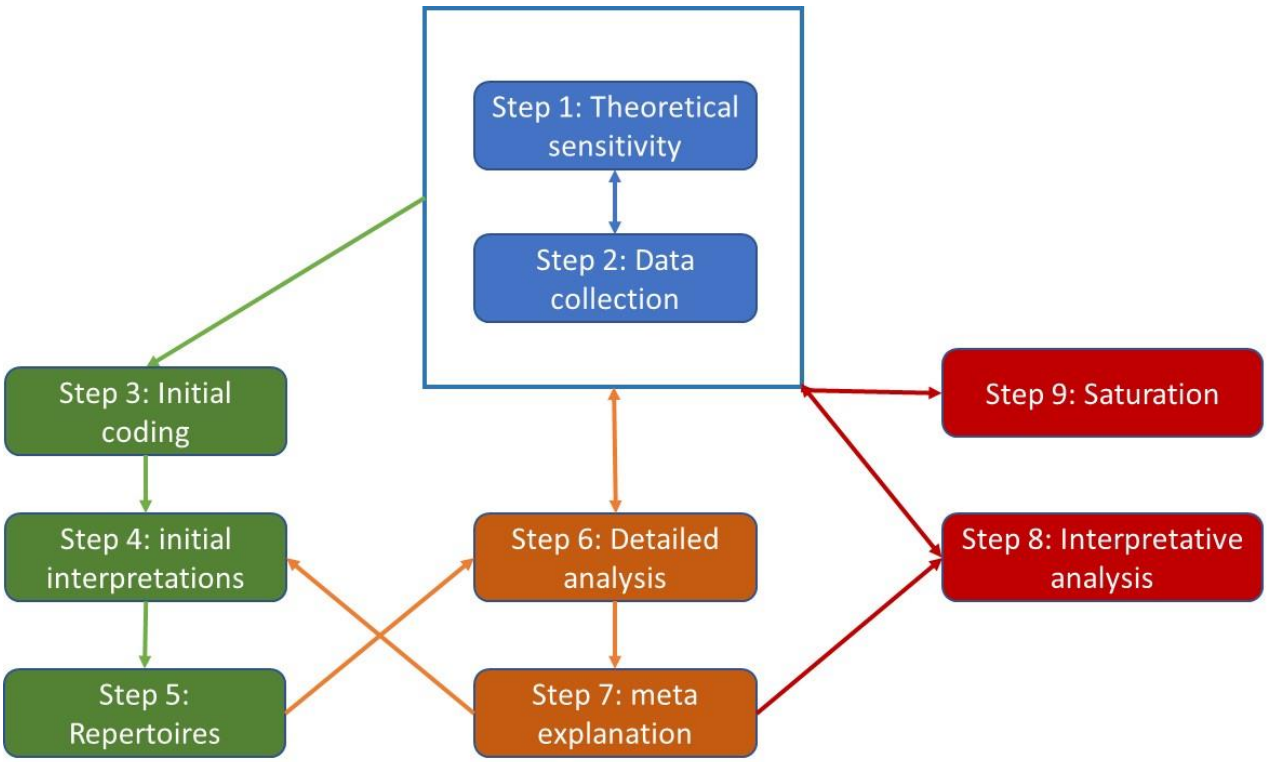

Figure 4: Iterative analytical framework

Step	Approach	Purpose
1: Theoretical sensitivity	Familiarisation with pre-existing ideas, concepts, arguments, historical and contemporary theories and knowledge.	To gain an understanding of the situational context of discursive interaction to help identify what may be "important" and give it meaning, what may be missing and when data does not support existing theory.
2: Data collection	Information collection using a wide range of type of data, sources and methods. Back and forth between Steps 1 and 2.	To create data for analysis.
3: Initial coding	The development and application of a common coding framework to generate low level "nodes" that categorise features of the discourse irrespective of the type of data collected.	To ensure some level of consistency in data management.
4: Initial interpretations	An analysis of data under a node of interest adopting a relational theory of risk perspective and business model value chain network lens asking the questions: • What is the discourse doing? • How is the discourse constructed to make this happen? • What resources are available to perform this activity? • What is the action orientation of the discourse? • What versions of the world are being constructed/ stabilised/ questioned? • Whose interests are being served?	To provide a descriptive interpretation of what the producer of the discourse was doing in relation to the node and provide insights into how entities and associated structures, concepts and causal powers have been constructed and for what purpose.
5: Repertoires	A review of the interpretations, identifying recurrent and irregular relationships between discourses that form repertoires and how these relate to the situational context.	To produce a set of repertoires incorporating patterns of discourse relating to the original node and their relationship to the situational context.
6: Detailed analysis	A review of the repertoires and patterns of discourse from Step 5 in relation to Step 1. Drawing on additional extant literature and knowledge or new data (Step 2) identifying consistencies and variations and providing a detailed analysis of the repertoire.	To provide a detailed analysis that underpins initial theoretical accounts of historically established causal mechanisms that are potentially culturally, socially or politically specific to the situational context of production of discourse in relation to perception of risk.
7: Meta-explanation	Application of prioritised repertoires to a new node, identification of new repertoires or discourses, consistency or variation.	To determine if prioritised repertoires in one node provide a meta-explanation of the ways another node is discursively constructed and relates to perception of risk.
8: Interpretative analysis	The revision, augmentation or discarding of findings and development of relational theoretical accounts as appropriate as new nodes are analysed. Steps 4 to 8 are repeated until no new relational theories are found.	To establish interpretative theories about relationships between concepts grounded in the data and situational context.
9: Saturation	Testing and refining the relationships between interpretative analysis results through additional data collection and constant comparison.	To constitute a formal position.

Table 5: Analytical framework steps

4.4 Methodological strategy and analytical framework summary

In this chapter the choice and development of the methodological strategy and framework has been reasoned. Based on the arguments presented, it was considered theoretically appropriate and pragmatically feasible to develop a framework combining a CDP approach to discourse analysis drawing on principles of GTM to answer the research questions outlined in Section 1.5. On this basis a nine-step iterative analytical framework was developed (see Section 4.3). Given the focus on "words" rather than quantification and the adoption of an interpretivist stance, this research fits centrally into the "qualitative" domain of social science research *(Bryman, 2001)*.

In the next chapter, the approach to data collection and management that enabled the application of the methodological strategy and framework is described. How each step of the analytical framework described in Section 4.3 was carried out is then summarised in Chapter 6.

5 Data collection and management

This chapter provides details of the discourse analysis (DA) research strategy and methods used to create data. Accounts are provided of the choice of methods and the data collected, including the ethical considerations and procedures and the sampling and recruitment strategies. The mixed methods approach adopted in this research resulted in 15 hours of interview data, three hours of workshop data, partial transcripts and field notes from 12 third party events and 70 public domain documents from 26 different institutions being collected.

Endeavours to answer the research questions set out in Chapter 1 through DA have the capacity to result in overwhelming quantities and type of discourse data being generated or collected and significant levels of analysis resource being required. Therefore, given that the production of this thesis was bound to a fixed timeframe and the resources of a single researcher, data collection for analysis was purposefully limited to:

- Geographical boundaries of England and Wales.
- Purposive, snowballing, convenience and opportunistic discursive interaction with individuals in established SMEs and the production value chain networks of influence.
- Published discourse data of a selection of influencers of businesses limited to that published after 2012[6].

Furthermore, as highlighted in Chapter 3, the range of knowledge, experiences, theories, discourses, entities and structures associated with the circular economy (CE), the role of Small and Medium-sized Enterprises (SMEs) and what could be perceived as risk is extensive and warrants the use of a mixed methods data collection strategy.

5.1 Mixed method research strategy

A mixed methods research strategy, as defined by Morse *(2010)*, was adopted to provide the flexibility needed in the choice of data collection method, the type of data collected, sources of data and timings of data collection in line with the approach to discourse analysis adopted in this thesis (see Section **Error! Reference source not found.**). In this thesis, methods that a llow analysis of possible links between the discursive and other dimensions of reality, from micro, mesa and macro levels, that can work together as causal mechanisms is paramount to enabling theoretically and empirically sound findings to be developed *(Hallam et al., 2014)*.

Although different methods and type of data have a role in DA research, pragmatic choices have to be made regarding the importance of data sources, type of data created, quantity of

[6] 2012 was chosen on the basis that this heralded in the inclusion of the term “circular economy” in political published discourse in England and Wales (see Section 3.3).

data, timing of data and information collection and data collection techniques that are influenced by researcher preferences or experiences.

Discourse data is predominantly presented as being associated with ‘texts’ in terms of spoken or written language data *(Wetherell et al., 2005)*. Fitting with the methodological strategy described in Chapter 4, obtaining discourse data can occur at any point in the research process. This means a wide range of data sources and methods of collection could be used and result in extensive quantities of data. To support effective management of data within the practical constraints of the research, it was considered necessary that a mixed method strategy centred around a core method of data collection and analysis that could be used to mainly answer the research question *(Morse, 2010)*. However, supplementary methods of data collection were deemed necessary that brought in different dimensions of the situational context of discursive interaction or acted to complement the findings of the core method. Such supplementary methods enabling elaboration, expansion, enhancement or contradiction of the research findings from another source or type of data collected via a different method *(Brannen, 2005)*. The findings from supplementary components cannot be published as a separate project due to issues of data saturation and sampling and their use being to focus on points and therefore do not tell the “whole story” alone *(Morse, 2010)*.

In this thesis, the core method of data collection was selected as researcher-orchestrated purposeful discursive interaction with individuals through interview, or with groups of individuals at facilitated workshops. Supplementary methods included obtaining information and discourse data through involvement in the structures that exist as part of the production network (e.g.: events, conferences, placement), and obtaining public domain extant material aimed at businesses (e.g.: policy documents, guidance). The purpose and scope of discourse in these different settings were expected to vary. However, the use of different methods and type of discourse data was of value in highlighting the hegemonic, institutionalised entities and associated structures and rules of the manufacturing regime and provided insights into the causal mechanisms associated with subordinate or marginalised discourses, as highlighted in Chapter 3.

The choice of data collection methods is summarised in Table 6 with explanation of the choice and details of the method provided in Sections 5.2 to 5.5.

Method	Approach	Key justification
Purposeful interaction		
Core: One to one Interviews	Semi-structured using a topic guide, interviewing members of the decision-making unit in SMEs and the production value chain networks of influence.	• Shared and conflicting discourses can be identified • Familiar mechanism to businesses • Flexibility in structure
Supplementary: Facilitated workshops	Workshops, events, group exercises organised in partnership with third party intermediary organisation for benefit to the audience and presenters.	• Insights into how discourses are produced/ reproduced in "natural" group settings • Increases access to wider range of people • Benefit to participants where financial inducements are not effective in encouraging participation
Involvement in existing structures		
Supplementary: ethnographic methods	Participant-as-observer (PaO) or action research (AR): AR: internal problem-solving activities within organisations PaO: involved in influencer or business working group(s), e.g., as secretariat/ facilitator	• Insights into the practice of discursive interaction and influence on decision-making • Insights into discourses and practices in "natural settings" • Insights into the rules of the manufacturing regime
Published discourse data		
Supplementary: Corpus of material	Collection of published documents from selected organisations that can be understood to be part of production value chain networks or aiming to influence rules of the manufacturing regime and the existence of entities and structures.	• Identification of dominant political "truths", discourse coalitions and marginalised discourses and knowledge.

Table 6: Data collection methods summary

5.2 Data collection strategy

The networks, entities, structures and manufacturing regime allows, reinforces and validates or otherwise decisions by actors *(Andrews-Speed, 2016)*. These often have a historical context that pre-exists the entry of any individual actor or organisation into the network *(Kilduff & Tsai, 2012)*. Therefore, all organisations, irrespective of size, nature of operation or institutional arrangement, that are part of production value chain networks, rely on in some way, the manufacturing regime to support the current system as discussed in Section 1.3. As such, I assumed that there is a complex array of networks within production value chain networks, where the position of being part of production value chain networks means it was likely individuals would call upon shared resources and rules of the manufacturing regime that actors can engage with and be reliant upon to help make major business-related decisions *(Brass et al., 2004; Kilduff & Tsai, 2012)*. The production value chain networks and

manufacturing regime are taken to exist, irrespective of the level of engagement, conscious acknowledgement or awareness by an individual *(Vasvári, 2015)*.

It was further assumed that every person and organisation involved in production value chain networks was of value in being able to provide useful data regarding discourses of risk, SMEs and the CE and understandings of causal mechanisms. The networks of influence that work together to stabilise production value chain networks and the manufacturing regime was taken to include internal arrangements within organisations (e.g. roles and responsibilities) and those institutional arrangements understood to be established structures in production value chain networks *(Sáez-Martínez et al., 2016a)*:

- Supply chain: e.g.: material suppliers, waste contractors/ consultants, customers.
- Policy and regulatory: e.g.: Government, regulators, policy advisors and experts.
- Financial: e.g.: banks, insurance companies, investors, shareholders.
- Support and advice: e.g.: trade bodies, unions, consultants, support & advice programmes, academia.

What this meant was that the number of individuals or organisations that could have been included in the research was extensive. Therefore, boundaries needed to be established. Primary boundaries related to which types of entities of production value chain networks, SMEs and people to include to make the research meaningful.

The strategy adopted for data collection combined forms of purposive, snowballing, opportunistic and convenience sampling tactics on the basis that the population associated with production value chain networks is potentially infinite *(Etikan et al., 2016; Noy, 2008)*. The strategy was moderated by my personal networks, experience and knowledge. It centred on individuals who agreed, after being approached, to be involved and self-identified, or can be assumed by status in the institutional setting that they're in (e.g., managing director, finance manager, head of strategy, senior consultant), to be part of a decision-making unit in an organisation or CE experts in their organisations. This was on the basis that transitioning to a CE involves change and requires decisions to be made by those with responsibility for making such decisions, as outlined in Section 2.3. Therefore, I chose to focus on engaging first and foremost with business owners in SMEs where possible, and those who could be understood to be an influential part of the decision-making process in businesses, e.g., managing director, finance manager.

A major difference between this thesis and other research on the CE involving SMEs is that in the recruitment of participants, the priority was to engage senior staff with change-related decision-making responsibilities in established SMEs who did not claim their organisation to be part of CE activities. Therefore, SME participants potentially had limited knowledge of the CE and did not claim to be actively positioning themselves as environment or sustainability entrepreneurs or ambassadors. It was purposefully decided that interviews with SMEs and

members of their network of influence was to be secured through attendance at established events that such organisations, and decision-makers in those organisations, are likely to attend as part of normal business practice. Major conferences and trade fairs were targeted that were open to the public, were not environmentally, sustainability or CE focused and incurred no attendance cost (see Section 5.3). Ethnographic notes were also produced at events and are discussed in Section 5.4.

Regarding published data, the choice of organisations and documents was based on my existing knowledge, references in academic journals and on-line searches of websites of the organisations I deemed to be influential. Data collection and analysis was designed as an iterative process and planned to incorporate four main phases of data collection as summarised in Table 7:

Phase	Planned activities	Outputs
Phase 1: Up to December 2018	• Interviews • Corpus of published data • Attendance at CE related events & conferences	• Eleven in-depth interviews • two short-focused question interviews • Transcripts, fieldnotes, copies of presentations and partial recordings from seven events over 11 days
Phase 2: January to December 2019	• Placement with a government department • Attendance CE related events • Collection of extant literature	• Placement fieldnotes • Transcripts from two workshops • Fieldnotes, partial recordings, copies of presentations, referenced documents and published event reports from seven events over 12 days
Phase 3: January to August 2020	• Interviews • Workshops with intermediary organisations • Events	• one face to face and one online interview • Workshops cancelled • Fieldnotes, partial recording, copy of reports from two events prior to lockdown • Partial recordings, copy of reports & access to webinar recordings from seven events over eight days post lockdown
Phase 4: September to December 2020	• Tailored interviews to test the outcomes of the interpretative analysis	No data collection

Table 7: Data collection and analysis process

5.3 Purposeful interaction with individuals

One-to-one semi-structured interviews were chosen as the primary method of data collection, involving direct engagement of a researcher with an individual *(Bryman, 2001; Charmaz, 2014)*. Such an approach is used extensively when interacting with experts, professionals or people considered to have influence in organisations *(Brannen, 2005)*. It is one of the most common approaches to data collection in research adopting a GT framework *(Charmaz, 2014)*. The semi-structured interview method, using a topic guide incorporating a series of open-ended questions, was chosen. This was due to it being a familiar technique for professionals and providing flexibility in terms of allowing what is important to the individual to

be voiced and explored in detail whilst taking account of the purpose of the interview for the researcher and their influence in directing the conversation.

These choices recognise that the researcher has had an active role and has therefore co-created the discourse in such interactions, as the researcher has determined the method, primary content and structure of the interaction.

5.3.1 Interviews

Important to this research is an understanding that interviews in discourse analysis research are designed to provide a situation for discursive interaction as a practice to take place and for those involved in the interaction to draw on institutionalised discourses, and are therefore active and can involve questioning by all parties of what has been said or presented *(Potter, 2009)*. Challenging questions and responses can lead to important knowledge *(Kvale & Brinkmann, 2015)*. In each interview carried out both parties were aware, through earlier communication and an information sheet supporting the interview consent form, that the focus of the conversation was concepts related to the environment, CE and businesses, particularly SMEs, and risk. In this way the person being interviewed was already aware of the focus of interview and how the data would be used. In all cases, all people involved could be assumed to understand that concepts of risk, SMEs and the CE were to be talked about. All interviews were purposefully structured to be conversational style where the flow of the conversation was largely dictated by the participant and questions reconstructed as the interview progressed *(R. Edwards & Holland, 2013)*. This was important to avoid the researcher acting to impose a definition of an entity, as is often the case in research on SMEs (see Section 3.2), and bring out understandings in a way that were meaningful to the participant *(Henwood et al., 2016)*.

A researcher topic guide was produced, as included in Appendix 3, in addition to the information sheet and consent form provided to each person agreeing to be involved in the research in line with the research ethics requirements (see Section 5.6).

As guided by other research, and reflecting upon the findings in Chapter 3, effort was taken to not define the term risk, SME, CE or circular business model (CBM) labels in interviews to avoid imposing an interpretation of the concept *(Slovic, 1992)*. The exception was for SME respondents who did not know what the CE was, or indicated difficulty in understanding a CBM label, where a printed definition was provided for discussion. However, although use of terms such as risk, SME and CE is considered to have methodological concerns, the terms were used explicitly in interviews. The purpose being to legitimise and make available rules of the manufacturing regime whilst avoiding limiting the scope of discourses used to give meaning to the concept and allow tacit or embedded knowledge of individuals to be made explicit *(Henwood et al., 2008)*.

On this basis, in this research no two interviews were the same as the relationships between parties, length of interaction time, location and the dynamics and "flow" of talk and interaction varied and shaped the form and features of the data generated *(Yeo et al., 2014)*. However, this is considered a strength in highlighting the influence of institutionalised entities, structures and rules of the manufacturing regime.

As outlined in Section 5.2, interviews were planned to be carried out at different phases of the research. However, due to the Covid-19 pandemic, face to face interview collection activity and planned workshops (see Section 5.3.2) from March 2020 had to be halted. Two interviews that had been arranged in February 2020 were carried out, one face to face before lockdown and one online after lockdown. No further interviews were carried out as it was considered inappropriate to "cold call" existing SME manufacturers during a time of crisis to engage in online interviews as part of research not related directly to immediate needs. This was especially important when day to day survival was a more acute issue, as highlighted in SME manufacturing industry reports *(CBI, 2020; SWMAS, 2020)*.

Overall, fifteen hours of interview data were collected that included thirteen in-depth semi-structured interviews and two short focused-question interviews carried out face to face, by telephone and by video chat.

In accordance with the data collection strategy, SME interviewees were recruited from attendance at open forum events. Events were selected following an online review of "manufacturing" events in the UK that were free to attend between February and July 2018 to align with the data collection plan timeframes (see Table 7, Section 5.2). The number of exhibitors and types of exhibitors determined from the online exhibitors list was used to determine which events to go to. Two events were selected. First, potential participants were recruited at the Materials Research Exchange and Investors Showcase 2018[7] (MRE18) two-day event organised by the Knowledge Transfer Network (KTN) and Innovate UK. The second event attended was the week-long MACH[8] 2018 annual trade fair organised by the Manufacturing Technologies Association that attracts over 600 UK based manufacturing technology exhibitors a year and 25,000 visitors. I attended only one day at each event.

As outlined in Section 5.2, convenience sampling was adopted in the selection of organisations to be approached at these events. Due to the nature of these events, exhibitors have fixed location stands and outline details of the exhibitors are provided in pre-event materials. Exhibiting organisations were targeted for approach. Work was carried prior to attending the events to identify exhibitors who were manufacturing SMEs or influencer organisations of SMEs, e.g., trade associations. Firstly, a "quick look" scan was undertaken of

[7] https://ktn-uk.co.uk/news/materials-research-exchange-2018-a-resounding-success
[8] https://www.machexhibition.com/#/

the pre-event online exhibitor lists and floor plans, or on-the-day printed catalogue, to make a first cut of potential stands to approach. This first cut was to primarily reject multinational organisations and organisations providing non-manufacturing specific services, e.g., training, air-conditioning units, office supplies etc. With the remaining long list, online searches were carried out of a range of the manufacturing exhibitors to determine if an SME, the aim being to create a shortlist of between 20 and 50 exhibitors depending upon event. On the day of the events, I approached stands of exhibitors on the shortlist, collected promotional material from the stand and engaged the stand representative in conversation about their products, before introducing my purpose for attending. Contact details were exchanged with those expressing interest in the research and were followed up by email and telephone post-event. Attending the MRE18 event resulted in twelve organisations (six SMEs, six trade associations or business support providers) agreeing to be contacted post-event. Eight organisations (three SMEs, five trade associations/ support organisations) from the MACH2018 event were followed up and included two short interviews taking place on the day. Of the 20 potential participants followed up, five resulted in interviews of which three were SMEs. Reflections on attrition of participants is provided in Section 10.3.2.

Other non-SME interviewees were individuals or organisations I already knew as part of my earlier professional network, whilst academic participants became known to me through my CE research interests and attendance at academic events.

Overall, the in-depth interviews included four SME engineering manufacturing businesses, three manufacturing business support providers, a manufacturing sector representative body, a government representative, three academics working with businesses on the CE and a CE consultant. The two short-focused question interviews were carried out at a manufacturing trade fair with a product manufacturing SME and a business equipment reuse and repair organization. All interviews were carried out by the same researcher.

5.3.2 Business workshops

Business workshops were planned as a secondary data collection method. The aim was to gain understandings of how individuals talked of being an SME, risks and the CE in a researcher orchestrated peer group setting. Workshops were planned to be an integral part of Phase 3 data collection activities as outlined in Section 5.2.

Two opportunities to run workshops with trusted intermediaries were being progressed for May 2020 with two different membership organisations. Both opportunities were cancelled due to the Covid-19 pandemic. However, whilst on placement with a Welsh Government department (see Section 5.4), workshops were run that provided an opportunity to test workshop materials and provided data suitable for analysis. The workshops were promoted through the government department, being free to attend half day events with lunch and

included presentations on visions of the future (policy, people, business, environment), CE and business, support provision and interactive workshops. For the workshops, agendas, introductory invitation text and information sheets and consent forms were produced and distributed before the event, with consent forms signed on the day in accordance with research ethics (see Section 5.6).

The first workshop had nine attendees and was a closed workshop tailored to invited food and packaging businesses. The second workshop was an open workshop aimed at manufacturing SMEs that had eight registered participants of which four attended (two academics, one SME manufacturer and one SME private sector business advisor) who were joined by two government employees involved in provision of innovation support to businesses. The workshops provided two and a half hours of recorded data and thirty minutes of a recorded presentation in addition to the material outputs of the workshops.

5.4 Involvement in existing structures

Peer to peer working groups, conferences, training events, business breakfast briefings, advice and support workshops, secondments and internships are a common feature of the business landscape in the UK. Therefore, they can be understood to be a natural setting for discursive interaction related to practices and decision-making. The settings described above are everyday social settings where institutional interaction occurs and can act to constrain or liberate the interaction in pursuit of specific goals. It can generally be understood that the purpose of conferences and events is the provision and obtaining of information, relationship development and discursive exchange through peer-to-peer networking. They can also be understood to be locations where actors work to persuade potentially powerful actors to legitimise particular perspectives over other perspectives *(Brivot et al., 2017)*.

It is important to recognise that the events attended were all organised by proponents of the CE and embedding of ESD values in production and consumption practices, as symbolised by a speaker at the Policy Forum for Wales[9] event where "*we've clearly got influencers who like the people on this panel who are very passionate about the topic and are going to drive it forward*". Furthermore, presenters at such events can be understood to have been included based on their status as having knowledge of the CE or the development of CBMs in practice. Therefore, they can be understood to be part of a group looking to legitimise their perspective on the CE. In addition, at events, presenters purposefully curate what is presented. Furthermore, attendees at such events have made a conscious decision to attend in the capacity of a specific role. Attendees can therefore be understood to have a stake in the knowledge being exchanged, the acts of persuasion, development of relationships and discursively engaging with others in some capacity. Aligning with arguments presented in

[9] https://www.policyforumforwales.co.uk

Section 2.3, event organisers, presenters and attendees can all be understood to have a vested interested in persuading of the value or otherwise of transitioning to a CE, expanding or undermining the CE ideological group, being seen to be part of or outside of such a group and attributing roles, responsibility and power for transition from their own institutional perspectives. As such, events and conferences are a structure that can act to influence, reinforce or undermine, perceptions of risk in transitioning to a CE. Involvement in such structures provides a wealth of opportunities in accessing potentially closed-door discourse data and observing or experiencing the effects of the situational context and agency. The ethical considerations are discussed in Section 5.6.

Overall, 23 third party events were attended in person, of which 12 enabled partial transcript data to be collected that could be analysed in line with the methodological strategy and framework described in Chapter 4. Data was collected in accordance with the ethics requirements associated with public domain events (see 5.6.2). A large quantity of data for analysis was created such as obtaining copies of presentations, taking photographs or recordings of presentations, transcribing presentations and producing notes of discourse and context of the discursive interaction. Data analysed was not a full account of all content presented or collected at events. During the Covid-19 lockdown, open forum events were attended online. The 12 events attended, providing partial transcripts of sufficient quality for detailed analysis, and the type of data used for analysis, are summarised in Table 8.

Event	Date and organiser	Data collection
Policy on waste in Wales - next steps for management, energy generation and the circular economy	4th July 2017, Policy Forum for Wales (delegate fee applicable)	Learning summary fieldnotes. Password protected transcript provided by organiser.
Circular innovation for SMEs	Advance London, 21st Nov 2017	Invite material, event leaflet, fieldnotes and copy of powerpoint presentation provided by organiser after the event.
SMEs and energy workshop	UKERC, 4th June 2018	Audience informed Chatham House rules applied. Fieldnotes, copies of presentations and meeting note after the event provided by the organiser.
Innovation in Lean Enterprise and Green Operations (iLEGO)	15th January 2019, Cardiff University	Recording of presentation & website information https://www.cardiff.ac.uk/news/view/1471348-circularity-in-industry
Closing Loops: Transitions at work	24th-27th Feb 2019, World Resources Forum	Fieldnotes, partial recordings and transcripts of presentations, powerpoint presentations, referenced documents and event published final report.
Waste to Wealth summit	12th June 2019, Business in the community (BiTC)	Fieldnotes, partial recordings and transcripts.
Sustainable Economy event series: Keep products and materials in use	27th June 2019, Sustainable Technologies Business Acceleration Hub (STBAH)[10]	Fieldnotes
Waste management in Wales: Creating a circular economy in Wales: Networking event	28th Feb 2020, Welsh Government and Tata Steel	Fieldnotes and partial recording and transcript.
How can we ditch the throwaway society?	10th March 2020, Green Alliance	Fieldnotes, recording of a presentation and copy of "Fixing the System" report launched on the day.
An equitable, inclusive, and environmentally sound circular economy in a post COVID-19 environment	13th May 2020, Future Earth, online open forum	Youtube live and recorded presentation https://youtu.be/CdRgj9ni-UE, notes of "chat" & summary report
How to Get Your Supply Chain to Embrace Circularity - webinar	23rd June 2020, webinar, GreenBiz	Copy of slides & recording of webinar via registration site
SCP virtual conference	24th August 2020, IChemE	Copy of recording of event

Table 8: Events attended used for analysis

5.4.1 Placement in government department

From February to end of September 2019 I undertook a part-time placement with a Welsh Government department, funded by the EPSRC[11], to carry out activities relating to the "grand challenge" areas highlighted in the UK Government industrial strategy, of which the CE is part

[10] https://www.stbah.org
[11] Engineering and Physical Sciences Research Council

(HMG, 2017). The primary activity of the placement was to support the development, testing and implementation of tools, resources and materials to enhance the engagement of businesses with CBMs, sustainable development goals and environmental sustainability innovation and support services.

The placement provided opportunities to test the scope of interactive workshop activities and materials, as detailed in Section 5.3.2, and directly obtain associated discourse data relating to understandings of risk in transitioning to a CE from SMEs and business support providers in this type of setting.

5.5 Published discourse data

Published public domain materials aimed at influencing policy can be understood to provide a wealth of data for DA studies and have been included in this thesis as a supplementary dataset. Methods commonly used to collect such data centre round creating a structured corpus of materials *(Breeze, 2011)*. Given the extensive quantity of material available and the detailed analysis to be carried out, for the purposes of this research the corpus of material was necessarily limited, and the corpus used in different ways.

As introduced in Section 3.4, one of the most powerful and legitimate groups that has the ability to influence the actions of SMEs through discourse has been argued to be public policy makers where there is often contested and negotiated narratives *(Silva et al., 2015)*. The dominant political "truth" created in policies and associated structures and instruments, for example, can be understood to legitimise particular knowledge, meanings, ideologies and intervention strategies *(Hajer, 1995)*. Furthermore, as stated in an ING[12] finance report *(2015, p. 7)*, "*the circular economy has attracted a lot of attention from a broad audience ranging from policy makers, scientist, NGO's and – often large – companies*". However, as both ING and TechUK[13] put forward this means there was "*a lot of hype about the circular economy*" *(TechUK, 2016)* and uncertainty of whether the CE is "*a trend to stay or a well intended hype?*" *(ING, 2015, p. 3)* in the period when the CE concept began to be embedded in UK and EU policy (see Section 3.4). As such, the published material was collected during a discourse structuration phase of the CE, so that there are likely to be arguments over the truth of knowledge claims, intervention requirements, ideological cohesion, meanings, roles and responsibilities and understandings of the CE in a range of different published materials from a range of actors. Therefore, this thesis looked to bring together a variety of documents produced by different actors considered to have the ability to influence policy and SME manufacturers.

[12] A global bank serving 39 million customers, corporate clients and financial institutions world-wide.
[13] TechUK is the "UK's leading technology membership organisation, with more than 850 members spread across the UK."

The corpus of materials centred on published documents (print or web-based) specifically aimed at businesses or can be understood to act to influence or relate to public policy in England and Wales. The aim was to collate together examples of the latest documents at the time of the research for each type of institutional arrangement associated with production value chain networks in the UK. The 70 sets of material included in the corpus are listed in Appendix 2 that included materials produced by the following bodies:

- Government: UK, Wales and Scotland
- Think tanks and policy influencers: Chatham House, Ellen MacArthur Foundation, Green Alliance
- Standards providers: British Standards Institute (BSI)
- Industry membership bodies: Aldersgate group[14], Business in the Community (BiTC)[15], CBI[16], MAKE UK[17], TechUK[18]
- Business consultants[19]: Accenture, Deloitte, EY, KPMG, McKinsey & company, PwC
- Financial institutions: AXA, ING
- Support and advice: WRAP, academia
- European institutions and programmes: CESME, EU, European Environment Agency

Trade associations were identified using the TA forum website[20]. At the time of searching the Manufacturing Technologies Association[21], GTMA[22] and EAMA[23] did not have published materials referring to the concept of the CE. The corpus was initially collected in November 2017 and a check made for updates in May 2018. New materials were also added as the researcher became aware of their availability, e.g.: a CE consultation, a new report launched at a CE-related event or a document informing research carried out by other institutions. The

[14] An alliance of leaders from business, politics and civil society that are politically impartial and champion the role of business in moving towards a sustainable economy. Members include some of the largest businesses in the UK with a collective global turnover of over £400bn, leading NGOs, professional institutes, public sector bodies, trade bodies and politicians from across the political spectrum.
[15] BiTC defines itself as "the largest and longest established business-led membership organisation dedicated to responsible business", has over 600 businesses as members, has a Resource Productivity and Circular Economy task force and state that their members have a "shared passion to bring the circular economy to life in the UK".
[16] CBI is one of the largest business membership organisations representing "190,000 businesses, employing 7 million people - about one third of the private-sector workforce globally".
[17] MAKE UK is The Manufacturers' Organisation who "champion UK manufacturing, and are a powerful voice at local, national and international level for all companies from small to large in the manufacturing and engineering sector."
[18] TechUK is the "UK's leading technology membership organisation, with more than 850 members spread across the UK."
[19] The list was selected from the 2016 Gartner list of top global consultancies: https://www.gartner.com/doc/3732917/market-share-analysis-consulting-services
[20] http://www.taforum.org/Members
[21] Represents over 300 businesses who "create and supply the technology that manufacturers use to make products" https://www.mta.org.uk
[22] Represents OEMs and Tier 1 businesses that are "leading companies in precision engineering, rapid product development, toolmaking, tooling technologies, metrology and other critical manufacturing related products and services" https://www.gtma.co.uk
[23] Engineering and Machinery Alliance, an alliance of independent trade associations that promote the interests of the UK machinery and component supply chain.

choice of documents was primarily based on the researcher's existing knowledge, references in academic journals and on-line searches of websites of organisations deemed by the researcher to be influential. Policy documents were analysed in detail and the remaining materials called upon to elaborate, expand, enhance, complement, or contradict the understanding of findings from interview, workshop and events data.

5.6 Ethical considerations and data management

The nature of the research raised a number of ethical considerations relating to management of data regarding participant informed consent, confidentiality and debriefing, use of data from public domain events and engagement with intermediaries, collaborators and influencers.

5.6.1 Interview and workshop informed consent and confidentiality

Participants who agree to be interviewed were fully informed about the aims of the research project and how data would be managed using a research information sheet compliant with GDPR[24]. A signed consent form, confirming participants understood the purpose of the interview and how their data would be managed was obtained from all participants (see Appendix 3). Participants were provided with options of either total anonymity or agreement of use of their institutional affiliation and were made aware they were providing consent for their details to be retained until December 2025 and that their data would be processed in accordance with GDPR. At the interview, the research aims and how the data would be used was reiterated verbally prior to the interviews beginning. This acted to ensure that any consent given was considered informed. All interviews were voice recorded.

Researcher and Supervisor contact details were provided to allow the participant to follow up after the activity in their own time, when they have had time to reflect on the activity.

The data management process in interviews entailed strict confidentiality and were entirely anonymous. Following transcription of recordings, all data remained confidential in accordance with British Psychological Society (BPS) 'Ethical principles for conducting research on human participants". Due to the nature of the research, it was necessary to be able to identify individuals who have participated in the project to be able match the identities of such participants with their data for a period (until December 2025). After transcription of recordings, original recordings of the interview and original transcripts derived from them are being held confidentially by the research team. Once transcribed, a generic identifier associated with the type of organisation was used in all discussions of the relevant transcript and any research output including publications, e.g., SME1, G1, A2. However, the researcher was necessarily aware of the identity of the respondent. Furthermore, information in the transcripts that could potentially identify the organisation or individual was replaced with a

[24] General Data Protection Regulations regarding consent and use of personal data that can directly or indirectly identify an individual

generic term to maximise anonymity, e.g.: process, material, name, turnover, role. The fully anonymised transcripts will be retained indefinitely for the purpose of checking the original data sets for clarifications if necessary.

Similar to interviews, participants in workshops were made fully aware of the research through the event information document (e.g.: online registration system, agenda, event synopsis, confirmation of registration etc.) and provided with an information sheet and consent form (see Appendix 3). Interactive sessions were voice recorded. All potential attendees were informed that they were under no obligation to take part in the recorded sessions, but participation required signing of the consent form. For the interactive workshops, data collection was neither strictly confidential nor strictly anonymous. The data management protocols adopted for the interviews were applied to the interactive workshop data. As with interviews, it was necessary for the research team to be able to identify individuals in the group activities and link them to the data set. However, the nature of the workshop meant that other people are present at the workshops affecting the level of confidentiality and anonymity that can be maintained upon completion of the workshops. Given that participants were all senior professionals they were understood to be familiar with the spirit of the Chatham House Rule:

"When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

The spirit of the rule applies primarily to the dissemination of information after an event, in which nothing should be done to identify, either explicitly or implicitly, who said what. The rule can be used effectively on social media sites as long as the person reports only what was said at an event and does not identify – directly or indirectly – the speaker or another participant. The requirement to adhere to the spirit of the rule was included in the workshop consent form and explained in the introduction to the workshop.

5.6.2 Use of collected information from public domain events and fieldnotes

Attending third party events was an integral part of the research activities (see Section 5.4) to obtain data on how the subject being researched was presented to audiences, the questions raised by audiences, responses obtained and to gain understanding of the situational context of the interactions. Although I acted to make it clear on registration and in direct conversation with other attendees the purpose of attendance, it was deemed unlikely that all attendees were aware of my intent. Furthermore, I took photographs or recordings of presentation materials and question and answer sessions and made notes. On this basis, these activities could be deemed as potentially being "observational without consent/ and/or involving any covert recording". However, the events attended were public access events, where it is common practice for photographs to be taken of presentation slides and recordings to be taken and provided on social media platforms after the event. The material collected was only for

research purposes and treated in the same way as interview or workshop data regarding anonymity.

The researcher adhered to the protocols of the events attended defined by the organisers of the event, e.g.: if Chatham House Rule applies or materials are asked not to be taken away (e.g., an unpublished report).

Fieldnotes taken during attendance at events and written up afterwards, included names or aliases and were held confidentially and available only to the research team. An anonymised version of field notes from events was also produced for wider use where appropriate within the research group.

5.6.3 Engagement with intermediaries, collaborators and influencers

The placement activity presented ethical considerations regarding my role and commitments, time available to deliver on agreements and the research and commercial opportunity aspects (e.g., workshop tools developed by the researcher). To address such issues, where a relationship was established and support provided by the intermediary body, a form of Terms of Reference (ToR) was produced for the placement, particularly as materials or information presented and shared during this activity were potentially deemed confidential or not available in the public domain (see Appendix 3). The placement required that I sign the “Official Secrets Act” regarding use of confidential or sensitive information, and on this basis the placement field notes remain confidential.

I adhered to the protocols defined in such agreements, including complying with the spirit of the Chatham House Rule (see 5.6.1). Due to the nature of the placement and my role in this setting, the data collection process carried out was neither wholly strictly confidential nor strictly anonymous. However, I treated all data not in the public domain as confidential.

Collaborators were called upon to support workshops carried out as part of the placement. Individuals presented either: the services they have available for the audience to call upon; new and informative research findings; information, guidance or advice on new developments (e.g., policies, standards, technological developments), or case studies applicable to the audience and the subjects being discussed. The involvement of third-party collaborators presented ethical considerations regarding managing participant data, use of presenters’ materials in the research and promotion of third-party services by Cardiff University. To manage these issues collaborators were informed that details on attendees at events would not be provided other than is provided on an attendees list, in line with common practice at such events. In addition, collaborators were informed that agreement to be involved in the event required them to agree not to actively solicit engagement with participants after the event, where participants have not explicitly agreed to further contact. Presenters were

required to make full disclosure during presentations any financial or other obligatory arrangements that apply to any services being presented.

During recorded interactive sessions at workshops, collaborators were able to attend and were treated as participants at that point and expected to abide by the same requirements as all other participants in the interactive sessions, such as Chatham House Rule. However, collaborators were free to network at the workshop as were all attendees. In addition, follow up communication with participants included copies of materials presented at the workshop, including contact details of presenters to allow attendees to follow up further if they wished. Such materials were provided through the researcher only. This type of activity is an expected norm of such workshops and was not considered to breach ethical requirements of workshops. Perceptions of endorsement of the collaborators is inevitable in this type of workshop and relies on trust of the quality of service provided by the collaborator. To minimise reputational risk, collaborators were purposefully selected from those endorsed by influential parties (e.g.: Government funded programmes, leading HEI departments) or were influential organisations in themselves (e.g., policy-makers, funding bodies, industry respected organisations).

5.7 Summary: data collection

In this chapter details of how data was collected and from whom and how it was managed in accordance with ethics requirements throughout the research process have been provided. A mixed methods data collection strategy was adopted. Purposeful interaction using interviews and workshops was the core method used. Supplementary methods included attendance at events, the collation of a corpus of published materials and taking up a placement with Welsh Government. Supplementary methods were called upon to obtain discourse data that could be used to elaborate, expand, enhance, complement, or contradict the understanding of findings from interview and workshop data. The mixed methods approach adopted resulted in 15 hours of interview data, three hours of workshop data, partial transcript and fieldnotes from 12 third party events and 70 public domain documents from 26 different institutions being collected.

In the next chapter, the process of analysis of the data collected is explained in relation to the analytical framework described in Chapter 4 and the reliability, validity, replicability and generalisability of research findings discussed.

PART 3: ANALYSIS AND RESULTS

6 Analytical steps

This chapter is an account of the approach adopted in performing the nine steps of the analytical framework defined in Chapter 4 using the data collected as described in Chapter 5. The findings and interpretative analysis resulting from carrying out these steps are presented in Chapters 7 to 9. An overview is provided of the approach. This includes: gaining theoretical sensitivity; initial coding; initial interpretation of how discourse is constructed and for what purpose; identification of repertoires; development of theoretical accounts; analysis and production of theoretically sound interpretations of the situational context influencing perceptions of risk for established Small and Medium-sized Enterprises (SMEs).

6.1 Theoretical sensitivity

The aim of this section is to provide an account of how the first two steps were addressed, i.e.:

Step	Approach	Purpose
1: Theoretical sensitivity	Familiarisation with pre-existing ideas, concepts, arguments, historical and contemporary theories and knowledge.	To gain an understanding of the situational context of discursive interaction to help identify what may be "important" and give it meaning, what may be missing and when data does not support existing theory.
2: Data collection	Information collection using a wide range of type of data, sources and methods. Back and forth between steps 1 and 2.	To create data for analysis.

In Chapter 2, the theoretical underpinnings of this thesis in relation to the conceptualisation of decision-making, perceptions and risk and experience and knowledge of the researcher were outlined. In Chapter 3, a review was provided of research, discourse and critiques relating to SMEs engagement with circular business models (CBMs) and how this relates to risk. Chapter 4 highlighted how taking account of entities and their structures that may or may not manifest themselves in discourse is important in developing robust interpretations. Overall, the research undertaken in producing these chapters was instrumental in gaining theoretical sensitivity. However, the review of literature in the production of these chapters demonstrated that there are multiple potentially consistent and conflicting theories, discourses, institutional arrangements, entities and associated structures and rules with causal powers that could work in isolation or in combination as causal mechanisms in perceptions of risk. The range of theories, entities and their structures and discourses identified in the literature, that could be organised as relating to the primary entities of interest, i.e., SMEs, transitioning to a circular economy (CE) (transition, waste, the environment, economics, governance) and risk,

influenced the data collection described in Chapter 5 and the analysis and development of theory described in Chapters 7 to 9.

Regarding Step 2, the data collection strategy is described in detail in Chapter 5. Implementation of the mixed methods strategy resulted in 15 hours of interview data, three hours of workshop data, recordings, presentations and part transcripts from 12 third party events, 70 public domain documents from 26 different institutions and a large volume of field notes being collected.

6.2 Initial coding

The aim of this section is to provide an account of how Step 3 was addressed, i.e.:

Step	Approach	Purpose
3: Initial coding	The development and application of a common coding framework to generate low level "nodes" that categorise features of the discourse irrespective of the type of data collected.	To ensure some level of consistency in data management.

As discussed in Section 4.2, principles of Grounded Theory Methodology (GTM) were drawn upon in this thesis including three stages of coding. The preliminary task of any GTM informed discourse analysis (DA) research is to develop and apply labels, or "initial codes" to the data as a facilitating mechanism for initial analysis *(Potter, 2009)*. This step is that first task.

The purpose and choice of coding approach is determined by the researcher, influenced by the questions being investigated and the type of DA being carried out. As explained in previous chapters, the focus of this thesis is understanding how established entities, structures and rules of the manufacturing regime are interpreted and used to discursively construct risks for SMEs in transitioning to a CE. The purpose, or action orientation of such construction, as discussed in Chapter 4, is important in understanding what is deemed as having causal powers and what combinations are understood to act as causal mechanisms, (see Section 2.2). In this thesis, initial coding was a mechanism for structuring the data that enabled different types of data to be brought together for further analysis under one low-level node or "broad theme" that described what the content was interpreted as being about and not how the discourse was produced *(Pidgeon et al., 1991)*. To facilitate this data management, a computer assisted/aided qualitative data analysis software tool, NVIVO[25], was used. Transcripts, published texts and ethnographic materials collected were incorporated into the software, although not all data was coded. A worked example of the data organisation and initial coding process using NVIVO is presented in Appendix 4.

[25] https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home. NVIVO was used as this is the tool available free of charge to students at Cardiff University. Other tools are available.

Initial coding, in terms of labelling of data, was an iterative process and carried out at different times in the research during Phases 1 and 2 (see Section 5.2). Paragraph by paragraph coding was carried out on all materials being analysed at a particular moment in time. An individual paragraph was generally coded at a number of the initial low-level broad theme nodes, e.g.: risk, SMEs, money, market and customers, subject positioning of others, responsibilities. Such coding consisted of *a priori* constructs derived from the literature as summarised in Section 6.1, informed by the researchers own knowledge, influenced by pre-existing theory, experience, perspectives and cultural understandings.

For each interview transcript or piece of text coded, the nodes were refined, added to, made redundant, combined or disaggregated into a set of what could be understood to be thematic labels encompassing a wide range of related concepts. The resulting thematic coding matrix, after this first stage coding of all 13 phase one interview transcripts and 17 of the published documents consisted of 17 "parent"[26] nodes and 53 associated "child" nodes as summarised in Appendix 4. The published materials coded at this initial stage focussed on policy documents, a CE standard guide and industry membership bodies, the Aldersgate Group and Business in the Community (BiTC) who are proponents of the CE.

Given that the nodes were intentionally open to interpretation, different type of data could be coded at the same node. For example, published text is just as likely to engage in a discourse of responsibilities as an interview participant is, although the nature and nuances of the discourse of responsibility may vary. However, this does not mean all the nodes necessarily applied to all type of data.

Published text were not always coded completely. Partial coding was carried out on lengthy documents, being generally coded at paragraph-by-paragraph level of detail for the executive summary, introduction and concluding sections and sections specifically referring to the concept of the CE or closely related concepts (e.g., resource efficiency, clean growth). For example, the UK Government's Industrial Strategy has 240 pages (excluding references) covering a wide range of government policy *(HMG, 2017)*. Therefore, for this document coding was carried out on 26 pages incorporating the ministerial foreword, the introduction, the grand challenges and conclusions and sections specifically referring to the CE. A full list of all documents collected for use in analysis are included in Appendix 2, where those coded and incorporated into the first phase of analysis are marked. The total number of pages fully or partially coded initially from the corpus was 137.

[26] Parent and child nodes is terminology used in NVIVO to describe a hierarchy of nodes. A parent node is a concept that would be understood to encompass a range of other concepts (child nodes), for example Time is a parent node with child nodes being lifecycle, pace or speed, urgency.

6.3 Initial interpretation

The aim of this section is to provide a description of the first stage of analysis of the data, i.e., Step 4:

Step	Approach	Purpose
4: Initial interpretations	An analysis of data under a node of interest adopting a relational theory of risk perspective and business model value chain network lens asking the questions: • What is the discourse doing? • How is the discourse constructed to make this happen? • What resources are available to perform this activity? • What is the action orientation of the discourse? • What versions of the world are being constructed/ stabilised/ questioned? • Whose interests are being served?	To provide a descriptive interpretation of what the producer of the discourse was doing in relation to the node and provide insights into how entities and their structures, concepts and causal powers have been constructed and for what purpose.

This Step is my interpretation of the second stage of coding adopted in GTM, in terms of creating second-level interpretative descriptions (see Section 4.2). The focus is on the finer detail of how producers present discourse *(Pidgeon et al., 1991)*.

Similar to the approach adopted by Willott and Griffin *(1999)*, the analysis was my interpretation of how network actors position different entities and their structures and causal relationships. In this step an initial parent node (see section 6.2) was selected for analysis to work towards identifying recurrent or variable discourses and their purpose. Investigating data in this way helps to understand how the producer of the discourse interprets the node, their "intentions" of the discourse (e.g., what is being done with the discourse) and the resources, entities and structures and rules of the manufacturing regime called upon to achieve this.

The parent node "being an SME*"* was selected as the first node for analysis, on the basis that identifying what understandings were called upon and the meanings associated with the concept of being an SME would potentially bound discourse of risk for SMEs and the CE as highlighted in Section 3.4. The initial analysis, brought together 97 extracts coded at the node being an SME from 24 sources, of which 68 were from interviews. Given that the business workshops and the majority of transcripts of events and conferences were produced after initial coding was carried out, these were not part of this analytical step. It is to be noted that extracts associated with the interviewed businesses was coded at SME when it was inferred they were positioning themselves as an SME, for example the utterance "business like us, the size of us" even though the term SME hadn't been used directly. In addition, seven extracts coded at the node "subject position self*"* were analysed when it was interpreted such positioning related to the concept of being an SME. Each extract was examined in turn and an initial descriptive interpretation of what the discourse was doing in relation to the concept of being an SME was

identified by asking each of the questions defined for Step 3. A worked example of this stage of the process is included in Appendix 4.

6.4 Repertoires

This section presents Step 5 of the analytical framework as shown below:

Step	Approach	Purpose
5: Repertoires	A review of the interpretations, identifying recurrent and irregular relationships between discourses that form repertoires and how these relate to the situational context.	To produce a set of repertoires incorporating patterns of discourse relating to the original node and their relationship to the situational context.

This Step is my interpretation of the third stage of coding adopted in GTM, in developing higher level categories that represent patterns or grouping of codes and make conceptual sense *(Tracy, 2013)*. In this thesis these patterns are defined as repertoires (see Section 2.3). A diagrammatic approach was adopted in relating patterns of discourse. For each initial interpretation, the discourses called upon in the construction of being an SME were visually linked. Each extract was then reviewed in turn and new discursive relationships added where necessary or relationships "thickened" when called upon by other actors or in other extracts potentially relating to a different entity. The arrangement of discourses were then interpreted as forming repertoires as summarised in Figure 5 and detailed in Figures 6 and 7.

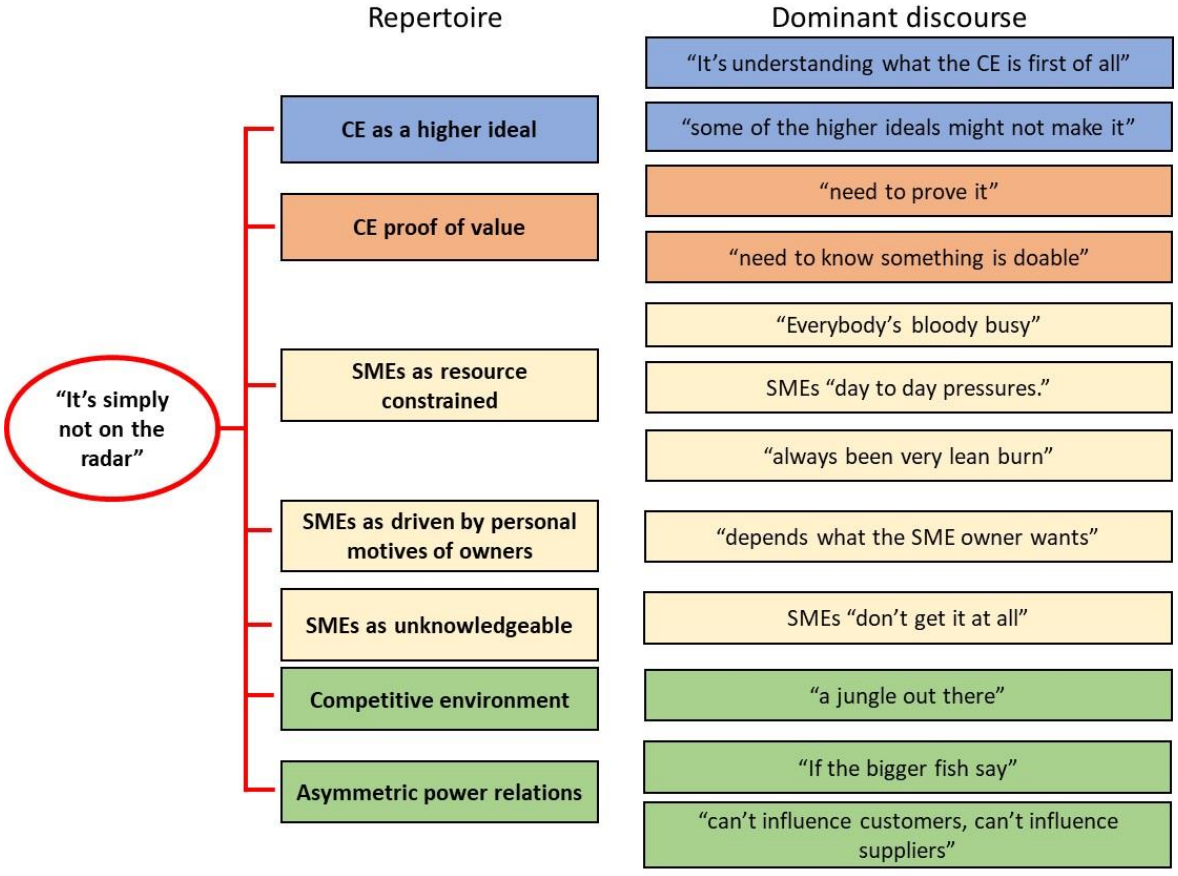

Figure 5: Identified repertoires

As shown in Figure 5, the discourses were allocated an emic descriptor derived from the data that was interpreted as encompassing a range of discourses orientating to a similar position. For example, “everybody’s bloody busy” was deemed an appropriate emic descriptor for the of SMEs as time constrained, relating to SMEs lacking time and human resources to carry out activities beyond the “day to day pressures” where SMEs have “always been very lean burn” in terms of financial resources of the business and profitability. Such descriptors were chosen on the basis of being representative of use of similar wording and the broad concept, ideas or images being presented *(Taylor, 2013b)*. These three discourses were interpreted as forming an “SMEs as resource constrained” repertoire.

Twenty eight recurrent discourses were identified from the analysis of the node being an SME for interview data relating to the construction of action by SMEs on innovation, environment or the CE. The relationships between the discourses were reviewed and a summarized interpretation of the variety of relationships is shown in Figure 6 for the interview data. Twelve coherent dominant discourses were identified that called upon the 16 subordinate discourses individually or in combination with other subordinate or dominant discourses in discourse of actions by SMEs. Each discourse also called upon a range of detail discourses. The dominant discourses were then interpreted as forming seven repertoires relating to the three questions in this thesis. In the figures, discourses coloured yellow have three overarching repertoires, one of “SMEs as resource constrained”, a repertoire of “SMEs as driven by personal motives of owners” and the third of “SMEs as unknowledgeable” and relate to Question 1: What is understood of SMEs and their decision-making when part of existing value chain networks regarding transitioning to a CE? The discourses coloured green also inform question 1 but relate to understandings of the role of SMEs in supply chains and revolve around an overarching repertoire of “asymmetric power relationships” and a repertoire of *a “*competitive environment*”*. The discourses coloured blue formed part of an overarching repertoire of the “CE as a higher ideal*”* and relate to Question 2: What is understood of the CE and development of CBMs? The discourses coloured orange form the repertoire of “CE proof of value” and are important for Question 3: What is understood of risks for SMEs in actively adopting CBMs? The discourses coloured grey are those determined to be subordinate discourses connecting to a range of dominant discourses. The uncoloured discourses were detail discourses that were highly variable. The discourses for the coded published documents at the node being an SME is shown in Figure 7. Further details of this state of the coding process are included in the worked example of the coding process in Appendix 4.

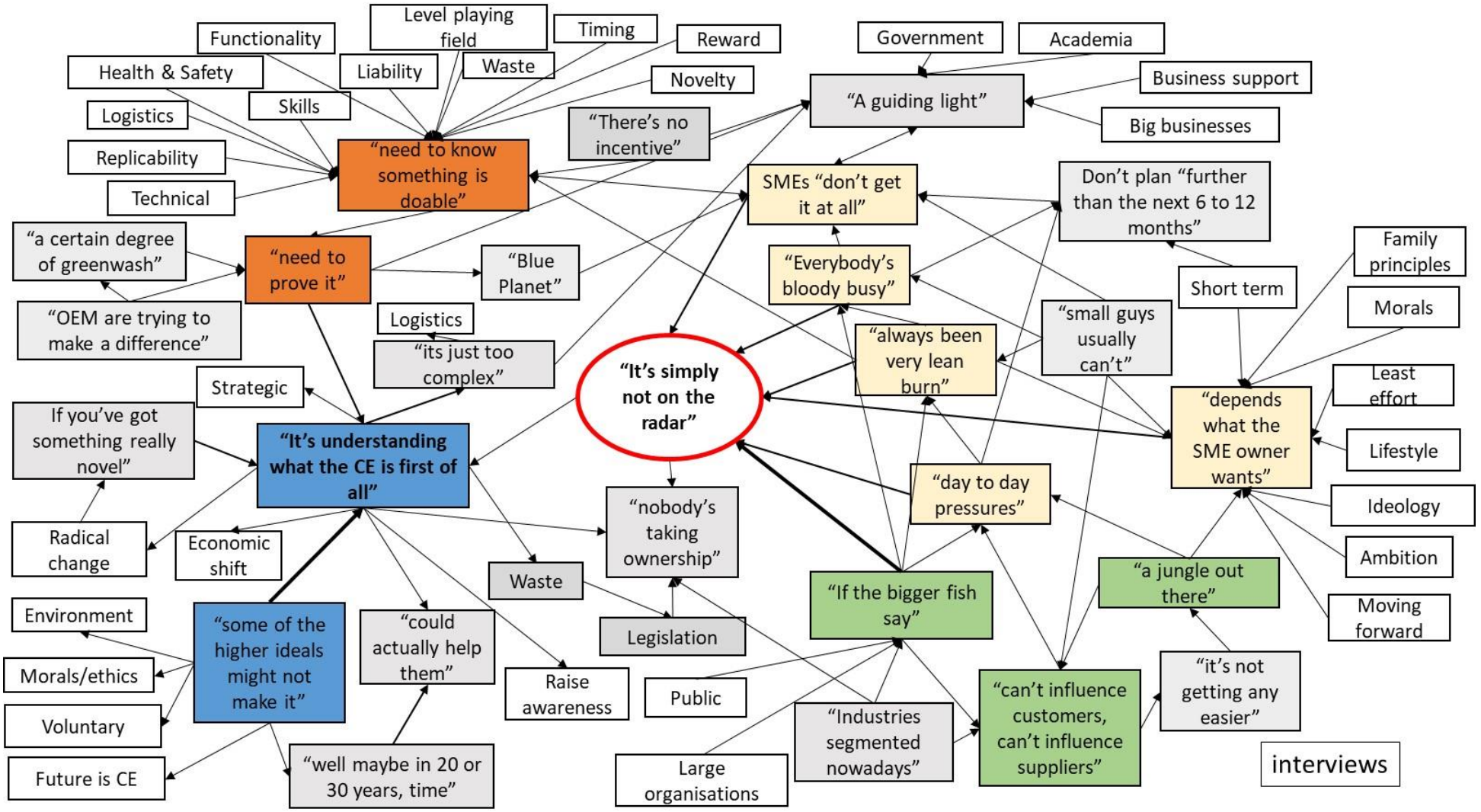

Figure 6: Network view of relationships between discourses for interview data at node "being an SME"

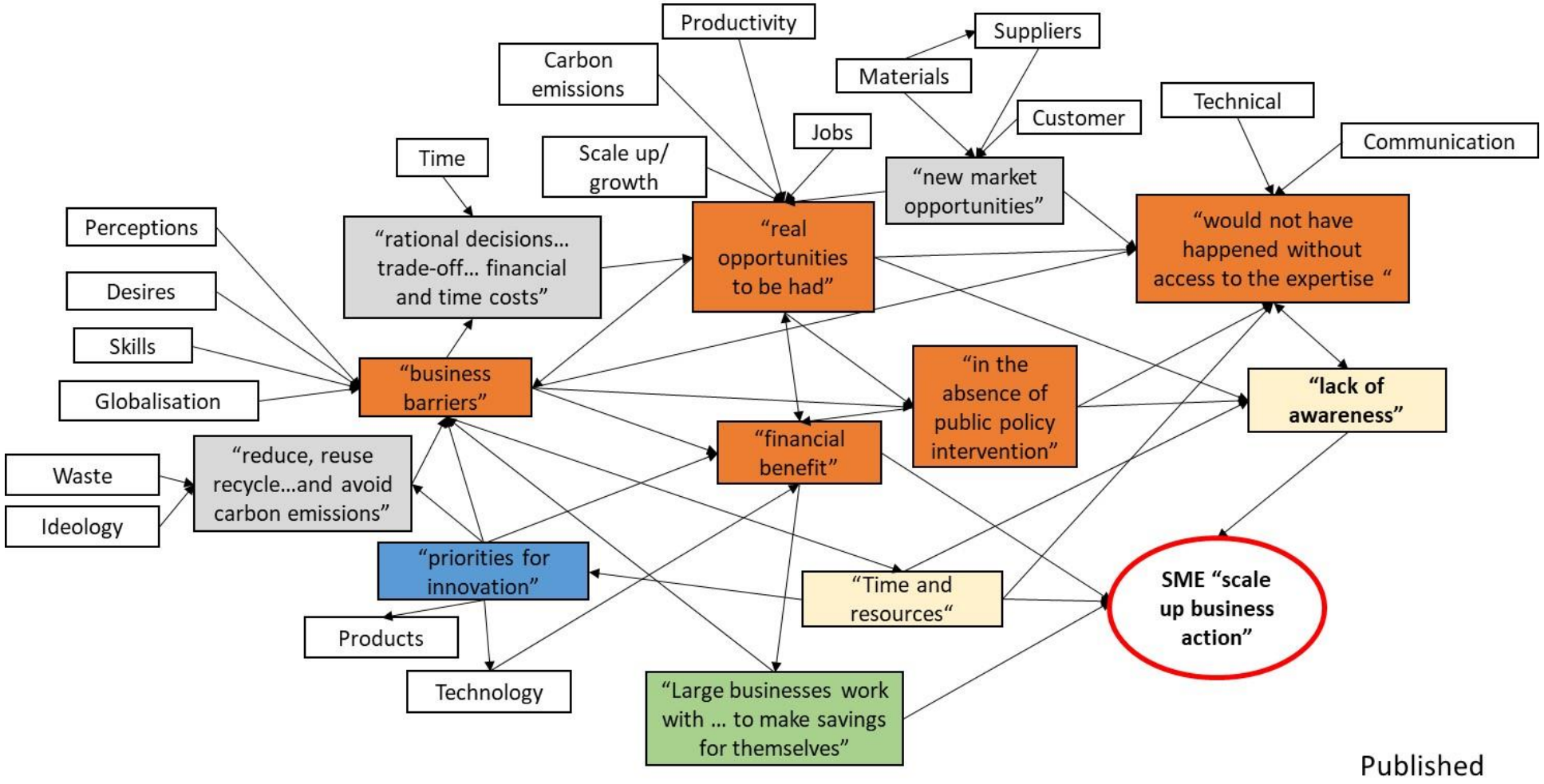

Figure 7 : Network view of relationships between discourses for analysed published data at node "being an SME"

6.5 Detailed analysis and meta explanation

This section explains the approach to carrying out Steps 6 and 7 of the analytical framework. However, these steps, as shown in Section **Error! Reference source not found.**, are part of a n iterative process with Steps 4 and 5 discussed in Sections 6.3 and 6.4 previously, and Steps 8 and 9 discussed in Section 6.6. As such, this section provides an overview of how repertoires were selected for detailed analysis, the identification of causal mechanisms and the data that was used for detailed analysis.

Step	Approach	Purpose
6: Detailed analysis	A review of the repertoires and patterns of discourse from Step 5 in relation to Step 1. Drawing on additional extant literature, knowledge or new data (Step 2) identifying consistencies and variations and providing a detailed analysis of the repertoire.	To provide a detailed analysis that underpins initial theoretical accounts of historically established causal mechanisms that are potentially culturally, socially or politically specific to the situational context of production of discourse in relation to perception of risk.
7: Meta-explanation	Application of prioritised repertoires to a new node, identification of new repertoires or discourses, consistency or variation.	To determine if prioritised repertoires in one node provide a meta-explanation of the ways another node is discursively constructed and relates to perception of risk.

As highlighted in Section 4.2, the DA approach adopted in this thesis pays particular attention to ideological dilemmas, where individuals can call upon conflicting and concurring positions regarding the generally unquestioned “common sense” rational ways of thinking and acting *(Billig, 2005)*. On this basis, the analysis centred on investigating repertoires that were interpreted as incorporating conflicting interpretations of entities and their structures, knowledge and rules of the manufacturing regime and their causal powers. For example, comparing the network maps presented in Section 6.4 there is consistency in the presence of the “SMEs as resource constrained” repertoire in both interview and published discourse. As discussed in Section 3.2, this repertoire is a prevalent feature of discourse of drivers, barriers and enablers used as a validating device for lack of engagement of SMEs with concepts. It is also used to warrant particular types of interventions that focus on the value creation aspect of a business model. The reality and shared knowledge of the availability of resources for SMEs and this having a relationship to actions taken by SMEs is not questioned in this thesis. Neither is the premis that access to support (knowledge, expertise or finance) would be of value in enabling SMEs to change how they deliver value to customers in terms of value creation (see Section 1.4). What was of more interest in this thesis were those repertoires that appear to incorporate conflict or contrary maxims that may act to position or reinforce engagement with CBM, irrespective of the availability of value creation support, as either a risk object for SMEs or not. Such repertoires focussed on the value proposition and capture

elements of a business model, in relation to what was perceived to be of value to customers and the value to the SME of delivering customer value.

The “asymmetric power relations” repertoire was interpreted as relating to the entity customer-SME relationships, influencing perceptions of the operating conditions for SMEs in production value chain networks, their role and freedoms. This was selected as the first repertoire for further investigation, on the basis that, firstly, the repertoire was interpreted as potentially countering the “SMEs as driven by personal motives of owners” repertoire. Secondly, as identified in Step 1, power relations and producer-consumer relationships are understood to be a major aspect in the future of the CE, determining who controls the discourse of the CE, who decides what is to be done and how and who is to benefit. However, it is rarely accounted for in discourse of the CE that tends to focus on value creation business led solutions, technology and innovation *(Friant et al., 2020; Hobson & Lynch, 2016; Lazarevic & Valve, 2017)*. Furthermore, as discussed in Chapter 3, an arrangement of rights, customer relationships and customer demands and behaviours have been identified in research as having powers to influence decisions. Therefore, it was interpreted that a power and relationship dynamics causal mechanism exists, influencing action in SMEs. However, few interventions are undertaken in relation to this mechanism beyond “greening” the supply chain, use of voluntary instruments and public procurement to encourage change. The “asymmetric power relations” repertoire was assessed as being a key part of the power and relationship dynamics causal mechanism and of primary importance in answering the research question: What is understood of SMEs and their decision-making regarding transitioning to a CE? Analysis of the repertoire enabled an understanding of what is of value and at stake for SMEs to be developed and is analysed in Chapter 7.

The 19 interview extracts and two published policy extracts coded at the node “being an SME*”* that called upon the repertoire were collated together and additional extracts coded at other nodes relating to the repertoire brought in. For the analysis, six business interview extracts coded at the node “subject position self*”* that were interpreted as calling upon discourses relating to relationships with customers, the Government, consumers, society etc were added. These extracts were included on the basis that how each person interviewed in an SME positioned themselves in the production value chain network was as equally valid an interpretation of being an SME as extracts where the concept SME is explicitly called upon. Furthermore, for the analysis of the repertoire, 15 extracts coded at the node “markets and customers*”* were also added where it was interpreted that power dynamics and relationships were being talked about. The new extracts were analysed in turn in the same way as the initial extracts coded at the node “being an SME*”*, asking the six questions (see Section 6.1). After each new extract was analysed, how it related to the previous interpretations was reviewed and previous interpretations amended and expanded as appropriate, going back and forth

between earlier analysis, new analysis, existing research, knowledge and theory to check for variations and consistencies. Given that each extract was coded at more than one node, therefore incorporating other discourses, these other discourses were analysed as part of the process. Where a “new” repertoire or discourse was identified, a check was made to earlier analysis to identify if they were evident but had not been coded. If necessary, the previously analysed extracts were then coded at the new associated node for consistency. In addition, nine extracts from the two interviews carried out in March 2020 with a consultant and an SME that had not undergone the initial coding but were deemed as calling upon the repertoire were also brought into the analysis. Example interview and published extracts are provided in Appendix 5.

The process of selecting a repertoire for further interrogation, bringing in additional extracts coded at different nodes, initial interpretation of new extracts and a back and forth between previous interpretations and new interpretations was repeated. The process stopped when it was deemed there were potentially theoretically robust explanations of the repertoire and its relationship to the situational context, embedded empirically in the data analysed, to be taken forward in the next step. Following analysis of the “asymmetric power relationships” repertoire, two others were interrogated as summarised below.

The initial interpretations of extracts coded at the node “being an SME*”* in relation to the “asymmetric power relations” repertoire indicated that there may be conflicting interpretations of how the CE and development of CBMs provides value to businesses and customers, as identified in Chapter 3. The “CE as a higher ideal” repertoire relates to the entity ideology and values. Central to the repertoire was an understanding that the CE had a connection to environmentalism values and ideology. This aligns with understandings and discourses presented in Chapters 1 and 3, such that it was interpreted that this repertoire is part of a values and ideology causal mechanism. However, the repertoire incorporated dilemmatic arguments regarding how environmentalism values and ideology fit with the expectations of SMEs to be “*commercial*” as part of a free-market economy ideology underpinning the current landscape. SMEs are expected to rationally make decisions on a utility, material and economic cost-benefit basis that align with how customers engage with environmentalism values and ideology. As such, perceptions of customers’ values influence perceptions of uncertainties. Conflicting interpretations of how the CE and CBMs are valued were highlighted in Chapter 3, with such conflict present in the “CE as a higher ideal” repertoire. Analysis of this repertoire was important in being able to answer the research question: What is understood of the CE and development of CBMs? In terms of explaining perceptions of uncertainties this question is analysed in Chapter 8.

During the initial coding step (see Section 6.2), extracts were coded at the parent node "ideology*"* when it was interpreted that the discourse referred to ethical or moral beliefs, values, ideals, principles, doctrines associated with a concept (e.g., circular economy, environment, governance, manufacturing). For respondents, such as government representatives, business support providers and academics who had vested interests in promoting the CE or associated pro-environmental concepts, this repertoire also called on the "SMEs as driven by personal motives of owner's" repertoire. This repertoire highlighted earlier as conflicting with "asymmetric power relationships" repertoire.

As with analysis of the "asymmetric power relations" repertoire, additional extracts were brought in for interpretation, that hadn't already been interpreted at the node "being an SME", "subject position self" or "markets and customers" in the previous analysis. 37 interview extracts and eight coded published text extracts interpreted as discussing ideological conflict (political, economic or environmental) were included in the analysis. Findings from the earlier analysis in relation to the new repertoire being investigated were reviewed before each new extract was analysed in turn with variations and consistencies identified when compared with the previous analysis.

All sets of analysis up to this point indicated that there were conflicting interpretations of the validity of the practicality and value of developing CBMs for SMEs and their customers. It was recognised that there are a wide range of uncertainties and consequences regarding value creation elements of CBMs by all actors. This including technology, access to materials, infrastructure, skills development and access to finance for investigating options that could be addressed through support and funding. However, constructions of consequences in relation to value proposition and capture for SMEs aligned with two counter discourse coalitions that were interpreted as relating to a trust and truth causal mechanism. One coalition positioned there being little uncertainty of value proposition and capture positive consequences as there is objective evidence of "opportunities" regarding "benefits", as included in policy discourse outlined in Section 3.4 and CE proponents discourse outlined in Section 3.5.5. The counter coalition, dominant in interviews and workshops, positioned high uncertainty of positive consequences as experiential evidence points to action resulting in unrecoverable costs and losses for SMEs and customers. Both coalitions called on the "CE proof of value" repertoire. Analysis of this repertoire was therefore important for answering the research question: What is understood of risks for SMEs in actively adopting CBMs? Analysis of the conflict in this repertoire enabled explanation of why differing perceptions of consequences of proactive action by established SMEs can co-exist and is analysed in Chapter 9.

On this basis, in addition to the extracts analysed under the previous patterns, five interview extracts and ten published extracts coded at the node "being an SME*",* interpreted as calling

upon discourses of evidence of value proposition and capture consequences and uncertainties associated with changing business models, were brought into the analysis. Furthermore, 19 interview extracts, and six examples of coded published extracts coded at the nodes “trust and credibility” and/or “cynicism or scepticism” that hadn’t already been analysed were called upon. This was alongside a further 36 interview extracts and 31 example published extracts coded at the nodes “opportunities”, “consequences” and “situational uncertainties” deemed to relate to proof of value proposition and capture uncertainties and consequences. An additional 15 extracts from the Phase 3 interviews were also brought in.

6.6 Results, interpretative analysis and saturation

This section provides an overview of the approach to developing interpretative theories explaining the existence and effects of the causal mechanisms on perceptions of risk for established SMEs, addressing Steps 8 and 9 of the analytical framework, as shown below:

Step	Approach	Purpose
8: Interpretative analysis	The revision, augmentation or discarding of findings and development of relational theoretical accounts as appropriate as new nodes are analysed. Steps 4 to 8 are repeated until no new relational theories are found.	To establish interpretative theories about relationships between concepts grounded in the data and situational context.
9: Saturation	Testing and refining the relationships between interpretative analysis results through additional data collection and constant comparison.	To constitute a formal position.

The detailed analysis and interpretations of the repertoires and associated causal mechanisms are provided in Chapters 7 to 9. The analyses presented in these chapters focuses on interview and published document extracts that underwent detailed analysis described in Section 6.5. However, testing and refining of findings was an on-going, iterative process. Firstly, workshop transcripts resulting from the placement with Welsh Government (see Section 5.4.1) were called upon to determine if the findings associated with interview data equally applied to researcher orchestrated workshop settings. As third-party events were attended and part transcripts produced, the findings continued to undergo review, and data from such events brought into the analysis. Examples of the type of data from the workshops and events collated together and used for analysis is provided in Appendix 5. Furthermore, the corpus of published materials (Appendix 2) was also called upon as a “light touch” check of the applicability of findings to a diverse range of published material.

The aim of Step 8 was to develop interpretative “theories”, i.e., statements, explanations or generalised patterns about relationships between a concept and an outcome *(Ezzy, 2002)*. In developing such theories, in line with the methodological strategy defined in Chapter 4, the findings were first interpreted inductively. Inductively, inferences were made that the findings

could also apply to discourse that has not been studied and to other individuals or organisations *(Bryant & Charmaz, 2007)*. Abductively, *a priori* theory, knowledge or experience was called upon in the analysis to situate the findings in the context of what I already knew. This primarily relied on the knowledge gained in carrying out Step 1 (see Section 6.1) regarding theoretical sensitivity and gave an indication of how existing theories and knowledge could explain similarities and differences. Abductive reasoning in this way was used to show how something might be logically inferred that was not evident in the data, bringing together things that might not be understood to be associated with one another *(Ezzy, 2002)*. Abductive theory may be inconsistent with existing or obvious explanations but it provided a hypothesis for investigating further and asking the question why does a relationship exist *(Ezzy, 2002)*. Importantly, in developing the interpretations I engaged in retroduction by taking the inductive and abductive descriptions and analysis and again calling upon *a priori* knowledge and experience, identifying the necessary contextual conditions that must be "true" to make an phenomenon possible *(P. K. Edwards et al., 2014, Chapter 1; Oliver, 2011)*. In this way, a theoretical perspective on the conditions necessary to encourage established SMEs to actively engage in the development of CBMs could be put forward.

6.7 Summary: the analytical process

As defined in Chapter 4 a nine-step analytical framework was developed and used. For Step 1, theoretical sensitivity was gained through the production of Chapters 2 to 4. Data collection (Step 2) was carried out in accordance with the mixed method research strategy described in detail in Chapter 5. Step 3 involved paragraph by paragraph coding of interview data and selected published documents in accordance with a grounded theory framework as discussed in Section 4.3. In Step 4, selected coded extracts were analysed, where the following six questions were asked of each extract:

1. What is the discourse doing?
2. How is the discourse constructed to make this happen?
3. What resources are available to perform this activity?
4. What is the action orientation of the discourse?
5. What versions of the world are being constructed/ stabilised/ questioned?
6. Whose interests are being served?

Each of the interpretations were then reviewed in Step 5, adopting a diagrammatic approach to identify recurrent and irregular discursive relationships that were deemed to form repertoires. Steps 6 to 9 involved an iterative process. In Step 6, those repertoires incorporating conflicting perspectives on the same entities, structures and rules of the manufacturing regime were selected for detailed analysis, that could help explain differing perspectives regarding the research questions and the existence of causal mechanisms. The relationship to causal mechanisms was determined by calling upon the results of Step 1. The

three repertoires and their associated causal mechanism in relation to each research question that were selected for detailed analysis are summarised in Figure 8.

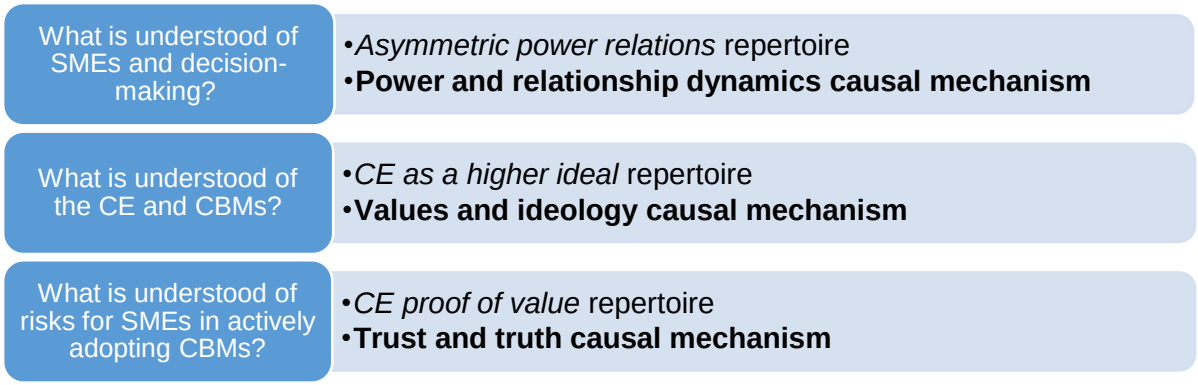

Figure 8: Investigated repertoires and causal mechanisms

For Step 7, all interview and published extracts that were coded at different nodes that were deemed to have a relationship to each repertoire were collated together and interpretively analysed. In carrying out Steps 8 and 9, additional data from workshops, third party events and the corpus of materials were called upon to refine, elaborate or validate the detailed analysis. Finally, interpretative theories were developed that explained the existence and influence of the identified causal mechanisms on perceptions of risk for SMEs in transitioning to a CE. These theories were developed through cycles of inductive, abductive and retroductive reasoning building upon existing theoretical perspectives and knowledge.

The analysis of data and the associated interpretative analyses are presented in Chapters 7 to 9. Chapter 7 addresses Research Question 1, Chapter 8 covers Research Question 2 and Chapter 9 answers Research Question 3. In the three chapters, discourse from the collected data is identified using speech marks and italics, e.g., "*if the bigger fish say*". Where discourse is attributed to a specific individual, they are purposefully anonymised, e.g., Interviewee 1, SME. This is because it was the call on the causal powers of institutionalised entities and their structures and rules of the manufacturing regime that was of interest and not the individual or specific organisation (see Chapter 2). The type of organisation is identified, as the role of an organisation and their associated rights and duties in production value chain networks was taken to influence engagement and interpretation of the causal powers of entities, structures and rules of the manufacturing regime as discussed in Section 2.3 *(Andreouli, 2010)*.

7 What is understood of SMEs?

As explained in Chapter 6, three repertoires were selected for detailed analysis. In this chapter the asymmetric power relations repertoire is the subject of analysis relating to customer-Small and Medium-sized enterprise (SME) relationships. This repertoire is fundamental to a power and relationship dynamics causal mechanism underpinning what is of value and at stake for SMEs. The repertoire was assessed as being of primary importance in answering Research Question 1: What is understood of SMEs and their decision-making when part of existing production value chain networks regarding transitioning to a circular economy (CE)?

Power is an abstract, familiar multidimensional concept that has many meanings. The power and relationships dynamics causal mechanism exists due to an arrangement of entities and their structures, knowledge and rules of the manufacturing regime that have causal powers and liabilities that when activated support or undermine existing power and relationships dynamics. This causal mechanism is fundamental to all business interactions, but the activation and influence of the causal mechanism relates to the dependency configuration and enactment of power between SMEs and customers *(Huo et al., 2017)*. What this means is that the effect is contingent on how the mechanism is recognised, constructed in discourse and activated (resisted or complied with) in interaction *(Sayer, 2004)*. As highlighted in Section 3.2.2, interpretations of power and relationship dynamics have been identified in research as influencing perceptions of freedoms and constraints in decision-making.

The overarching repertoire incorporated arrangements of three dominant discourse patterns constructed as structures of SME-customer relationships relating to size that influence action. These being discourses of, hierarchy, power distribution and enactment and dependency, as shown in Figure 9, drawing on the other discourses and repertoires (see Section 6.4) to supplement or enhance the use of the repertoire. Forty-nine interview extracts and two coded published policy extracts plus the transcripts from two facilitated workshops were central to the analysis. However, in line with the methodological strategy detailed in Chapter 5, supplementary data was brought in from third party events (see Section 5.4) and the corpus of public domain materials (see Appendix 2) to refine the findings. Each pattern of discourse is analysed separately in Sections 7.1 to 7.3. An interpretative theory explaining why the repertoire and associated causal mechanism exists and has an effect is presented in Section 7.4.

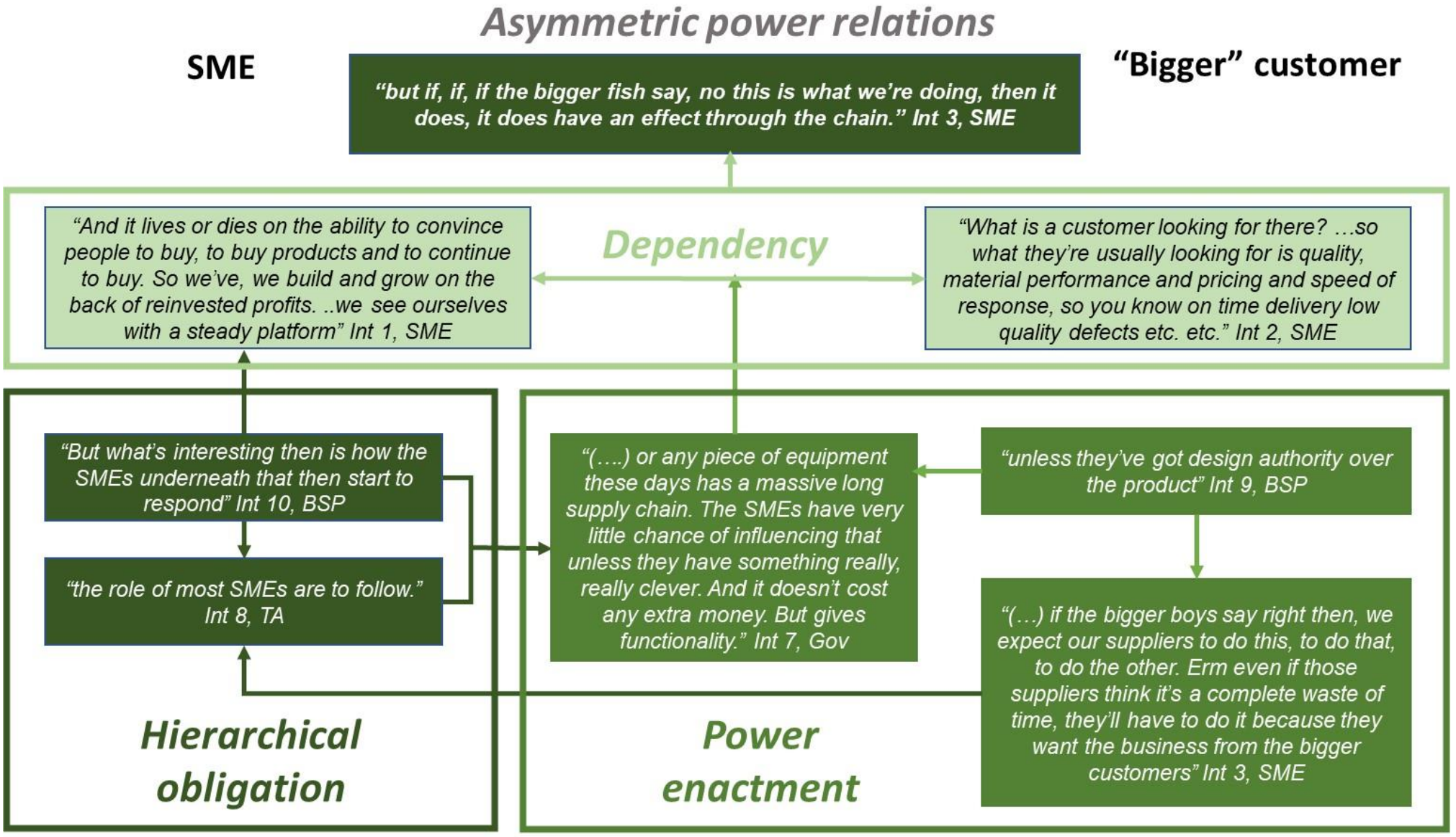

Figure 9: Discourses of the asymmetric power relations repertoire[27]

[27] Int is an interviewee, Gov is a government representative, TA is a trade association, BSP is a business support provider

7.1 Hierarchy

In talking about SMEs, actors developed and used a "symbiotic food chain" metaphor to position SMEs as "*lower down*" in production value chain network hierarchies and having constraints upon their "*choice*" to develop circular business models (CBMs). The use of the symbiotic food chain metaphor was organised as a linear narrative centred on size-related hierarchy, power distribution and relationship dependency, that establishes the identity of SMEs compared to others and legitimises a particular worldview of SME-customer relationships *(Charteris-Black, 2017)*. By constructing small as synonymous with a lowly position, it is taken for granted that the opposite must also be true, that big is synonymous with being higher up a hierarchy. Thereby, big customers, either individual businesses or collectively as public sector organisations or citizens, were positioned as legitimately having the right and power to influence the actions of established SMEs. This includes choosing how and when they engage with the CE, as demonstrated in the following extract where a multinational enterprise (MNE) was culturally recognised as representing a big organisation:

"(….) if MNE you know, in its err you know, keenness to show demonstrate it doesn't want another (0.2) err, environmental issue [I: Um] says well we are going to do this and our suppliers are going to do this, then it will happen (0.2). Erm, but it, it in general terms, the small, the lower down the chain you get the smaller things get the more difficult it is to make a, an impact, (….) But you know, farm shops and things, people do, if they can they like to do things that err are better err, and if you've got the choice, as we said about materials, (….)So it's the people that have got some (0.2) power and control that, that will make it different, I think, (….)" Interviewee 3, SME

In a range of accounts, Interviewee 3 consistently worked within the bounds of a hierarchical structure existing, positioning the relationship between SMEs and customers as "*generally*" or "*mostly*" being directed by the choices made by customers, such that they are *"only responding to what bigger fish decide"* and the "*decisions taken by our customers really mostly direct how we operate*" where customers are inherently bigger than the SME. This construction of power over being possessed by customers and existing SMEs having limited choice, adopting a taken for granted understanding of hierarchy and obligation, was a common feature used by all types of actors when discussing the ability and rationality for established manufacturing SMEs to proactively engage with the CE. This is highlighted in the following extract from a business support provider:

"It goes back to the original that I said before, a lot of SMEs are (0.6) manufacture to print so they're effectively, (0.4) the circular economy (0.4), they have to buy into it because that's, that's what their customers dictate, but they've, they've no desire to change or influence it as long as they conform to it. [I: Um] I mean, a circular economy has probably got to be driven by the OEMs[28], to some degree, and then the SMEs fall into line" Interviewee 9

[28] OEMs are Original Equipment Manufacturers who own the rights to a brand, part, product or equipment, e.g. a car manufacturer, who has extensive financial assets and assembles a final product from parts designed by them obtained via subcontract to other smaller manufacturers

In such accounts a discourse of rational decision making was used to position SMEs as making logical, reasoned and sensible decisions. However, there was an implicit understanding of a taken for granted, expected hierarchy of power, built upon authoritarian principles where size and financial wealth of the entity relates to the position in the hierarchy and the power over others they possess and the rational choices they can make.

Asymmetric power dynamics was also a shared construction in the workshops, framed in the context of "*responsibility*". Here customers were positioned as devolving "responsibility" to suppliers to develop solutions to help them meet legal obligations, address environmental problems and respond to societal discursive demands. Manufacturing SMEs "*have to*" accept the responsibility for meeting existing and changing customer demands and matching competitor practices, particularly the demands of the end user of products, as demonstrated in an exchange at workshop 1 as shown in Table 9:

Participant	Transcript
Participants 1 to 4 are SMEs with participant 4 being an academic	
1	Don't you think there's a very limited actual responsibility between there {*retailer}* and there {*consumer}* cos they push it back up here {*manufacturing/ processing}*.[2: yes]
1	It's from here {*retailer}* to here {*consumer}* that they've got the obligation, but push it back up the supply chain that they have to take that. They have to have all those things but actually from here {*retailer}* to here {*consumer}* they have very minimal responsibility for packaging. They don't put anything in to that (0.2) system and product they deliver, they push it back up.
3	The retailers
2	They determine
3	Absolutely
2	But whether they take any responsibility
3	yeah, yeah, they won't take any responsibility but they certainly, yeah
2	Like [presenter] said earlier you know, or it was on one of the presentations, how the feedback from consumers was that they want the people manufacturing (0.1) the product to take responsibility and pay for it where actually that's being dictated to by the retailer.
4	Yeh
2	To facilitate for themselves, but there's a real nice side step here {*processor}*.
1	It's much easier to [Ben: yeah] push it up much further up [Ben: yeah, yeah] the supply chain.
2	Put it up here. Because everyone seems to like (0.2) hitting the farmer at the moment*,(joint laughter)*. They don't get a good press at all, whereas actually it's all driven through here {*retailer}* and it's two way. We talk a lot about how everyone likes t' maybe put an evil cloud over the retailers but they're driven by consumers and footfall, you know, and as consumers we're really savvy and we will change where we shop and what we do very, very quickly. Erm and the retailers have to jump to that and that pushes it all back upstream.

Table 9: Workshop example of asymmetric power dynamics

The engagement with hierarchical obligation discourse acts to position those perceived to be up a production value chain network hierarchy, i.e., customers, as having the "*power and control*" (Interviewee 3, SME) to obligate action in SMEs, and thus the freedom to choose and direct, how or when to make transitioning to a CE a reality and by which criteria. Hierarchy

and power of customers was also evident in discourse at events, where size and how "*inserted in the system or supply chain*" the SME is (Academic, IChemE[29] webinar) were understood to affect levels of engagement. As put forward at events, e.g., WRF event[30], the "*degrees of freedom*" an established SME possesses was inherently understood to affect engagement, such that established SMEs were primarily positioned as being "*reactive*" (Academic, IChemE webinar) to external customer and regulatory pressures. On this basis there are understandings of a hierarchical structure in production value chain networks that has causal powers, supported by hierarchical obligation and customer freedom of choice rules of the manufacturing regime that are to be considered when making decision involving judgemental rationalism (see Section 2.2).

How this hierarchy has been established, i.e., the structures with causal powers that support customers having power over SMEs, was made explicit in interview extracts when actors used the regime specific idiom *"manufacture to print"* (Interviewee 9, business support provider) and terms such as *"*OEMs*" and "well known brand"* (Interviewee 12, consultant). Such businesses can be any size, but OEM or brand are terms generally used as synonyms to represent large businesses. Such terms signalled a lack of control over the overall technological design of products for SMEs. In such a way, technological design rights and financial wealth were positioned as important structures in determining power. By engaging with such terms, existing SMEs are positioned as lacking structural power, due to size-related financial wealth and control over overall technological design and production rights. As such they are positioned as having limited power and choice in the hierarchy, with this being a problem for SMEs in active development of CBMs. This problem of financial wealth being highlighted by the consultant in talk of why SMEs should be expected to innovate on the CE:

"I don't think it's fair to… no, it's not fair to expect SMEs to do that, because they've got the least ability to, to withstand the… any shocks, you know, any, any risk or any… and also the least erm (0.2) buying power, if you like. … You know, you can't expect a business that's selling a thousand units a year to be operating in the same space as a business selling millions." Interviewee 12

Structural power is associated with having control over technological design rights or means of production alongside extensive financial assets that enables maintaining some form of control over all aspects of design and production *(Rutherford & Holmes, 2008)*. This relationship between structural power and development of CBMs was a consistent construction by all actors in interview, where SMEs were positioned as being unable to "*influence your customer and you can't influence your supplier.*" (Interviewee 13, academic), e.g.:

[29] Institution of Chemical Engineers, IChemE: Sustainable Production, 24 August 2020
[30] World Resources Forum. Closing Loops: transitions at Work, 24th – 9th February 2019

"(….) A lot of our customers (0.2) specify, err they're, they're looking very carefully at the materials they're using to achieve (0.2) design criteria, (….) so we don't, we don't have a great deal of choice in that usually, erm we have some customers who insist you can't buy from certain countries for various reasons, (…) we don't get very often get to say you ought to use this or you ought to use that (....)" Interviewee 3, SME

In the above extract, Interviewee 3 used control-oriented language to position big business customers with structural power as having the capacity to exert power over SMEs and limit their freedoms of "*choice*" in manufacturing-related decisions that would normally reside with a supplier, i.e., sourcing of materials, or the ability to advise customers. However, Interviewee 3 can be understood to have been complicit in allowing customers control over their normative activities and limiting their freedom. Such discursive tools align with the symbiotic food chain metaphor. This adds strength to arguments of there being structures and rules that maintain established manufacturing SMEs lacking freedom and choice in what to take account of in making rational decisions due to the value chain network hierarchy and scope of the structural power of customers. Conversely, the use of the repertoire included understandings that SMEs can have greater freedoms. The conditions necessary being where "*SMEs that design their own products*" (Interviewee 9, business support provider), where SMEs have "*their brand*" (Interviewee 12, consultant) or have products they "*own the rights to"* (Interviewee 2, SME). In addition, where SMEs have the capability to "*innovate quicker*" (Interviewee 12, consultant) and develop products that are "*really, really clever*" (Interviewee 7, government), or, as the SME Interviewee 2 positioned, have the ability to provide customers with something that is "*unique and something different*", SMEs can change the dynamics.

However, as shared in workshop 2, between the SME participant and government representative, the enactment of technological design or production rights by established manufacturing SMEs, was discursively constructed as relating to meeting the technological demands of customers, irrespective of the level of control an SME has over the design rights of a product "*for customer satisfaction ….otherwise they won't come back*". This acts to reinforce a rule that customers are to have freedom of choice in their purchasing decisions, as reinforced by an exchange between the SME participant and private sector business advisor participant in workshop 2, e.g.: "*customer needs will drive the process…. you have to know the customer needs….And then you design. You don't design and then create {demand}...*". This rule of hierarchy where "*the consumer is king*" and where "*Businesses will not develop products or services for which there is no demand." (TechUK, 2015, p. 7)* is a major aspect of discourse of how SMEs engage with innovation and customers in published material and presentations associated with businesses and trade associations, e.g.:

"Digital technology businesses, especially those providing consumer electronics, are extremely focused on and responsive to consumer demands and requirements." (TechUK, 2015, p. 28)

This can be explained by the enactment of structural power being reliant not only on design and control rights over technological aspects of products and means of production but the financial assets an entity has, i.e., size. More importantly, how this is understood to be affected by position, power and choice in globalised value chain networks and the ability and willingness of each to enact power, i.e., the "active" power of both parties *(Rutherford & Holmes, 2008)*.

7.2 Power enactment

In rhetoric of power, the active power of customers was discursively constructed by all actors as taking both passive and coercive forms in all types of discursive settings. This would be expected given that active power can take many forms, being spatially and temporally contingent and can be intentionally activated or have an effect because it is perceived to exist *(Ireland & Webb, 2007; Raven et al., 1998; Sayer, 2004)*. Whilst coercive power relates to threat of reprisal, a negative consequence *(Raven et al., 1998)*, passive power relates to benign or positive consequences. Passive power has a number of forms, with their effect being based on perceptions of the influence of enactment of power in a relationship *(Huo et al., 2017)*. Passive power can take the form of "legitimate" power that relates to perceptions that characteristics associated with an entity, such as hierarchy, financial wealth/size and technological design rights, i.e., structural power, gives that entity an unquestioned right to influence others *(Raven et al., 1998)*. This is demonstrated in the following SME interview extract and was a recurrent construct at workshop 1:

"but if, if enough bigger companies <decide that's what they're going to do>, then that, that, then it'll happen.[I: Oh, OK. OK. Erm] So you're talking MNE1 and MNE2 in an INDUSTRY context, MNE1, MNE2, MNE3, all those names, they have to decide (0.2) no we're not using X material. [I: Um] but we'll use Y. if they all say we're not having that X again ever. That'll, that'll be it. Done." Interviewee 3, SME

In addition to engaging with a taken for granted understanding that size and wealth related hierarchy is a legitimate condition that gives entities a right to power over others, this was used in conjunction with a discourse of referent power. Referent power being a structure that mediates the activities of SMEs engagement with CBMs. Referent power is the desire to be identified as having a relationship to a particular customer, e.g., a major brand, a public sector body or type of citizen, where such a relationship is perceived to act to legitimise the capabilities of the SME to other similar customers *(Raven et al., 1998)*.

The referent power of such customers was signalled by the use of brand names or made explicit by business support providers, such as "*the Toyotas, and Fords*" (Interviewee 10), "*Waitrose*" (Interviewee 12), "*larger businesses or the public sector*" (Interviewee 10) , SMEs in terms of "*OEMs*" and "*big desirable customers*" (Interviewee 2), "*key accounts*" (Interviewee 3), or as the representative of a trade association put forward "*the public*" (Interviewee 8). Having such customers was actively constructed as being desired by SMEs, e.g.:

"(0.2) Well I think (0.2) it's, it's a sort of big to small approach in that sense [I: Um] because as we've just been discussing, if the bigger boys say right then, we expect our suppliers to do this, to do that, to do the other. Erm even if those suppliers think it's a complete waste of time, they'll have to do it because they want the business from the bigger customers" Interviewee 3, SME

Interviewee 3 was consistent in engaging with the symbiotic food chain metaphor understandings of the existence of a "*big to small*" hierarchy of power. The use of "*they'll have to do it*" obligation terminology in combination with desire terminology "*want*" invokes the legitimate coercive and referent power of "*bigger boys*". However, SME Interviewee 1 positioned the activation of such power as involving a rule. SMEs are expected to trade-off decision-making power they may possess "*even if*" they think an alternative decision is more appropriate to become associated with the "*bigger boys*". This is in a similar way that Interviewee 1 positioned the activation of coercive power of a customer:

"*I mean, not everybody buys on price but most of them do. We've just won a piece of work from a big UK company, which was previously buying in from China, we had to beat their price. They <u>really</u> didn't care, they'd never been out to China to see how it was made, what the working environment was, what their operation environment was. They just bought these bits, (….) from this Chinese supplier. And they, they knew what the price was, that they were looking for, and we had to get that price point" Interviewee 1, SME*

By constructing SMEs as unwilling or unable to act against customer active power and being obligated to respond to customer price-performance demands, such as "*design it to a price point*" (Interviewee 12, consultant), the positioning of customers having power over SMEs is reinforced. In this way established SMEs are positioned as lacking "social power", i.e., the potential or ability to influence beliefs, attitudes or practices of others *(Raven, 2008)*. This acts to uphold positioning of decisions not to proactively develop CBMs as rational, given that the "*power and control*" (Interviewee 3, SME) for transitioning to a CE is understood to lie with customers. The power of customers to obligate action in SMEs is also a consistent element of published material, e.g.:

"Pressure along the supply chain can be a major driver for businesses to 'green' their products. 25% of companies in our survey were taking action to meet customer demands. In fact, nearly two thirds of respondents had achieved or were working towards standards such as ISO14001" (MAKE UK, 2018a, p. 3)

However, the willingness to activate the legitimate, referent and coercive power of customers by agreeing to their requirements, supports an understanding that what is of value to SMEs relates to what is perceived as SMEs potentially losing or gaining in the context of the relationship with customers, i.e., the "reward" power of a customer, monetary or otherwise *(Raven et al., 1998)*, e.g.:

"So, for example, like Toast Ale, to use them as an example. If they'd just gone down the beer route, or making beer, right, [I: laugh] don't matter what we're making it out of, they wouldn't have got any of that profile [I: okay] and they might, they might not have got, in with Waitrose and in with all those [I: Yeah.] cos they've sold it on their sustainability thing.[I: mm] They've sold it on its credentials, haven't they?" Interviewee 12, consultant

Reward power was consistently constructed as relating to the power of the customer to provide and maintain a regular flow and scale of work by agreeing to co-create a preferred supplier or strategic partnership status on the SME. A preferred supplier status is obtained by consistently delivering technological needs that adhere to price-performance requirements of a customer, with a strategic partnership being a collaborative, mutually beneficial agreement working to a common goal *(Gosling et al., 2010)*.

However, even when established manufacturing SME suppliers have the capability and willingness to respond to discursive demands by big customers and citizens, the uncertainty of customers translating such demand into practice was positioned as inhibiting proactive action by SMEs. Uncertainty, creating ideological dilemmas for SMEs requiring trade-offs to be made that weigh up options between the here and now and longer term, was a consistent construct in both workshops, e.g.:

"But there's, there's, there's a lot of movement happening. I'm, I'm told to expect a 5% rP.E.T[31] offering by Q2 next year. So for me, I've, I've got a commitment with RETAILER, where we're supplying some of their trays, but I can't invest massively because I don't know it- you know, a, a commitment isn't a guarantee- [Yeah.] …that that's gonna be there by half-year next year. So our- my view is that we're a stepping stone to RETAILER hitting their objective of out of plastic in five years. You know…. And we, we gave them a really quick win, but will they be with us in three years' time? They could well be. But I'm not gonna do a 15-year investment based on, you know, that." workshop 1, Participant 5, SME

As such, joint dependency that avoids customers who are higher up the food chain destroying the SME, by manufacturing SMEs tailoring what they offer to customer technological demands and price-performance preferences can be interpreted as being an established rule of the manufacturing regime. This influences what is deemed to be a rational decision, including producing and selling things "*on their sustainability thing*" (Interviewee 12, consultant) when there is an understanding that customers value this.

7.3 Dependency

In interviews, the nature of dependency for SMEs was constructed around concepts of survival and stability in rhetoric of SMEs lacking choice, invoking a conceptual metaphor of "SME as a body*" (Charteris-Black, 2017)*. This metaphor is consistent with understanding SME-customer relationships as part of a symbiotic food chain. The metaphor was used to position the function of the relationship as meeting basic life or death needs of SMEs and avoiding "*business suicide*" (Interviewee 12, consultant). In this way established manufacturing SMEs are discursively constructed as being critically reliant on a regular level of nutrients, in this case

[31] rP.E.T is recycled polyethylene tetraphyte, a commonly used plastic

"*profits*", without which the SME cannot survive and have the "*opportunity*" to grow and get older as shown in the following interview extract:

"*And it lives or dies on the ability to convince people to buy, to buy products and to continue to buy. So we've, we build and grow on the back of reinvested profits. But we have now started to, we see ourselves with a steady platform and we're looking to diversify. So, we've started out in one area of the materials piece but we recognised that there's a big growth opportunity for a company like ours." Interviewee 1, SME*

As such there are understandings that path dependencies are created. In a later extract, Interviewee 1 used validating terminology "*which is why*" to orientate to decisions taken to work in a known "*established market*" source of profit as being rational and needed to enable them to have regular profit to grow and survive in the future. This rationality was argued using a discourse of future unpredictability, to represent the concept of risk. By using extreme case terminology "*absolutely nowhere*" it was positioned that there is high uncertainty of success in being able to obtain the financial stability they need from creating "*a long term supply*" when working with unknown "*new*" customers or markets, i.e.:

"What the risks for us is that, we're, we're dealing with customers who are actually trying to create new markets [I: um, um] If those don't appear, then we're not going to have a long term supply into those customers. Because they're gonna go bust. Which is why we're, I'm very keen on this (….) area because that's an established market. The whole area, area of (….) is still embryonic and there's still, it's still got a potential to go absolutely nowhere or to go somewhere but (0.2) over decades in which case, you know I'm probably not going to see the fruits of our labours." Interviewee 1, SME

In this way Interviewee 1 positioned existing path dependencies and long-term relationships in an "*established market*" as safer and more stable, and less of a risk than moving into "*embryonic*" markets. As with the SME as a body metaphor, by using the term "*embryonic*", markets were also constructed as a living entity that can survive or die.

SME Interviewee 2, similarly engaged with a rhetoric of SMEs' lack of choice and the SME as a body and "markets as living entities" metaphors and survival and stability keywords and synonyms. Interviewee 2 called on culturally shared idioms, e.g., "*throw away the baby with the bathwater",* to position their decision to work to maintain the path dependencies and retain existing customer relationships developed over the long term as rational for SMEs:

"…Because you can't simply just (0.4) hack out a load of sales when you have a (0.4) the size of this business you have quite a high overhead.[I:Yeh] …. Which, uses electricity whether or not, you know, you've got somebody there PROCESSING or not. So the business needs a certain level of erm (0.4) (tut) sales in order to keep the lights on. So it's a delicate operation …what you didn't want to do is throw away the baby with the bathwater [I:um] so in amongst some of those customers, (….) there are some really big desirable customers who could have spent, could have been spending with us 100,000 pounds a year. So you don't want to, you know [I:no] jettison them and annoy them" Interviewee 2, SME

Interviewee 2 also used validating terminology to orientate to the rationality of their decision to "*carefully*" maintain selected existing customer relationships for the longer term, particularly "*big desirable customers*" to provide financial stability and enable them to survive and "*keep the lights on*". The reference to a culturally shared business language "*overhead*" was used to strengthen the rhetoric of SMEs lack of choice. To add weight to the argument for having to be careful, Interviewee 2 discursively constructed relationships with existing customers as fragile "*it's a delicate operation*". As such, they shared the understandings of SME Interviewees 1 and 3 that there are trade-offs involved in long-term relationships with customers and that SMEs are more dependent upon their existing customers than existing customers are upon the SME. However, creating a stable environment is an established goal.

Therefore, there are understandings that the survival of the SME is dependent upon the SME obtaining a preferred supplier status or strategic partner status with existing customers to maintain a stable "*long term supply*" of income (Interviewee 1). However, as shown, the co-creation of such a status does not mean that the level of dependency, trust and freedom of choice is equal. This is on the basis that the nature of the relationship between SMEs and their existing customers was consistently constructed to be an asymmetric joint dependency configuration. Whilst being asymmetric it is also symbiotic in nature, with SMEs and customers actively cooperating for some form of mutual value involving blends of structural, expert, coercive and passive power enactment *(Huo et al., 2017)*.

Similar to Interviewee 1, in a later extract Interviewee 2 positioned themselves as also developing their customer base to "*survive*" in the future. Interviewee 2 used a commonplace term "*sticky*" to represent future dependency of customers on the SME and the SME gaining a preferred supplier or strategic partner status. It can be interpreted that Interviewee 2 understands stability as being based on the level and temporal length of dependency of customers on the technological services of the SME, including new customers:

"this business will only survive if we innovate and you know in our materials. And that's what will enable us to remain competitive. Whereas reducing energy and reducing waste, it's, you have to be able to offer something unique and something different. And if you can offer something unique and something different to <those big customers> and it means something to them then they become sticky customers because they can't get it elsewhere. So, that's a, that's a key part for us really, is, is that." Interviewee 2, SME

Interviewee 2 engaged with an understanding that the dependency of the customer on the SME and development of long-term relationships, relates to how the SME differentiates itself from competitors and how the value chain network they operate in values the differentiation. As highlighted by a trade association in a published document, this includes CBMs:

"Commercial opportunity has generally been the catalyst for successful circular economy examples; whether driven by the need for resource security or to create value-add in a low margin market. (TechUK, 2015, p. 7)

The retaining or gaining of relationships with customers as being of primary value was also made explicit by presenters at events where for example, at the PFW event[32] "*for us is all about building long-term customer relationships.*" (SME) and "*being able to re-get in touch with your customers*" (Consultant). This was understood to be important for all types of businesses, irrespective of size, as demonstrated by those presenters at events who called on experiential knowledge of business practices, e.g.:

"Caterpillar. The MD. So he talks about the fact that of course if you use less material you, you can sell it cheaper and sell more units. But the interesting thing here is it doesn't allow you to form a relationship with the customer. And counter intuitively sometimes focusing on resource efficiency alone might not be a very good idea." CE organisation, WRF event

At events, understandings of markets, competitiveness, economic value, maintaining long term customer relationships and reputation as being objects at risk and of value and at stake for businesses dominated discourse on businesses, as summarised in Appendix 6. These understandings were shared by all types of actors, irrespective of their institutional identity, although the relationship element was primarily incorporated into discourse from businesses, their representatives and consultants. However, the Greenbiz[33] webinar is of particular note, in the context that it focussed on the dynamics of the relationship between a recognised CE large business case study in CE networks, and one of their SME suppliers. The presentations demonstrated the existence and influence of asymmetric power relationships and dependency. From the customer perspective, the presenter positioned that to address the environmental issues associated with their products they had to do something with their suppliers and "*create an environment where they're working in partnership with us"*. They positioned that they achieved this by creating a "*supply chain programme*", setting "*targets*", sharing goals and data through meetings and in-person visits and asking for data from suppliers. However, the presenter used the concept of competitiveness and called upon their reward power of being able to create a long-term joint dependency relationship as an incentive, as being instrumental in success, i.e.:

"Another strategy that MNE used early on was to talk to multiple suppliers who were supplying us with similar products and actually challenge them to make progress on recycled content with the promise that we would bring more purchasing power to them. You know if there were three suppliers offering us a similar project and just say whoever can give us a better performing environmental product we would favour them with higher purchasing and building those things into contractual requirements with the supply chain for example. I'm really excited to have NAME and COMPANY on the call today because this is an example of a 20-year relationship that MNE has had with a supplier where it's actually moved through each of these levels of engagement and strategy" MNE customer, GreenBiz webinar

It is to be noted that the presentation from the SME supplier demonstrated how there was uncertainty regarding the reward on offer, in terms of the SME being "*very sceptical of having*

[32] Policy Forum for Wales: Policy on waste in Wales, 4th July 2017
[33] Greenbiz: How to get your supply chain to embrace circularity, 23rd June 2020

a good customer for a long period of time". Scepticism is discussed further in Chapter 9. However, the SME chose to respond to "*what your customer is demanding*" and became "*not only the preferred choice of CUSTOMER but also several other hundreds of fashion companies, among them…Gucci, Prada*". Here the supplier engaged with referent power of brands as discussed in Section 7.2.

Delivering existing customer satisfaction to maintain relationships as a primary driver is also demonstrated in published materials from business representative organisations, e.g.:

"*Similarly conversations on innovation show the development of low-carbon products and services to be only a minor driver, well behind more general desires to satisfy existing clients and markets, or even improving compliance with environmental regulation*." *(EEF, 2017)*

However, in interviews, tailoring manufacturing services to become dependent on bigger customers was also understood to be a risk object, as the customer retains the freedom of choice in determining the SMEs preferred supplier status and thus the survival of the SME. For example, when customers decide to "*offshore*" production, e.g.:

"Erm, so you know, if err, as has happened over the years people decide (0.2) offshore cost is the key criteria, then we have to look to other markets because it's no good trying to offer err <standard simple volume parts> because we're never gonna be competitive in the UK so, so there's, we have to say well there's no point doing that we'll do something else."
Interviewee 3, SME

In addition, although the analysis highlighted how obtaining or protecting preferred supplier or strategic partner status in existing markets was constructed as being of primary value to SMEs in decision-making, there was an understanding that existing customer relationships and markets can become unstable. By becoming dependent on a customer, or a market, based on a particular technology, the survival of the business is put at stake, as made explicit by SME Interviewees 3 and 4:

"(….)And essentially it's a, a nearly NUMBER year old company that has, has worked with a small number of key accounts[34] *as a particular approach. Erm, and that meant all's well whilst things are going well, [I:um] but if things change, for example in the SECTOR industry, it's a bit of a shock and a bit of a time to catch up.(....) to offset the risk if you like of having too few accounts." Interviewee 3*

"I think in terms of the, the business itself, it, it has a limited life, mainly due to the impact of online shopping and the reduction of shops. [I: yeah.] And probably even more so at the moment, because a lot of the shops are just shutting." Interviewee 4

[34] The use of the term "*key account*" is a shared business management culture specific term that positions a business as having a strategic partner status - see https://www.linkedin.com/pulse/20140221064430-1468172-when-a-key-account-is-not-a-key-account-and-what-to-do-about-it/

All interviewees engaged in constructions of new relationships being required for future stability, as reliance on existing relationships and markets and actions of existing customers where SMEs lack "*control*" are a risk object, as reinforced by SME Interviewee 4:

"… I suppose I've become a bit frustrated with, with that current, that current system and (…) I wanted to find something where we could, you know, get, get into, you know, a, a reusable model, rather than just making more, more stuff and not having the control." Interviewee 4

Proponents of the CE engaged with this understanding of market and customer instability as a risk object. They used this to consistently position developing CBMs as a solution to overcoming instability. CBMs were consistently found to be constructed as being associated with new markets and customers for manufacturers and being a differentiator that is valued in some markets in interview and published discourse, e.g.:

"and as we've sometimes said to businesses in this, if you can demonstrate that your product has got just that little bit more environmental credentials, you might be the new partner, of choice You know, you might be the one who's selling the widgets to them, instead of another company because you can now say, you know there's CO2 savings because we've got 50% recycled content in our (0.2) you know whether it's the, the container for the water for the wash, you know, whatever it might be if, if you can add that because that's what they're looking for, you're onto a winner." Interviewee 10, business support provider

However, in such rhetoric, by using language associated with a future state, there is an implicit understanding that potential new customers are not currently activating their social power and technological and price-performance choice preferences in SME-customer relationships towards the adoption of CBMs. Furthermore, talk of the future invokes an implicit understanding of uncertainty. This uncertainty of positive consequences for SMEs was made explicit by business support provider Interviewee 10 when they repeated use of terms of uncertainty such as "*might*" and "*if*". Use of such terms infers that there is no guarantee the potential new customers will choose the option offered, or that the SME would become a "*new partner of choice*" and gain preferred supplier status through development of CBMs.

In another interview extract, Interviewee 9, a different business support provider, positioned that due to the uncertainty of customer actions in new markets, it is rational and common sense for businesses in existing stable markets with preferred supplier-based relationships to choose not to be proactive in developing CBMs "*unless there's actually an advantage*" in taking action in the present as "*there's no reason for them to change.*" Even though proponents of the CE work to position the opposite, that "*demand and pressure is coming from customers down through the supply chain."* (Interviewee 7, government) and that "*actually those businesses are starting to think differently"* (Interviewee 10, business support provider) to position certainty of value for SMEs, the CE is constructed as a future state.

In discourse, uncertainty of established SMEs being able to obtain preferred supplier or strategic partnership status by developing CBMs was a shared construct. Economic value and

citizen, business customer and market choices, preferences, practices, knowledge and expectations were dominant elements of discourse of such uncertainty. These understandings of uncertainties condition the effect of the power and relationship dynamics causal mechanism. This is on the basis that there are understandings that CBMs are currently implemented in niche applications and markets with few customers currently enacting their power in choosing CBMs in existing relationships. For example, at workshop 1, a "*niche*" CBM product was positioned as *"the cream of the idealism"* (Participant 2, SME). Furthermore, experiences of failure of the uptake of CBM products when market and customer preferences are unsupportive of change, as brought to the fore in workshop 1 when discussing packaging, can act to reinforce perceptions of uncertainty of developing stable, long-term relationships:

"I had- we had a product in 2008, which is these guys I worked with on the LOCATION border, they've gone bust three times because they invest and deliver, the market doesn't go. I brought it to market. [Yeah, yeah.] But then everything needed to be black plastic got left out, got left out of RETAILER because it wasn't mark- didn't hit the marketeers' brief. Now, the marketeers are trying to tip the environmental brief, they're all… it's all new technology. That's why we haven't done it earlier. It's- you know, there's a bit of tongue in cheek cynicism there, but it works." workshop 1, Participant 5, SME

In question-and-answer sessions at the bigger events (i.e.: PFW, WRF and Waste Management in Wales[35] events), I was an active participant at such events. This enabled me to purposefully ask questions aimed to solicit discourse on the effect of the situational context of established SMEs being embedded in globalised supply chains or lacking overall product rights and their freedoms to proactively develop CBMs. The responses received demonstrated understandings that active engagement relates to the "*degrees of freedom*" a manufacturing SME has, where larger businesses "*OEMs*" were constructed as having high degrees of freedom and the success of SMEs is for them to find their "*niche*". Furthermore, there were understandings that for manufacturing SMEs to engage there is a necessity for "*market creation*" through "*green procurement*" by those large organisations who were positioned as having structural, coercive and referent power due to scale of financial reward power, e.g.:

"..But then, what we did was that we brought in the suppliers, … and said, okay, we'd really like now to try and change how you operate, how can we bring in more reuse, how can we bring in remanufacture? So with, with the companies themselves… because we have a big budget, this is how many kitchens that we replace, year in, year on. And I think then… so it's about, market creation, in answer to your question… And I think green procurement is a <really> erm major. Method that we can use in both government and the public sector can actually use that as a big, weapon to change the way that those products are being produced now. Without doubt. But then we need to create those markets, … So you create that market by saying, this is, the, we have the procurement weight behind us and er, and this is what we want you to come up with." CE proponent, Waste Management in Wales event

[35] Creating a circular economy in Wales: Networking event, hosted by Welsh Government and Tata Steel, 28th February 2020

As demonstrated in the above extract, the speaker engaged with an "SMEs as a key" metaphor to position manufacturing SMEs as solution providers to problems or demands of customers in rhetoric of customer freedom of choice. However, in interviews with SMEs, the role of manufacturing SMEs as solution providers was constructed in relation to how SMEs carry out their expected role of performing "*commercially*" (Interviewee 1). To be commercial SMEs were expected to be "*competitive*" (Interviewee 1) and offer "*competitive pricing*" or a "*comparative price*" (Interviewee 2) so that they "*get that price point*" (Interviewee 1) wanted by customers such as "*the cheapest cost possible*" (Interviewee 3). In a similar way to Interviewee 10, a business support provider, a government representative who was interviewed engaged with an understanding that even when SMEs have "*something really, really clever*" and meets expected "*functionality*" requirements, customers want it not to "*cost any extra money*" than alternative products and services (Interviewee 7). Price or how "*cost effective*" the services of a business are for the customer was positioned as a differentiator by the repair business:

> *"Because when you have to (0.4), when a product becomes end of life and you have to upgrade one particular part of the system it might not talk anymore to another part of the system which you then need to upgrade as well, so it becomes very expensive to upgrade various systems. Whereas if they come to us they can have it repaired for a fixed price, but at about 40 % of the last known new price of a particular item, So it's very cost effective. That's why they would come to us instead of yeh upgrading systems." Interviewee 6*

In this way, price parity or proximity to existing products and services is understood to be a rule for manufacturing SMEs, and businesses in general, as is SMEs adapting their services to meet price-performance customer preferences. The rule regarding price or "*costs*" and functionality expectations was the dominant understanding engaged with in discussions in the workshops. For example, as demonstrated in the exchange in Table 10 from workshop 1, expectations on packaging are for it to enable safe transport that protects the product being transported, limits waste and maximises "*efficiencies*" at the lowest cost:

Participant	Transcript
Participants 1 & 2 are SMEs with participant 4 being an academic	
1	It's about moving it from A to B and protection. [Yeah.] And, you know, making sure that actually, your pallet of boxes doesn't fall over and suddenly you have a load of waste. So it's about transporting from A to B and reducing waste and efficiencies at each point.
researcher	So okay. So why is it cardboard then?
2	Cost. Cost and functionality.
4	Price, sustainability, recyclability.
2	Yeah. That's all it is. It's cheap, the cheapest way to get something that's rigid. You could put them in steel boxes, they'd be reusable, they'd be recyclable, but they'd be too heavy and too costly. [Yeah.]

Table 10: Workshop example of price performance expectations

As can be seen in Table 10, calling upon experiential knowledge and engaging in language of comparison, attendees shared an understanding of a rule that CBM products and services are to perform at least equitably on the price-performance nexus to existing offerings. This rule

was also dominant in workshop 2, where conditions of acceptance of CBM products were positioned as:

"if it meets that standard, and if it's less expensive and it does the same thing, and the guarantee is exactly the same then. That, that's the answer." Participant 1, SME

Although price was positioned as a primary entity in value chain networks by all actors, evaluations of price were discursively constructed in interviews as being moderated by the "expertise" and "informational" power that is possessed by SMEs *(Huo et al., 2017; Porter, 1985; Raven et al., 1998; Rutherford & Holmes, 2008)*. Expertise and informational power relate to perceptions of specialist or higher-level technological or production expertise and knowledge. Expertise and informational power are understood as "*good*" attributes for SMEs to own, as demonstrated in the following extract, where product and material "*quality*" and "*specific performance*" and production capabilities such as "*if you only want low volumes"*, alongside performance of the business in terms of "*good service*", "*good support*" and timing "*on time delivery*" were positioned as being what the "*customer is looking for*", that are met by SME Interviewee 2:

"(…) products which we own the rights to (...) What is a customer looking for there? They're looking for good quality, er competitive pricing, good service and good support and good performance (…) Erm, the other side (…) we make widgets for people, (…) and so what they're usually looking for is quality, erm (2.0) material performance and pricing and speed of response, so you know on time delivery low quality defects etc. (…)Er, the material gives them a really, really specific performance, er, enhancement if you like and you wouldn't want to use any other materials for the types of products.(....) So, if you only want low volumes, rather than spending 25,000 pounds (….) you say well for 1500 quid because you can (….) and I want 500 a year, brilliant you know." Interviewee 2, SME

Here Interviewee 2 orientated the talk to SMEs delivering the technological and price-performance solutions for the problems of customers. The other SME interviewees also engaged with a rhetoric of technological and price-performance problem and solutions in a similar way. For example, Interviewee 1 positioned their business as "*we're experts at handling these materials*" that solved difficulties for their customers "*We take that headache away from them*". Interviewee 3 positioned the organisation as being specialists in providing a "*level of support, the ability to process lots, lots and lots of paperwork*" wanted by their customers by having the "*right equipment*" and the way they "*operate*" that customers are "*prepared to pay for*". Interviewee 4 on the other hand, was looking to support the "*big appetite for a solution from corporate OUTLETS*" that "*don't want to be using disposables*". Interviewee 6 from the repair business also positioned the organisation as providing solutions, being a "*one stop shop*" delivering "*quality*" and "*functionality testing*" and a "*warranty*" that "*solved the defects*" faced by customers. Interviewee 10, a business support provider, also positioned SMEs as possessing capabilities to provide the solutions to customers problems in terms of helping "*The larger businesses, the Toyotas, and Fords*" meet their "*targets to get more environmentally sound*". In workshops, as already demonstrated in Section 7.1, customers

were understood to "*push it all back upstream*" (workshop 1, Participant 2, SME) devolving responsibility for finding solutions to manufacturing SMEs. This expectation for manufacturing SMEs to be solution providers, such as "*SMEs and start-ups coming up with some of the best examples of circular solution*s" *(BiTC, 2018a, p. 7)* is embedded in CE published materials and event discourse. As such, to develop preferred supplier or strategic partnership relationships with customers, established SMEs businesses are expected to provide technological solutions to problems that meet price-performance values of customers.

7.4 SME-customer relationships interpretative analysis

As explained in Section 6.6, the interpretative analysis presented in this section (and Sections 8.4 and 9.4) involved inductive, abductive and retroductive reasoning as described in Section 4.3 *(Bryant & Charmaz, 2007; P. K. Edwards et al., 2014; Ezzy, 2002; Oliver, 2011)*. This approach means that in putting forward my interpretation, inferences have been made that the findings could apply to discourse not studied and to other individuals and organisations. Furthermore, the interpretation is based on theory, knowledge or experience I have, including that developed before and during undertaking the research. Therefore, the analysis presented in this section is my interpretative theory regarding what influences perceptions of risk and what is of value and at stake for established SMEs in decisions involving evaluations of risk and why they exist. I define theory in this context as an explanation of the generalised pattern of relationships between concepts and an outcome *(Ezzy, 2002)*.

Based on the findings, an asymmetric power relations repertoire is a dominant discursive resource used by actors in production value chain networks as a warranting device for the rationality of SMEs decision-making and response to calls to develop CBMs. In this section I argue that this causal mechanism has a major influence on what is understood of SMEs and their decision-making and perceptions of risk for SMEs in developing CBMs. As such, my findings add weight to and explain the outcomes presented by drivers, barriers and enablers (DBE) researchers, summarised in Section 3.2.2, who position size and existing relationships, in terms of trust, power dynamics, dependency, competition, complexity and customer demands' as key influencers on CE and sustainability-related action by SMEs *(Ballard et al., 2013; Fandrich & Kivinen, 2011; Fonseca et al., 2018; Gusmerotti et al., 2019; Oelze & Habisch, 2018; Ormazabal et al., 2016; Quintás et al., 2018; Ritzén & Sandström, 2017; Rizos et al., 2016; Webb et al., 2006)*.

The availability of the repertoire and the existence of the power and relationships causal mechanism, and therefore the scope of dependency in SME-customer relationships, is a historically embedded arrangement that limits established manufacturing SMEs freedoms to engage with CBMs. This is irrespective of the technological rights a manufacturing SME may have over a product or production capability and the type of value chain network configuration. I argue that this is due primarily to the structural, passive and coercive powers of bigger

entities, in line with French and Raven's theory of power *(Raven et al., 1998)*, that has resulted in asymmetric joint dependency arrangements being created and reinforced. As demonstrated in the analysis, these asymmetric relationships build upon a taken for granted hierarchical structure where size matters in relation to who has "social power", in terms of power over others, how power is enacted and the freedoms of choice established SMEs and customers have *(Raven, 2008)*. Furthermore, in discourse, the general use of subordination, hierarchy and command-oriented language and rhetoric of manufacturing SMEs lacking choice, reinforces asymmetric power dynamics as a normative, legitimate and expected condition of production value chain networks *(Czinkota et al., 2014; Huo et al., 2017)*.

My analysis demonstrates how institutionalised entities, structures and rules are understood to exist as part of this causal mechanism and have been established complicitly by SMEs, customers and other production value chain network actors, e.g., government institutions. The aim being to create and maintain a stable operating environment by balancing different stakeholders' interests. These entities, structures and rules resulting from industrialism and modernisation of society, as outlined in Section 1.3. The contingent arrangement of entities, structures and rules constrain decision-making freedoms in established SMEs, and have been historically and socially embedded, as outlined below, based on studies of the history and role of businesses and manufacturing *(Mcintyre, 2001; P. L. Payne, 1967; Sturgeon, 2002)*.

Up to the industrial revolution, manufacturing in the UK was dominated by small businesses, often doing the same thing, but dependent upon geographically constrained resources and serving localised needs directly to the end user. However, entities such as advancement of technology and the mechanisation of labour, including access to large scale new energy sources, transport systems and production technology, political change, the rise of institutions and changes in global economic and social conditions, including access to large quantities of cheap labour, created an environment where small scale manufacturing of the same products was deemed unproductive. From around 1850 until the 1970s, manufacturing in the UK moved to becoming dominated by monopolistic family-run firms with protected rights over products and control of production. This "corporatisation" was achieved through use of patents or creation of vertically integrated "big business" firms, often multinational. These multinational corporates were created through mergers or acquisitions (nationalised or privately owned) and accumulated large financial assets, based on economy of scale mass production techniques.

My analysis demonstrates how structural power, gained through having significant financial assets and the ability to control technological design and production rights influences the position in the hierarchy, freedoms and active power potential *(Rutherford & Holmes, 2008)*. This move resulted in the destruction of many small non "specialised" businesses providing directly to end users. However, during the 1970s and 80s big businesses began large scale subcontracting and outsourcing of "non-core" elements of production that did not benefit from

economies of scale that could be achieved through mass production. The change resulted as a response to "stagflation" in the 1960s and 1970s brought on by the global energy crisis, employment unrest and high inflation and the wide adoption of free market economy ideology and globalisation of production throughout the 1970s and '80s. This resulted in the growth of SME manufacturers *(Abramovsky et al., 2004; Bolton, 1971; Kitson & Michie, 2014; Sturgeon, 2002)*. In 1971, there were 7.9 million people employed in manufacturing in the UK *(Berry, 2016)*. Therefore, the modern day SME has co-evolved with and is complicitly embedded in the historically established existing industrialism, globalisation and neoliberal political ideology based structures and power dynamics *(Sheppard, 2011)*.

However, as Bolton *(1971)* highlighted, manufacturing SMEs that developed during this period in the UK were either contracted to manufacture products to a design specified and controlled by the big business, common in aircraft, engineering and car industry value chain networks, or contracted to provided "specialist" functions that were deemed uneconomic for big businesses to pursue themselves. As demonstrated in my analysis, SMEs can be working in market-based value chain networks[36] where they "*own the rights to*" products (Interviewee 2, SME) and/or modular value chain networks[37] where they deliver the "*jobbing shop*" (Interviewee 2) competencies for producing "*widgets"* (Interviewee 10, business support provider) to someone else's design *(Gereffi et al., 2005)*. As Gereffi et al. specify they can also be in captive value chain networks[38] where having "*a small number of key accounts*[39]*"* (Interviewee 3, SME), manufacturing SMEs are transactionally dependent on the larger customers they serve. All SMEs involved in this thesis self-identified as "specialised" contractors, having blends of market-based, modular or captive value chain networks. As such, they can all be understood to already serve a "niche". However, in all arrangements, my findings demonstrated compliance with the historically embedded expectations of the subservient, limited power role of manufacturing SMEs. Compliance or complicity was suggested because of the way actors constructed the technological and price-performance preferences of customers and markets as determining why and how SMEs were set up and what is of value in the value chain network.

However, my analysis points to further understandings: that technological design and production rights have the capacity to act as a liberating mechanism for established SMEs *(Gereffi et al., 2005)*. In line with Porter's theory of competitive advantage, differentiation,

[36] Customer selects services from what suppliers have to offer on an open market.
[37] Customer selects services, such as production capability, to produce a product to their design where other businesses provide "turn-key services" taking full responsibility for production competencies
[38] Customers control the design and how a product or part is made
[39] The use of the term "*key account*" is a shared business management culture specific term that positions a business as having a strategic partner status - see https://www.linkedin.com/pulse/20140221064430-1468172-when-a-key-account-is-not-a-key-account-and-what-to-do-about-it/

which can include technological design and production rights, is a structure that enables SMEs to develop dependency relationships with customers in particular value chain networks *(Porter, 1985)*. This position underpins discourses of DBE researchers who construct design rights as an enabler or driver (see Section 3.2.2), policy discourse of entrepreneurship of SMEs (see Section 3.4) and CE advocate discourses of the benefits of developing CBMs (see Section 3.5.5). This perspective is used to warrant a focus on value creation interventions, under the concept of innovation. Such discourse fails to account for established manufacturing SMEs already being specialists in their supply chains and having weak social power due to their limited financial wealth. It has also been argued in the business literature that technological differentiation alone may be insufficient in gaining or maintaining competitive advantage. Advantage will not be gained without cost "parity" or "proximity" to competitors, without the differentiator being valued widely by customers in an industry or the differentiator being tailored to a target sector *(Porter, 1985)*. Therefore, even though structures exist to enable SMEs to gain some form of expertise and informational power through technological design rights, the interpretation and engagement with the normative rules of the manufacturing regime associated with power enactment and price parity/ proximity and performance has the greater influence on what is perceived as a rational decision and the action taken by established manufacturing SMEs.

Therefore, based on my findings, I contend that gaining of new product or production rights by developing CBMs will be perceived to have value to an established manufacturing SME only when they meet the expertise, informational and price-performance preferences and choices of existing customers who have high levels of financial wealth *(Porter, 1985)*. This is on the basis that my analysis demonstrates how the complicit enactment by SMEs and their customers of legitimate, referent, coercive and reward powers of customers, mediate the activities of SMEs *(Raven et al., 1998)*. In addition, my analysis demonstrates how by enacting their role as a specialist provider of solutions, path dependencies are co-created with customers, in line with transitions theory *(Cherp et al., 2018; Clausen et al., 2017; Geels, 2012)*. By co-creating path dependencies that provide something of value to both SMEs and their customers, my analysis demonstrated how the goal is understood to be about creating a stable operating environment for SMEs and customers. For SMEs stability is understood to be achieved by being given a preferred supplier or strategic partnership status with customers *(Gosling et al., 2010)*. Such a status being developed through tailoring their specialism to customers' demands and preferences. This results in established manufacturing SMEs being locked in technically, in terms of what they do, socially, in terms of who do they it with, politically in terms of ideology, and culturally regarding sharing of values. Becoming established as a specialist provider revolving around specialist skills, management and organisational structures and development of concomitant relationships resulting in path dependencies is recognised as making change increasingly irreversible, expensive and difficult *(P. L. Payne,*

1967). Furthermore, as already outlined, my findings demonstrate how, although these path dependencies have been co-created between SMEs and customers, the scope of dependency, and therefore what is of value and at stake, is established on an asymmetric basis.

My findings show how the scope of dependency for established manufacturing SMEs is needs driven, where survival of the business is reliant on maintaining relationships with existing customers and gaining new customers in existing markets given their limited financial resources when "*generally a manufacturing SME, if they're lucky, may not be making more than 10% net profit a year*" (Interviewee 9, business support provider). Therefore, dependency of established manufacturing SMEs aligns with a "need satisfaction" theory of value, where the value of a relationship or change is evaluated in terms of how much the physical needs of the SME are met to increase survival of the SME *(Tory-Higgins, 2007)*. Such needs-based dependency acts to limit the social power an established SME has. Conversely, my findings accord with the scope of dependency for customers being desire satisfaction, where their choice of suppliers, technological solutions and price-performance preferences, that can change at any time, relate to what goals are deemed worth pursuing and what values are to be prioritised and shared by the SME. As such customers are positioned as having social power.

Furthermore, my analysis demonstrated how the referent and reward power possessed by customers, due to their significant financial assets and ability to define a relationship status of an SME, is a major aspect of decision-making in SMEs, influencing the freedoms SMEs are willing to trade-off. In this way, in line with role theory and social representation theory, as described in Section 2.3, established manufacturing SMEs are constrained to enacting the expected "rights and duties" established by their position in production value chain networks *(Andreouli, 2010; Geels et al., 2017; Korhonen, Nuur, et al., 2018)*. The rights and duties being to deliver technological and informational expertise demanded by customers that meet price-performance preferences.

My findings on the nature of dependency also align with resource dependency theory, where the extent of dependency in existing relationships determines how much an established SME is willing to change or adapt what they offer *(Cragg, 2016)*. The more dependent an SME is on an existing customer, the greater the level of influence the customer has over the SME *(Sandhu et al., 2010)*. Overall, the structural, passive and coercive powers of customers and needs-based dependency makes change in SMEs "socially dependent" on the actions of customers *(Raven, 2008)*.

Although the findings demonstrate how joint dependency relationships are sought after to create stability, needs-based dependency relationships with customers with social power and being specialists are also perceived to be risk objects for SMEs. This is on the basis that the

enactment of social power by customers, particularly changes in customers' preferences and choices and market conditions, could ultimately destroy the SME. For example, as customers retain the freedom of choice in determining the SME's preferred supplier or strategic partnership status at any time, they can choose to enact their "withholding" power and walk away from the relationship if other options are available to them *(Sandhu et al., 2010)*. This type of action has been historically enacted, as made explicit by SME Interviewee 3, when "*as has happened over the years people decide offshore cost is the key criteria",* resulting in significant offshoring of manufacturing by large companies that began in the 2000's to countries with lower labour costs such as China. Such action resulted in the number of UK engineering SMEs halving between 1997 and 2010, although "on shoring" is starting to reverse this trend *(Merlin-Jones, 2012)*. Between 2001 and 2011 there was a 33% reduction in the number of people employed in manufacturing in the UK *(Berry, 2016)*. As highlighted in workshop 1 this withholding power is understood to exist in the present day, "*as consumers we're really savvy and we will change where we shop and what we do very, very quickly*" (workshop 1, Participant 2, SME).

In addition, where SMEs have developed a strong needs-based dependency relationship with customers in specific markets, a collapse of the market and customer through external events or in times of crises, can result in the instant demise of the SME. This is demonstrated by recent 2020 Covid-19 and Brexit impacts in automotive[40,41], aeronautical[42] and hospitality[43] sectors and historical events since the 1970s, that have significantly impacted SMEs tied into organisations operating in certain markets. Between 1971 and 2016, over five million people lost their jobs in manufacturing, with existing jobs shifting from high value manufacturing processes to lower skilled assembly plants *(Berry, 2016)*.

Therefore, although dependency relationships are created for stability, established manufacturing SMEs are in a constant state of instability due to uncertainty of changes in landscape conditions and the active power of customers. To negate such instability and give themselves the best chance of survival, established SMEs use their limited resources to maintain or develop relationships that create the highest dependency of customers on their existing expertise. In deciding which action to take, my analysis demonstrates how SMEs focus on cues from existing customers, competitors and markets. This aligns with strategic orientation theory where market oriented dominant businesses primarily base decisions on existing customer and competitor behaviours *(Jansson et al., 2017)*. However, as my analysis demonstrates, to mitigate against uncertainty, such as if "*something dire happens to a*

[40] https://www.expressandstar.com/news/business/2020/07/07/2200-jlr-supply-chain-jobs-at-risk/
[41] https://www.theguardian.com/business/2019/feb/19/honda-confirms-swindon-plant-will-close-in-2021
[42] https://www.insider.co.uk/news/airbus-job-cuts-signal-risk-22281598
[43] https://www.cga.co.uk/2020/07/02/uk-hospitality-survey-reveals-460000-jobs-at-risk-in-sector-supply-chain/

customer" (Interviewee 3, SME), SMEs look to "*diversify*" (Interviewee 1, SME), develop new "*sticky customers*" (Interviewee 2, SME) and "*broaden it out to spread the risk*" (Interviewee 3, SME) in areas where there is an "*established market*" demand (Interviewee 1, SME). In contrast, "e*mbryonic*" markets, even when being driven by policy, such as development of CBMs, are perceived to have "*the potential to go absolutely nowhere*" (Interviewee 1, SME). Furthermore, experiences of SMEs going "*bust*" when looking to bring CBMs to markets when "*the market doesn't go*" in the same direction (workshop 1, Participant 5, SME) exacerbate perceptions of uncertainty of the ability to establish dependency relationships when engaging with CBMs. Delivering obligations in retaining a "*partner of choice*" (Interviewee 10, business support provider) status in existing relationships and developing new relationships in established markets where customer technological and informational expertise and price-performance preferences are known are therefore less risky options. This contrasts to proactively developing CBMs that are associated with uncertainty regarding customers preferences future and advantage that "*might*" accrue for an established SME.

Overall, my analysis demonstrates how maintaining and gaining preferred supplier or strategic partnership status with existing customers is what is of value and at stake for established SMEs in decisions on developing CBMs. This is to create a stable operating environment that maximises the survival potential of the SME and dependency of customers on their specialist services. As such, risks in developing CBMs will be evaluated on this basis.

In line with rational choice theory outlined in Section 3.2.3 *(Webb et al., 2006)* and judgemental rationalism described in section 2.2 *(JCGOSJ, 2019; Sorrell, 2018)*, established specialist manufacturing SMEs' decisions not to develop CBMs are therefore rational when there is uncertainty about markets and customers for CBMs. As Interviewee 7 summed up, the uncertainty of the future choices and preferences of customers regarding CBMs and existing power asymmetry in SME-customer relationships positions engaging with the CE as an ideological dilemma for SMEs and a risk object:

"*timing is all the, they [SMEs] can't make the change until they're told to but they've got to gear up for it and anticipate it." Interviewee 7, government*

Therefore, perceptions of customer and market preferences and practices, external conditions supporting transition and evidence of price-performance value have pivotal roles in evaluations of uncertainty and consequences, as discussed in Chapters 8 and 9 respectively. A summary of the findings and interpretative analysis in this Chapter is provided in Table 11.

Interpretations	Entities & structures	Rules of the manufacturing regime		Discourses
Power and relationship dynamics causal mechanism – value and stake				
Gaining and maintaining of preferred supplier or strategic partnership status with big customers is what is deemed of value and at stake for established SMEs in decisions on developing CBMs				
Shared interpretations	Hierarchy and obligation • Referent, reward, legitimate, coercive and withholding power of big customers • Asymmetric power relationships • Path dependencies • Industrialism • Corporatisation • Specialism outsourcing • Modernisation of society	• Asymmetric symbiotic dependency relationships co-created for stability and mutual value • Customers to have freedom of choice • Established SMEs have expert power being specialists on a price-performance nexus • SMEs adapt and tailor services and design rights to customer price-performance preferences • SMEs are solution providers and respond to behavioural cues from customers, competitors and the market • SMEs use resources on relationships that create highest dependency of customers		• Symbiotic food chain metaphor • Subordination, hierarchy and obligation • Power, control and influence • Freedom of choice • Size & financial wealth • Customer demands • Regular financial reward • Power trade off • Dependency: needs vs choice • Relationship fragility • SME as a body metaphor • Solution providers • Survival and stability • Responsibility
Contrary maxims	Size and financial wealth • Structural power	• Design rights by developing CBMs provides structural power to SMEs	• Big customers have structural power	• Design rights
	Customers and markets • New and established markets • Landscape conditions	• CBMs are being demanded by customers • CBMs act as a differentiator providing commercial price-performance advantage • There are new customers and markets for CBMs supporting future stability	• CBMs are not being demanded • CBMs do not act as a differentiator or provide price-performance advantage • Customers and markets for CBMs are limited and undermine stability	• Rational decision making • Short term vs long term • Differentiation & competitiveness • Price-performance compatibility • New relationships • Market instability • CE as a future state • CBMs as niche • Uncertainty

Table 11: Summary of findings and analysis regarding what is understood of being an SME

8 What is understood of the CE and CBMs?

As outlined in Section 3.5.5 and discussed in Section 7.4, changing business models is disruptive, hard, expensive or potentially impossible for established Small and Medium-sized Enterprises (SMEs) to achieve without destroying the business. This is due to established SMEs being locked in as specialist providers in asymmetric joint dependency relationships as demonstrated in Chapter 7. Therefore, perceptions of customer values preferences and practices in relation to circular business models (CBMs) have a pivotal role in evaluations of uncertainty. In this chapter the detailed analysis of the circular economy (CE) as a higher ideal repertoire is provided relating to the entity ideology and values. This repertoire is fundamental to a values and ideology causal mechanism that underpins evaluation of uncertainties for SMEs. The repertoire was assessed as being of primary importance in answering Research Question 2: What is understood of the CE and development of CBMs?

As discussed in Section 2.3.3, in this thesis, ideology is a value system that is shared by production value chain networks defining how members of the group are expected to prioritise values and place a value on an entity.

As with power discussed in Chapter 7, ideology, values and value with their associated structures and rules embedded in the manufacturing regime are understood to have causal powers in the development, expression, reinforcement or questioning of established SMEs' engagement with CBMs. Although ideology, values and value may not be expressed explicitly in discursive interaction, they are fundamental entities that influence everything we do, consciously or otherwise, and can therefore be both actively included in discourse or be implicit by what and how language is used *(van Dijk, 2006)*.

All interview and workshop participants were either made aware of a connection between climate change, material and energy use, waste, sustainable development and protecting the environment and the CE through use of the research ethics documents (see Appendix 3), the questions asked during interview and presentations at workshops. Due to their role, Government representatives, business support providers and consultants involved in interviews and workshops already had knowledge of such relationships. Similarly, as discussed in Section 1.2 and Chapter 3, published materials and proponents of the CE explicitly construct a relationship between developing CBMs and pro-environmental and sustainable development (ESD) values and ideology. As highlighted in Chapter 5, CE events involved a CE and ESD ideological group. In this way, in all cases of interview, workshop, events and published discourse, development of CBMs can be understood to have been constructed and understood as having a relationship to ESD ideology and associated values.

In this analysis, the term “ESD ideology” is used to represent a broad ideology that values intrinsic “ESD values” of reducing harm to and protecting natural entities and services (including the planet, flora and fauna) and people for its own sake, equal to or above extrinsic, measurable human economic, utility and material value *(Zimmerman et al., 2019)*. Similarly, through use of the same resources, the CE and development of CBMs can be understood to have been constructed and understood to have a relationship to industrialism ideology, that values maximising human economic, utility and material benefit values in the use of people and natural entities and services. As outlined in Section 3.5.3 such values and ideology have historically been interpreted as being in conflict.

The CE as a higher ideal repertoire was used in different ways to construct uncertainties and consequences for SMEs and argue what is, could or should be, or isn’t, can’t or shouldn’t be, of value in decisions by SMEs in production value chain networks. The overarching repertoire incorporated arrangements of three dominant discourses of ethics and morality, citizen and customer values and political ideology, that built around the asymmetric power relations repertoire as shown in Figure 10. Thirty-seven interview extracts and eight coded published extracts and the transcripts of the two workshops, in addition to the extracts analysed in Chapter 7, underpinned the analysis in this chapter. Consistent with the approach to analysis in Chapter 7, supplementary data was brought in from third party events and the corpus of materials to test and refine the findings. Each pattern of discourse is analysed separately in Sections 8.1 to 8.3. An interpretation of why the repertoire and associated causal mechanism exists and has an effect and the conditions necessary to overcome perceptions of high uncertainties of value in developing CBMs is presented in Section 8.4.

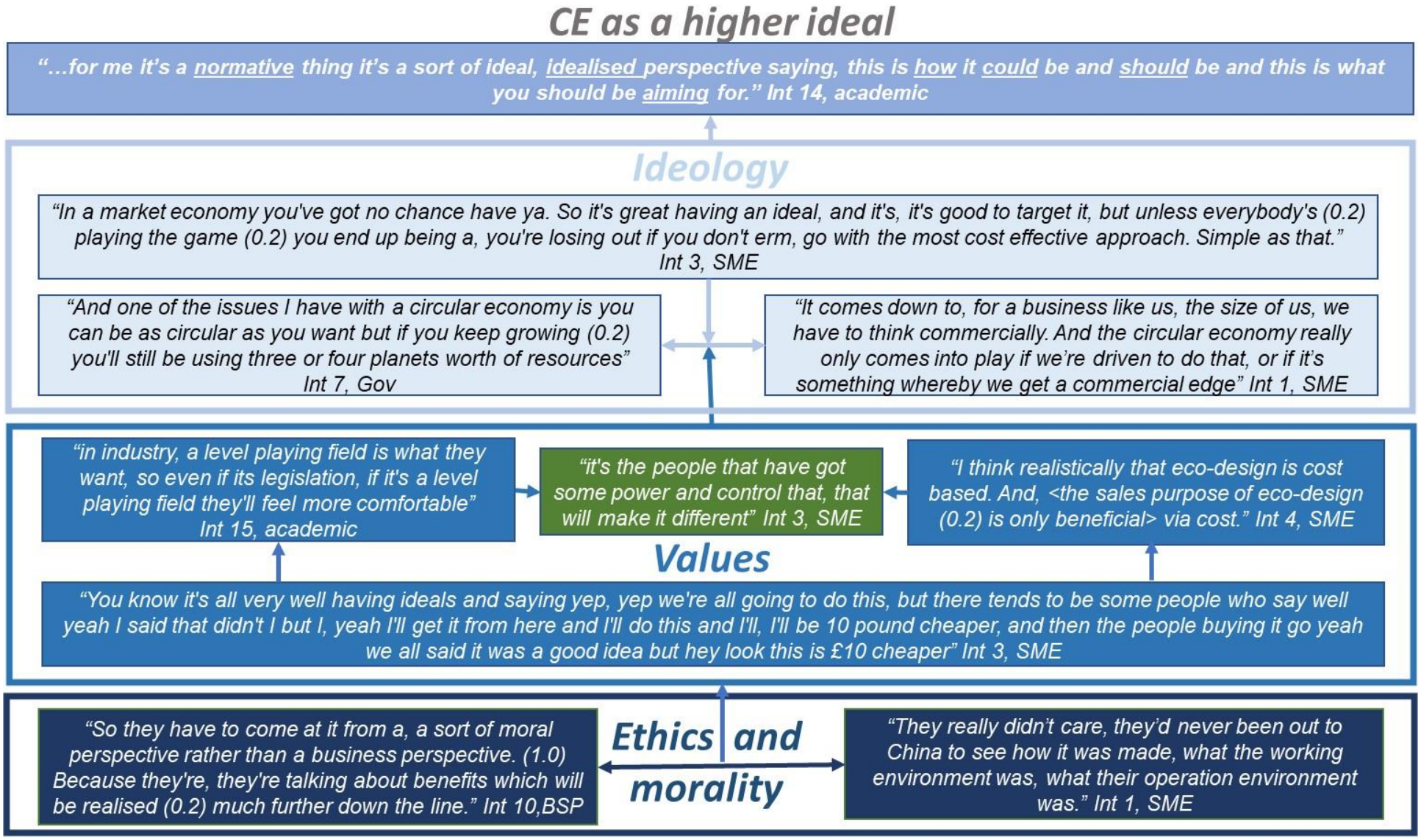

Figure 10: Structure of the CE as a higher ideal repertoire[44]

[44] Int is an interviewee, Gov is a government representative, BSP is a business support provider

8.1 Ethics and morality

In a range of extracts, interviewees across the different types of organisations engaged with a "higher ideal" metaphor associated with ethics and morality, positioning the CE as part of a "higher domain of value" *(Ludwig, 2000)*. This acts to construct ESD ideology and values, and by association the CE, as being a standard of practice and beliefs beyond expected everyday business norms and legal obligations in the UK and potentially unattainable, e.g.:

"So, you know, whilst everybody can talk about it, [I: um] sometimes you know there's plenty of erm demands on the business and time and money that, err, some of the higher ideals might not make it to the list" Interviewee 3, SME

In the workshops and interviews, this understanding regarding the CE being a moral or ethical higher ideal was signalled by constructions of ESD values as "*principles*", "*having a conscience*", "*doing the right thing*" and being concerned about geographically distant ethical standards in production practices, such as "*if you go to the Congo, DRC, … you'll see child workers there*" (workshop 2, Participant 1, SME). Similar constructions were evident in discourse at events, such as at the WRF[45] event, where a "*moral compass*" metaphor was engaged with. This construction is also evident in the Scottish Government's published strategy on the CE:

"For me, the circular economy is about the environment, the economy, and people. And above all it is about the moral imperative to reduce our demand on the planet's resources." (Scottish Government, 2016)

However, at events, the necessity for transition to address ethical and moral obligations was mostly taken as a given and rarely made explicit. The exceptions being those organisations whose remit is to address issues such as poverty, justice and inequality. This builds on shared constructions of CE proponents at events that "*the circular economy has become de facto now, it's what we do*" in policy (PFW[46] event), there is a human responsibility to address "*biodiversity loss and… climate change impacts*" (WRF event) and deal with a "*climate emergency*" (Waste to Wealth[47] summit). At such events it was positioned that "*regardless of temporary political turbulence and so on, it's so clear and so agreed across so many different actors now that we know where we have to be heading internationally, but also domestically*" (Facilitator, PFW event).

As outlined in Sections 2.3.3 and 3.2.1, engaging in discourse of ethics and morality invokes the concept of right and wrong, good and bad. This understanding of ethics and morality being good was demonstrated throughout the interview, workshop, event and published materials. However, operating to "*higher ideal*" standards and having the right "*moral compass*",

[45] World Resources Forum, Closing Loops: Transitions at work, 24th – 27th February 2019
[46] Policy Forum for Wales, Policy on waste in Wales, 4th July 2017
[47] Business in the Community, Waste to Wealth summit, 12th June 2019

therefore being ethical in practice, is understood as being a choice-based voluntary practice of individuals and organisations, e.g.:

"…some others in the company say you know, not quite can we get away with this but are we operating within the law. And then there's another group of people say well, you know what else should, can we do. Is this, this something that, yes it's within the law but does it fit with our ethos and the, the ethics that we try to operate within. I mean we will (0.2), we will sometimes put our people in uncomfortable positions with appropriate (0.2) protections because you know it's a one time job and, we're not going to invest a million pounds but we can do this on a short term thing. In the same way that every company, every company does." Interviewee 1, SME

However, as shown in the interview extract above, ethical and moral practices were positioned as being inconsistent. In interviews, SMEs and proponents of the CE engaged with constructions of there being "*some*" SME and business owners who are inherently amoral or unethical, in line with constructions of SMEs lacking pro-environmental attitudes prevalent in CE research highlighted in Section 3.1.2.

The concept of "*Corporate Social Responsibility*" and accounts of publicised acts such as "*supporting a local football team and local charities*", involvement in non-profit activities such as being a "*director on this housing association, or I'm part of this wildlife trust"* or the adoption of "*ISO14001*" management standards were positioned as evidence of ethical or moral practices by Interviewee 10, a business support provider. The lack of evidence of such acts is taken to represent a lack of ethics and morality. At events, voluntary standards, charters, commitments and initiatives such as "*Courtauld 2025*" and "*Love Food Hate Waste*" (PFW event), and "*green growth pledge*" (Waste Management in Wales[48] event), strategies or claims of corporate social responsibility were similarly called upon as evidence of ethical and moral practices and "*corporate activism*" (Waste to Wealth[49] summit), e.g.:

"*And also we use kind of ISO 14001 as a backbone internally within the organisation of how to be environmentally as effective as possible to understand what our big impacts are*" *SME, PFW event*

In published materials, voluntary networks, initiatives, supply chain online forums including a "*PCRRG*[50]" and a "*CE 100 programme*"[51] *(BiTC, 2018a, pp. 16&17)*, are used to persuade of corporate activism.

In this way, voluntary performance management standards were used as part of a "badges as activism" metaphor for evidence or truth of voluntarily working to an ideal or criteria beyond

[48] Creating a circular economy in Wales: networking event, hosted by Welsh Government and Tata Steel, 28th February 2020
[49] Business in the Community, Waste to Wealth summit, 12th June 2019
[50] www.pcrrg.uk The Paper Cup Recovery and Recycling Group: a membership group since 2014 consisting of "*pioneering organisations from across the paper cup supply chain, including: paper cup manufacturers, retailers, recycling and waste management companies and paper reprocessers.*"
[51] https://ellenmacarthurfoundation.org/network/overview "*the world's leading circular economy network*" set up by Ellen MacArthur Foundation

normative expectations and putting ESD values into practice. By engaging with this metaphor, actors work to legitimise the positioning of organisations and customers who ask for or adopt voluntary standards and badges as possessing ESD values and being green activists, as highlighted by Interviewee 3:

"when we're asked for certification, if we have an environmental policy, if we have [I: Um um] relevant TS or whatever specification you know, certification and that sort of thing. So it is discussed and it is on the management (0.4) erm plan [I: Um]<to add those things to it>, partly because we're (0.2) obviously jolly nice folk[I: (laugh)] (amusingly) and partly because if customers are asking for it we need to have it" Interviewee 3, SME

In engaging with the badges as activism metaphor, Interviewee 3 understood that the consequences of being seen to have voluntary management standards acts to position themselves as "*jolly nice folk*" actively possessing ESD values as a matter of course whilst also complying with the demands their customers are asking of them. However, Interviewee 3 positioned "*certification*" evidence of such standards as an "*add*" on in the "*management plan*" and repeated that customers were asking for such evidence. On this basis, it is the perceptions of the consequences of being seen to be able or otherwise to meet the demands of customers that primarily influenced the rationality to put in place such standards and the value attributed to voluntary standards. This use of voluntary standards as part of the "*company image*" *(MAKE UK, 2018a, p. 6)* is also evident in published materials from business representative bodies, e.g.:

"Pressure along the supply chain can be a major driver for businesses to 'green' their products. 25% of companies in our survey were taking action to meet customer demands. In fact, nearly two thirds of respondents had achieved or were working towards standards such as ISO14001" (MAKE UK, 2018a, pp. 3 & 5)

An alternative use of the badges as activism metaphor was adopted by Interviewee 1 as shown in the following extract:

"But when customers come to us to say we're also talking to your competitors no-one says, we need to check you're ISO14001 compliant, or what's your (1.0) waste policy, they say tell me what your price and lead time is please. [I: Oh, OK yeh.] So even if our customers did adopt those protocols and sort of approaches, I'm not sure we would be, something that would add to their commercial proposition (1.0) [I: Oh OK] it certainly wouldn't be, it's certainly not harming us by not having some of this ISO numbers or you know being eco-friendly in that respect." Interviewee 1, SME

By calling on an account of experience of customers actions, Interviewee 1 was consistent in positioning that the expectation is for their organisation to be a problem solver and provide a "*price and lead time*" that is better than their "*competitors*". They used this to position that evidence of compliance to voluntary management standards is not currently being sought and therefore customers do not value ESD values more than economic values. Interviewee 1 acted to close off counter arguments that customers value such standards, and therefore ESD values. This was achieved by positioning as fact "*it's certainly*", in a discourse of

consequences, that not having "*ISO*" standards or evidence of the adoption of "*eco-friendly*" values had not harmed the business. In this way Interviewee 1 constructed their choice of not demonstrating evidence of green activism or prioritising putting ESD values into practice as rational. As with Interviewee 3, Interviewee 1 positioned providing evidence of ESD values in practice as being primarily influenced by the consequences of meeting the choice demands of customers.

Similar to SMEs, business to business (B2B) customers were also constructed by all types of interviewees as being on a spectrum of ethical and moral practices. There were constructions of large businesses and customers, including citizens, being inherently unethical or amoral in purchasing practices, only engaging with ethical and moral practices when forced to or when there is commercial advantage. Conversely, other B2B customers and citizens were constructed as actively adopting ethical and moral practices in their purchasing practices as green activists, e.g.:

"Some of them are starting to move away from it {disposable parts}, but because, as, as some of the bigger companies are going well this is ridiculous from a sustainability (0.2) er potential" Interviewee 2, SME

The extract is an example of how work was done by all actors to position businesses (large and small), organisations, themselves and members of society as valuing ESD values in practice or not. In this way people and organisations are positioned as good or bad. This positioning, particularly of being good, is evident throughout published documents and events. For example, "*manufacturers are committed to sustainability*" *(MAKE UK, 2018a, p. 2)* where "*Many UK manufacturers are already implementing green initiatives*" *(EEF, 2015)*, with Businerss in the Community (BiTC) members having "*a shared passion to bring the circular economy to life in the UK*" *(BiTC, 2018a, p. 5)*. Even financial institutions have acted to position themselves as CE advocates and possessing ESD values where they "*have been investing in the circular economy since 2016*" and "*act internally , through our responsible purchasing policy that promotes circularity*" *(AXA, 2018)*, where "*the importance of sustainability is unquestioned. Our social and corporate responsibility agenda is an integral part of both our commercial and risk strategy.*" *(ING, 2015, p. 3)*. Such discursive acts reinforce the positioning of the CE as a higher ideal.

However, the simultaneous positioning of SMEs, businesses, organisations and members of society as being good, valuing intrinsic over extrinsic value, and the necessity to be bad and value the extrinsic over intrinsic, demonstrates how putting ESD values and ideology into practice is an ideological dilemma for SMEs. This dilemmatic nature of business decision-making is highlighted in a published document from the trade association MAKE UK, i.e.:

"What is the cost driver? There are some companies that will do things because they believe it is morally right to do it. I would say that is primarily going to be owner operator businesses or you get to a certain size and in fact that is your business model – body shop for example. For most, certainly listed companies, then people are taking much harder nosed decisions about it and in that situation, there needs to be a strong financial element to it because otherwise they are not maximising shareholder value potentially." Professor Paul Leinster (MAKE UK, 2018a, p. 12)

Recognising the dilemmatic nature of such decisions, carrying out acts to be seen to be good by engaging with ESD values, was a consistent feature of discourse, as shown in the following interview extract:

"One would be I might (0.5) cynically use this as a marketing ploy to say we've got this closed loop, we're repurposing materials, aren't we good, don't buy from those nasty competitors that aren't. And our customer will say fine how much is it?" Interviewee 1, SME

On this basis being seen to engage with ESD values has causal powers in mediating the price-performance expectations and practices of SME-customer relationships. Entities and structures such as "*Blue Planet II*" (workshop 1, Participant 2, SME), "*public pressure/opinion*" and "the media" (Interviewee 7, government), "*Government*" (Interviewee 3, SME), "*competitors*" (Interviewee 7, government), "*their own communities*" and public sector "*procurement system*" (Interviewee 10, business support provider) were all positioned as having causal relationships with expectations to be seen to be putting ESD values into practice. In this way it can be interpreted that a rule of the manufacturing regime is that businesses are to be seen to be addressing higher domains of value. However, in the extract from SME Interviewee 1 above, they discursively constructed CE "*closed loop*" claims of being driven by ESD values as lacking truth. This was achieved by positioning such discursive acts as being a pretence "*ploy*", employed in commercially orientated acts to increase demand in customers to gain competitive advantage. The relationship between being seen to engage with ESD values or not and commercial benefits was also called upon by proponents of the CE, such as *"like putting things it into compostable packaging because they think the public will buy more"* (Interviewee 7, government). Overall, there is an understanding that ESD values and maximising extrinsic values may conflict.

However, although explicit calls upon the concepts of morality and ethics was used infrequently, implicit understandings of an ethical or moral obligation underpinned constructions of "responsibility", where proponents of the CE look to position that "*responsible business is not an optional extra*." *(BiTC, 2018a, p. 5)*. The implicit call upon ethical or moral obligations, or responsibility, where "*we cannot continue with our current linear trajectory*" *(BiTC, 2018a, p. 4)* is embedded in a range of CE proponent organisations published materials and discourse at events.

Discourse of responsibility was found to be interwoven into discourse of risk and moral obligation. In interviews, individuals were specifically asked where responsibility lies for transitioning to a CE or addressing ESD and climate change issues or what roles different groups of actors have. Interviewees found this type of question difficult to answer, in some cases moving to a different subject to avoid answering. When answered, all interviewees built an argument of shared individual accountability of past negative consequences that moved towards positioning some form of shared responsibility. Responsibility being shared between individuals, businesses and Government to take action going forward, as exemplified in the interview exchange with Interviewee 1, presented in Table 12:

Ref.	Transcript
Q	I: …Where do you think responsibilities lie for addressing environmental sustainability, climate change, energy use?
1	Interviewee: (6.0). That's a big question that isn't it (0.5).
2	I: Just take one of them. If we looked at
3	Interviewee: Where does responsibility lie? Ultimately, responsibility lies with us as individuals, as it's only individuals that can do something. Whether that's driven by policy or legislation it's still individuals that have got to follow the, follow the rules. I think there's a role for Government to give the steer. And UK Government does I think on the whole.[I: Um] It's decided to decarbonise the electricity system and therefore we've got a load of wind turbines and PV.
4	…..So Government, Government has responsibility to <correct behaviour> through policy and legislation (1.4). Even (0.4), there's a load of bloody capitalists there calling themselves renewable energy eco warriors. But they're just a bunch of subsidy surfers and they'll go around and they'll, whatever the latest subsidies on that's what they'll do. I'm extremely cynical as you can potentially tell.
5	I: That's fine, that's your perspective.
6	Interviewee: But the, it's, it's, it's Government that dictates that behaviour and it might be a cynical capitalist ploy to label yourselves a green operator but you know if that's what Government wants you to do and you can make some additional returns on the basis of it. Through reduced taxation or incentives or whatever it is, then it makes good commercial sense
7	I: And so what's the role of business then, manufacturing?
8	Interviewee: I, I well if I come to it, it's (0.2) to obey the law. As an absolute minimum. But I think there are a bunch of people who want to do a lot more than that, or even a bit more …So I think in terms of responsibility, yeh it comes down to individual (0.2) business owners and shareholders in businesses are the actual business owners and they can dictate the way businesses should operate. (3.0)"

Table 12: Example discourse of responsibility in interview

As demonstrated in the exchange in Table 12, there is an understanding that risk, responsibility and fulfilling societal moral and ethical obligations relate to power, control, individual and organisational values and agency. However, in line with the analysis in Chapter 7, SMEs are inherently understood to have limited social power *(Raven, 2008)*. In comparison, as Interviewee 1 put forward, Government is fundamentally understood to have social power that "*dictates the behaviours*" of many individuals, having the ability to "*correct behaviour*" and is trusted to establish "*the rules*" to be followed collectively. Hence, a rule of the manufacturing regime is understood to be that governments have primary responsibility for changing future rules. This helps explain why dispute can arise on attributing responsibility and a role to established SMEs to proactively develop CBMs.

The attribution of responsibility and understandings of who has social power to make transitioning to a CE a reality and reset the "*moral compass*" of society was a major aspect of all the events attended. As with interviews and workshops, at all events and in published materials, governments, government funded bodies (e.g.: local authorities) and businesses are positioned as having key roles in developing solutions, aligning with CE proponent arguments presented in Chapters 1 and 3 (see Sections 1.2, 1.3 and 3.4.5). At events, this was signalled primarily by the inclusion of representatives of government, funded bodies and businesses, both multi-national enterprises (MNEs) and SMEs, as presenters. Furthermore, the promotion, titles and agendas being targeted at businesses, influencers of businesses and government funded institutions and organisations, strengthened this positioning. By the act of involvement in these events, such organisations engage with the rule regarding responsibility and social power whilst positioning themselves as actively taking on this responsibility, acknowledging the influence of size, e.g.:

"*we are quite large, and with that comes quite a great responsibility and a burden that we all feel because the actions we take make a real difference*." *MNE, PFW event*

However, a more diverse position was evident at the research and academic focused events organised by CE and ESD proponents and in business discourse. Here the role of consumption practices and citizens consumption values were presented alongside roles of government and business. At such events, solutions were constructed as being needed that addressed "*how government, businesses and, crucially, people can become part of a wider solution*." (post event information, Green Alliance[52] event). The way to do this was through "*our individual and collective responsibility*" (Environment body, WRF event) and the need "*to transform our economic and social-ecological systems*" (post event summary report, Future Earth[53] online forum) and not just business practices, government funding and policy-making. The focus on "*production*" without addressing "*consumption*" is also positioned as unfair in published material from business representative organisations, e.g.:

"The result has been that policy makers have tended to place the responsibility on businesses rather than consumers whose behaviour and preferences have sometimes been ignored. While placing constraints on business - such as excluding hazardous materials from the supply chain - does indeed deliver obvious benefits, ignoring the consumer altogether is not a viable option." *(TechUK, 2015, p. 12)*

The tripartite understanding in events of the need for shared responsibility between governments, business and citizen was called upon to position transitioning to a CE having to be collaborative, building on working in partnership and collectively with a range of different actors and changing of values. This is underpinned by understandings that "*there are many*

[52] How can we ditch the throwaway society?, 10th March 2020
[53] An equitable, inclusive, and environmentally sound circular economy in a post Covid-19 environment, online open forum event 13th May 2020

stakeholders. It's not just the company that makes the products that can make the system work" (R&D organisation, WRF event).

Overall, there is a rule of the manufacturing regime that attribution of responsibility to address ethical and moral issues is to be fairly distributed in relation to who is understood to have power, control and freedom and how consequences are distributed. This rule helps explain why proactively developing CBMs will be perceived as a risk object without customer demand and why dispute can arise on attributing responsibility and a role to established SMEs to change. This is especially as there is an understanding that responsibility is a contested concept as outlined by a presenter at the Green Alliance event, where "*people of course are waiting for somebody else"* to sort things out *"but won't necessarily, most ordinary people, won't go to great efforts to make a change themselves"*.

All the extracts highlight how there were understandings that ethical or moral practices, in particular putting ESD values into practice, have economic, material and utility consequences for customers and businesses. However, there are conflicting perspectives on how ESD values are valued in practice. Understandings of how values are prioritised in practice is the subject of analysis in Section 8.2.

8.2 Values

As discussed in Section 8.1, being seen to put ESD values into practice to satisfy customers' discursive demands is a rule of the manufacturing regime. However, whilst it was positioned in discourse that "*generally people want to do things that are, are, are good for the environment"* (Interviewee 3, SME), there is an understanding that voluntarily putting ESD values into practice, as an ethical or moral consideration without customer or market demand, is a risk object for SMEs. This is on the basis that decisions were rationalised in discourse, as highlighted in Chapter 7, on understandings of how customers prioritise extrinsic price-performance value to themselves and the intrinsic value of ESD values in practice as it's only "*if consumers value it then you're more likely to get recognition for it*." (MNE, PFW event).

A dominant construction, engaged in by all actors, was that initial price is the primary value customers orient to and prioritise in purchasing decisions, as demonstrated in the following interview extract:

"…you know I've <u>never</u> had a conversation with a customer in the <u>last</u> NUMBER years of COMPANY existence where they've said (0.4) yeh I'll pay an extra 10 percent if you can show it's ethically sourced, or if, you know, you're not disposing of it, if your waste rates are lower than others, you know. <<u>Never</u>> (0.2) have I had anything like that" Interviewee 1, SME

In this extract putting ESD values into practice, as in the development of CBMs, was constructed as incurring additional costs for customers, aligning with the concept of a green premium as discussed in Section 3.2.3 *(Gates, 2020; Guyader et al., 2017)*. As such there is

an understanding embedded in the manufacturing regime that ESD values and ideology in practice incurs a green premium, discussed further in Chapter 9. However, two opposing positions were evident in discourse of the CE regarding customers' willingness to pay. Customers, including citizens, were positioned as willing to pay the green premium in practice or were not. In cases where customers were positioned as willing to pay the green premium, the rule that could be understood to influence this is the added extrinsic value to the customer. This includes reduced costs elsewhere in the organisation and meeting environmental policy commitments or quality and identity from being a "*premium*" product (Interviewee 7, government) or identity as a "*dark green*" or "*light green*" consumer (Interviewee 12, consultant). SME Interviewees 5 and 6, both involved in CE activities, also positioned customers as engaging with CBMs under the condition that doing so would result in significantly lower costs for the customer, whilst delivering the same or improved functionality.

The understanding of a lack of citizens' willingness to pay without "*added value*" was also incorporated into discourse at events. For example, at the Green Alliance event where a presenter called on research on citizens to position how citizens "*don't want to pay more of course*" and "*actually paying extra or paying more tax [is] not so popular*". In interviews, workshops and at events there were also constructions of people unwilling to pay either a green premium or the same price when existing values such as "*convenience*" or choice are negatively affected. Constructions of customer choice also including understandings that customers prioritise ownership and the "*new most up to date item*" *(EEF, 2016)* from an emotional being "*happy*" perspective, with this being an expected prioritised value of the current ideology in practice, e.g.:

"…and change from a model, on giving people stuff [Um] to make them happy. To actually giving them something else that makes them happy that involves less stuff. And that will be a massive challenge for our capitalist (smiling) consumer-base society" *Interviewee 7, government*

This prioritisation of price and performance was not restricted to citizens and businesses, demonstrated in the following interview extract regarding public sector organisations (see also *Tech UK, 2015, p. 28*):

"when the tender goes out and everyone goes all right yes we're gonna have to include recycled content in the pipework or recycled content in aggregates or whatever … it becomes well I'm gonna put some weighting in my tender then to see if that happens and make it move in that way. But ultimately when it came to the tender, the cost overrode the whole thing, … So, because that environmental part of it was maybe had a weighting of 10% if you're lucky [Um] whereas cost was a weighting of 40% [40%, yeah] And even though the company that wins the contract might have scored really low on their environmental credentials, cost is everything," Interviewee 10, business support provider

These constructions of ESD values in practice having a relationship to cost and performance and customers prioritising extrinsic value over intrinsic value, reinforces understandings of

decisions by SMEs being mediated by customer price-performance choices, as detailed in Chapter 7. As such, there is a taken for granted rule that "*realistically*" extrinsic financial benefits are to always be the priority in decision making regarding product and service development and embedding of ESD values into business models, as Interviewee 5 positioned:

> *"I think realistically that eco-design is cost based. [I: OK] And, <the sales purpose of eco-design (0.2) is only beneficial> via cost. And principally if you use less electricity, (0.4) less raw materials to do what you do (0.4) then erm (0.6) you, your cost saving is directly proportional to the economical* advantage.*" Interviewee 5, SME*

This relationship is reinforced in policy documents, when economic value is discursively placed first, inferring priority, and at events where the emphasis was on achieving economic value for nation states, organisations or citizens. However, unlike constructions of CBMs as incurring a green premium, proponents of the CE and ESD values constructed action as resulting in "*cost savings*" and being "*cheaper*", discussed further in Chapter 9. However, both the green premium and cost savings discourse align with a taken for granted rule that products and services provided by established SMEs must address values prioritised by customers.

Engagement with this rule, regarding how ESD values in practice are to be valued on a price-performance nexus in purchasing decisions, was consistent throughout interviews, workshops, events and published materials. As outlined in Chapter 7 in interviews, proponents of the CE understand that price and functionality are pre-requisite constraints on adopting ESD values in practice. It is a taken for granted rule that SMEs *"still want to compete with all the things they would normally compete on [I: Um] the price and the quality and all those kind of things"* (Interviewee 10, business support provider) with the "*last thing any manufacturer wants*" is getting "*a name for being unreliable*" (Interviewee 12, consultant). At events, quality and material/product consistency, performance and functionality were key elements of discourse of the development and acceptance of CBMs, as shown in Appendix 6 and discussed further in Chapter 9.

However, by positioning that CBMs must be taken up from a "*moral perspective*" (Interviewee 10, business support provider) or, as another business support provider Interviewee 11 put forward, is being instigated by businesses who are "*already values led so the business is already a business that has embedded kind of usually ethical values*", there are understandings of uncertainty of the consequences of CBMs on the price-performance values of customers. To counteract such uncertainty, as introduced in Section 8.1, proponents of the CE engage with a "green activist*"* metaphor in acts to persuade that customers (organisations and citizens) are increasingly prioritising intrinsic value over extrinsic economic, material and utility value, e.g.:

"but yeah, I think the OEMs are being more, a lot more proactive in, in, in the circular economy [I: um] …. So, yeah I mean I think the, say the OEMs are trying to make a difference." Interviewee 9, business support provider

"On the other hand they are faced with increasingly demanding customers and markets when it comes to sustainability." (ING, 2015)

This understanding of B2B customers and citizens as green activists was also a recurrent element of discourse at events by proponents of the CE. However, there was also an understanding that the prioritisation of values in practice has not necessarily changed, but how people and organisations present themselves have. This being in reaction to potential negative consequences of not being seen to be putting ESD values into practice, as demonstrated in the following interview extract and in published material *(e.g. MAKE UK, 2018b, p. 2)*:

"I mean for years, I sat in an international plastic recycling conference two years ago and I was amazed that one of the really big brands had virtually zero recycled content in their plastic [I: um] and yet (0.2) the packaging regulations came in 20 years ago you know. And they'd done absolutely nothing but now they're falling over themselves to do something because of Blue Planet [I: yeah] and the public pressure" Interviewee 7, government

In all cases, the voluntary nature of putting ESD values into practice is maintained as a rule of the regime. As are such practices not being historically and currently an expected norm of production value chain networks unless resulting in added extrinsic value to customers. Overall, performance and price are understood to be what is prioritised in purchasing decisions, taking precedence over ESD attributes *(Sandhu et al., 2010)*. In comparison, the construction of customers valuing CBMs intrinsically, and therefore there being a demand for CBMs, underpins much of the policy and recommended interventions that support transitioning to a CE. Especially interventions focused on the promotion of the use of voluntary instruments and changing how SMEs are led and managed as the appropriate mechanisms for putting ESD values into practice, as highlighted in Chapter 3. The effectiveness of voluntary instruments, the economic value of ESD values in practice and trust and truth of the possession and valuing of ESD values above the extrinsic in practice (whether SMEs, B2B customers or citizens in general) was consistently questioned in interviews and at events.

The analysis demonstrates how there are conflicting understandings of how ESD values in practice are prioritised by customers and the consequences of proactive development of CBMs from a moral or ethical perspective. Contrary maxims regarding these issues are the subject of the CE proof of value repertoire analysis in Chapter 9. However, entities and structures that reinforce a causal relationship between ESD values in practice and a green premium or cost savings and the prioritisation of extrinsic value in purchasing decisions were implicit or made explicit in discourse. Entities and structures were understood to be associated with the prevalent ideology embedded in production and consumption systems, as summarised by Interviewee 3:

"But we can't, if, if we (….) saying we don't like that X material we want to use Y, unless, and they say no you've got to use this or Y's twice as much as X (0.4), you know. In a market economy you've got no chance have ya. So it's great having an ideal, and it's, it's good to target it, but unless everybody's (0.2) playing the game (0.2) you end up being a, you're losing out if you don't erm, go with the most cost effective approach. Simple as that." Interviewee 3, SME

The relationship between ESD values and ideology and free market economy political ideology underpins the discourse of the influence of political ideology analysed in Section 8.3.

8.3 Political ideology

In a wide range of extracts discussed as part of the asymmetric power relations repertoire in Chapter 7, by engaging with a "being commercial" metaphor, being "*commercial*" was positioned by all actors as an inherent, rational everyday required principle for SMEs operating as a member of production value chain networks, e.g.:

"The commercial risk assessment, that's the answer do we think we can get it to market, and again the costs of getting it to market. Where and who the customers are, what the likelihood of buying from us, you know what else might we need to do to convince them that we're a sensible supplier. What payment terms are people looking for and how's that going to be financed." Interviewee 1, SME

Whilst political ideology was not made explicit in the above extract, the conscious or automatic choice of being commercial metaphor keywords and synonyms are inherently bound to neoliberal free market economy based political ideology *(Charteris-Black, 2017)*. A free market economy, whilst a subjective term, is generally understood to be an economic system in which supply and demand dynamics determines the nature and price of goods and services, including how, when and where they are made and for whom, free from significant interventions by governments.[54] Engagement with the being commercial metaphor positions SMEs as necessitating being profit and competition oriented in an exchange of goods or services in markets to align with rules of operating to free market economy based political ideology *(Charteris-Black, 2017)*. This relationship and its historical context, was made explicit by an MNE business presenter at an event:

"*… And thank goodness we've shaken off the shackles of Milton Friedman*[55]*, who most of you I'm sure will have heard of, a very famous economist who advised Ronald Reagan and Margaret Thatcher and held up that the only, the only thing that business should think about is profit, the only social responsibility business is to make a profit." MNE, Waste to Wealth event*

All actors engaged with this understanding of the historically constituted situational context of SMEs and businesses in general. The use of combinations of being commercial metaphor keywords and synonyms, focusing on competition and economics, as summarised in Table

[54] https://www.investopedia.com/video/play/free-market-economy/
[55] *see* https://en.wikipedia.org/wiki/Milton_Friedman

13, were evident throughout the extracts analysed in Chapter 7 and those interview and published extracts coded at the node "ideology". As such an established rule of the regime is that SMEs, and businesses in general, are to be "commercial" in their decision-making and evaluations of risks.

Competition	Demand and supply	Economics	Markets
"*competitive(ness)*" "*competitors/competing*" *"unique / different"* *"differentiate"* *"speed of response"* *"on time delivery"* *"lead time"* *"good service / support"* *"performance"* *"quality"* *"enhancement"* *"beat / winner"* *"instead of another company"* *"innovation / clever"* *"an advantage/ edge/ little bit more"* *"design authority /rights/ IP"* "*marketing/selling point/advertising/PR*" *"China/ Asia/abroad"* "*experts"* "*right equipment*" "*credentials*" "*responsive*" "*market share*" "*custom design"*	*"supplier(s)"* *"supply(ing)"* *"customers"* *"consumers"* *"client"* *"retailer"* *"public sector"* *"end user"* "*key criteria*" "*sell(ing)*" "*buy(ing)*" "*procurement*" "*supply / value chain*" "*OEM*" "*demand*" "*gap in the market*" *"targets"* *"warranty"* "*level of support"* *"process lots, lots and lots of paperwork*" *"scale"*	*"pricing", "price", "price point"* *"profits, margin"* *"overhead"* "*pay(ment)"* *"spend(ing)"* *"(X) pounds"* "*cheap/ cheapest"* *"cost*" *"commercial(ly)"* "*money*" "*saving money/ make savings"* "*funding"* *"cost effective"* *"sales"* *"efficient (cy)"* *"finance(d)"* *"income"* *"quoting"* *"bottom line"* *"premium product"* *"lean"* *"weighting"* *"manpower"* *"afford"* *"goldmine"*	*" established / maturing/ growing/ other/ new market"* *"industry"* "*diversify*" ***"**area"* "*world / global*" "*sectors*" "*niche*" "*corporate image*" "*market place*"

Table 13: Example free market economy metaphor keywords and synonyms in analysed extracts

Commitments to free market economy political ideology and its focus on economic growth are explicitly positioned in a range of UK Government published policy aimed at industry, produced under successive Conservative-led party administrations. For example, in the 2017 Industrial Strategy *(HMG, 2017)*, where repeating of the term free market economy combining obligation terminology, definitive language, belief and being commercial metaphor keywords can be understood to position such ideology as ideology of the Conservative party. The reinforcing of this political ideology places an obligation on UK businesses and citizens to operate in compliance with this political ideology, whilst acting to negate alternative ideology visions that may be possessed by other political parties, institutions or individuals, e.g.:

"What will not change is our commitment to an open, liberal, modern economy, built on the core principles of competition, free trade and high regulatory standards" (HMG, 2017)

This commitment to free market economy political ideology and economic growth is evident in a range of published materials from government, business representative bodies and financial

institutions, demonstrating the embedding of the ideology as normative in production value chain networks, e.g.:

"We believe that economic success, both now and in the future, depends upon a political and economic framework that delivers a healthy environment and sustainable use of resources, good environmental performance at the organisational level, growth, jobs and competitive advantage" (Aldersgate Group, 2017)

Therefore, working to free market economy political ideology and commitments to economic growth are inherent rules of current production and construction systems. As put forward by an environment body at the WRF event, "*production and consumption systems are based on the logic of consumerism and growth*" where "*democratic political systems, public and financial institutions have inbuilt short term focus and logic*". It can also be interpreted that a consequent rule is that SMEs are to sell, and customers to consume, more and more products or services to achieve growth and adhere to this ideology, as constructed in a range of interview extracts, e.g.:

"So it's challenging because UK manufacturing (0.2) by its very <u>name</u> >manufacturing is goods dominated<. [I: um] So you've got <people with very good dominant logics who see (0.4) that their money comes from selling <u>things</u> not selling> information or ideas and experiences." Interviewee 13, academic

There were occasions in interviews where the rule regarding operating within free market economy political ideology principles and commitments to economic growth was made explicit by the government representative and SMEs, e.g.:

"*In a market economy you've got no chance have ya. So it's great having an ideal, and it's, it's good to target it, but unless everybody's (0.2) playing the game (0.2) you end up being a, you're losing out if you don't erm, go with the most cost effective approach. Simple as that*."
Interviewee 3, *SME*

However, the interview extract above positioned the "*ideal*" of putting ESD values into practice and solutions for dealing with the "*problem we've got with the environment*" (Interviewee 7, government) as not fitting free market economy political ideology and commitments to economic growth rules. Across interviews, workshops and events there were understandings that entities, structures and rules associated with free market economy political ideology disadvantages the development of CBMs, resulting in a green premium. For example, established efficient infrastructure and systems developed to support the linear economy in terms of economies of scale that advantage "*volume related pricing*" (Interviewee 1, SME) or "*the cost is too high, like refill is really hard. Infrastructure wise*" (Interviewee 12, consultant). However, the effects of globalisation of supply and demand where "*today we have a global economy*" (environment body, WRF event) was a dominant entity oriented to in discourse. Here there were understandings of geographical labour and working conditions standards outside of the UK disadvantaging CBM products as "*supply from China is actually dirt cheap*"

(Interviewee 2, SME) allowing products to be made and sold cheaply "*using cheap labour from Asia, Asia and beyond*" (Interviewee 7, government) in comparison to "*using local people means we're gonna pay 20% more*" (Interviewee 3, SME). Such understandings are also evident in published materials from industry representative bodies, e.g.:

"*Indeed, this transition has not been driven by an evangelical desire to achieve circularity. In reality it has been fuelled by the realisation that such approaches are commercially attractive and present the prospect of economic as well as environmental sustainability for companies operating in a global marketplace where differential labour and energy costs render them unable to compete on prices for manufacturing output alone*." *(TechUK, 2015, p. 5)*

This extract also aligns with understandings of the CE concept being understood as an ideal, "*a lofty..intention and ambition*" (MNE, iLEGO[56] event), or an "*evangelical desire*" or "*a theory*" that is "*promising*" *(EEF, 2016)*. However, at events, it was positioned that transitioning to a CE only works when consequence of action conforms with the rules of the existing ideology in practice. Understandings of the CE as an alternative "ideology" also underpinned discourse of presenters at events that positioned the existing ideology as wrong, e.g.:

"We need to have a serious discussion about the core of the system. … And the core of the system is of course capital. We live in a market economy, Americans are a bit less capital apologetic, they call it capitalism. It's not called naturalism or naturism. It's not called labourism, it's called capitalism." Environment body, WRF event

However, the CE is primarily presented by proponents of the CE and in policy as working within the existing ideology, particularly regarding economic growth and competitiveness.

Discourse on the CE in the range of settings included understandings of the influence of market dynamics, globalised supply chains and costs, supply and demand, commodification as well as political and economic systems and structures and the effect of technology and scientific advancement as part of the current ideology. The workshop 1 exchange in Table 14 demonstrates understandings of the influence of all these entities established as part of the current ideology:

[56] Innovation in Lean Enterprise and Green Operations, hosted by Cardiff University, 15th January 2019

Participant	Transcript
Participants 1, 2 & 6 are SMEs	
2	From, from my experience, the, the bale wraps are the same as stretch wraps in manufacturing and why- you know, the last 18 months, you could have got a recyclable price for it now you're paying for it to go away. [Yeah.] And people aren't wanting to, to buy it. The markets aren't looking to use that so. The supply or the availability of it outweighs the, the, the thirst for recyclability of it. It's, it's a real shame. You know, it's, it's changing the direction of the bins that it's going into for collection off-sites.
6	The market dynamics might change.
2	Yeah, it's constantly evolving. [Yeah.] So it is, yeah.
6	It's a moving beast, isn't it.
1	Yeah, yeah. You can get good quality polymer, as you say the bale wraps that can be recycled, then it can be exported to places like China. [Yeah.] So they won't take in waste, but they will take in products which has been cleaned and palletised and then can be used for the material. But it's about whether or not we're going to in this country be able to process that into something that is usable, as opposed to just processing it to send it somebody else. And all we've done so far is process it to hand it on to someone else.[Yeah.] And when, as a country, we start to go actually we'll take responsibility to find the solutions with what you do with this is when you'll get a market for it.[Yeah.] And then people will recycle it because it's worth doing, and it suddenly becomes a circular economy to do it.
6	That only, only happens in sort of niche areas at the moment. [Yeah.] It's not happening on a sort of scale. [Mm.] By any means, is it.
2	This is the other thing as well. We do send off a lot of erm, a lot of our waste materials, but we have to send it Malaysia cos it's the only place we can get it recycled because of the costs. If we were to try and set up a place in the UK, it's just not cost-effective. So we are, we are actually recycling all of our waste, scrap, but in Malaysia.

Table 14: Workshop example of knowledge of influence of political-economic ideology

Such exchanges were underpinned by understandings that a change in political ideology in practice would provide the solution to addressing ESD values. This was epitomised by a speaker at the WRF event, who represented an organisation that is a key advocate of a move from a focus on growth, who positioned the need to "*… become a brand new civilization. To have a new renaissance. To save ourselves and our planet."*. However, in workshop 2, counteracting this type of revolutionary vision or alternative ideology, it was positioned that "*we cannot change the system*" (Participant 3, academic) and are therefore constrained to working with the existing rules. Enabling change whilst working within the established rules of the current system was dominant in interviews, workshops, published materials and at events. In interviews, this was either in terms of people voluntarily changing what they believe, a "*mindset change*" and their ideologically informed practices in terms of "*totally (0.2) changing either our (0.2) consumption, [um] patterns or the way, the way we consume erm."* (Interviewee 7, government), or through existing types of interventions of the state that ensure that "*everybody's playing the game*" (Interviewee 3, SME). Workshop discursive interaction produced similar discourse, but where the power and need of "*some external force*" (workshop 2, Participant 2, private sector business advisor) was positioned as necessary to create universally applicable obligations on businesses for change to occur such that "*there's got to be that pull" where "you've got to have that national <drive> to make those changes."*

(workshop 1, Participant 1, SME). This condition is also highlighted in published materials from business representative bodies, e.g.:

"*A circular economy cannot work unless there is market pull for non-virgin products and materials.*" *(TechUK, 2015, p. 29)*

In line with the analysis in Section 8.1 on responsibility, this "*national drive*" was constructed primarily in relation to the role of Government, where it is implicitly understood that governments have a central role in enacting political ideology. However, the social power of MNEs, particularly "*retailers*" was also understood to have the capability to create a level playing field and work within the existing system, e.g.:

"So retailers either have to agree that they'll to take a price increase, <or> they insist you have to do it, and, therefore, make everybody do it.[Mm.] [Laughs] So it's got to push from that" workshop 1, Participant 1, SME

The social power of Government and big enterprise were understood to have the ability to overcome uncertainties in the future regarding development of CBMs and create "*a level playing field*" (Third sector organisation, PFW event). Government representatives understood that there are such expectations on governments, as Interviewee 7 constructed:

"Government <will have a role to play.> But it can't talk to individual businesses [I: um] They have to go through intermediaries. So the only way they can do that is by getting the corporates to do something voluntarily erm or by legislation." Interviewee 7, government

This extract demonstrates shared understandings of key structures and rules that are available to governments that have the power to enable them to enact or change ideology in practice. These being policy and legislation, the "*carrot and stick*", the "*incentive*" and "*penalty*" (Interviewee 14, academic), or more simply the voluntary and obligatory. The ability for legislation to obligate action was understood by SMEs to relate to negative consequences of non-compliance, e.g.:

"what we don't want is HSE coming through the door and saying you can't do that (....) That would be, we would definitely want to avoid those sorts of things. Similarly with the Environment Agency" Interviewee 1, SME

For example, the social power of legislation to overcome uncertainty and the prioritisation of extrinsic economic, material and utility value in practice was a consistent construct in interviews, workshops, events or in published materials. This was irrespective of whether customers valuing ESD values in practice is believed or not. This is on the basis that the "*rules*" established by legislation are understood to be universally applicable and obligatory, in terms of having the ability to "*force*" changes in practices, be fairly applied, and be "*effective*" in levelling out economic, material and utility and sustainability trade-offs. This is irrespective of "*the sector, size, ethos and public profile*" of businesses or what people say, as "*the biggest driver is clearly financial savings but issues such as regulation and demand from customers*

are also significant" *(MAKE UK, 2018a, p. 4)*. Legislation is understood to be a "*penalty*" for not voluntarily taking action which has the power for "*those who don't develop sustainable solutions [to be] regulated out of existence by governance*" (SME, IChemE[57] webinar). It can be interpreted that there are expectations that changes are needed to legislative rules to overcome price-performance inequalities of ESD values in practice. As put forward at workshop 2, this includes non-sustainable practices incurring financial penalties for businesses and customers through "*tax*", limiting freedoms of choice by obligating "*a standard way to make*" a product, and/or placing legislative responsibility for action on others such as "e*xtended producer responsibility amendments which will have a massive impact*" (Interviewee 7, government).

However, there are conflicting understandings of citizens and businesses responses to legislation. On one hand there were understandings that organisations, including SMEs, and citizens are supportive of governments implementing legislation regarding ESD values. As an academic (Interviewee 15) put forward "*if it's a level playing field they'll feel more comfortable*", a sentiment shared by the government representative in interview, i.e.:

> *"Actually no, to be fair. Most businesses, a lot of businesses that I'm aware of now, want Government to regulate, to allow an even playing field because the first adopters (0.2) are taking a risk […I've heard that said quite a few times so, more and more now, erm the businesses want legislation to create that even playing field and certainty." Interviewee 7, government*

However, as highlighted by another academic at the Future Earth online forum, there are also understandings that strong government intervention is a risk object, such that "*Governments don't want to invest heavily in programmes that might be politically unpopular. Or threaten their relative tax base*". There were also understandings at events that legislation can add "*more burden for businesses that operate across the UK*" (Waste sector representative body, PFW event) and that manufacturers "*never advocate for Government intervention we like the market to address the risks*" (R&D organisation, WRF event). This was coupled with understandings that citizens in the UK can be unsupportive of legislation where "*I don't think the public will respond to… we've been told we have to do it so we're going to do it.*" (Local Authority, PFW event) especially if it limits freedoms.

This is where policy is understood to have a key role in encouraging voluntary action. Through policy, at workshops and events, there were understandings that the Government has the ability to give an "*incentive*", make financial "*investments*", develop "*infrastructure*" and "*educate the market*" to influence the customer "*mindset*". As highlighted at events, supported by published materials, "*where government puts money informs where businesses want to*

[57] Institution of Chemical Engineers, IChemE: Sustainable Production, 24th August 2020

play" (Financial services, STBAH[58] event), especially "*in the areas of public procurement*" where "*the Government can play a role as a consumer*" (R&D organisation, WRF event).

However, in all settings, actors engaged with an understanding that a "*balance*" has to be struck between the voluntary, legislative and incentive as there were understandings that governments cannot "*rely on mass movements as history dictates that legislation is required*" (audience member, STBAH) for ESD values to be enacted in practice and "*This will require a strong role for government to steer markets towards circular behaviour*" (Local Authority, WRF event). There were also understandings that "*financial incentives and reward schemes … They haven't been that successful, they've cost a lot of money and have not necessarily achieved that much increase in recycling*" (Government, PFW event). The "*carrot and stick"* metaphor and concept of penalties was called upon directly in workshops and events, but this is understood to create dilemmas for governments in "*getting the policy landscape right*" and avoiding "*disjointed, over ambitious or poorly implemented policies creating perverse incentives*" *(TechUK, 2015, p. 26)* in terms of determining the balance between different options, e.g.:

"I think it's a challenge about getting that balance right. I think you do need the threat of a penalty in certain circumstances because quite frankly it's effective … I think equally though you do need…I think we think more about the carrot in certain circumstances and how in our policymaking legislation we can do better with that both for businesses, individuals, councils and so on. ….But how can we incentivise people to do better?" Law representative, PFW event

Getting the balance right creates uncertainty. Such uncertainty, "*a punt*", was understood to position development of CBMs as a "*leap of faith*", irrational "*it's mental*" (Interviewee 12, consultant), a "*holistic*" (Interviewee 14, academic) or "*fanciful*" (Interviewee 12) future ideal and therefore a risk for established SMEs requiring them to be "*brave*":

"But again, you know, <u>that's</u> a punt and that <u>is</u> a leap of faith. So here's me saying, oh it's not a leap of faith, but I probably wouldn't have advised them to go (0.2) <u>whole hog</u>, you know. But some people, you know, some SMEs are pretty, you know, <u>brave</u> and assertive people and they, being an SME is, you know, <u>often</u> about taking risk, isn't it? It's quite a <u>risky</u> place to be." Interviewee 12, consultant

This reinforces understandings of proactive development of CBMs as a risk object, but that "*one would <u>hope</u>*" would become the future norm, as shown in the following extract:

"for me it's a <u>normative</u> thing, it's a sort of ideal, <u>idealised</u> perspective saying this is <u>how</u> it <u>could</u> be and <u>should</u> be and this is what you should be <u>aiming</u> for" Interviewee 14, academic

[58] Sustainable Technologies Business Acceleration Hub: sustainable Economy event series: keep products and materials in use, 27th June 2019

This goal of CE proponents, of the CE being the future ideology in practice, is made explicit in published material from BiTC, where "*Their aspiration is that over time, these ways of working will become the norm, adopted by all actors in the value chain*." *(BiTC, 2018a, p. 12)*. However, as highlighted by SME Interviewee 3, if proponents of the CE fail to acknowledge existing obligations that are "*on the list*" for SMEs to continue to be "*commercial*" and the potential negative consequences for SMEs not meeting existing obligations and rules associated with the existing ideology in practice, this may exacerbate limited development of CBMs in SMEs (see also *Tech UK, 2015, p. 7)*:

"whilst everybody can talk about it, sometimes you know there's plenty of erm demands on the business and time and money that, err, some of the higher ideals might not make it to the list" Interviewee 3, SME

Perceptions of proof of consequences of voluntary action therefore influences the effect of the values and ideology causal mechanism in developing CBMs. This being the subject of the analysis of the CE proof of value repertoire discussed in Chapter 9.

8.4 Values and political ideology in practice interpretative analysis

In line with the analysis in Section 7.4, the interpretative analysis presented in this section involved inductive, abductive and retroductive reasoning *(Bryant & Charmaz, 2007; P. K. Edwards et al., 2014; Ezzy, 2002; Oliver, 2011)*. The theory presented in this section is my proposed explanation of the major influences on perceptions of uncertainties in proactively developing CBMs.

Based on my analysis in this chapter, the CE as a higher ideal repertoire, supported by the existence of a values and ideology causal mechanism, is an important discursive resource that is used in conjunction with the asymmetric power relations repertoire, analysed in Chapter 7, in the construction of uncertainties for established SMEs in proactively developing CBMs. It is used primarily to validate the rationality of decisions and attribution of responsibility for action. In this section I argue why this causal mechanism has such an influence.

First of all, the understanding of the development of CBMs as a voluntary ethical or moral higher ideal is due to the association of CBMs with ESD values. Such values being inherently perceived as being a "higher domain of value" associated with individuals' personal interpretations of what is right and good *(Ludwig, 2000)*. The positioning of ESD values as an ethical and moral entity, and thus a higher domain of value, supports taken for granted understandings that putting ESD values in practice recognise and prioritise the intrinsic value of protecting natural entities and services, humans and non-measurable value over extrinsic measurable material, economic or utility value for humans, in line with philosophies of moral judgement and environmental ethics *(Brennan et al., 2020; Zimmerman et al., 2019)*.

My findings demonstrate how perceptions of uncertainties of proactive development of CBMs relate to understandings of how ESD values are valued by customers and influenced by political ideology in practice. This not only places constraints on what established manufacturing SMEs are to prioritise in decisions, but creates uncertainty when, as highlighted in Section 3.5.5, a moral responsibility is being placed on businesses when values enacted by society in consumption practices are not supportive of such action. This is irrespective of the values held by decision-makers in established SMEs. This is on the basis that my findings support a value-belief-norm (VBN) theoretical position. Here embedding ESD values in practice, and by association the development of CBMs, is mediated by a causal arrangement of personal values and beliefs; perceptions of negative or positive consequences regarding what is of value when enacting ESD values; perceptions of capabilities, freedoms and responsibilities for action; obligations and norms, and the external and situational causal powers that support or contest enacting ESD values for both existing SMEs and customers *(Stern, 2000)*. Each element of the arrangement directly affects the other elements, with some having greater influence than others in resulting in action. However, in accordance with the theory developed in Chapter 7, and the existence of the power and relationship dynamics causal mechanism, what is of value for established SMEs is the maintaining, strengthening or gaining of long-term preferred supplier or strategic partnership status with customers. Such action being influenced by historically constituted asymmetric dependency relationships. Therefore, uncertainties and consequences of actions are evaluated on this basis. As such, Schwartz's theory of cultural values applies, as outlined in Section 2.3.3 *(Schwartz, 1999)*, where decision-makers in established SMEs orient to and engage with the values defined as important in the production and consumption system. As Jansson et al. *(2017)* conclude, these pre-conditions constrain the influence of the personal ESD values of individuals who have the role of a decision-maker in an established SME when deciding on engaging with CBMs, whilst directing interpretations of the norms and obligations on established SMEs. Therefore, how customers and external entities and structures, that influence both SME decision-makers and customers, are perceived to value ESD values in practice have pivotal roles in evaluations of uncertainties and development of CBMs being a risk object.

As demonstrated in pilot projects where businesses actively engaged with setting up CBM, thus inferring possession of ESD values, projects have ended in failure when not meeting business-as-usual performance values requirements and there has been a lack of customer support and demand, commercial interest and markets *(Blomsma, 2016, 2018; Blomsma & Brennan, 2017)*. Furthermore, as demonstrated in my findings, supported by existing case study research outlined in Section 3.2.1, successful examples of CBMs rely upon there being a market demand where there are price-performance improvements for customers *(Bassi & Dias, 2019; Garcés-Ayerbe et al., 2019; Oelze & Habisch, 2018; Rizos et al., 2016; Sáez-Martínez et al., 2016a)*. Supporting the findings of Gusmerotti et al. *(2019)*, established SMEs

have little social power to influence others, with their personal ESD values and beliefs having limited causal power in the successful uptake of CBMs.

On this basis I contest the position taken up by those SME researchers, influencers and policymakers who position internal characteristics of established SMEs as being wrong, requiring interventions focused on changing how SMEs are run, their values and levels of knowledge and awareness, as presented in Sections 3.1 and 3.2.1. Instead, prioritisation of extrinsic value in consumption practices, and how political ideology in practice values ethical and moral values, are the primary risk objects. This is on the basis that, firstly, my findings demonstrate embedded understandings that customers' price and performance extrinsic value take precedence over the intrinsic value of ESD values in practice *(Sandhu et al., 2010)*. And secondly, my findings show how political ideology in practice legitimises the prioritisation of extrinsic value determined on a cost-benefit basis, rather than what is morally right *(Pidgeon & Butler, 2009)*.

On prioritisation of values, conflicting perspectives on SME decision-makers and customers possessing and enacting ESD values was evident in the data. In line with ideological interaction theory, individuals and organisations were either positioned as being in an "in group" that put a value on ESD values beyond the extrinsic value or an "out group" that does not *(van Dijk, 2006)*. However, there are conflicting interpretations of the importance of being seen to possess such values and put them into practice and the consequences for established SMEs of working to embed these values in production practices. These conflicts are reinforced by interpretations of the normative expectations of how ESD values are to be evaluated and the obligations on established manufacturing SMEs regarding price parity/ proximity and performance requirements *(Porter, 1985)*, as introduced in Chapter 7. I argue that this prioritisation of extrinsic value embedded in the values and ideology causal mechanism, builds on a historically constituted taken for granted understanding of the human-natural world relationship.

Whilst the growth of environmentalism in the 1960s, as introduced in Section 3.5.4, is understood to have had an influence on how western societies started to look differently at the human-natural world relationship, the deep-rooted historical influence of religious doctrine has been suggested as underpinning values regarding this relationship *(Brennan et al., 2020)*. Although ideas may have varied throughout the centuries about what nature is, the development and implementation of Christian religious doctrine over 1700 years has maintained the conceptualisation of humans being "exceptional", superior beings *(Corner et al., 2013)*. As such the purpose of all aspects of the natural world is for the use and exploitation by humans to best serve humankind *(White, 1967)*. As Paul Stern *(2000)* outlined, throughout human history, negative consequences for the natural world have been at the expense of meeting human desires.

My analysis in this Chapter demonstrates how this perspective of the human-natural world relationship is an embedded taken for granted norm in decision-making practice regarding production and consumption systems, irrespective of understandings of the intrinsic value of addressing ESD issues. The norm is for decisions involving embedding ESD values to focus on an evaluation of impacts on customers, irrespective of SME decision-makers, personal values. This is a key feature of discourse at events, where discourse of necessity, and therefore risk, irrespective of whether framed as an ethical or moral obligation, is dominated by discourse of extrinsic value to humankind. This perspective strengthens the normative expectation of business decision-makers to evaluate value from an economic and financial theory perspective, where the value of an entity is to be judged in relation to good or bad material, economic, status, importance or utility worth, as outlined in Section 2.3.3 *(Carney, 2020; Tory-Higgins, 2007)*.

In this way, a rational decision on whether to proactively develop CBMs for SMEs is to primarily meet the condition of maximising or retaining customer extrinsic value and adhering to customer value preferences, irrespective of the moral or ethical consequences regarding the intrinsic value of addressing ESD values. This aligns with suggestions that a "rule" of products and services with embedded ESD values must provide direct, tangible benefits aligning with the primary reasons customers buy such products, they do not adversely affect quality or performance and any premium pricing must provide superior benefits and performance *(Ottman, 2014a)*. The focus on price and performance extrinsic value in practice also aligns with research carried out on consumers engagement with the CE where product quality, price and durability were identified as the three most important factors influencing purchasing decisions *(Cerulli-Harms et al., 2018)*.

Even so, being seen to adopt ESD values by engaging with voluntary instruments may be becoming a more normative expectation in a range of production value chain networks. As with customer values, the trust in and truth of public declarations of businesses enacting ESD values is covered in Chapter 9. However, the evaluation of whether to demonstrate engagement with ESD values remains determined in relation to how customers are understood to value ESD values.

Discursively declaring commitments to ESD values demonstrates how SMEs adopt the role of a "political citizen" when situational and external conditions require under conditions of uncertainty. This complies with a supply and demand theory of Corporate Social Responsibility (CSR) where businesses meet CSR requirements that customers demand *(Kuokkanen & Sun, 2020)*. A person enacting the role of a "political citizen" acts to comply with expectations (whether regulatory, politically or socially determined), in part because of a belief in the subject but also as a matter of long-term self-interest in sustaining a self-concept of social responsibility and humanity and earning approval and respect of others *(Corneliussen, 2004)*.

Building upon the theory developed in Chapter 7, being a “political citizen”, regarding being seen to put ESD values into practice, is of value in retaining relationships for established manufacturing SMEs when doing so has positive extrinsic value for them and their customers. A condition being that action results in differentiation that conforms with customers’ normative prioritisations of value that enhances, maintains or obtains preferential status with customers. This aligns with a theory of the firm perspective on CSR, where such actions act as a differentiator *(Kuokkanen & Sun, 2020)*. However, without “*demand and pressure*” from customers to demonstrate engagement with ESD values, or where engagement does not result in a differentiator, the expectation is for SMEs to be “*commercial*” and engage with the “amoral calculator” model of decision making in practice *(Corneliussen, 2004)*. Here, the external conditions define norms and obligations where SMEs survival “*comes from selling things*” (Interviewee 11, business support provider). This “amoral calculator” model requires established manufacturing SME decision-makers to make decisions on a commercial *cost-benefit analysis* basis.

Adopting this model, SMEs comply with expectations to put ESD values into practice and develop CBMs where there is certainty that positive consequences (benefits) outweigh negative consequences (costs) for their customers and themselves. This includes when 1) costs of complying are lower than costs of not complying (e.g. when using existing materials costs more than sustainably sourced materials); 2) not complying has the potential to destroy the individual, institution, or business (e.g. when a customer an SME is strongly reliant on demands change and the SME fails to respond); 3) complying or not complying significantly impacts upon reputation (e.g. product or service quality and performance resulting in gaining or losing customers, preferred supplier status), or 4) complying enables access to substantial incentives providing commercial benefits (e.g. grant funding enabling differentiation that enhances customer relationships) “*in the same way that every company does*” (Interviewee 1, SME) *(Corneliussen, 2004)*.

In all instances, certainty of these conditions existing influences action. The taken for granted norm of how value and consequences are to be determined is for them to be determined on “*the most cost effective approach. Simple as that*” (Interviewee 3, SME). However, as positioned in published materials, there is uncertainty of positive economic consequences, where businesses ask “*will there be a cost-benefit to manufacturers to undertake such a process?*” *(EEF, 2016)*, built on understandings that “*A robust business case is critical for the circular economy to work*” *(TechUK, 2015, p. 7)*. This evaluation of the cost-effectiveness condition determined by cost benefit analysis, builds upon a number of taken for granted socially and institutionally established rules embedded in the values and ideology causal mechanism that reinforce the privileging of economic utility and primacy of economic cost-benefit analysis *(Pidgeon & Butler, 2009)*. Firstly, what is of value can be measured and

monetised. Secondly, maximising benefit for humankind is the most important aspect of existence. Thirdly, competitive markets, innovation, technology and science will resolve conflict between the intrinsic and extrinsic, in line with free-market economy political ideology.

My findings demonstrate how when rationalising cost-benefit based decisions regarding embedding ESD values, people engage with (knowingly and unknowingly) the conceptual "economic production" metaphor of nature *(Raymond et al., 2013)*. Although proponents of the CE tend to use a *"*closed loop*"* benefit vs harm balance metaphor in discourse of the CE, as demonstrated in Sections 1.2 and 3.3.4, such discourse retains the economic production conceptualisation and cost-benefit analysis perspective. The use of this discourse positions humankind as retaining the freedom and a right to use natural entities and services and economically and materially benefiting from such use, as long as they do so by the "*sustainable use of resources*" *(Aldersgate Group, 2017)* in a balanced way *(Raymond et al., 2013)*. Irrespective of terminology, the right of humankind to use natural entities, services and peoples for their own extrinsic economic, material and utility value is a normative expectation. This is underpinned by conceptualisations of natural entities and services and humans as *commodities* or "*resources*" that an appropriate price can be allocated to and then traded in markets.

The interconnectedness of commodification of nature, human-natural world moral relationships, growth of neoliberalism and governance of the natural world are the subjects of a range of political economy, environmental ethics and ecology studies. Significant debate exists that identify the dilemmatic nature of such entities in terms of being a problem for the natural world and humanity, whilst simultaneously being understood to be a solution to protecting the natural world and societies *(e.g. Brennan et al., 2020; Castree, 2003, 2010a, 2010b, 2011; Dale, 2016; Liverman, 2004; McAfee, 1999; Mrozowski, 1999; O'Neill, 2001)*. Commodification results in entities in their locations being seen as resources that are marketed, conceptually homogenised, used, traded-off, off-set or exchanged for money. This is irrespective of their immeasurable or unmonetized intrinsic value to plants, animals, insects or people (e.g. ethical, aesthetics, heritage, spiritual) in their location *(Castree, 2003)*.

As argued by Sandberg et al. *(2018)* interventions to embed ESD values become limited to those entities that can be measured and priced. In this way, a taken for granted norm embedded in the values and ideology causal mechanism is that ESD values, and the natural world in general, are expected to earn their right to exist by being commodified, tradeable and valued extrinsically by society in some capacity *(McAfee, 1999)*. What aspects of the natural world are of extrinsic value and how costs are determined, in compliance with theory of cultural values and economic and financial value theory, underpins the ideological dilemma for established manufacturing SMEs in evaluating uncertainties. To overcome this dilemma and enable cost-benefit analysis evaluations to be carried out, my findings show how individuals,

institutions and entities allocate a “shadow price” to intrinsic value. Shadow prices are based on proxy estimates determined in relation to shared characteristics with existing monetised entities, or how much people are willing to pay or accept in compensation for losses of intrinsic or extrinsic value or functionality/ performance if markets existed *(O’Neill, 2001)*. In accordance with shadow price theory, if there is no proxy price or customers are deemed unwilling to “*pay an extra 10 percent if you can show it’s ethically sourced*” (Interviewee 1, SME), or what people accept in compensation is deemed small, the rational conclusion is that the intrinsic value in question have little or no worth in a decision.

The emphasis on “*saving money*” *(NAW, 2017)* and other proxies of economic benefit such as delivering “*growth, jobs and competitive advantage*” *(Aldersgate Group, 2017)* embedded in CE policy gives primacy to the prioritisation of extrinsic economic, material and utility value and cost-benefit analysis in the values and ideology causal mechanism. Through linking jobs, economic growth and business competitiveness to use of natural resources, commodification of nature and people is also reinforced and becomes increasingly politicised *(Castree, 2010b)*. Therefore, the existence of the values and ideology causal mechanism means established manufacturing SMEs are obligated to evaluate development of CBMs on an extrinsic cost-benefit, price-performance basis to survive in their role as a commercial business, constrained by the socio-political context and mainstream economic rationalities *(Pidgeon & Butler, 2009)*. To do so they rely on existing allocated economic prices and costs of resources and existing and potential customers, evaluations of value in terms of their willingness to pay or acceptance of compensatory losses where there is a green premium. ESD values in production practices resulting in a green premium where economic costs and prices to customers are higher is an established understanding, although in use efficiency may outweigh increased initial prices *(Gates, 2020; Guyader et al., 2017)*. Understandings of the existence of a green premium aligns with research presented in Section 3.2.3, such as costs for an individual product being higher due to the design and logistics complexity of developing CBMs in comparison to existing linear models *(Haziri et al., 2019; Linder & Williander, 2017; Masi et al., 2018; Prosman et al., 2017; Werning & Spinler, 2020)*.

My analysis demonstrates how these normative rules of ESD values being a higher ideal, eco-design being cost based, the human-natural world relationship, commodification of nature and the green premium, are understood to have become established and are reinforced by entities and structures developed to support enactment of political ideology. Political ideology embedded in industry norms, organisations and social networks of influence of decision-makers in businesses were understood to influence social, material and cultural practices and norms in relation to business activities, including values and rule of thumb rules, and provide normative guidance on concepts such as ESD values *(Gupta et al., 2017)*. Political ideology in the UK is understood to have developed in association with colonialism, industrialism,

modernisation, liberalism and strengthening of capitalism across Europe and further afield throughout the 19th and 20th centuries *(Dale, 2016; Mrozowski, 1999)*.

Throughout this period, liberalist capitalist political ideology also became prominent, with Britain operating under a policy of "free trade" creating unrestricted capital markets for commodified entities, including people *(P. L. Payne, 1967)*. This evolved into a form of "regulated capitalism" involving state intervention, to protect access to commodities, wages and employment in Britain and against competition from other nations *(Dale, 2016)*. This regulated capitalism political ideology is understood to have evolved into a "neoliberalist capitalism" political ideology from the 1940s onwards, centred on a free-market economy concept, that was put into practice in strong ways in the 1970s in Chile, the UK and USA *(Castree, 2010a)*.

Operating within this neoliberal capitalism political ideology is an inherent rule embedded in the values and ideology causal mechanism, regarding how established SMEs in the UK are to operate. This being demonstrated by the ubiquitous use of free market economy terminology, synonyms and keywords in discourse associated with business in the findings *(Charteris-Black, 2017)*. Commitments to neoliberalist capitalism ideology and operating to free market economy principles, with their focus on jobs, competitiveness and growth, and encouraging voluntary action underpins CE discourse aimed at industry. My findings are in concurrence with taken for granted understandings of policy and proponents of the CE, that developing CBMs has to align with the rules associated with existing political ideology (see Sections 3.4 & 3.5.3). They also support arguments of CE theorists who position entities, structures and rules associated with industrialism, globalisation and modernisation, that rely on continued economic growth, as influencing the ability to transition to a CE, as outlined in Section 3.5.3 *(e.g. Charonis, 2013; Jackson, 2016; Jansiz, 2014; Sandberg et al., 2018; Spangenberg, 2010)*. In addition, the results ally with other discourse studies that identified the role of individuals, institutionalised entities and structures and demands of customers, society and policy in production value chain networks as determining action (see Section 3.3).

Entities and structures that have become stabilised to fit with this neoliberalist capitalism political ideology around the world, including discourse, are perceived to act against "*doing the right thing*" (Interviewees 10 &15, PFW and Waste to Wealth events) and voluntarily embedding ESD values in production practices. This is especially where there is no customer demand or there is a green premium that customers are unwilling to pay for and there are differing allowable standards of practice, as doing so would result in negative consequences for established SMEs and customers *(Sandhu et al., 2010)*. These understandings are commensurate with CE drivers, barriers and enablers (DBE) research presented in Section 3.2.3, where the green premium is positioned as being due to the influence of economic structures and rules underpinning the existing linear economy system *(Brammer et al., 2012;*

Caldera et al., 2019; Conway, 2015; de Jesus & Mendonça, 2018; Garcés-Ayerbe et al., 2019; Kumar et al., 2019; Masi et al., 2018; Ormazabal et al., 2016; Sáez-Martínez et al., 2016a). My findings also support the positioning of DBE researchers presented in Section 3.2.2, who call upon the lack of market support and high levels of uncertainty of customers valuing ESD values and CBMs without added extrinsic value as inhibiting action *(e.g.: Ballard et al., 2013; Fandrich & Kivinen, 2011; Fonseca et al., 2018; Mativenga et al., 2017; Oelze & Habisch, 2018; Ormazabal et al., 2016; Ritzén & Sandström, 2017; Rizos et al., 2016)*.

To overcome uncertainty in proactively developing CBMs, governments, citizens and big business are assigned responsibility for changing political ideology in practice. This is on the basis that responsibility is understood to relate to social power, wealth and size, where there are embedded understandings that Government has the social power to "<*correct behaviours*> *through policy and legislation*" and change "*the rules*" (Interviewee 1, SME). However, big business, as well as Government, is also understood to have "*a great responsibility*" due to their size (MNE, PFW event), to create an "*even playing field*" (Interviewee 7, government) that overcome failures of individuals to enact societal moral obligations voluntarily.

This can be explained by arguments relating to theory of moral responsibility, and the difference between and integration of external "legal" and internal voluntary "moral" responsibility and individuals freedoms and roles *(Alznauer, 2008)*. Here, those with social power to define external legal responsibility and influence voluntary moral responsibility in society can be perceived to be responsible for changing the limits and scope of responsibility and associated practices embedded in society. However, those with such power do so from their own moral perspective regarding ESD issues. In this way the concept of responsibility has a diverse range of meanings and conceptualisations, being variously linked to forward looking and backward looking events and causality, agency, authority, power, ethics, morality, obligation, roles, reward, knowledge, blame, liability and accountability *(Garsten & Hasselström, 2003; Giddens, 1999; Sena, 2014; van de Poel & Fahlquist, 2012)*.

As demonstrated in my analysis, the complexity or ambiguity of the concept of responsibility makes the attribution of responsibility a contested space, in terms of allocating and taking responsibility as a collective (e.g., societal, countries, governments, organisations, businesses) or an individual. Contestation is high when there are both individual and collectively shared aspects of a "manufactured risk" that has been created by human development and science and technology innovation, including climate change *(Giddens, 1999; van de Poel & Fahlquist, 2012)*. Responsibility dispute is especially high when large numbers of people are voluntarily involved in and have a stake in a "manufactured risk" as part of a globalised society, such as the linear economy system, as outlined in Section 1.4. An issue is that every individual has agency and is to "blame" in some way through their actions

for the negative consequences of that activity. As Sena *(2014)* puts forward, this includes climate change, environmental degradation and social injustice and inequality with each actors' contribution and level of agency being unclear or difficult to evaluate. This type of situational context has been labelled the "problem of many hands" (PMH). In line with theory of moral responsibility, authors on the PMH recognise that there are embedded understandings of a moral and ethical responsibility to act somewhere on ESD values, but upon whose shoulders this rests is diffuse and complex, when negative ESD consequences are a result of co-created collective action *(Sena, 2014; D. F. Thompson, 1980; van de Poel & Fahlquist, 2012; van de Poel & Sand, 2018)*.

However, from an established SME perspective, CE discourse can be understood to attribute "responsible innovation" to SMEs to solve societal level challenges voluntarily, even though innovation involves uncertainty, a wide range of actors and trade-offs or compromises between potentially conflicting value preferences *(van de Poel & Sand, 2018)*. This builds on taken for granted constructions of SMEs as innovators as discussed in Section 1.3, and the characterisation of SMEs as a homogeneous entity and smaller versions of big businesses, as discussed in Section 3.1. Alternatively, it is positioned that there needs to be a "*mindset change*" (Interviewee 7, government) across society. Both these positions are consistent with environmental governance literature where the "collectivisation of risk" through intervention of the state is replaced by placing an onus on groups in society to take responsibility and voluntarily do the right thing, as discussed by Pidgeon and Butler *(2009)* and Newell et al. *(2015)*.

However, attribution to an individual or collective can only be deemed fair if the actor has social power and can: 1) act intentionally, 2) can make a causal contribution to the required outcomes they are responsible for, 3) has insight into normative implications of action, 4) is free to act without constraint and 5) knows the consequences of action *(van de Poel & Sand, 2018)*. As demonstrated in the analysis in Chapter 7 and in this chapter, the existence of conditions 2 to 5 are disputable regarding established SMEs *(see also van de Poel & Fahlquist, 2012)*. As my finding demonstrate, there are understandings that some form of "*individual and collective responsibility*" (Environment body, WRF event), working to the same rules, values and goals, and the sharing of consequences is therefore necessary to address ethical and moral societal risk issues *(e.g. Garsten & Hasselström, 2003; van de Poel & Fahlquist, 2012)*.

As already discussed, shared rules, values and goals are understood to be defined by political ideology and therefore, as the primary agents of political ideology in practice that are understood to have social power, governments are expected to intervene. However, the majority of government intervention is based on "*getting the corporates to do something voluntary*" (Interviewee 7, government) and the promotion of innovation support aimed at

entrepreneurial oriented businesses. My analysis demonstrates how the PMH, the complexity of attribution of individual and collective responsibility aligns with research on the "governance trap", where global issues are understood to be so big that national governments have "*latent permission*" (Green Alliance event) to make changes and take a lead role. The voluntary-based form of governance embedded in CE discourse is a consequence of the "governance trap". Here, responsibility for addressing ESD problems are devolved by governments to individuals, communities, businesses, institutions etc. to maintain alignment with liberalist political ideology in practice and avoid negative consequences for the political party in power, even though citizens call for strong action by national governments *(Newell et al., 2015; Pidgeon, 2012b; Pidgeon & Butler, 2009)*.

My findings support an argument that stronger policy and legislative "*carrot and stick*" (Interviewee 14, academic) intervention by governments, that are not reliant on engaging with the CE from a voluntary morally informed perspective, are needed to overcome perceptions of high uncertainty for established SMEs. As put forward by the trade association TechUK, strong, consistent and stable governance by governments and fair attribution of responsibility needs to be in place *(TechUK, 2015, p. 4)*.

My findings also reinforce the position of the large number of DBE researchers outlined in Section 3.2.3, that call for push-pull measures by Governments including stronger legislation, regulation and enforcement, incentives and support programmes and establishing of an operating environment where everyone is to work to the same standards. They also support arguments of CE critics, presented in Section 3.5.1, that a move from weak to strong governance is understood to be required involving more disruptive socio, technical, political and economic change for transition to be successful *(e.g. Allwood et al., 2017; Geissdoerfer et al., 2017; Johansson & Henriksson, 2020; Kallis, 2017; Korhonen, Nuur, et al., 2018; Prieto-Sandoval, Jaca, et al., 2018)*. Therefore, perceptions of the truth of evidence of values and political ideology in practice advantaging embedding ESD values in manufacturing can be understood to influence perceptions of consequences, as discussed in Chapter 9. A summary of the findings and interpretative analysis in this chapter is provided in Table 15.

Interpretations	Entities & structures	Rules of the manufacturing regime	Discourses
Values and ideology causal mechanism - uncertainties			
Engaging with the CE is a voluntary ethical or moral higher ideal that is beyond normative expectations placed on existing SMEs who are to maximise extrinsic value to customers. Perceptions of customers valuing ESD values and ideology, effects of CBMs on customers price-performance extrinsic value, political ideology advantaging the development of CBMs and attribution of responsibility influences evaluations of uncertainty.			
Shared interpretations	Ethics & morality • Intrinsic and extrinsic value • Domain of values • Corporate social responsibility • Group identity • Stakeholder pressure • Legislation	• CE and ESD values are ethical and moral entities • Putting ESD values into practice are the morally right thing to do • CE and ESD values and ideology are a standard of practice and beliefs above expected norms • Implementing of ethical and moral values are voluntary and choice-based • Established manufacturing SMEs to engage with ESD values of concern to customers and influential stakeholders • Changes to products and services to retain or improve on existing extrinsic customer value • Extrinsic value is a priority • Legislation has power to embed ethical and moral values as normative practice	• Ethics and morality • Higher ideal metaphor • Badges is activism metaphor • Voluntary add on • Identity as good or bad • Spectrum of ethical and moral practices • Customers' prioritisation of values • Legislation and compliance • Extrinsic and intrinsic value
	Commodification of nature • Human-natural world relationship religious doctrine • Marketing and trading of natural entities & services as commodities or resources • Proxy economic value	• What is of value is measured and monetised • Humans as exceptional superior beings • Humankind to retain the freedom and rights to use natural entities and services and economically and materially benefit from their use • Established manufacturing SMEs to make decisions on a cost-benefit analysis basis	• Cost benefit analysis • Human well-being • Commodities and resources
	Political ideology • Commercialism • Neoliberal capitalism	• Established manufacturing SMEs are to be commercial, profit and competition oriented • Established manufacturing SMEs to work to the rules of political ideology enacted in society	• Differentiation & competitiveness • Being commercial metaphor • Competitor and market conditions

	• Free market economy doctrine • Economic growth • Industrialism • Supply and demand • Infrastructure • Globalisation of production • Disparity of labour and working conditions standards and costs • Ecological modernisation • Austerity	• Manufacturing SMEs are to sell and customers to consume more and more services and products • Prioritisation of economic extrinsic value • Economic growth is to continue		• Globalisation • Price-performance parity and proximity • Jobs, growth, competitive advantage • Free market economy capitalism • Austerity and affordability • Economies of scale
Contrary maxims	Ethics & morality • Intrinsic and extrinsic value • Corporate social responsibility	• Customers prioritise extrinsic value in practice	• Customers value intrinsic value in practice	• Inconsistency of ethical and moral practices • Customer price-performance values • Customer ethical and moral practices and demands • Consequences
	Commodification of nature • Market costs and price • Proxy economic value	• Customers are unwilling to pay a green premium without added extrinsic value	• Customers willingly pay a green premium	• Green premium metaphor • Green activist metaphor • Customer willingness to pay
	Responsibility • Problem of many hands • Governance trap	• Responsible innovation by businesses will enable transition to a CE working within the existing landscape conditions	• Government intervention is required to change mindsets and the landscape conditions that disadvantage development of CBMs	• Responsibility • Power, control and agency • Innovation • Behaviours • Rules • Problem of many hands • Voluntary-legislation balance • Carrot and stick metaphor
		• Businesses to absorb economic risks of solving societal ESD issues	• Customers to absorb economic risks of solving societal ESD issues	• Responsibility • Green premium metaphor

Table 15: Summary of findings and analysis regarding what is understood of CBM

9 What is understood of risks for SMEs in actively adopting CBMs?

As outlined in the analysis in Chapter 8, perceptions of how circular business models (CBMs) affect extrinsic value has a key role in evaluations of consequences for established Small and Medium-sized Enterprises (SMEs). In this chapter the detailed analysis of the circular economy (CE) proof of value repertoire is provided relating to the entity economics. This repertoire is fundamental to a trust and truth causal mechanism. The repertoire was assessed as being of primary importance in answering Research Question 3: What is understood of risk for SMEs in actively adopting CBMs?

The analysis in this chapter focuses on conflicting constructions regarding trust and truth of the evidence of the value to businesses and their customers of developing CBMs. This is on the basis that trust has a fundamental role in mediating perceptions of risk and the subsequent actions of individuals *(Walls et al., 2004)*. As Wynne *(1992)* surmises, trust in and credibility of actors and institutions influencing the uptake of information is dependent upon the nature of identities and relationships.

Chapters 7 and 8 call upon the concept of proof to address uncertainty and establish that something exists and/ or is true, in which the truth of the information presented was constructed in relation to trust, experience or expertise. In studies of risk perception, perceived "trustworthiness" and a "common sense" mistrust or scepticism are recognised as important in mediating perceptions of risk and the resulting actions that people take in accepting or rejecting information provided to them *(Walls et al., 2004)*. This aligns with existing research presented in Sections 2.3 and 3.2 where trust dynamics, perceptions of the credibility and confidence in organisations and customers and actions and experience of the tried and tested are recognised as influencers of actions taken by SMEs. This is because the concepts of trust, truth, evidence and risk are intrinsically linked. Trust relates to the level of willingness a person will put themselves or an object of value at harm on the expectation that the person or organisation they are trusting is being truthful in what they say *(Mayer et al., 1995)*.

On this basis, constructions of truth and trust regarding evidence of value proposition and capture were interpreted as having an important role in explaining perceptions of consequences for SMEs in voluntarily developing CBMs.

In this thesis, trust dynamics, credibility, evidence, knowledge and truth with their associated structures and rules embedded in the manufacturing regime contingently combine and act as a causal mechanism in the engagement of established SMEs with CBMs. This is in the same way as argued in Chapters 7 and 8 for power and political ideology and values. In addition, as

with political ideology or values, trust, truth, evidence and knowledge may be expressed explicitly or be implicit in discursive interaction but are fundamental to relationships and how people decide what actions to take *(van Dijk, 2006)*.

The CE proof of value repertoire was dominated by contrary maxims associated with three interrelated discourses regarding citizens' practices, business to business (B2B) customer practices and economic value that built around the CE as higher ideal repertoire as shown in Figure 11. Citizens were understood to be both Janus-faced and green activists. B2B customers engage in both greenwash and brownwash. Developing CBMs results in costs and losses or benefits and opportunities. Each contrary maxim is analysed separately in Sections 9.1 to 9.3. Seventy-five interview extracts and 47 coded published extracts in addition to those analysed in Chapters 7 and 8 and the transcripts of the two workshops form the basis of the analysis. As with the analysis in Chapters 7 and 8, supplementary data was brought in from third party events and the corpus of materials to enhance, corroborate or identify contradictions in the findings. An interpretative analysis of why the truth and trust causal mechanism exists and has an effect on perceptions of consequences is then provided in Section 9.4. The conditions necessary to ensure consequences are perceived as positive for established SMEs developing CBMs are also presented.

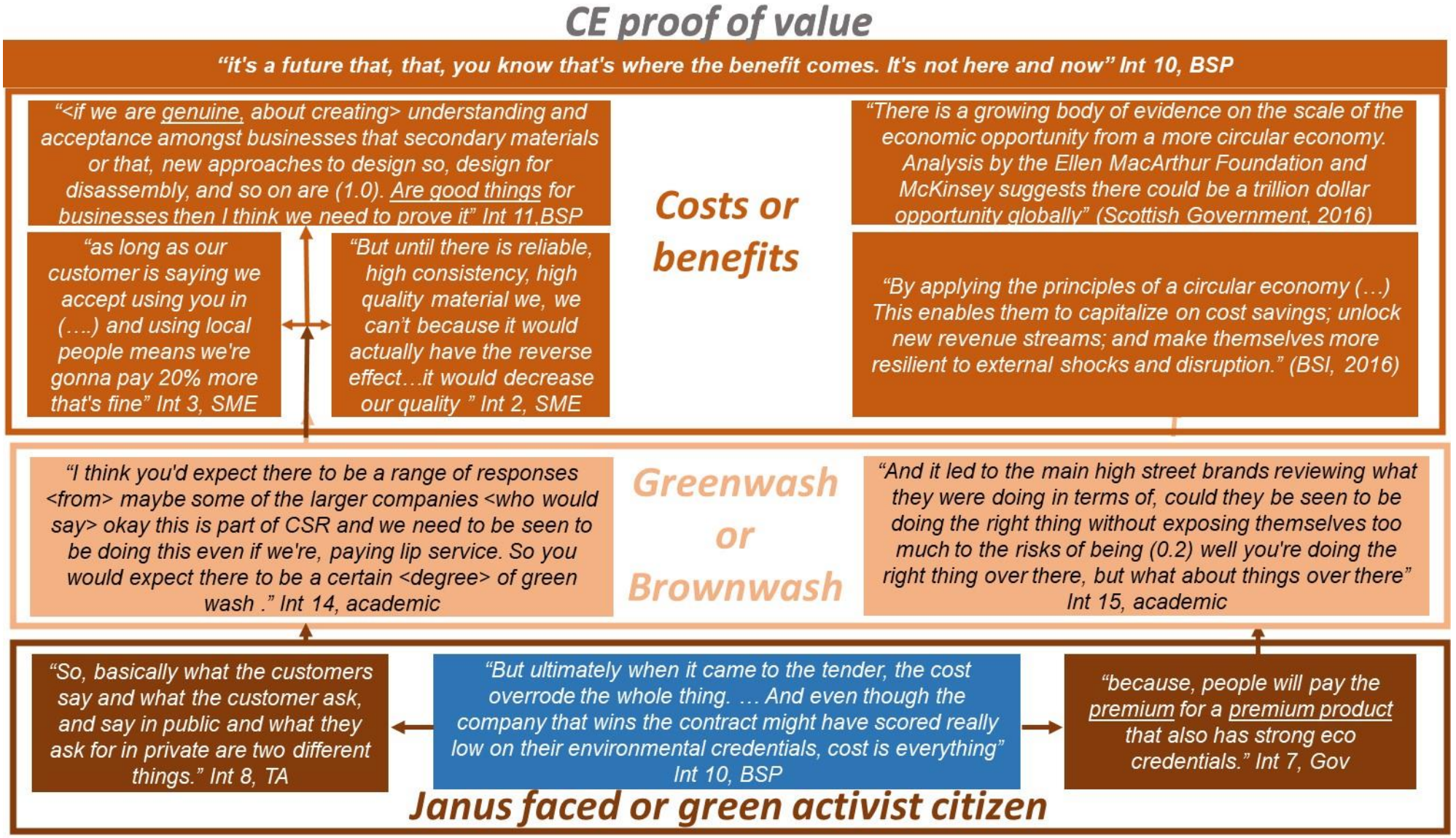

Figure 11: Structure of the CE proof of value repertoire[59]

[59] Int is an interviewee, Gov is a government representative, TA is a trade association, BSP is a business support provider

9.1 Janus-faced citizens or green activists

As demonstrated in Chapter 8 there are conflicting understandings of the prioritisation of ESD values by customers such that contrary maxims on the truth of citizens' and B2B customers' practices exist.

In constructions of customers' practices, use of a green activist metaphor by proponents of the CE positions customers as valuing CBMs, and when costs are higher prioritising environmental and sustainable development (ESD) values and paying more in practice, as introduced in Chapter 8. The use of this metaphor underpins governments' actions in encouraging development of CBMs through voluntary action. Use of the alternative "citizens as Janus-faced"[60] metaphor positions citizens as either not demanding or valuing CBMs or willing to pay more in practice unless extrinsic economic, utility and material value is also improved. Engagement with the latter metaphor signals perceptions of a lack of trust and truth in citizens' discursive claims, and underpinned constructions of the necessity for legislation and financial incentives.

Firstly, there were understandings that business decision-makers in established businesses are inherently cynical, e.g.:

"And I have a very cynical view of cause and effect and things like that so. Erm, maybe it's because I've worked for some (0.2) very successful businesses which can be quite cynical." Interviewee 13, academic

Or, as introduced in section 7.3, demonstrated at the Greenbiz[61] webinar, there is embedded scepticism in established manufacturing SMEs:

"*because I think there's a lot, there was a lot of scepticism from the supply chain in the early days about if you want more data that's gonna cost more. If you want us to do something different that's going to cost more. So I think there was this fear of us asking for things that would cost more." SME supplier*

Whilst modern cynicism is understood to be a negative construct describing disbelief in people making decisions other than for self-interest, modern scepticism relates to people doubting claims of truth *(McNamara, 2000)*. As Andersson *(1996)* explains, negative cynicism towards one individual, organisation, institution, practice or ideology often generalises to cynicism towards whole groups of society or practices having similar characteristics.

Generally, cynicism or scepticism manifested themselves in the construction of evidence and truth of customers' practices regarding prioritising ESD values. Doubt or mistrust were signalled by actors engaging with an "actions speak louder than words" metaphor that constructed citizens collectively as Janus-faced. By engaging with this metaphor actors

[60] https://www.collinsdictionary.com/dictionary/english/janus-faced two-faced, hypocritical, deceitful.
[61] Greenbiz: How to get your supply chain to embrace circularity, 23rd June 2020

position those members of society discursively claiming themselves to be concerned about ethical and moral issues, including ESD values, to be untrustworthy by failing to translate discursive concern into purchasing behaviours unless there is added extrinsic value to themselves. As shown earlier in Chapters 7 and 8, this positioning was achieved by interviewees and workshop attendees constructing practices as being dominated by price and performance considerations irrespective of how much individuals discursively claimed that they valued ESD values *(Sandhu et al., 2010)*. This construction of there being a difference between what people say and what they do in practice was made explicit by a range of actors in interviews, workshops and at events, e.g.:

"So, basically what the customers say and what the customer ask, and say in public and what they ask for in private are two different things." Interviewee 8, trade association

In all cases, the heuristic[62] constructions of citizens' failure to act upon their discursive demands positioned the spoken or written word as being untrustworthy. Irrespective of discursive constructions of citizens' desires, practice-based evidence of customer and competitor economic practices and supportive market conditions for change were positioned as more truthful in determining consequences for established SMEs, as shown in the following extract:

"You know sending out a survey to 500 people or a thousand people or 15 hundred people [I: (laugh)] is gonna get 15 hundred people telling you that yes they would do it. Whereas spending a bit of time [I: um] with 20 people will tell you why they're not gonna do it or if they're not gonna do it. So, (2.4) and that's a difficult argument to make because marketing is so (0.4) heavily dominated by numbers and what gives us the answers [I: um]. But actually I don't think it is I think <really working> and looking at how somebody behaves is what gives you the answer as to whether a product will be successful or not if it's got secondary materials." Interviewee 11, business support provider

Proponents of the CE and policy discourse positions development of CBMs as providing "*opportunities*" for SMEs and act to present evidence of the scale of economic opportunity such as "*in just three UK manufacturing sub-sectors re-manufacturing has the potential to create £5.6bn to £8bn a year and support over 310,000 jobs*" *(House of Commons, 2014)* and "*action across 8 manufacturing sub-sectors could result in annual cost savings of £0.8-1.5 billion in Scotland*" *(Scottish Government, 2016)*. Such accounts, that focus on placing an onus on business to take action, are consistently underpinned by an implicit assumption of citizens valuing CBMs. Furthermore, there is implicit trust in citizens changing their economic practices if businesses were to make CBMs available. Market conditions are assumed to support

[62] A strategy employed as a cognitive short cut in judging the probability or uncertainty of an event occurring and constructing a causal relationship between the heuristic information (even when limited) and the event occurring *(Tversky & Kahneman, 1982)*.

change and deliver positive economic consequences. In this way citizens, or "*consumers*", are positioned as green activists, as demonstrated in the following published extract:

"*Consumers have a strong preference for buying and owning new products. However, WRAP research found that there is a strong appetite for repair and rental services, trade-in and purchasing second-hand when delivered by trusted, major retailers*" *(BiTC, 2018b, p. 6)*

Against such assumptions built into CE policy and proponent discourse, citizens are positioned by business representative bodies in published materials as rarely prioritising ESD values when making purchasing decisions, e.g.:

"Studies of consumer behaviour by the CBI, by NESTA and by DEFRA regarding the purchase of electronic equipment suggest that environmental performance is still low on the priority list at point of sale." (TechUK, 2015, p. 14)

In the above extracts, the authors call upon "*studies*" or "*research*" by influential organisations to warrant the position. In published materials there is also recognition of uncertainty of citizens' economic practices even when products are made available, where "*We also need to create a greater demand for these products*" *(Seargeant, 2016)* and changes "*requires engaging consumers…While business must build consumer confidence and excitement in low-carbon products" (CBI, 2017)*. At events, the uncertainty of citizens voluntarily enacting ESD values in practice underpinned discourse of incentives such as "*vouchers off your council tax*" (political party, PFW event[63]) where there was a shared understanding by presenters at the PFW event of "*how can we incentivise people to do better?*" and as echoed at the Green Alliance event[64] "*make things very easy*" for citizens to do the right thing. However, the use of incentives for people to do the morally right thing was also understood to be a dilemma, complex and result in a rebound effect where "*it then perpetuates people wanting to be paid to do something that's a public good*" (Government representative, PFW event). Such constructions support the arguments presented in Chapter 8 that there is a need for balance between the voluntary, legislative and incentive. This on the basis that successful development of a CBM is understood to require all three elements of "*customer demand, policy change and funding opportunities*" (SME, Advances London[65] event). The uncertainty of citizens' prioritisation of ESD values and demand for CBMs in practice underpinned arguments at events against the reliance on voluntary instruments, e.g.:

"but I think whilst we have done several things, we've done lots of things and the voluntary approach allows organisations to do small things, what it doesn't really do is develop a consistent tone of voice, a consistent way of communicating with consumers, and so in order to scale something, I think you need to go beyond the voluntary agreement approach, the voluntary approach." MNE, PFW event

[63] Policy Forum for Wales: Policy on waste in Wales, 4th July 2017
[64] How can we ditch the throwaway society?, 10th March 2020
[65] Circular innovation for SMEs, 21st November 2017

In this extract, the multinational enterprise (MNE) positions that voluntary development of CBMs limits the ability for CBMs to move beyond small scale applications such that they concluded that "*voluntary agreements can take us so far*". This supports the analysis in Chapters 7 and 8, where CBMs were found to be understood to only be viable in niche applications. In published discourse, this understanding of the limit of voluntary action to scale the adoption of CBMs is also evident, and used to position the necessity for "*support*" from government, e.g.:

"Support for SMEs with innovative circular solutions to find routes to market to enable them to scale up their activities." (BiTC, 2018b, p. 7)

There are also implicit understandings of CBMs involving higher costs for citizens in published discourse, aligning with the analyses in Chapters 7 and 8, e.g.:

"Companies developing circular business models may have difficulties competing solely on price. The purchasing price of long lasting goods is indeed often higher than low-end imported products with a far worse environmental footprint. In recent years, the growing imports of cheap single-use tyres have reduced the market share of retreaded tyres in the UK by 30% (see Box 7)." (Aldersgate Group, 2017)

Therefore, changing business models based on practical experience and knowledge of citizens' economic practices and market signals rather than what is said, is understood to be a rule of the manufacturing regime regarding what is a rational decision for established SMEs.

In addition to constructions of citizens as Janus-faced, claims of engaging with ESD values by B2B customers through use of voluntary instruments were also constructed as a potential "*ploy*" (Interviewee 1, SME) or "greenwash".

9.2 Organisational greenwash or brownwash

As with constructions of practices of citizens, contrary maxims exist regarding prioritisation of ESD values by B2B customers, that build around either a "greenwash" or a "brownwash" metaphor. Firstly, it is to be noted that scepticism of the authenticity of ESD claims of organisations is understood to be growing *(Lyon & Montgomery, 2015)*, as demonstrated by the following interviewee extract:

"I think (0.4) <there's, there's also a sort of> healthy, unhealthy cynicism about you know, this is tokenistic, and it's, you know, and we're all meant to applaud that they're doing these things, but what for?" Interviewee 10, business support provider

Actors in interview engaged with a greenwash metaphor that positioned mistrust or lack of truth in both discursive claims and one-off ESD-related actions by B2B customers, that could be called upon to warrant lack of action. There were explicit uses of the term greenwash in interviews, e.g.:

"So you would expect them to be a certain <degree> of greenwash kind of well yeah, we'll, we'll put an advert up and we'll do a, few good processes and we'll talk about it at meetings and, advertise it or whatever." Interviewee 14, academic

Engaging in greenwash was constructed as an antonym to those who "*genuinely believe they need to do the right thing*" (Interviewee 7, government), and therefore lacking truth. However, greenwash was more generally implied in discourse. For example, at the GreenBiz webinar, B2B customers were constructed by the SME presenter as discursively responding to ESD concerns to maintain being commercial in response to market signals by "*creating a lot of, how can I say, noise, of good noise"*. The implication of greenwash was achieved by constructing acts of embedding ESD values as being symbolic and/or related to profit-related or cost reduction beliefs, motives or actions of businesses and customers. This is in comparison to "*genuine*" ESD beliefs or commitments that are embedded in all activities of an organisation, with such acts being constructed as being a limited component of an organisation's activity, e.g.:

"…I use Unilever again because I like, I think Unilever have done a cracking job.[I: Yeah] But, but what, the way they've done it, is very <cleverly> linked their sustainability strategy to their, er actual brand. And their profitability. …, I'm sure if Unilev', sorry if Unilever, I'm sure if Unilever didn't <make soap>, they wouldn't be running hand washing classes in India. [I: Um] Well they just wouldn't. And I'm sure if they didn't make bleach, they wouldn't be talking about, you know, toilet cleaning in Sub-Saharan Africa. [I: Yeah] They just wouldn't." Interviewee 8, trade association

At the events, the concept of greenwash was rarely made salient. This would be expected given that CE events are organised and predominantly attended by representatives of organisations who are proponents of the CE. However, there were a few occasions where knowledge of greenwash was made apparent such as "*there's a lot of lip service*[66]*paid to community responsibility of businesses that I don't think there's so much done in terms of actual real work, including my own firm*" (Law organisation, PFW event). This also included understandings that actions may be perceived as "*potentially a publicity stunt depending on how cynical you want to be*" (MNE, iLEGO[67] event). However, all the calls upon greenwash came from individuals representing organisations that were showing support for transitioning to CE but could be understood to not be constrained to only presenting a positive discourse of the CE.

As indicated in Chapter 8, engagement with a badges as activism metaphor, is used to symbolise evidence or truth of organisations possessing ESD values and voluntarily putting them into practice. This was a consistent construction in interviews. However, organisations were also constructed in interviews as "*need to be seen to be doing this even if we're, paying lip service"* (Interviewee 14, academic). In this way these types of activities were positioned

[66] "To pay lip service" is an idiom understood to mean to agree something verbally but do nothing of substance in practice representing insincerity

[67] Innovation in Lean Enterprise and Green Operations, hosted by Cardiff University, 15th January 2019

as a "*tick*" box exercise with little efficacy "*as long as you're promising to do a little bit better",* that is limited in its scope, as constructed explicitly by Interviewee 10:

…I've got some environmental initiatives going on, I'm ISO 14001[68] accredited, …. How much of it is, (0.4) shall we say <verified and auditable,> might be another question all together, because you know, as with any sort of standard type of thing, as long as you're promising to do a little bit better, you're fine.[I: Um] it doesn't necessarily mean you're actually doing really well. So, you know, there's a sense that as long as you can tick the box, then (0.2) [I: Um] it's gonna be OK." Interviewee 10, business support provider

This understanding of organisations engaging in greenwash and symbolic activities that "*tick boxes*" to enable them to be seen to be committed to ESD values was also evident in workshops, as demonstrated in the workshop 1 exchange in Table 16 when discussing activities of the retailer, IKEA:

Participant	Transcript
Participants 1, 2 & 6 are SMEs with participant 4 being an academic	
1	They're not growing trees and doing all their furniture on site are they
	(joint laughter)
1	It's a top line tick box. it's kind of like organic, it's 5% of the market
6	But they'll be doing it before long.
4	Funnily enough they are, they're err, they're going to be carbon negative by (0.4) 2025, something like that. They've just invested in two massive solar farms in the US. So, basically, they, they've figured out that, yeah, obviously, there are… you know, still a lot of trees get ripped up for to create IKEA furniture, but they'll be carbon…
2	They are a furniture business, not a salad company.

Table 16: Workshop example of greenwash discourse

Box ticking has become an everyday term in discourse of corporate and political governance, where there are understandings that this has become a norm since the 1990s in many areas of public service governance and is subject to growing criticism *(J. Baxter & Clarke, 2013)*. The term is used to represent a view that activity is performed to meet bureaucratic requirements in a perfunctory or resigned manner to be seen to be doing what is right rather than as an act to achieve the intended "higher purpose"[69], such as reducing harm to the environment across all activities. Furthermore, in the extract presented earlier from business support provider Interviewee 10, they engaged with a discourse of governance, and by adopting a questioning stance implied that scrutiny of voluntary ESD claims is poor and lacks effectiveness regarding achieving overall ESD outcomes. The positioning of existing governance arrangements of voluntary instruments as being ineffective in addressing ESD issues was evident in extracts from other actors involved in CE activities, e.g.:

[68] Third party certified voluntary environmental management system (EMS) standard developed by the International Standardization Organization, first published in 1996
[69] https://medical-dictionary.thefreedictionary.com/boxtickingexercise

"… and the, the number of non-conformances you see in management systems around objectives and targets <not being linked to the risk>.[I: Yeah] Is, is just frightening, I mean but obviously they still get through the certification because that's the certification body's raison d'être erm." Interviewee 8, trade association

By questioning the sincerity and scope of voluntary instruments in terms of "*the fallacy that the environment's being looked after, cos organisations have got 14001."* (Interviewee 8, trade association) and the process of governance, there is an understanding of engagement with voluntary ESD-related instruments as being a version of greenwash *(Lyon & Montgomery, 2015)*. As Flynn and Hacking *(2019)* highlight, the efficacy of standards is reliant upon how much people trust the scope of the standard and it's governance to be reliable and robust. In workshop 2, voluntary management standards, such as ISO 9001[70] and the British Standard Institute (BSI) CE standard[71], were introduced into discussions by a representative of Government who was familiar with such standards. However, they were positioned as having limited effect on changing practices without it having a formal "*accredited*" status:

"That standards are going to drive in. It seems we've got the larger manufacturers saying, you know, "You- we're adhering to this. You know, 9001 is, is, is a good indication. Here, we've got 9001. You can't be in our supply chain. [yeah] You can't supply us unless you, you, you know, you've also got it."[yeah] I mean, in terms of the standards, that would drive circular economy. Until you've got- until it <u>becomes</u> and actual <u>accredited</u> standard, you haven't got anything to <u>drive</u> that kind of standardisation with. So do we then <u>push</u> the circular economy standard?" workshop 2, Participant 5, government

The effect of legislative standards was also called upon by an SME presenter at an event, where they positioned that such standards are trusted by customers, enabling them to build "*long-term customer relationships*" for remanufactured products, i.e.:

"…And we also are working to the British Standards for the process of remanufacturing[72] to try and convince everybody that you don't need to buy new every time. … which for us is all about building long-term customer relationships." SME, PFW event

However, even though strong legislation and policy are positioned as necessary for transition to occur, as discussed in Section 8.3, how policy and legislation is enacted in practice has the potential to influence perceptions of greenwash. The design and use of legislation, policy and public procurement is understood to necessitate being fair, clear and consistent. This was made explicit at events and in published materials where "*stability within the policy context*" (facilitator, PFW event) and the necessity for policy and legislation "*to be credible*" (Environment body, WRF event[73]) and be a "*joined-up approach*" (MNE, PFW event) without

[70] Third party certified quality management system (QMS) standard developed by the International Organization for Standardization, first published 1987
[71] BS 8001: a framework for implementing the principles of the circular economy in organisations, published in 2017
[72] BS 8887: series of standards for designers on the design for manufacture, assembly, disassembly and end-of-life processing (MADE), first published in 2006
[73] World Resources Forum. Closing Loops: transitions at Work, 24th – 9th February 2019

different policies undermining each other, rapidly changing or causing confusion was a consistent component of discourse of the power of legislation and policy, e.g. (see also *MAKE UK, 2018, p. 13-14)*:

"Policies have to be visionary. They have to be consistent. You cannot reinvent your energy system with every new Government. It needs to be coherent. If your tax policies says please be wasteful with resources don't come with micro measures that go in another direction, it makes no sense. They need to be strong in implementation or you lose legitimacy. They need to reflect the sense of urgency and they need to be engaging not off-putting. Which means they need to be credible." Environment body, WRF event

The necessity for consistency was constructed on the basis that sudden policy change creates uncertainty for business, as positioned by an MNE presenter at an event:

"…*we've got knee-jerk policy change because we've got policy-makers nationally and locally who are having to react very fast to the public agenda. And they're also, morally, are trying to react very, very fast to the climate crisis. But that results in sudden policy change and for businesses that's very, very hard to deal with. Especially if you're a small business and you're not well resourced." MNE, Waste to Wealth*[74] *summit*

As put forward by the Aldersgate Group in published material, a lack of a "*clear message*" and multiple interventions that are similar but lack consistency and clarity and long-term commitment to the CE is understood to result in high levels of uncertainty leaving "*companies and consumers dazed and confused*" *(Hill, 2020)* regarding the development and adoption of CBMs *(see also MAKE UK, 2018a, pp. 2&13; TechUK, 2015, pp. 7,11-12&28)*. As such, policy and some forms of legislation can also be perceived as greenwash. Furthermore, as demonstrated in Section 8.2, there are understandings that public procurement, whilst being seen to value ESD values, prioritises economic value in decisions where "*environmental part of it was maybe had a weighting of 10% if you're lucky whereas cost was a weighting of 40%"* (Interviewee 10, business support provider).

Conversely, there were constructions that businesses may actively choose not to engage in such symbolic acts when responding to market signals, even when products can be understood to align with CBM principles. This is done to avoid being seen as engaging with greenwash or to protect themselves from criticism, e.g.:

"And so when Rana Plaza happened then that (...) will permeate a culture. And it led to the main high street brands reviewing what they were doing in terms of, could they be seen to be doing the right thing without exposing themselves too much to the risks of being (0.2) well you're doing the right thing over there, but what about things over there. The, so it's been a bit of a defence mechanism really for them to engage in that and. But that's on the social side. On the environmental side, the (1.0) picture is much more mixed." Interviewee 15, academic

[74] Business in the Community, Waste to Wealth summit, 12th June 2019

In this way a brownwash metaphor was engaged with, the opposite of greenwash, as outlined in Section 3.5.4. Organisations were positioned as wanting to avoid scrutiny of wider business activities *or* avoiding negative consequences of being seen to be green, such as "*because they think the customers won't like it*" (Interviewee 7, government). Whilst use of such discourse positions organisations as actively engaging in brownwash to avoid negative consequences, all the SMEs that were interviewed, including the repair business, already provided products and services that would fit being labelled as part of a CBM, particularly as *"<most of the things we make> are designed to last, to be strong, to be tough, to be used lots of times erm (0.8) not to be thrown away.*" (Interviewee 3, SME). As such they can be understood to engage in passive brownwash.

In all cases of greenwash and brownwash (active or passive), knowledge of the practices and values of customers and market signals, existing or future, was called upon to rationalise action regarding engaging with a CE identifier and/or development of CBMs. Therefore, the rule outlined in Section 9.1, where established SMEs take action based on experience and knowledge of evidence of citizen practices and market signals, and not their discursive or symbolic claims, equally applies to B2B customers. Consequently, how proponents of the CE construct the consequences of developing CBMs and evidence of customer practices and market signals is important in evaluations of risk. As SME Interviewee 1 surmises, where something is understood to have been proven to be "*a better*" technology, "*the growth opportunities are there*" providing "*a massive commercial opportunity*" irrespective of whether "*policy is driving increased use*" of the technology. Alternatively, when entering markets with a lack of certainty regarding "*what customers think?"* or there is existing knowledge of customers not valuing existing models that fall under the CE umbrella, there is an understanding that "*of course it's risky*" requiring "*a leap of faith*" (Interviewee 12, consultant) for established SMEs to change their business models, as constructed in the following extract:

"of course it's risky. Well you're moving into the unknown and you might be, you know, kind of first (0.2) dabbling your toes in the water, you know. Does it work? You know what will the customer think? What are the, what are the challenges? You know, what if what we do doesn't work and they don't like it? You know. How are we going to manage that and what can we do and could it end up being a really costly exercise if we put that stuff in and they say well we want it all different you know" Interviewee 10, business support provider

9.3 Benefits and opportunities or costs and losses

As explained in Chapter 8, SMEs are expected to make decisions on a price-performance cost benefit basis in evaluating risk. Therefore, what is understood to be required is proof or

evidence that benefits outweigh costs or losses, as constructed by Interviewee 9 when they call upon the concept of "*return on investment*" (ROI)[75]:

"… you know as long as there's a return on investment, then there's a benefit there for the SME. But they're gonna do it, mainly going to do it for financial reasons more than anything else" Interviewee 9, business support provider

In this thesis, evidence, or information, is taken to be a collection of data drawn together and contextualised with a purpose in mind *(Hajric, 2018; Olomolaiye & Egbu, 2005)*. However, there are two contrary discourses associated with evidence of a ROI available. On one hand, a benefits and opportunities discourse is engaged with by proponents of the CE, primarily in published discourse and at events. Expert knowledge is relied on to position a "*growing body of evidence on the scale of the economic opportunity from a more circular economy*" *(Scottish Government, 2016)* in acts to persuade of a lack of uncertainty and truth of positive consequences and the rationality of proactively developing CBMs. Expert knowledge is generally positioned to be "fact based", formalised, true and easily shareable that allows a situation to be treated objectively independent of the situational context of an individual actor *(Hajric, 2018; J. Henderson, 2010; Olomolaiye & Egbu, 2005)*.

However, in interview and workshops, proponents of the CE and SMEs alike engaged primarily with a costs and losses discourse when talking of risk. Here, actors relied on lay or tacit knowledge to position development of CBMs as "*moving into the unknown*" with action that could "*end up being a really costly exercise*" in acts to position CBMs as having high uncertainty and negative consequences (Interviewee 10, business support provider). Consequently, development of CBMs is positioned as lacking truth of a ROI and positive consequences for SMEs and customers. Tacit or lay knowledge is the taken for granted, intuitive, experience based, personal and contextually embedded knowledge of a group of actors *(Hajric, 2018; J. Henderson, 2010; Olomolaiye & Egbu, 2005)*.

9.3.1 Benefits and opportunities discourse

When Interviewee 11, a proponent of the CE, was asked "*Why should businesses take that responsibility*?" regarding proving that CBMs work, they assigned responsibility to advocates of the CE to provide proof of positive consequences:

"They shouldn't I don't think. I think <if we are genuine, about creating> understanding and acceptance amongst businesses that secondary materials or that, new approaches to design so, design for disassembly, [I: um] and so on are (1.0). Are good things for businesses then I think we need to prove it. There needs to be some proof" Interviewee 11, business support provider

[75] https://www.investopedia.com/terms/r/returnoninvestment.asp a finance term in common usage to denote the efficiency of an investment, predominantly economic profit received, relative to financial costs, expressed as a ratio of percentage calculated by dividing net profit (current value-cost) by the cost.

This assignment of responsibility to proponents of the CE aligns with the analysis presented in Chapter 8, where those determining ideologically informed practice are understood to have social power. Proponents of the CE, including governments, can be understood to adopt this responsibility for provision of proof and act to persuade businesses of the positive consequences, or value, of transition. This is demonstrated by such actors orchestrating events aimed at businesses and producing documents as described in Chapter 5. To achieve this, they call upon a benefits and opportunities discourse that is an embedded component of policy as indicated in Sections 1.4 and 3.5.5.

Two discursive approaches to provision of evidence of business value is normative practice in published materials and at events. In the first instance, a rhetorical approach is used, as would be expected given that rhetoric is an everyday social practice used to persuade and influence an audience to which the rhetoric is targeted *(Kotecha, 2018)*. The benefits and opportunities rhetoric is consistent in all type of published data and at events, supported by CE proponents discourse of "*opportunities*" in interviews and workshops. The rhetoric incorporates positioning of high certainty of positive consequences for businesses in the future that aligns with existing political ideology in practice, and therefore this being true. This is achieved through the use of definitive language. This includes terms such as "*will*", "*are*", "*is*" and "*can*", for "*saving money*" *(NAW, 2017)*, "*improving the competitiveness*" and "*creation of good quality jobs" (Aldersgate Group, 2017)*, "*growth in new markets*" *(Defra, 2015b)*, building "*resilience*" *(Defra, 2012b)* and reducing material supply "*volatility and vulnerability*" *(Scottish Government, 2016)*, as shown in the following published extract:

> *"We see this agenda as a business opportunity … Creating this stream of secondary resources will boost the resilience of UK businesses. It will enable them to become more competitive in the face of increasing and fluctuating commodity prices. ..Some businesses are already responding to this challenge, and benefiting from cost savings, and new market opportunities. But there are many more companies, particularly SMEs, who are yet to react or are unaware." (Defra, 2012b)*

As demonstrated in the above extract, and as introduced in Chapter 8, the "*cost savings*" rhetoric is a dominant feature of the benefits and opportunities discourse in published materials and at events.

At the events, claims of cost savings were based on constructions of the development of CBMs and ESD values in practice resulting in "*resource efficiency*" benefits, or as commonly understood in production and consumption getting "*more value out of as little*" resources as possible (SME, PFW event). As demonstrated in the following interview extract, CE proponents' engagement with a "waste as a resource*"* metaphor underpins the construction of resource efficiency-based cost savings:

"I, I was challenged in a workshop … Where I was saying about all these jobs well that's going to cost us money? You know paying for all these extra people. But I said yeah but you won't be paying for the products cos you'll get them cheap. They'll be made somewhere else. Yeah? So, so you know your two input costs, to put it crudely, are the human resources and the materials and the material source. So I said your material source would be a lot cheaper because it's a waste product (I: um]. And yes your human costs will go up but is that a bad thing? (0.6)" Interviewee 7, government

In this extract, there is an implicit understanding that using waste materials costs less than conventional materials, in that they'll be "*cheap*". Interviewee 7 positioned that it is taken for granted "*so you know*" that the costs of material and labour "*resources*" are the major concerns for businesses. Building upon this taken for granted understanding, they constructed that using waste reduces material costs, whilst implicitly recognising labour cost increases, but positioned material cost reductions as being sufficiently high to counter any higher labour costs. As such, using waste as a resource is positioned as making rational economic sense for established SMEs. There was also an understanding of this relationship of the use of waste and reduced or comparable costs of material supply in workshops, e.g.:

"… normally this, from my experience, I think that maybe experience, companies, may benefit because getting the raw material, which is like waste, whatever it is, you're getting paid for that, so this actually pays for your costs, and then you sell the product. So actually, you make money, by your raw materials" workshop 2, Participant 3,academic

In addition to constructions of positive consequences for businesses due to lower costs of material supply, when using the benefits and opportunities discourse, actors engage with a rhetoric of future material access losses. Actors use this discursive mechanism to persuade of the necessity and rationality of action in the present as a point of urgency to avoid future negative consequences inherently understood to result in increased material costs and price volatility, e.g.:

"In a world of finite resources, where global population and consumption growth are driving increased volatility and vulnerability in the supply of raw materials, the circular economy offers a new and exciting perspective" (Scottish Government, 2016)

However, the use of rhetoric is commonly perceived to be associated with deception, a lack of truth or a pretence *(Kotecha, 2018)*. On an understanding that "cynicism is everywhere" in business *(Dean Jr et al., 1998)*, as indicated in the analysis this far (See section 9.2), rhetorical approaches to presenting evidence of positive benefits and market changes in CE policy could be perceived as greenwash, as put forward at the Waste to Wealth event "*Although we're talking the talk and putting lots of deadlines about 2040 or 2050. That's too late"* (third sector organisation). However, the second discursive approach adopted by CE proponents can be understood to be used to counter perceptions of benefit rhetoric being greenwash, untrustworthy and lacking truth. Here proponents of the CE engage with a discourse of "evidence-based policy*"* that has become prominent in UK and EU policymaking in the 21st century *(Hawkins & Ettelt, 2018; Pawson, 2012)*.

Engagement with discourse of evidence-based policy is signalled throughout all published materials in acts to validate the benefits rhetoric, by calls upon concepts such as "*studies*", "*research*", "*analysis*", "*pilot projects*" and "*business case studies*". This was also a key component of discourse of presentations at events. The use of this discourse acts to persuade that the evidence of positive consequences provided is reliable, trustworthy and truthful on the basis of it being "dispassionate, independent and objective" produced by people with specific subject or skill expertise *(Pawson, 2012)*. Such information is associated with expert knowledge.

Benefits in published discourse are discursively presented in terms of generic millions, billions or trillions of pounds, dollars or Euros per year "*opportunity*" that "*could*" be achieved by a set timeframe, e.g.:

"Analysis by the Ellen MacArthur Foundation and McKinsey suggests there could be a trillion dollar opportunity globally." (Scottish Government, 2016)

Such benefits are presented as "facts" in the wide corpus of published materials and in presentations at CE events e.g.:

"Ellen MacArthur identified economic opportunities of £486 billion per annum for the UK, WRAP using that work and working with McKinsey & Company did some further analysis and found £2 billion worth of cost savings in medium lived and complex consumer goods." Trade association, PFW event

However, regarding expert knowledge and construction of consequences, quality and "*trustability*" of expert knowledge is questionable. An argument to this effect is made by a presenter at workshop 1. They built upon constructions of such studies being selective in data used, where "*They <u>don't</u> include all the relevant emissions."* as shown in this extract:

"… what you find when you look into these life cycle assessments is that… <u>many</u> of them are not cradle to grave. They <u>don't</u> include all the relevant emissions. Erm, <they> skip sections of the process out. They… there's a whole variety in <u>quality</u> and erm, <u>trustability</u> of these assessments." workshop 1, presenter, academic

This "*trustability*" of benefits evidence, or CE "*unhelpful assumptions*", is also questioned in published material from business representative organisations, where "*We must examine many of the assumptions associated with the circular economy: not all of them stand up to scrutiny*." *(TechUK, 2015, pp. 8&25)*.

The call upon "*case studies*" and "*pilot projects*"[76] as evidence can be aimed at persuading others that evidence-based policy and the expert knowledge used to produce information is underpinned and validated by lay or tacit forms of knowledge of the target audience. As such,

[76] A pilot project (also known as trial, feasibility study, scoping exercise etc.) is a small-scale study aimed at evaluating the feasibility, costs and consequences of an activity prior to committing to full-scale implementation of the activity

the use of these instruments can also be used to reduce perceptions of uncertainties or "*risk*" and negative consequences of developing CBMs and "prove" that CBM benefits are practice-based truths of customer and market support, as shown in the following interview extract:

"..we can propose <why> it's not as scary as you might think and we'll give them kind of like examples [I: yeah] and case studies of where companies have addressed that deterring risk" Interviewee 11, business support provider

This aligns with findings in Sections 9.1 and 9.2 where practice-based proof of customer and competitor practices are understood to be truthful, credible and trustworthy interpretations of the situational context. In the construction of consequences in interviews, use of practice-based evidence was a dominant, consistent feature in discourse, as demonstrated in the following extract:

"We need to know something is do-able before we start. (....) If somebody, we have some customers who say to us look we're buying this product A from ya, we're buying product C from somebody else, do you not think you could make that for us. [I:hm] And that's, that's a big indicator that it's do-able. You know, if, if something gets (0.4) based on scientific principles but not been proven out, then we wouldn't be spending our own money on it." Interviewee 1, SME

On this basis, for claims of positive consequences to be deemed truthful and trustworthy, practice-based evidence of positive consequences for the SME and their customers is understood to be needed that addresses the "*lack of market pull, elusive return on investment (ROI), the speed of technology development, consumer preferences and the inherent difficulty of predicting market trends*" *(TechUK, 2015, p. 5)*. To this end, case studies of successful CBMs in practice are a ubiquitous aspect of discourse of the CE in published materials and presentations at events. However, Interviewee 10 called upon tacit knowledge of using and producing case studies to position the current scope of case studies and pilot projects with SMEs as being limited in their effectiveness:

"And unfortunately, the kind of models we're seeing currently are still, you know, <very young> businesses and [I: Um] not yet really, you know you want a business that has got a 10 year history of doing it [I: Yeah] And saying this is how we've always done things and it really, really works for us you know. (…) It probably needs to be quite sector specific. [I: Yep, OK.] It's no good you know, having a furniture manufacturer talking to a hairdresser, you know (laugh). You have to get the right sort of, people need to, people need to see something and recognise themselves in it." Interviewee 10, business support provider

Interviewee 10 was consistent, throughout the interview, in engaging with a "mirror" metaphor to position case studies as effective when the audience sees their own situational context reflected in the characteristics of the business in the case study, i.e., where they *"recognise a business model that maybe you know, is them now and was that business then."* In this way, there is a taken for granted understanding by proponents of the CE that how close businesses in case studies mirror the SME audience situational context influences perceptions and resultant action, as highlighted by a business presenter at an event:

"…we need examples, we need case studies, to show what's working and what's possible with a similar set of cultural and environmental backgrounds…. So I think yes for the case studies and for the examples, but it'd be good to find a way of scaling them across some of the borders that we've got" MNE, PFW[77] *event*

However, the benefits and opportunities discourse scale of opportunity information is based on scaling up of forecasts or estimates of future benefits and market conditions and material resource efficiency-based cost savings or results of innovation, using a very limited set of successful case studies. Firstly, the source of information is usually entrepreneurial-oriented businesses operating in niche sustainability or waste management markets and/or had access to government funding and support such as "*the EU LIFE+ funded REBus*[78] *project*" *(Aldersgate Group, 2017)*. This was demonstrated at events and in published materials, where SME case studies are usually either start-up businesses and/or businesses who had started up as sustainability-oriented businesses and/or those who had received government funding as a pilot project. Alternatively, case studies used as practice-based evidence are often associated with a small number of very large or multinational organisations, where it is taken for granted they have access to large scale financial resources that could manage the "*rollercoaster*" (Interviewee 13, academic) of time-based fluctuations in market conditions and costs enabling taking higher economic risks, e.g.:

"In the UK, many leading businesses – including Amey, Anglian Water, Arup, Interface, JLL, Jaguar Land Rover, Lloyds Bank, PwC, Recycling Lives, Ricoh, Rolls Royce, Unilever, Veolia, Viridor and Walgreen Boots Alliance to name a few – are embarking on a circular economy approach and are seeing significant economic benefits in terms of direct cost savings, new market opportunities, improved market positioning and the ability to grow in a challenging environment" (BiTC, 2018a)

Furthermore, in line with the analysis in Section 9.2, well publicised "*famous"* examples in published materials and used at events existed before the CE concept became embedded in discourse.

As Interviewee 10 outlined, calling upon their tacit knowledge as a support provider, a different approach may be needed to provide "*credibility*":

"But I think also they need to see some credibility and understanding… They need to be inspired. … It's challenging because <I don't think that is available> in our standard business support offering, you know. …. So I suppose what they've got to do is not just to be an inspiration but they've got to show them how, the how to along the way. And acknowledge (0.2) these are the issues" Interviewee 10, business support provider

This is especially when there are understandings that proactively developing CBMs in response to "*hypothetical*" discursive claims of benefits without "*long-term certainty*" could act

[77] Policy Forum for Wales: Policy on waste in Wales, 4th July 2017
[78] www.rebus.eu.com An EU funded project that began in 2013 and was rebranded by WRAP as being associated with the CE from 2015 onwards

to reinforce perceptions of development of CBMs as a risk object with high uncertainty of positive consequences, as put forward by proponents of the CE in interview, e.g.:

"… what's the risk. Well, huh, the risk is, huh, and when you try to (0.2) articulate it, the risk is just hypothetical, you know the Government's talking, the experts are talking about, this changing pattern. [I: Yeah] Um, yeah but when? Well the next sort of you know 5 to 10 years and this <might> happen, well come back to us when it, come back to us when it will happen then. With the question you were getting, come back to us you know when it's more certain."
Interviewee 8, trade association

In such accounts, as demonstrated in the above extract, interviewees constructed temporality as an influence on evaluations of risk and resultant action in SMEs. This was a consistent component of discourse in interviews by all actors, e.g.:

"<I think some of the more challenging aspects, is that, it's> (0.2) in some respects addressing things that are not in the here and now, they are for something that is 20, 30 40, 50 years down the line. ….They're kind of going, well maybe in 20 or 30 years' time there might be a shortage, but here and now, no. It's until I see it (0.2) impacting on me, you know, … because scarcity and market forces and all that. (0.2) So, I think it's quite difficult for people to really buy into it, or certainly small businesses, to buy into it unless they can actually feel the pinch, in terms of what they do" Interviewee 10, business support provider

Furthermore, in this extract, Interviewee 10 positioned decision-making in SMEs as focused on those risk objects that are temporally close that they can physically experience in the present where "*they can actually feel the pinch, in terms of what they do"*.

Temporality, in terms of temporal certainty of customers changing practices "*how long that will stick*" and choosing products "*that might not get adopted*" and preferences not changing such as "*will that be the substrate that's used in a year's time?*" and staff "*costs*" in developing the product and engaging customers, was also constructed in workshops as affecting evaluations of risk, as demonstrated in the exchange at workshop 1 in Table 17:

Participant	Transcript
Participant 5 is an SME with participant 4 being an academic	
researcher	But for you, what was the greatest uncertainty in terms of adopting that model?
5	Erm. (1.0) Scaling it up? And the consistency of it maint- being adopted. So at the, at the moment, it's quite a… first, the uncertainty is it's, it's new. Everyone's looking for a change or an alternative to plastic. It's just how long that will stick. Or whether the- you know, it, it can either regress back to plastic cos of price. Or we'll simply- people will suddenly realise it's counterproductive? And it wasn't that bad, or there will become another (0.4) substrate that competes and fulfils the process better.
4	For both it's cost, isn't it, cos you've got the cost of development, which is considerable in both, and then… and it costs to take to market, and we like- say for something that might not get adopted, are you taking up?
5	Yeah. No, it's been adopted. It's there, our, our. No- I mean, we- yeah, we're tripling the size of the business this year, but the constraint on growth, and we, we could do- we could triple it again is. Not just cost, but it's availability of machinery. I think it's, I think it's a three to five-year lead time at the moment from the one American people who manufacture the machines. Erm which is a challenge. And then you look at well, will that, will that be the substrate that's used in a year's time?
4	That's- yeah, that's, that's my thoughts.

5	Yeah, so if you can invest- with a small business, every investment has to be a- has to be 12 months to 18 months payback, and you've got- Even then you call it a punt. [Yeah.] You know, not a certainty. [Yeah.] Whereas, you know, we, we could?… We're, we're actually looking with my engineers at developing our own machinery because of the lead times are so long and the costs are so high cos they're… they set their price, so…

Table 17: Workshop example of the influence of temporality

This positioning of a relationship between temporality and physical closeness of an entity to actions in established SMEs, on an understanding that SMEs "*are working to stand still*" (Interviewee 14, academic) and that "*there's a risk with changing*" for SMEs (Interviewee 9, business support provider), was a consistent construction in interviews in how established SMEs were positioned as evaluating risk, e.g.:

"Risk is short term. …. Risk is two to three years. That's the timeframe you'll look at. And if you moving it, where I worked in the fast moving consumer business, in terms of food and drink, risk can be 6 months. So it's <very> very much a short term thing. Er, and if you start talking to any of the senior managers about 5 years or 10 years they just look at you <completely> as if you're on a different planet. Because that's not the timescan, not the timescales in which they operate." Interviewee 8, trade association

Furthermore, in alignment with the analysis in Section 8.3, understanding of policy commitments involving long timeframes being subject to change, as demonstrated in the following extract from an event, can increase perceptions of negative consequences of taking action:

"…And this means we need to ask serious questions about our policies. In 2001 the EU promised we would stop biodiversity loss by 2010. it didn't happen. What did we promise in 2011? We'll do it by 2020. We are writing the state of nature report right now but we are nowhere near this line. So what is next? 2030?" Environment body, WRF event

However, in published materials and presentations at events, the CE benefits and opportunities discourse is dominated by information that can be understood to not resonate with established manufacturing SMEs' situational context. This includes operational timeframes and scale of benefits such as "*generate £10bn GVA and 200,000 jobs by 2030*"*(BiTC, 2018a)*. It also includes information that is associated with specific markets and sectors that are outside of B2B relationships, such as "*the waste industry*" *(House of Commons, 2014)* or B2C markets such as "*beer, fish and whisky sectors in Scotland" (UK Parliament, 2016)*, that may not be perceived as manufacturing. Furthermore, the time and labour costs of achieving the material resource efficiencies are rarely included in accounts.

9.3.2 Costs and losses discourse

In comparison to the benefits and opportunities discourse, a costs and losses discourse was a dominant discursive mechanism engaged with by SMEs and those actors having relationships with SMEs and businesses, in the construction of rational decision-making in SMEs.

In using the costs and losses discourse, actors engaged with understandings that there is uncertainty regarding proactively developing CBMs resulting in a positive ROI, where *"it's all about making sure the cost makes sense to them, that they can make savings."* (trade association, PFW event) and that *"it's a real barrier, if that the costs don't stack up."* (Interviewee 12, consultant). The costs and losses discourse was used to persuade of the rationality of not taking proactive action without changes to the operating environment of SMEs on the basis that lay knowledge positions developing CBMs as "*A) it's not technically possible, and B) it would not be economically viable to do.*" (Interviewee 8, trade association).

In the first place, arguments built on constructions of a lack of trust in discursive evidence of customers valuing CBMs when in practice "*the answer you get from the customer is no they won't accept*" CBM products, particularly if they have a green premium (Interviewee 8, trade association) as discussed in Sections 9.1 and 9.2. This uncertainty of customer demand was a dominant feature of lay knowledge in the costs and losses discourse, where, as put forward at the Advances London event, resonating in published materials, there are shared tacit understandings that successful CBMs result from "*customer demand, policy change and funding opportunities*", e.g.:

"*If companies are not seeing enough demand for their products to justify large investments then they may become stuck in a low productivity, low growth trap." (BiTC, 2018b, p. 6)*

However, when engaging with the costs and losses discourse, even when SMEs were understood to have been persuaded to take action, actors constructed SMEs as facing ideological dilemmas. SMEs were positioned as having difficulty in "*finding the right solution*" (Interviewee 4, SME) or determining "*which one seems to be the best*" (Interviewee 2, SME), such that it's "*a challenge to kind of find services that make sense for them*" (trade association, PFW event), in terms of which CBM to develop. This was against a shared, taken for granted understanding that SMEs are constrained to making decisions in accordance with "*whatever the usual sort of market decisions that are being made*" (Interviewee 14, academic), as demonstrated in the following interviewee extract:

" … because the circular economy pulls in so many (0.2) <goals> shall we say … I think, businesses still struggle to know they're doing the right thing. …. It's <still incredibly confusing for them to pick the right way to go> [I: Um] for their business, because each business is gonna be different, and I think (0.8) that is a really, is a big barrier because businesses don't <quite> know what's the right thing to do. … What's the right thing for me to do? … what's the right thing for my company to do. …Where's the answer? And I think in a lot of areas (0.4), with circularity the answer isn't there" Interviewee 10, business support provider

On the basis that cost-benefit analysis is a taken for granted expectation of rational decision-making in business as discussed in Chapter 8, deciding the right or best action to take is heavily reliant upon an evaluation of costs and losses. As demonstrated in the following published extract, when evaluating costs and losses, they are understood to relate to both economic and functionality costs and losses in relation to customer, competitor and market

expectations, built on tacit knowledge that "*The, the big risk for <all> of them is financial and then reputational"* (Interviewee 3, SME):

> "*where sustainability and commercial objectives are aligned and we start to see positive outcomes like unconscious environmentalism – where the sustainable approach is the obvious approach for the consumer and does not involve difficult decision making, additional cost or sacrificing performance." (TechUK, 2015, p. 12)*

Firstly, as indicated in Section 8.2 and demonstrated in the above extract, there is lay knowledge of the existence of a green premium. The understanding that a causal relationship exists between products and services with ESD values and higher costs was made explicit or implied by actors when engaging with a "green premium*"* metaphor. This included incorporating concepts of "*afford[ability]*" (Interviewee 9, business support provider), a CBM product being a "*premium product*" (Interviewee 7, government), not being as "*cost-effective*" as new products *(BiTC, 2018b, p. 7)*, or more generally increased labour costs where "*going green often requires an initial outlay, such as conducting assessments, working with experts to formalise plans, and changing business processes.*" *(EEF, 2015)*. Actors called upon lay knowledge of manufacturing to position "*the products they put out there (0.2) will probably be more expensive. And people won't buy them. Yeah?*" (Interviewee 7, government) and by taking action "*it's not obviously going to be a cost saver for you*" (Interviewee 10, business support provider). The green premium concept was a shared understanding of all types of interviewees, e.g.:

> *"(....) but I think people (businesses) would like to but it's difficult, especially if you come against the thing well we're gonna do all of these things and that's gonna cost you £20 people (customers) go well that's great, that's lovely yeah, yeah but without those things we can get it, you know not necessarily abroad, we can get it for half the price." Interviewee 3, SME*

The existence of a green premium was also a taken for granted understanding at workshops, as shown in the exchange from workshop 1 in Table 18:

Participant	Transcript
Participants 1 and 5 are SMEs	
1	I don't know, maybe… well, no, maybe you can, actually, because if you- yeah, if you guys can supply a P.E[79], P.E product that does the same job. (1.0) Gives the same product life. [Yeah.] Is, therefore, recyclable. Erm actually, you can push that down the supply chain. The only restriction then is the fact that somebody somewhere won't take the cost. Now, either we won't take the cost as the producer… or, so you won't, you won't absorb that additional cost as the producer, or we won't absorb the additional cost in terms of erm manufacturing it, or the retailers won't absorb that additional cost cos it's the additional- you know, so you can push it down- up and down the supply chain, but you've got to share that responsibility and cost.
5	I, I think that, that's what it's got to be, is, is that there has got to be a longstanding- yeah, we'll, we'll, we'll take it to, to grow the market, we'll take a hit initially. But everybody else has got to take a little bit of that pain as well.

[79] Polyethylene: the most common polymer or "plastic" in use, primarily for packaging

1	They do, but it's the producing that is the… the, the centre, manufacturer that is being pushed upon to take that responsibility, so even from a Government point of view, where it's going to tell you that producers take the responsibility. It's <not being>… it's not being absorbed by the manufacturers. You know, you guys have produced a recyclable PE, PE material, but you're gonna charge us more for it in the end, and the retailers are saying, "Well, I don't really need to take it just yet, so erm we don't want to take that cost. Great if you want to," and you're stuck, as a manufacturer, in the middle with neither one wanting to take that responsibility.

Table 18: Workshop example of understanding of the green premium

In the exchange in Table 18, by associating the green premium to "*pain*", the concept of risk is invoked. In this exchange, in alignment with the analysis in Section 8.3, there is an understanding that "*responsibility*" for taking on these costs is a contested space, where customers are understood to be unwilling to pay more. Lay knowledge of there being a green premium in addressing ESD issues and customers prioritisation of low costs also underpinned a range of discourse at events such that action "*will create additional costs to the business sector*" (Environment body, WRF event) whilst "*what the public want to see from the circular economy … the sort of obvious ones of affordability and convenience*" (Academic, PFW event).

Lay knowledge of the scope of additional costs ranged from labour costs of redistributing surplus food from supermarkets to "*investment costs*" (SME, IChemE[80] webinar) and "*the hidden costs {labour} that erode the apparent cost-effectiveness of the investment*" (Academic, UKERC event[81]), products not being "*the cheapest because we design then for a very long life*" (SME, WRF event). In this way developing CBMs are primarily understood to "*come at a cost*" (MNE, PFW event) that is more than linear economy models. Understandings of a green premium and increased labour and capital costs underpinned the warranting of intervention by governments, e.g.:

"but we've learnt quite a lot from doing that and clearly it costs money, there's a risk profile around investing in infrastructure and it's very difficult for individual organisations to do that, is there a way of sharing the risk within a more collaborative model than relying on individual companies voluntarily to make that choice.." MNE, PFW event

This aligns with findings in Chapter 8, in that the primary "cause" of the green premium was constructed in relation to entities and structures underpinning political ideology, including commodification where "*The fall in oil prices has made the recycled market temporarily unviable because the commodity price for virgin plastics has dropped so significantly*." *(TechUK, 2015, p. 15)* and globalisation resulting in "*cheap labour and the cheap manufacturing costs, and cheap raw materials*" (Interviewee 2, SME). Such discourse reinforces the interpretations in Chapters 7 and 8 regarding customers primary orientation to

[80] Institution of Chemical Engineers, IChemE: Sustainable Production, 24th August 2020
[81] The UK Energy Research Centre, UKERC SMEs and energy workshop

price, the influence of political ideology and values in practice, and customers expecting businesses to develop their products and services to meet price-performance preferences.

In use of the green premium metaphor, actors also constructed development of CBMs by UK SMEs as having a causal relationship to increased value creation labour, material, operational and logistics[82] costs over existing linear economy-based products and services, e.g.:

"But the open system is harder because your, your… you've got less repeat business and you've got a much wider area in order to collect the items back in. So you, you need bigger investment in the infrastructure. [I:Yeah.] So if you were doing a city centre, then, you know, you, you need, you need that investment in the infrastructure so that it's convenient for people to drop the items off, rather than just putting it in a bin. So, so really our strategy is prove it in a closed or semi-closed system… and this is the biggest challenge. It's, it's, it's managing… it's understanding the user behaviour and providing the, the user convenience to get, to get the interest and the, and the usage" Interviewee 4, SME

Furthermore, the "*long term impact*" on the economic performance of businesses experiencing reduced volumes of sales by developing CBMs, was also constructed as a taken for granted expectation, e.g.:

"… the coffee shop in LOCATION? (1.5) … that has <moved away from>, they don't sell any coffee in disposables. So it's either a china cup or your own cup. And they lost something like a quarter of a million pounds in the first, in a year, first year. [I:Yeah, yeah.] Erm, but they were like, we're gonna stick with it. So that's, I think that's, (a) that's unusual, …" Interviewee 12, consultant

Actors were consistent in calling upon experience and lay knowledge that enabled them to construct a relationship between the development of CBMs, a green premium and increased labour costs and the wider situational context in terms of customer preferences and a competitive operating environment for SMEs.

However, there are understandings that for established manufacturing SMEs to engage more actively in developing CBMs that involve waste, there is a need for proponents of the CE, not SMEs or businesses in general, to incur the costs of proving "*that secondary materials or that, new approaches to design so, design for disassembly, and so on are. Are good things for businesses"* (Interviewee 11, business support provider). These lay understandings contrast with the cost savings discourse embedded in the benefits and opportunities discourse that focuses on material resource efficiency and "waste as a resource" that neglects account of the labour and performance costs associated with achieving resource efficiency and using waste.

As outlined earlier, in addition to direct economic costs, perceptions of impacts upon functionality were also understood to be key elements of evaluation of risks as "*the questions they get asked relate to quality and price."* (MNE, WRF event). When engaging with the costs

[82] The organisation of access to and movement of materials and product, skills, people, processes, facilities etc.

and losses discourse in discourse of functionality and performance and customers responses, actors engaged with the waste as a problem metaphor. This was used to position there being high degrees of uncertainty of CBMs involving "*sustainable materials*" (Interviewee 2, SME) meeting or exceeding the expected performance requirements of customers without it being "*prohibitively costly*" to prove equitable performance *(TechUK, 2015, p. 15)*. Constructions of reduced "*quality*", including safety and hygiene aspects, were used as a synonym to represent performance and functionality losses associated with using materials or products deemed waste.

At events, quality and material/product consistency, performance and access was a primary aspect of discourse related to risk for businesses and SMEs. Discourse of quality built on lay understandings that manufacturers "*have to focus on the quality of material as a raw material into a manufacturing process. We need consistent high quality in recycling so that we can make quality products.*" (MNE, PFW event). There were also examples of engagement with the waste as a problem metaphor in workshops that positioned materials generated from waste as of lower or variable quality and value, e.g.:

"Which, which to, to be on P.E, … the only thing they'll use them into is plant pots and plastic bags because it's low value. It's such low value as, as it stands, so I think the business value performance, you know, the world only needs so many plant pots and plastic bags."
workshop 1, Participant 4, academic

This understanding that products and services involving waste are understood to be "*inferior items*" by citizens and result in "*lesser quality or reduced functionality*" is a consistent aspect of discourse of quality in published materials from business representative bodies *(EEF, 2016; TechUK, 2015)* and in interaction. Perceptions of waste by customers is understood to limit the ability for businesses to retain or gain relationships with customers when using waste as a resource, e.g.:

"how do you validate the quality of say, for example, secondary sources? [I: um]. So companies might wanna use a secondary material? But, they don't know, how to prove that secondary material's up to the standard of the primary material. They don't know how customers will view secondary materials.(…) Oh it's, it's years ago Marks and Spencer created this beautiful wool coat. (…) Oh it's lovely and yeah it's made from secondhand clothing and suddenly, attitudes just plummeted. And for quite, and in a lot of industries there is (0.2) an (0.2) <unfounded> suspicion. [I: um] Of, I can't actually say it's unfounded, but there is an un-evidenced suspicion that that might happen. So a lot of companies are kind of like what do our customers think about using secondary materials do they think it's secondary it's not good quality did they think? You know, do they think we're cheating them because we're just buying cheap materials." Interviewee 11, business support provider

In the above interview extract, the interviewee engaged with an understanding that citizens perceive waste products and materials as being "*cheap*". This understanding was also evident at an event where customers were understood to ask "*why isn't the price lower than virgin materials?*" on the basis that "*the perception is that secondary materials have to be a lower price*." (MNE, WRF event). The discourses of "quality" and customer perceptions of waste is

used in published materials to validate arguments against using waste in terms of "*it is safer to exclude recycled materials from the manufacturing process*" *(TechUK, 2015, p. 15)*. Such discourse is used to position the need for "*changing perceptions*" of citizens regarding CBM products and services *(EEF, 2016)* or legislation. This is consistent with constructions of the need for a change in "*mindset*" or creating a "*level playing field*" discussed in Section 8.3.

Irrespective of whether waste is positioned as a resource or a problem, there are indications of lay knowledge in published material that the discourse of waste and recycling targets embedded in CE policy could act as an inhibitor to the development of other CBM, particularly repair and re-use:

"The policy focus is currently inconsistent and the disproportionate focus on waste is in some cases hampering the implementation of circular thinking." (TechUK, 2015, pp. 4,14&26)

However, it is not just waste that is deemed a problem. Consistent with the analysis relating to brownwash in Section 9.2, there were lay understandings that a more "*environmentally sustainable product*" (not related to waste) may not meet existing functionality and quality characteristics whilst incurring a green premium, as demonstrated in the following exchange at workshop 2:

Participant	Transcript
Participant 3 is an academic and participant 5 is a government representative	
researcher	Well, but that's assuming. Do we have a view that people perceive potentially environmentally sustainable product to be of less quality than something else? Or higher quality?
3	Especially in yes- especially in clothes. [Mm.] That's, that's a problem.
5	That's- but- so it's also the slow fashion movement as well, isn't it.
3	Yeah. But you would get clothes, and then you would wash it two times, and then the colour would turn something completely different.[[Laughs]] So, yes, sustainable. I would pay double the amount of money for that and then I have to buy new clothes, because…
	[Group make sounds of laughter]
3	…it would not be sustainable for me.

Table 19: Workshop example of perceptions of detrimental impact on quality & price

This type of experiential knowledge of detrimental performance of sustainable materials is also evident in the TechUK report:

"*Companies have also explored the use of biodegradable alternatives but early experiments demonstrated that in hot or humid environments the rate of biodegradation was such that the life expectancy of the device was severely truncated.*" *(TechUK, 2015, p. 15)*

However, Participant 5 at workshop 1, whose business relies on developing and promoting such materials, called on their expert knowledge to counter perceptions of reduced functionality. They called upon accounts of practice-based evidence to position such materials as truthfully having comparable performance, as demonstrated in the exchange in Table 20:

Participant	Transcript
Participants 5 and 7 are SMEs	
7	What about production side, using those carton board trays versus plastic. Is it more difficult to handle?
5	Erm (1.0) <No>. Not every- you don't… they rarely put them straight on a line that works, but we've put them down 10 different production facilities now in the last 18 months, and they're all using it on the same scale. As, as where they were with the CPET. Some adjustments. Some, some trays have to be designed specifically for an existing line.[Mm]But… Erm yeah, there's no, there's no issues with that. Machine supply…
7	So what about the design of these? I mean, in terms of the fact you've reduced the polymer content. I mean, are they the same weight as the original products? Lighter or…?
5	Yeah. Same, same weight. Same product weight, if not a little bit lighter, actually. It's about a gram…[Right, okay] ..in the product. So it doesn't, doesn't have any weight effect. There's other, there's other features, advantages the benefits of it in the supply chain or in the end-use, doesn't, doesn't reduce its rigidity when it's heated up as much as some of the CPET does. It's not hot to touch, so you can actually functionally use it, which works with an ageing demographic.

Table 20: Workshop example of positive functionality impact and performance

Given such contrasting understandings of the value and perceptions of waste, it is not surprising that there is also an understanding that "*manufacturers in many sectors still need to be convinced*" *(MAKE UK, 2018a, p. 13)*. This builds on lay understandings of "*an increasingly uncertain and competitive environment*" *(EEF, 2016)* and perceptions of limited evidence of successful implementation of CBMs in practice beyond niche, case studies or pilot projects, as discussed in Section 7.3. As epitomised in the following published extract, there are understandings that if developing CBMs were as easy and straightforward as the CE discourse implies and results in positive consequences, then they would be business as usual:

"*In reality potential pitfalls are legion and fall across many categories: if they weren't, then faced as we are with the combined factors of resource constraint and business opportunity, we'd be there already." (TechUK, 2015, p. 25)*

9.4 Trust, truth and evidence interpretative analysis

In line with how the interpretative analysis was carried out in Chapters 7 and 8, the theory presented in this section is my proposed explanation of perceptions of consequences in proactively developing CBMs. The findings in this Chapter reinforce the interpretations in Chapters 7 and 8 regarding value, stake and uncertainty. However, my analysis shows how there are pre-conditioned contrary maxims underpinning a trust and truth causal mechanism that influence perceptions of consequences in proactive development of CBMs. Engagement with the causal mechanism is used to warrant taking proactive action or not. In this section I explain why contrary maxims can co-exist and the influence they have.

First and foremost, my findings support a theory of the availability of conflicting discourses, use of contrary maxims and differing constructions of consequences is compounded by the CE concept being in a discourse structuration phase in line with Hajer's discourse theory

(1993). The development of the CE as an umbrella concept underpins the availability and validity of the use of contrary maxims. In addition, contestation in CE discourse on the CE, as described in Section 1.2, strengthens this position. Furthermore, CE researcher conflicting arguments, summarised in Section 3.5, can fuel lack of trust in CE narratives being truthful, creating confusion on what action to take and what or who can be trusted to provide evidence of the value of transition for established SMEs. A lack of consensus and an extensive, complex scope enables and reinforces the ability for people and institutions to call on selective and partial representations of what is true when making economics-based decisions, determined by what is salient to them *(Shrum, 2021)*. Without "*clearer messages*" that are "*consistent*" (MNE, PFW event) and resistant to "*knee jerk*" (MNE, Waste to Wealth event) change from those with the social power to influence production and consumption practices, people can call upon different and conflicting knowledge about the same entities, structures and rules.

Available knowledge and the entities and structures that exist and support differing knowledge, influences perceptions of consequences *(Phillips & Jørgensen, 2002; Potter & Wetherell, 1987; Dianne Scott, 2017)*. In addition, this aligns with perceptions of risk theory, where individuals rely on and make selective choices of information from others in judgements of risk *(Renn & Benighaus, 2013)*. However, my findings showed how, in accordance with salience and vested interest theories, the choice and weighting of information called upon in economics-based decisions was influenced by what was of value and at stake regarding an individuals' situational context and what was salient to them *(Crano & Prislin, 1995; Hajer, 1995, 2003, 2005; Shrum, 2021)*. This also being demonstrated in the previous discourse studies outlined in Section 3.3. Vested interest theory and salience theory are intertwined, in that the level of salience of transitioning to a CE and certainty of its consequences in practice, in relation to what is of value and at stake, influences the level of vested interest in developing CBMs.

In carrying out the review of constructions of risk at events, summarised in Appendix 6, what was of value and stake for different actors was strongly associated with the vested interests associated with their role, with consequences being framed within this context. Furthermore, the scope of information and knowledge called upon to validate the construction of consequences was also found to align with their vested interests. On this basis, I first discuss salience and vested interests and effects on perceptions of consequences for established SMEs. I then discuss conflict in knowledge of customers' values in practice, consequences of developing and adopting CBMs and the value of waste and the entities, structures and rules that can reinforce conflict.

Building on salience and vested interest theories, my findings support a psychological distancing Construal Level Theory (CLT) theoretical perspective, where psychological distance influences perceptions of consequences and consequent behaviours *(Spence et al.,*

2012). According to this perspective, psychologically distant entities in discourse will act to inhibit action, as the cognitively associated temporal, spatial or geographical, social and certainty proximity dimensions of a phenomenon influences perceptions of truth of consequences coming to pass and consequent behaviours. When an issue is psychologically distant in these dimensions, practices aligns with core values of a social group, whilst psychological closeness is more likely to encourage action in relation to the issue, especially where social norms support action *(Soliman et al., 2018; Spence et al., 2012)*. As shown in Chapter 8, the core values expected to be adhered to by established SMEs are for them to be commercial, maximise extrinsic material, utility and economic value for customers in the present and make decisions on an economic cost-benefit basis.

My findings demonstrate how the effectiveness of a benefits and opportunities discourse in persuading SMEs that developing CBMs is not risky in the "*here and now*" (Interviewee 10, business support provider) and will result in positive consequences is understood by actors to relate to how the information presented and knowledge used in discourse, is perceived to resonate with the lived experience of established SMEs. However, my findings show how use of the benefits and opportunities discourse in CE discourse, primarily focuses on psychologically distant consequences and concepts. Even when CE proponents use case studies in acts to persuade of CBM development being psychologically close, in terms of mirroring UK SMEs' situational context in the present time, my findings support a position that the case study businesses rarely reflect embedded SMEs. The scope of businesses included in case studies at events, in interviews and published materials align with findings of existing research on CBM implementation discussed in Section 3.2. This is in terms of the number of case studies in circulation being limited and when they are called upon they are niche market examples, sustainability start-up entrepreneurs, businesses who had received funding or big businesses *(Hofmann, 2019)*. When SMEs are included, they are primarily sustainability-oriented start-up businesses. Furthermore, information on consequences built on a limited number of successful entrepreneurial-oriented business case studies and pilot projects in niche applications or big businesses (that have usually had government funding). These examples not mirroring the situational context of established manufacturing SMEs. In addition, only successful examples are called upon whereas, as highlighted in Section 3.3, there are studies that demonstrate a high number of CE-related pilot projects funded by Government end in failure *(Blomsma, 2016)*. Therefore, as Interviewee 10 put forward, case studies currently in circulation may not be successful in persuading of the truth of positive consequences and encouraging proactive action in SMEs embedded in existing supply chains as "*people need to see something and recognise themselves in it."*. This is on the basis that they may be perceived as failing to mirror the lived experience and knowledge of established market-oriented SMEs in terms of "*a similar set of cultural and environmental backgrounds*." (MNE, PFW event).

Therefore, by including psychologically distant timelines, large scale economic and employment numeric values, start-up or MNE business centric case studies that are not commensurate with many SMEs' day to day experience and decision-making constraints, psychological distancing is reinforced. In addition, psychological distancing is strengthened when discourse orients to changes in the universally applicable "landscape" conditions such as demographics and geo-political trends that SMEs have little influence over *(Geels, 2018)*. However, the wide scope of the concept of the CE and continued debate on what is in and out, also increases psychological distancing. This is on the basis that my findings align with research that showed how established UK SMEs fear doing the wrong thing, needing to be confident in "*finding the right solution*" (Interviewee 4, SME) first time, when there are a wide range of options and uncertainty of outcomes *(Street, 2006)*.

The importance of psychological distancing is demonstrated in the use of the costs and discourse. My findings demonstrate how users of this discourse orient to those temporal, spatial, geographical and social entities that are psychologically close and have experiential salience as cues for what is to be trusted and deemed true regarding consequences to warrant taking action in the present *(Spence et al., 2012)*. This aligns with business orientation theory that market-oriented businesses base decisions on customer and competitor economic practices and market changes *(Jansson et al., 2017)*. My findings also support the small corpus of research on perceptions of risk in business managers, where business managers were understood to focus on size of losses and signals of certainty in decision-making and how to avoid such losses *(Helliar et al., 2001)*.

This latter point is noteworthy, in that my findings show how the benefits and opportunities discourse is notable for its absence of accounts of costs and losses. This includes labour costs in investigating options, on-going change management activities and achieving the benefits or capital investment costs. Neglecting accounts of immediate and on-going costs increases psychological distancing and limit trust in benefits claims. This is on the basis that established businesses have experience of change activities and their costs at some time in their history. As indicated in a small number of studies, large quantities of time and financial resources are needed to make change happen *(Werning & Spinler, 2020)*. Instead, the benefits and opportunities discourse focuses on economic gain and reputational advantage in the future and protecting against future losses. As such, I argue that the CE discourse relies on a regret-focused "fear of missing out" (FOMO) response to loss aversion to claims of high certainty of future gains or losses in acts of persuasion *(Hodkinson, 2019)*.

This lack of account of immediate and on-going costs and a FOMO discourse is in sharp contrast to the use of the costs and losses discourse. When engaging with the costs and losses discourse, practitioners oriented to immediate losses and irrecoverable future costs and negative reputational impacts. Here, such discourse aligns with the certainty effect and

loss aversion prospect theory where people value losing what they already have more than what can be gained, under conditions of high uncertainty of the gain and high certainty of immediate loss *(Kahneman & Tversky, 2000)*.

Therefore, discourse aimed at encouraging change in the present with immediate costs, for uncertain benefits or protection of losses in a distant future can make the CE concept appear unattractive and risky *(Spence et al., 2012)*. This is especially where the future for SMEs is influenced heavily by landscape conditions beyond the control of SMEs. In this way, my findings support arguments of risk management and SME communication researchers that position the necessity for salient concerns of SMEs to be recognised, and discursive and practical actions undertaken by those promoting a concept to limit perceptions of uncertainties and negative consequences *(Brook Lyndhurst Ltd., 2011; Corner et al., 2013; Renn & Benighaus, 2013)*.

However, my findings demonstrate how there is conflict between expert and lay knowledge in constructions of temporally close practice-based evidence and consequences. Proponents of the CE rely heavily on information produced through expert knowledge, whilst practitioners associated with manufacturing call predominantly on lay knowledge. This difference aligns with the position presented by Kasperson et al. *(1988)*, outlined in Section 2.3.2, where perceptions of risk vary considerably between lay people and experts. Furthermore, the conflict between lay and expert knowledge, relationship to trust and credibility, and how risk is communicated and expected to be managed, is recognised in risk management literature as creating dilemmas *(Renn & Benighaus, 2013)*. This can be explained by both expert and lay derived knowledge being partial representations of the situational context for SMEs and therefore being equally true and false *(Ezzy, 2002)*. This is on the basis that both are necessarily or purposefully selective in the evidence called upon and influenced by everyday interactions, salience, and vested interests *(Hajric, 2018; J. Henderson, 2010; Olomolaiye & Egbu, 2005)*. As Flynn & Hacking *(2019)* highlight, this approach to selection of evidence is understood to be used by actors in acts to legitimise their perspective. This applies equally to expert and lay knowledge.

The reliance on CE evidence being generated by those with vested interests in the construction of positive consequences for businesses supports perceptions of CE discourse being untruthful. This is in line with the views of Renn and Benighaus *(2013)*, where communication efforts that can be linked to vested interests were found to negatively impact upon the credibility of information. Therefore, such information is or will be perceived as "policy-based evidence" rather than evidence-based policy. Here, the simplification and ambiguity of such evidence, attribution of responsibility to others, the selectively of what data

is to be sought, used and promoted or orchestrated by self-professed "punditry"[83]-based political-institutional arrangements and relationships, creates an environment for scepticism to flourish *(Pawson, 2012; Strassheim & Kettunen, 2014)*. As such, trust in such knowledge and government policy calling upon such information can be limited or become eroded. This is demonstrated in my findings, where use of lay knowledge supports a theory of "postmodern cynicism" being embedded in contemporary western cultural understandings of knowledge, institutions and practices *(Stanley, 2012)*. As Stanley explains, postmodern cynicism developed as a fallout of the advancement of capitalism, industrialism and modernisation of society and the "reign of money". This having resulted in growing disillusionment of the morality of humankind and expectations of society as corrupt and self-centred, especially those with social power to influence, creating "hostility to certain knowledge". Lay knowledge of "*a huge attitude behaviour gap"* (Interviewee 11, business support provider), "*a certain <degree> of greenwash*" (Interviewee 14, academic) in organisations, and a lack of trust in "*assumptions associated with the circular economy*" used by experts *(TechUK, 2015, pp. 8&25)* supports this theory.

Expressions of cynicism and scepticism in the data provided insights into what is salient, who or what is deemed truthful and what actions of others are perceived to be trustworthy. Understandings of an attitude-behaviours gap, greenwash and selectivity of data demonstrates that cynicism and scepticism of the intentions, vested interests and morality of others and positive consequences is directed primarily at discursive claims. Hence, there is a taken for granted understanding that the spoken or written word lacks truth and is not to be trusted in evaluations of consequences. Instead, temporally close experience of economic practices is perceived as a more trustworthy, truthful and credible form of information than psychologically distant discourse-based evidence. Trust in practice-based experience compared to discursive-based evidence is historically and culturally embedded in the UK. This is demonstrated by the wide range of shared maxims regarding understanding of truth in peoples' values in practice, such as the 17th century "actions speaks louder than words*"* proverb[84] or the 1940s "put your money where your mouth is*"*[85] idiom. However, my findings point to differences existing between lay and expert knowledge constructions of practice-based evidence, in terms of citizen and customer practices, price-performance consequences of developing CBMs and the value of waste.

On customer practices, my findings demonstrate how CE discourse calling on expert knowledge positioned citizens and organisations as demanding CBMs and implicitly trusts

[83] Punditry is the self-expression of expertise in a particular field, associated with special advisers, policy analysts, think tanks, quangos, special interest groups set up by government or government-funded, etc.
[84] https://www.phrases.org.uk/meanings/
[85] https://idiomorigins.org/origin/

them as actively translating this discursive demand directly into practices when provided with options. As such, citizens and customers of SMEs were positioned as green activists. However, lay knowledge of citizens being janus-faced and organisations engaging in greenwash, where what customers "*say in public and what they ask for in private are two different things*" (Interviewee 8, trade association), acts to limit trust in CE discourse of positive consequences for established SMEs. This is especially where there is limited practice-based evidence of changes in customer purchasing practices. The difficulty is that, as argued in Section 2.2, differing interpretations of the same concept can be reinforced by and reinforce the same entities, structures and rules of the regime that have existed before or created during an individual's life established as part of the existing socio-political-economic system *(P. K. Edwards et al., 2014; Lovell et al., 2009; Maxwell, 2012; David Scott, 2005)*. What this means is that the conflicting interpretations of customer discourse and practices are equally true and false and can be used to construct contrary positions. For example, practice-based ethical and green purchasing economic evidence regarding citizens and use of voluntary ESD reporting instruments and labels in relation to B2B customers.

On the first point, there is evidence of growth in green and ethical consumerism and therefore citizens' willingness to pay a green premium, that validates understandings of citizens as green activists. As demonstrated by a study by the Co-op supermarket chain *(2019)* there has been a fourfold increase in the size of the ethical food and drink, green home, eco-travel, personal products consumer market in the UK between 1999 and 2019 from £11.2bn to £41.1bn. *(Co-op, 2019)* However, the economic evidence of green and ethical consumerism, as an important aspect of spending, is weak and can uphold positioning of citizens as Janus-faced, given total consumer spending of £675bn and £1.39 trillion in 1999 and 2019 respectively *(ONS, 2019)*. Green and ethical consumerism in the UK can therefore be seen to have grown modestly from 1.7% to 3% of market share over 20 years, aligning with understandings of eco-friendly products being only 4% to 6% of global market share at any one time *(Bray et al., 2011; Guyader et al., 2017)*.

Furthermore, this is against a background of a wide variety of such products and services being available *(Sandhu et al., 2010)*. Such knowledge aligns with a growing number of studies over the last decade that shows the existence of a consistent gap between talk and practice of people choosing CBMs, ethical or sustainable products and services *(Bertilsson, 2015; e.g. Bray et al., 2011; Carrigan & Attalla, 2001; Cerulli-Harms et al., 2018; Ipsos Mori, 2020; Jiménez-Parra et al., 2014; Johnstone & Tan, 2015; I. Payne et al., 2020; Sandhu et al., 2010; Schuitema & de Groot, 2015)*.

In a similar vein, lay knowledge of the concept of greenwash and expert knowledge of organisations as green activists, are both supported by the availability and use of voluntary ESD reporting instruments. My findings highlighted how the concept of greenwash has

become discursively embedded in the manufacturing regime, since being introduced in 1983 *(Ottman, 2014b)*. As with citizens, understandings of voluntary instruments being true reflections of customers' demands and practices regarding green and ethical products, and also being symbolic acts to be seen to be green and ethical, are both true and false. Such instruments require businesses to provide evidence of improvements in ESD performance and compliance and therefore they are engaging with ESD values. At the same time they enable businesses to be selective in what is included in performance measures or the level of compliance and may not be applied consistently, therefore improvements may have limited scope and effect *(Wijen & Chiroleu-Assouline, 2019)*. As outlined in Section 3.5.5, the promotion of voluntary certification schemes, CSR, charters, standards etc. for businesses has undergone extensive growth in the UK to encourage businesses to be seen to be enacting moral/ ethical obligations *(Hirschnitz-Garbers et al., 2015; Jackson, 2016; Lane & Watson, 2012; Weiss, 2014; Wickert & Risi, 2019)*. Regarding lay knowledge, my findings demonstrate that there are embedded understandings of voluntary performance management standards, policies, certification and labels being "rationalised myths" and ceremonial or symbolic acts to be seen as good *(Corneliussen, 2004)*. Hence, "*as long as you can tick the box"* (Interviewee 10, business support provider) and can "*be <u>seen</u> to be doing this even if we're, paying lip service"* (Interviewee 14, academic) as "*they're simply wish lists*" (Interviewee 8, trade association), organisations engaged in voluntary reporting have delivered their obligation.

In addition, there are also understandings that governance of voluntary instruments is weak. Lay knowledge of the use of voluntary standards being widespread for decades, yet detrimental ESD impacts having not been halted, can also reinforce perceptions of a lack of truth in such instruments *(e.g. Wijen & Chiroleu-Assouline, 2019)*. On this basis my analysis supports a theory put forward by Baxter & Clarke *(2013)*, that there is a taken for granted understanding of a "tick box culture" approach to governance of activities aimed at achieving public good in the UK. This fuels cynicism and scepticism of big organisations (public or private sector) discursive claims and actions. As argued in Section 8.4, this form of governance is a consequence of the "governance trap" *(Newell et al., 2015; Pidgeon, 2012b; Pidgeon & Butler, 2009)*. Furthermore, entities, structures and rules, including discourse of the CE, that enables the CE term to be used as a new label for existing products and services, and therefore a symbolic badge to be seen to be embedding ESD values, could act to reinforce concerns that the CE concept may be perceived as another form of greenwash, as outlined in Section 3.5.4 *(Friant et al., 2020; Hofmann, 2019; Korhonen, Nuur, et al., 2018; Nylén & Salminen, 2019)*. This is on the basis that established SMEs are likely to have had experience of engaging with previous concepts, such as resource efficiency, and how they are valued by customers. They are also likely to have had experience of greenwash, such as in public procurement tendering, where claims of valuing CBMs are undermined by a focus on costs, as discussed in Chapter 8. Furthermore, perceptions of greenwash are reinforced by lay knowledge of customers

continuing to expect SMEs to "*match price and quality"* (Interviewee 15, academic) of existing products and services when it is understood that CBMs incurs a green premium. By regulators, policy-makers, researchers, customers, public bodies and citizens continuing to legitimise symbolic environmentalism through acceptance, use and promotion of such voluntary instruments and labels, perceptions of greenwash are unlikely to be abated *(Bowen & Aragon-correa, 2014)*. Therefore, as with the citizen attitude-behaviour gap, I argue that the existence of greenwash, reinforced by weak governance and complicit assent of voluntary instruments "*as the UK likes to run things*" (Interviewee 14, academic) and policy promoting "*getting the corporates to do something voluntary*" (Interviewee 7, government), has a detrimental influence on perceptions of consequences in proactively developing CBMs.

Green activism, the janus-faced customer and greenwash are intrinsically connected to perceptions of the effect of CBMs and embedding ESD values on the price and performance of products, materials and services. On the aspect of price, the analysis in this chapter confirms the findings in Chapter 8, that in both expert and lay knowledge there is an embedded understanding of a green premium, although proponents of the CE argue the development of CBMs results in cost savings. As also argued in Chapter 8, embedded understandings of entities and structures established to deliver the current linear economy model that underpins capitalism-based political ideology in practice disadvantages development of CBMs by enabling existing products and services to be "*cheap*" were also reinforced. However, what is of particular note in this Chapter, is the differing constructions of price and performance/ functionality effects due to the association of CBMs with waste and sustainable materials.

When calling upon lay knowledge in constructions of consequences, a discourse of "quality" was a dominant aspect of the costs and losses discourse to argue against engaging with CBMs. "Quality" was used as a synonym for all aspects of performance and functionality of an entity. However, in CE proponents' discourse, there is a notable absence of discourse of quality, whilst relying on a cost savings discourse to persuade of the value of developing CBMs. In both cases, my analysis supports a position that this contrast in focus is dependent upon how waste is conceptualised.

As demonstrated in Section 3.4, how waste is framed in policy discourse has evolved from waste as a problem in the period 1960 to 2000 to waste as a resource that is embedded in present day CE policy and proponent discourse. As outlined in Section 3.5.2, this change in framing of waste is built upon a notion of perpetual quality, where waste can effectively replace new materials and products currently in use and will be accepted by society *(Bassi & Dias, 2019; Gregson et al., 2015; Welch et al., 2016)*. However, as Silva et al. *(2017)* explain, the production and management of waste is an established part of UK social history developed over centuries. Before the mid-19th century limiting waste was an everyday practice in households and what residual waste was produced was treated as having value in industrial

processes *(Blomsma, 2016)*. In contrast, at the height of industrialism and modernisation of society, the discarding of products and materials increased, with the resultant waste understood to be unhygienic and harmful to human health, and a problem to be disposed of via landfill, into water or incineration *(Nylén & Salminen, 2019; Silva et al., 2015)*.

Whilst policy and CE proponents work to reframe waste as a valuable commodity, calling upon expert knowledge and a limited number of successful examples of utilisation of waste, lay knowledge is dominated by this historically established conceptualisation of waste as a problem. As such, products and materials that have been discarded at a point in their lifecycle are inherently understood to be "*inferior items*" and result in products and materials that are not "*reliable, high consistency, high quality"* (Interviewee 2, SME). My analysis supports a position that in lay knowledge there are embedded understandings that "*certainly amongst the population as a whole, waste still has no value*" (Political party, PFW event). In addition, customers' expectations of "*why isn't the price lower than virgin materials?*" on the basis that "*The perception is that secondary materials have to be a lower price*." (MNE, WRF event) reinforces understandings of waste as being of lower quality. This supports a theory that people collapse durability, quality and price together so that they expect more costly items to have longer life spans and be higher quality and vice versa *(Cerulli-Harms et al., 2018)*. As Deval et al. *(2013)* state, perceptions of lower price products and services being associated with sub-standard quality is commonplace.

My findings also fitted with a range of other existing research on understandings of the relationship between utilisation of waste and quality. For example, research that shows citizens' negative perceptions of the quality of remanufactured products and willingness to pay for such products *(e.g. Gu et al., 2015; Matsumoto et al., 2016; Michaud & Llerena, 2011)*. Research on recycled materials such as plastics *(e.g. Veelaert et al., 2020)* or textiles *(Rucker, 2009)* and refurbished products *(e.g. Van Weelden et al., 2016)* also demonstrate negative perceptions of such products. In addition, negative perceptions may be reinforced by established practices where many materials and products at end of life are "downcycled" *(de Wit et al., 2019)*. Downcycling is associated with lower value/ low price markets where functionality, performance, lifespan or future resale expectations in comparison to buying new are lower due to contamination and a lack of purity *(e.g. W. Baxter et al., 2017; Nylén & Salminen, 2019)*. My findings also support critiques of the CE outlined in section 3.5.4, regarding the inability for CBM products and materials to be effective substitutes for existing products and materials due to perceptions of lower quality and CBM products competing in different markets for different customer needs *(Figge & Thorpe, 2019; Hobson & Lynch, 2016; Kallis, 2017; Makov & Font Vivanco, 2018; Nußholz, 2017; Valenzuela & Böhm, 2017; Zink & Geyer, 2017)*.

What this means is that the discourse of cost savings in the benefits and opportunities discourse, built on understandings of waste being cheap, can act to reinforce perceptions of CBM products resulting in losses in quality and income, as customers expect such products and services to be lower cost. In addition, the discourse of cost savings fails to take account of the work needed to make waste have equitable performance characteristics. As Cullen *(2017)* outlines, quality of waste in the CE discourse has received little attention yet requires energy, materials and technology to return waste to its original quality state to enable replacement of new products and materials. For businesses this means increased capital and labour costs rather than cost savings overall.

Given that there are taken for granted understandings that for established SMEs "*the big risk for <all> of them is financial and then reputational"* (Interviewee 3, SME), as highlighted in Chapters 7 and 8, lay understandings of waste as a problem will undermine CE discourse of positive consequences for businesses. As such, CE proponents' claims of cost savings associated with utilisation of waste may be perceived as lacking truth. On this basis, my findings support those researchers who position the need to focus more on waste as a problem and look to avoid waste production, as outlined in Section 3.5.2 *(Fandrich & Kivinen, 2011; Hultman & Corvellec, 2012)*. This is on the basis that maintaining existing entities, structures and rules that support the conceptualisation of waste as a problem, including the promotion of increased consumer recycling, are positioned as failing to limit waste production *(Silva et al., 2017)*.

Not all CBMs build on utilisation of waste, instead focusing on the use of sustainable materials. Promoting products and services "*because its more sustainable*" (Interviewee 15, academic) may not be positively received by citizens. This is demonstrated by understandings that businesses do not always want to be associated with adopting ESD values in order to protect their reputation, "*because they think the customers won't like it*" (Interviewee 7, government), in line with research that indicates businesses may actively or passively engage in brownwash *(Coburn, 2019; Kim & Lyon, 2015; Lyon & Montgomery, 2015; Sandhu et al., 2010)*. Reputational losses are important as they can lead to "*business suicide"* if a business becomes associated with "*design faults and ….any brand that gets a name for being unreliable"* especially in "*B2B, you'd never work with a supplier if their products were useless"* (Interviewee 12, consultant). Engaging in brownwash, actively or passively, relates to lay knowledge of customers being uninterested in ESD values and/or how embedding ESD values is perceived by them to impact upon performance and functionality expectations of products and services. CE proponents' discourse, using expert knowledge, is underpinned by an assumption that ESD attributes are perceived to be positive by end customers of products and services. However, this contrasts to lay knowledge where there are understandings that "*there is an un-evidenced suspicion"* (Interviewee 11, business support provider) that CBM products and services (other than designing longer lasting products and improving in use energy

efficiency) will be perceived as reducing product performance and being of lower quality in comparison to products on the market that CBM products must compete with. As Usrey et al. *(2020)* conclude, products with ESD attributes are often perceived as being of lower quality and less effective than contemporary products such that businesses promoting green credentials risk inferences being made that their products have lower performance characteristics.

These understandings are actively reinforced by tacit knowledge of historically constituted conceptualisations of “natural” products and services in relation to “quality of life” and the advancement of science and technology in the age of industrialism and modernity. For example, understandings that science and technology has improved physical and material “quality of life” by out-performing many nature-based products, materials and solutions western society was reliant upon beforehand, particularly in medicine, hygiene and agriculture *(Farming First, 2021; Hoy, 1996; Inkeles, 1993)*. Therefore, lay knowledge of products with ESD attributes being perceived as having lower performance will act to reinforce perceptions of negative consequences for established SMEs in developing CBMs due to perceived negative effects upon reputation or customers actively choosing not to have products with ESD attributes.

Overall, the analysis of the CE proof of value repertoire as part of a trust and truth causal mechanism strengthens the interpretations in Chapters 7 and 8, whilst explaining why CE discourse of benefits and opportunities may be perceived as lacking truth. A summary of the findings and interpretative analysis in this Chapter is provided in Table 21, demonstrating consistent and contrary maxims, the entities structures and rules embedded in production and consumption underpinning the maxims and the discourses that were called upon.

Interpretations	Entities & structures	Rules of the manufacturing regime	Discourses
Trust and truth causal mechanism - consequences			
In evaluating consequences of engaging with CBM, to alleviate uncertainty, psychologically close practice-based evidence and lay knowledge is perceived as more truthful and trustworthy and upon which decisions are to be made. CE narratives calling on expert knowledge with vested interests and psychologically distant evidence can act to increase perceptions of uncertainty and untrustworthiness of claims of positive consequences for established SMEs. Entities, structures and rules relating to citizen and customer ESD practices, CBM effects on price and functionality, waste and CBM costs and benefits can be interpreted differently and have different levels of salience in lay and expert knowledge, influencing perceptions of what is truthful and to be trusted in relation to consequences of action.			
Shared interpretations	Cynicism and scepticism	• Practice-based evidence is more truthful and trustworthy than discursive evidence • A rational decision is to be based on practical experience, knowledge and proof of customer and competitor practices and market signals	• Cynicism • Actions speak louder than words metaphor
	Evidence • Evidence-based policy • Expert knowledge • Lay/tacit knowledge • Psychological distancing	• Cost benefit proof is required by established SMEs • Rhetoric is an everyday social practice used to persuade and influence • Rhetorical approaches to construction of consequences to call on expert and lay knowledge to validate reliability, trustworthiness and truth of claims • Practice based evidence is to be called upon in evidence-based policy and lay knowledge to position evidence as truthful and alleviate uncertainty of positive consequences • Available practical evidence based on forecasts and estimates of future benefits • Psychological distancing influences perceptions of uncertainties and consequences • Psychologically close entities have salience and provide credibility to discursive claims	• Cost benefit analysis • Proof • Evidence-based policy • Case studies, pilot projects, research • Mirror metaphor • Practical experience • Social networks of influence
	CE discourse • Circular business models	• Circular economy options are diverse and complex and have different value in different markets and with different customers	• Complexity • Uncertainty • The right solution

		• It is rational for established SMEs not to invest in an innovation concept when there is high uncertainty of market and customer responses		
Contrary maxims	Evidence • Evidence-based policy • Lay/tacit knowledge • Psychological distancing	• Expert knowledge proves development of CBMs provide economic and reputational benefits and opportunities and avoidance of future losses • Expert knowledge builds on practice-based knowledge	• Lay knowledge proves development of CBMs result in costs and irrecoverable losses • Practice-based evidence lacks proof of price and performance costs and losses	• Risk and uncertainty • Benefits & opportunities • Costs and losses • High certainty vs uncertainty • Market signals • Temporal, spatial and physical proximity and certainty
		• Evidence-based policy is fact based, true and objective • Failure of SMEs to act is due to poor knowledge of SMEs	• Evidence-based policy is based on vested interests, hypothetical and selective. • Failure of SMEs to act is due to lack of transparency of salient and psychologically close issues for SMEs including costs and losses	• Awareness raising • Headline large scale claims • Ambitious scenarios • Costs • Trustability
		• Successful case studies can be replicated by established SMEs and result in positive consequences without support from Government	• Case studies are niche applications, new markets, sustainability start-up entrepreneurs or MNEs where scalability is uncertain without government funding and support and existing customers valuing ESD values	• Niche • Scalability
	Customers and markets • Discourse • Voluntary performance management standards, certification and policies • Governance	• Discursive claims in voluntary instruments are trustworthy and prove customers value ESD values in practice	• Voluntary instruments cannot be trusted being symbolic acts and greenwash • Businesses do not prioritise ESD values in practice	• Badges is activism metaphor • Tick box exercise • Greenwash • Green activist metaphor • Genuine vs symbolic • Being seen to be good • Governance

	• Citizens' consumption practices	• Businesses can be trusted to prioritise ESD values in practice		
		• Citizens are demanding and value ESD values in products and services • Citizens can be trusted to enact their discursive claims in practice	• Citizens cannot be trusted to value ESD values in practice without added extrinsic value	• Janus-faced citizen metaphor • Green activist metaphor • Attitude-behaviour gap
	Industrialism advances in technology & science • Product functionality & quality	• Using sustainable materials does not negatively impact on extrinsic values of customers	• Using sustainable materials perceived by customers as reducing quality and functionality	• Quality • Brownwash
	CE discourse • Psychological distancing • Waste	• Certainty of large scale economic value, jobs, competitiveness, changing landscape conditions and avoiding losses in the future means need to act here and now	• Future consequences and landscape changes are psychologically distant and have high uncertainty of value in taking action in the present	• Short terms vs long term • Fear of missing out • Immediate losses vs future gains • Temporal proximity
		• Waste can replace virgin raw materials and perform to the same level	• Using waste reduces quality, performance and functionality	• Waste as a resource metaphor • Waste as a problem metaphor
		• CBMs result in cost savings from using waste for SMEs and customers	• Developing CBMs that include waste increases production costs and prices for customers	• Cost savings rhetoric • Green premium metaphor • Resource efficiency • Political ideology • Values prioritisation • Design & logistics complexity and costs • Labour costs

Table 21: Influence of entities, structures and rules on perceptions of risk for established SMEs

PART 4: DISCUSSION AND CONCLUSIONS

10 Discussion and conclusions

This thesis has investigated the perceptions of risk for UK manufacturing Small and Medium-sized Enterprises (SME) from a relational theory of risk perspective through discourse analysis. In this chapter, I argue why my findings have significant implications for policy and research regarding established manufacturing SMEs engagement with the circular economy (CE).

As outlined in Chapter 1 and demonstrated in Chapter 3, established manufacturing SMEs are understood to have little involvement in developing circular business models (CBMs). However, as introduced in Section 1.2, risks associated with such activities for established manufacturing SMEs who are embedded in production value chain networks as part of the existing linear economy system have not been studied in any detail *(Miras-Rodríguez et al., 2018; Ranta et al., 2017; Stewart & Niero, 2018)*. To start to fill this gap, I have provided insights in this thesis on perceptions of risk for established manufacturing SMEs. More importantly, I have provided explanations of the institutionalised context of being an incumbent manufacturing SME and arguments on the effect this has on perceptions of risk. A key aim was to add to the knowledge on why established manufacturing SMEs in the UK are, or are not, will or won't, proactively develop CBMs and what this may mean for CE policy aspirations and research. Here my analysis identified and developed understanding of how contingent arrangements of historically developed and socially embedded entities and their structures and rules of the manufacturing regime influences perceptions of risk.

The following Research Questions formed the locus of enquiry:

1) What is understood of being an SME and their decision-making as part of existing production value chain networks regarding transitioning to a CE?

2) What is understood of CBMs?

3) What is understood of risk for SMEs in developing CBMs?

4) What are the implications for intervention and support for established manufacturing SMEs in engaging with the concept of the CE?

The main body of this Chapter is focussed on answering Research Question 4. I first briefly summarise my findings regarding Research Questions 1 to 3, discussing them more broadly in terms of their implications for researchers and policymakers engaging established SMEs in the development of CBMs. This is followed by my propositions on what questions still need to be answered in Section 10.2. Then in Section 10.3, I reflect on the assumptions brought to the research; the implementation of the methodological strategy and framework; taking manufacturing SMEs as the unit of analysis; the sample, and the influence of changes in the

research landscape such as Brexit and Covid-19. My conclusions are presented in Section 10.4.

10.1 Discussion of findings

My analysis demonstrated how the existence of contingent arrangements of historically developed and socially, culturally and politically embedded entities, structures and rules associated with production and consumption have resulted in the establishment of currently stable causal mechanisms. My arguments build on there being shared, embedded understandings of the existence of entities, structures and rules embedded in production value chain networks continuing to advantage the linear economy system. These understandings reinforcing and being reinforced by three main mechanisms: power and relationship dynamics, values and ideology, and finally a trust and truth causal mechanism. Through the analysis of discourse presented in Chapters 7 to 9, I have shown empirically and explained theoretically, the effect these mechanisms have on perceptions of risk and how and why they exist.

As I argued, engagement with these mechanisms influences understandings of freedoms and constraints on established manufacturing SMEs, what is to be of value and prioritised in developing CBMs, who or what is to be trusted to provide the truth of the costs and benefits of developing CBMs and where responsibility lies in making transition to a CE a reality. In turn, my analysis demonstrated how these understandings influenced discourse of risk, in terms of what is perceived of value and at stake for established SMEs and the uncertainties and consequences of proactively developing CBMs.

In Sections 10.1.1 to 10.1.3 I summarise the findings relating to each of the mechanisms investigated and present the implications of my findings. An overall summary is provided in Section 10.1.4.

10.1.1 Power and relationship dynamics

The availability and use of an asymmetric power relations repertoire, analysed in Chapter 7, was fundamental to identifying and understanding the contingent arrangement of entities, structures and rules that reinforce and are reinforced by a power and relationship dynamics causal mechanism. The mechanism influencing what is understood of SMEs and their decision-making, helping answer Research Question 1.

As I argued, this mechanism is historically constituted and continues to be socially embedded, defining what is to be of value and at stake for established manufacturing SMEs and the social power they have. Social power being the potential or ability to influence beliefs, attitudes or practices of others *(Raven, 2008)*. I argue that the existence of this causal mechanism

constrains the level of freedom established SMEs have in deciding to proactively develop CBMs.

From a relational theory of risk perspective, my analysis and arguments presented in Chapter 7, explain why maintaining and gaining preferred supplier or strategic partnership status with customers, is what is of value and at stake for established manufacturing SMEs in decisions involving change. Such a status being understood to be achieved by SMEs enacting the expected rights and duties on them to deliver specialist technological and informational expertise that differentiates them from competitors. Although the expertise is also understood to be expected to be tailored to particular customer and market expertise and price-performance preferences.

As outlined in Section 1.2, CE discourse and policy positions the development of CBMs as enabling differentiation that is being demanded by new customers and markets and delivering positive consequences for SMEs. Furthermore, advocates of the CE engage with a basic assumption that SME decision-makers have ultimate freedom to change what they do, such that they position that what is needed by established SMEs is access to finance, technology, knowledge and skills. On this basis it would be expected that SMEs would willingly take action on the CE and look to differentiate themselves through developing CBM specialist expertise by accessing funding and value creation support structures that are made available. Although I accept that everyone is "free" to make their own decisions, as presented in Chapter 7, there are embedded understandings that freedoms of established SMEs are mediated by the expected rights and duties of being an established manufacturing SME. These rights and duties being defined and reinforced by a historically constituted and socially embedded size-related hierarchy of power.

Due to their size, this results in established manufacturing SMEs having limited social power and being expected to maintain and develop their expertise in line with how those with social power enact their structural, passive and coercive powers *(Raven et al., 1998)*. My findings indicate that established manufacturing SMEs are specialist providers of technological and informational expertise tailored to price-performance requirements of customers and have complicitly co-created path dependencies with customers. However, my findings show how such path dependencies are established, and expected to be maintained, on an asymmetric basis. The norm being for established SMEs' dependency to be needs-based, in comparison to customer dependency that is to be choice-based, in established relationships *(Tory-Higgins, 2007)*. On this basis, I conclude that the needs-based path dependencies and specialist function of established SMEs locks-in what they do, how they do it, who with and why. Therefore, the degrees of freedom that an established manufacturing SME has is limited.

The effect of such social norms is that established manufacturing SMEs focus on cues from existing customers, competitors and markets when deciding on change *(Jansson et al., 2017; Teso & Walters, 2016; Walpole & Renfrew, 2018)*. Thus I argue that, what this means is change in established SMEs becomes more and more "socially dependent" on the power enactment of existing customers and markets *(Raven, 2008)*. This makes it difficult and expensive, or potentially impossible, for established SMEs to proactively change what they do without destroying the business *(P. L. Payne, 1967)*. This is unless customers are demanding change in practice or landscape changes, such as times of crisis, provides no alternative if the SME is to survive.

As shown in Section 1.3, CE research, policy and narratives focus on what is of value and at stake from a systems-level and CE proponents' perspective and future conditions, e.g., new jobs, economic growth, reducing CO_2 emissions resulting from innovation. Furthermore, as demonstrated at events, what is positioned as being of value and at stake in discourse of transitioning to a CE by proponents of the CE aligns with the rights and duties of the institutional roles of individuals. These rights and duties being different to those of established manufacturing SMEs. When businesses are included in discourse, actors not involved in manufacturing can be seen to assume that cost savings, new markets and avoiding costs and losses in the future is what is of value and at stake for established businesses.

By continuing to focus on this simplified understanding of what is of value, and stake and failing to account for how established SMEs are socially dependent on existing customers and market conditions, the impact of CE discourse will be limited. Therefore, based on the analysis presented in Chapter 7, without one or other or all of the following conditions being in place, proactive development of CBMs will continue to be perceived as a risk object:

- Existing or new customers demanding CBMs in practice from SMEs.
- Existing customers enacting their withholding power by moving to suppliers having CBMs.
- Existing or new customers rewarding suppliers who develop CBMs equally or more than existing offerings.

Overall, there has to be a contingent arrangement of conditions in place for established manufacturing SMEs that aligns with the expected rights and duties of established SMEs and supports proactive development of CBMs.

The first is for market-oriented SMEs operating in stable markets and relationships. Here the development of a CBM acts as a differentiator over competitors whilst meeting existing customer and market expertise and price parity/ proximity-performance value preferences.

Such acts resulting in maintaining and strengthening the development of preferred supplier or strategic partnership status.

The second is where established SMEs' markets or relationships are under threat from external conditions. Developing a CBM must mitigate instability and uncertainty for established SMEs by creating new markets, customers and relationships, when there is evidence that characteristics associated with CBMs are being valued by a new customer base above alternative innovation options.

However, my findings show how certainty of customers valuing the characteristics associated with CBMs and external conditions favouring the adoption of CBMs on a price-performance basis influence discourse of consequences. Therefore, understandings of the enactment of social power and customer and market preferences are pivotal in perceptions of risk. This was the subject of analysis in Chapter 8, regarding the values and ideology causal mechanism, and is summarised in Section 10.1.2.

10.1.2 Values and ideology

Analysis of the CE as a higher ideal repertoire in Chapter 8 demonstrated how a historically developed and socially and culturally embedded values and ideology mechanism has a major influence on what is understood of CBMs and evaluations of uncertainties in the proactive development of CBMs.

My findings and analysis support a position that the use of the repertoire, the existence of the mechanism and its influence is underpinned by understandings of the CE being associated with voluntary, choice-based ethical or moral "higher domain of values" *(Ludwig, 2000)*. This is due to the characterisation of the CE as addressing global environment and sustainable development (ESD) issues. The voluntary, choice-based status is what was found to be the foundation of perceptions of high uncertainty of the value for established SMEs developing CBMs.

Firstly it is important to note that, due to the nature of relationships between established SMEs and customers as summarised in Section 10.1.1, my findings demonstrate how personal ESD values of decision-makers in established SMEs are mediated by customer and societal prioritisation of values and the consequences of adhering or not adhering to the politically and socially embedded rules regarding evaluation of value *(Jansson et al., 2017; Schwartz, 1999; Stern, 2000)*. My findings demonstrate how the existence of the values and ideology mechanism is understood to place expectations on established manufacturing SMEs. These expectations being to be commercial and evaluate decisions on a cost-benefit basis that maximises extrinsic material, utility and economic value for customers and society through

their activities. As shown in my analysis in Chapter 8, these expectations aligning with and being reinforced by understandings of historically developed structures and rules underpinning political ideology in practice.

From a relational theory of risk perspective, my findings show how there are perceptions of high levels of uncertainty of customers and political ideology prioritising ESD values in practice sufficiently to advantage proactive development of CBMs. This is on the basis that constructions of uncertainties, in line with a wide range of other research, built on understandings that economic values are the dominant values oriented to in society whilst political ideology in practice currently economically disadvantage embedding ESD values. This economic disadvantage is due to current entities and structures either being unable to place a market price on ESD values or failing to include the costs of ESD negative consequences in current modes of production and consumption. As my findings show, this is understood to cause difficulties for established manufacturing SMEs in being able to carry out the expected cost-benefit analysis in favour of developing CBMs. Therefore "willingness to pay" is used as a proxy estimate, or "shadow price", for how ESD values are valued in practice *(O'Neill, 2001)*. The issue is that where customers are understood to be unwilling to pay, embedding ESD values in production are understood to have little value.

This willingness to pay, or more widely who is to pay for ESD values to be embedded in production and consumption, underpinned contestation on where responsibility lies for transitioning to a CE and the scope of actions to be taken. Proponents of the CE work to place an onus on businesses to engage in "responsible innovation", although as shown in my findings, this attribution of responsible innovation can be perceived as unfair. This is on the basis that my findings highlighted how attribution of responsibility dispute built upon understandings of the "problem of many hands", where everyone is understood to have contributed to negative ESD consequences in some way and therefore have a role to play in addressing the problem *(Sena, 2014; D. F. Thompson, 1980; van de Poel & Fahlquist, 2012; van de Poel & Sand, 2018)*. Due to this, as demonstrated in my findings, responsibility for addressing ESD issues, moral obligations and consequences of change were positioned as needing to be fair, transparent and consistent throughout all aspects of society and across nations. Such a condition being understood to only be attainable by governments changing the entities, structures and rules that economically disadvantage embedding ESD values in practice and maintain ESD values in practice being a voluntary endeavour. As such, governments, due to understandings of their high social power to influence and being the orchestrators and custodians of political ideology in practice, were assigned primary responsibility. Their responsibility being to put in place fair, consistent, stable policy "carrot" and legislation "stick".

However, calls upon obligation-focussed interventions, such as legislation, taxes and standards, act against neoliberalist CE policy. Such policy adopts discourse of ecological modernisation, free market economy principles and moral obligations to warrant a focus on "responsible innovation" support, entrepreneurship and use of voluntary instruments as highlighted in Sections 1.4 and 3.5.4. As I argued in Chapter 8, this approach being a consequence of the existence of a "governance trap" *(Newell et al., 2015; Pidgeon, 2012b; Pidgeon & Butler, 2009)*.

Maintaining the governance trap works against encouraging proactive action on the CE by established SMEs in the UK, as the reliance on enactment of moral obligations on a voluntary basis will fuel perceptions of high uncertainty of value in developing CBMs. On this basis I argue that, where there is certainty that policy and legislation effects on costs and prices, competitor activities or customers willingness to pay advantage development of CBMs within the existing ideology without compromising extrinsic value for customers and the SME, consequences will be perceived as positive. Alternatively, where there is uncertainty of these conditions existing, consequences will be perceived as negative. This aligns with taken for granted expectations that deciding not to invest in an innovative concept when there is high uncertainty of customer demand is a rational decision *(Government Office for Science, 2014)*. Therefore, based on my findings, to overcome uncertainty, more has to be done to bridge the "governance trap" by governments enacting their social power and bringing in stronger policy, legislation and governance that advantages development of CBMs. This includes putting in place stable, consistent and fair policy instruments, legislation and strong governance that results in the following conditions:

1. Willingness to pay no longer being the proxy price for how ESD values in practice are to be costed.
2. Market costs and prices either advantaging development and use of CBMs, e.g., repair and refurbishment costs are significantly lower than existing products or services, or are not disadvantaged, e.g., costs of sustainable material supply are equitable to non-sustainable supply.
3. Development of CBMs not compromising material and utility value or performance/ functionality norms associated with existing products and services.
4. Competitors are obtaining advantage from providing CBMs in a range of markets.

However, my findings demonstrated conflicting interpretations of these conditions existing, and whether political ideology in practice would support the development of these conditions. This conflict was the subject of analysis of the trust and truth causal mechanism in Chapter 9, as summarised in Section 10.1.3.

10.1.3 Trust and truth

Analysis of the CE proof of value repertoire in Chapter 9 highlighted how a trust and truth causal mechanism has the potential to influence responses to a CE discourse of benefits and opportunities. Compounded by the CE concept being in a discourse structuration phase and ESD values in practice being voluntary and inconsistent, I showed how engagement with the mechanism enables differing interpretations of consequences and knowledge to be equally true and false and be reinforced by the existence of the same entities, structures and rules *(Ezzy, 2002)*.

As reaffirmed by my findings, proponents of the CE discursively position that there are economic benefits for businesses developing CBMs and there is expert and practice-based knowledge to support the position. Such discourse builds on constructions of growth in new markets, citizens and B2B customers being green activists, using waste resulting in cost savings, and action in the here and now resulting in economic gains and avoiding losses in the future. However, my findings demonstrated how psychological distancing, cynicism and scepticism and lay knowledge of production and consumption can position the opposite. Here, the proactive development of CBMs is understood to result in negative, potentially fatal, consequences for established manufacturing SMEs.

As I showed, temporally, spatially and socially/psychologically distant entities act to inhibit action reinforcing uncertainty, and a lack of trust in proposed outcomes coming to pass, especially if they fail to resonate with existing social norms *(Soliman et al., 2018; Spence et al., 2012)*. Furthermore, inconsistency between the discourse and practice of individuals and institutions, in an era of "postmodern cynicism", results in hostility to knowledge and institutional discourse *(Stanley, 2012)*. Also, evidence produced by expert knowledge, that lacks acknowledgement of salient lay knowledge, can act to undermine the credibility of the evidence and the urgency for action to be taken *(J. Henderson, 2010; Popay, 2018; Wynne, 2008)*. Together or independently, these entities were found to support a costs and losses discourse.

As demonstrated in Chapter 9, in discursive constructions of consequences, psychologically close existing customer, market and competitor practices, preferences and landscape conditions and immediate costs and losses are dominant in lay knowledge. This is against a background of SMEs fearing making the wrong decision. This is in comparison to a discourse of new markets and future benefits in CE discourse built on claims of future landscape conditions changing. What this means is that CE discourse, particularly when framed in terms of timescales of 10, 20 or 30 years and landscape changes that SMEs have no control over, will lack salience. Furthermore, what is psychologically close, in terms of the here and now

and past, was deemed more trustworthy and understood to be a more certain indication of positive or negative consequences in both the short and long term. However, in an attempt to increase salience of the CE, proponents call upon case studies as proof that there is demand for CBMs and economic advantages ensuing. In line with a range of other research, my analysis demonstrated how case studies in circulation rarely reflect the situational context of established SMEs. They also often gloss over the costs involved, other than capital costs, and the extent of support provided through government funding. Without greater transparency in overall economic costs, including accounts of the level of funding and expert support received, such case studies may be regarded as greenwash. My findings also highlighted the effect of five aspects of CE discourse in increasing psychological distancing and potentially contributing to CE discourse of benefits and opportunities lacking credibility.

The first aspect relates to transparency on costs, as understandings of large quantities of time and financial resources being needed for change to occur are embedded in lay knowledge *(Werning & Spinler, 2020)*. CE discourse that relies on a regret focused "fear of missing out" (FOMO) response to loss aversion and gains in the future will lack salience when decision-makers in established SMEs value more what they understand to lose in the present than what they may potentially gain in an uncertain future *(Hodkinson, 2019; Kahneman & Tversky, 2000)*. CE discourse that fails to demonstrate evidence of costs and losses, that is commensurate with lay knowledge and what is salient to established SMEs, will reinforce perceptions of negative consequences of taking action in the here and now *(Brook Lyndhurst Ltd., 2011; Corner et al., 2013; Renn & Benighaus, 2013)*.

The second is engagement with the concept of "evidence based policy" that calls upon a blend of expert knowledge to present "facts" and use of case studies to position citizens, customers and competitors as green activists *(Hawkins & Ettelt, 2018; Pawson, 2012)*. The call upon lay knowledge demonstrated the existence of scepticism and cynicism towards discursive practices and governance in addressing ESD issues built upon understandings of vested interests. This was demonstrated in shared embedded understandings of an attitude-behaviour gap in citizens' purchasing practices, business to business (B2B) customers engaging in greenwash using voluntary instruments and labels (including case studies), a "tick box" culture of governance and policy commitments having not been adhered to *(J. Baxter & Clarke, 2013; Bray et al., 2011; Ottman, 2014b)*. In this way CE discourse may be perceived as "policy-based evidence" *(Pawson, 2012; Strassheim & Kettunen, 2014)*, with use of voluntary instruments and discursive demands being seen as symbolic environmentalism.

The third and fourth aspects are interconnected and relate to lay knowledge of waste and use of sustainable materials and how this affects costs and performance of products and services.

In CE discourse, cost savings are an embedded aspect of the benefits and opportunities discourse built on positioning waste as a lower cost resource that can perform equally well with virgin material. On the first point, my findings showed how there is taken for granted shared lay knowledge of the development of CBMs and embedding ESD values incurring a green premium *(Gates, 2020; Guyader et al., 2017)*. But more importantly, as demonstrated in my findings, there was also an historically established set of lay understandings of waste as a problem and the use of sustainable materials negatively affecting the "quality" of products and services. In fact, I argue that positioning waste as a lower cost resource has an unintended consequence of reinforcing perceptions of lower quality, as people perceive a direct relationship between quality and price *(Cerulli-Harms et al., 2018; Deval et al., 2013)*. Furthermore, historically embedded tacit knowledge of products with green credentials not performing as well as non-green products influences perceptions of negative consequences *(Usrey et al., 2020)*. As such, my findings support a position that businesses would prefer to engage in "brownwash" to avoid negative perceptions of their products or themselves *(Coburn, 2019; Kim & Lyon, 2015; Lyon & Montgomery, 2015; Sandhu et al., 2010)*.

The fifth aspect relates to the CE concept being an umbrella concept *(Blomsma et al., 2019)*, and in a discourse structuration phase *(Hajer, 1993)* such that conflicting arguments abound on the right and wrong action to take. As making the right decision first time is important for SMEs, a lack of consensus, a complex scope and instability and incoherence across policy, will increase uncertainty and decrease salience of taking action in the here in now.

A continued focus on cost savings, promotion of voluntary instruments and labels as evidence of green activism, reliance on discursive evidence of citizens' prioritisation and demand for green products and services and "policy-based evidence", will fail to make CE discourse appear credible in terms of persuading SMEs of their positive consequences. Furthermore, without clarity and coherence on what the "*right solution*" is for established manufacturing SMEs, trust in CE discourse will be limited.

To increase trust in CE narratives, building upon the position presented in Sections 10.1.1 and 10.1.2, the following evidence is required to address inherent cynicism and scepticism and salient concerns of established manufacturing SMEs that are psychologically close:

1. Long term certainty of policy commitments to the development of CBMs enacted through legislative instruments and investment in entities and structures that create a level playing field, such as infrastructure.
2. Transparency of labour, material, operational and logistics costs and context (e.g., spatial, geographical, sector/market and size-related distribution) alongside economic benefits information.

3. Practice-based proof of recycled materials, repaired, reusable or remanufactured parts and components meeting existing performance and functionality expectations of customers.
4. Practice-based proof of increasing and large-scale economic activity of citizens and B2B customers and competitors engaging with the development of products and services with ESD attributes.
5. Practice-based proof of temporally close negative economic impacts for businesses and citizens of maintaining linear economy production and consumption practices.
6. Practice-based proof of strong governance of standards and voluntary instruments overcoming symbolic environmentalism, including public procurement.
7. Political ideology in practice privileging development and adoption of CBMs, including economic instruments that advantage ESD values and ideology in practice.

10.1.4 Discussion summary

I argue that my findings support the position of the trade association MAKE UK *(2018a)*, that work is still needed to convince many established manufacturing businesses that they will benefit from proactively taking action to address ESD issues. To be convinced, discourse, evidence and action has to be consistent and have salience with psychologically close lay knowledge. This includes demonstrating acknowledgement and understanding of lay knowledge of negative consequences, in terms of costs and losses, resulting from: the existence of an attitude-behaviour gap in citizens purchasing practices; the use of voluntary reporting instruments as symbolic environmentalism; the economic advantage of linear economy production and consumption gained by political ideology in practice, and the price-performance effects of using waste as a resource and sustainable materials. It also includes coming to consensus on what the right action is and ensuring a "*joined up approach*" in government policy that is consistent and resistant to sudden change. As positioned by MAKE UK *(2018a, p. 14)* "*Ultimately, manufacturers don't want deregulation just good, stable and well-enforced rules that take into account business reality*".

Based on the arguments presented in this thesis, there is a complex arrangement of conditions that need to be concomitantly in place and purposefully aligned to reduce negative perceptions of risk in the development of CBMs, as summarised in Table 22.

<table>
<tr><th colspan="2">Values and ideology in practice</th></tr>
<tr><td colspan="2">• Removal of willingness to pay as a proxy price.
• Market costs and prices either advantage development of CBMs or do not disadvantage their development.
• Development of CBMs does not compromise material and utility value or performance/ functionality norms associated with existing products and services.
• Competitors are obtaining advantage from provision of CBMs.</td></tr>
<tr><th>Stable markets/relationships</th><th>Unstable markets/ relationships</th></tr>
<tr><td>• CBMs act as a differentiator.
• Enables, maintains or strengthens dependency of existing & new customers.
• Meets existing price parity/proximity-performance value preferences.</td><td>• CBMs mitigate instability and uncertainty.
• Creates new stable markets and relationships.
• CBMs being valued in new markets or by customers.</td></tr>
<tr><td colspan="2">• Certainty of customers valuing CBMs.
• External powers driving market transition.</td></tr>
<tr><th colspan="2">Evidence of value and market transition</th></tr>
<tr><td colspan="2">• Long-term certainty of commitments in policy to the development of CBMs that creates a level playing field.
• Transparency of labour, material, operational and logistics costs and benefits distribution.
• Practice-based proof of:
  • CBM products and services meeting existing performance and functionality expectations.
  • Increasing and large-scale economic activity of customers and competitors adopting CBMs.
  • Temporally close negative economic impacts for citizens and businesses of maintaining a linear economy.
  • Strong governance of standards and voluntary instruments overcoming symbolic environmentalism.
• Political ideology in practice privileges adoption of CBMs.</td></tr>
</table>

Table 22: Conditions necessary for established SMEs to proactively develop CBMs

Fundamentally, these conditions mean that to address negative perceptions of risk, calls to transition to a CE has to be viewed from the established SMEs perspective. Furthermore, there has to be evidence of market demand in practice, confidence in the price-performance effects of CBMs and coherent policy and legislation, as also outlined in transitions theory based research on the CE *(Matti et al., 2018)*. In line with critiques of the CE presented in Section 3.5 and calls to treat transition holistically, there needs to be profound changes in the social, political, technological and economic entities and their structures and rules that advantages the linear economy system. This is in addition to consensus on the CBMs to be

prioritised for which markets and a move towards the destruction of the governance trap. However, I recognise that this is at best likely to be a long process and at worst may even prove an impossibility. Furthermore, the past and on-going effects of Brexit and the Covid-19 pandemic, being times of crisis as discussed in Section 10.3, are likely to affect the mechanisms identified and their influence. Therefore, in Section 10.2, the propositions that I present are to be recognised as being underpinned by an assumption that in a post Brexit, post Covid-19 world, the entities, structures and rules underpinning the existence of the mechanisms remains largely unchanged. As such, linear economy production and consumption and established neoliberal, ecological modernisation approaches to policy development and state intervention continues to be the norm. Furthermore, being true to my pragmatist philosophical position outlined in Section 2.2, the propositions are focused on what I believe can be achieved in practice working within the existing socio-political-economic context.

10.2 Implications of findings

Building on the analysis in this thesis, I position that it is important for proponents of the CE to acknowledge the five headline findings presented in Table 23. The implications of these finding for policy are discussed in Section 10.2.1, with implications for research presented in Section 10.2.2.

Key findings	Implications
Established manufacturing SMEs are socially dependent on the practices of those with social power who have a stake in production and consumption. This is due to their specialist role, lack of structural power, size and being in needs-based dependency relationships.	Failing to recognise the existence and influence of the power and relationship dynamics mechanism will mean calls to proactively develop CBMs will lack urgency, being perceived as a risk object for established SMEs.
Salient concerns of established SMEs regarding responsibility and market demand influence values in practice. ESD values in practice in established SMEs are mediated by the prioritisation of economic values, particularly low cost, and customers' willingness to pay. These prioritisations are enacted in purchasing practices across society and legitimised by political ideology in practice.	Without acknowledging the values and ideology mechanism and ensuring the distribution of responsibility for additional costs is fair and coherent, the responsible innovation discourse will be ineffective and discourage action rather than encourage proactive engagement.
The prevalence of cynicism and scepticism of discourse of pro-ESD values as symbolic environmentalism affects perceptions of the truth of CE discourse. Cynicism manifests itself in lay knowledge of practices such as greenwash, an attitude-behaviour gap amongst citizens, and a "tick box" culture of governance.	By reinforcing the validity of symbolic environmentalism through focusing on prioritisation of cost savings, promotion of voluntary instruments and using the CE label as a new badge cynicism will prevail. Without recognising the influence of the trust and truth mechanism CE discourse will be perceived as untrustworthy and lacking truth.
Lay knowledge is perceived as more trustworthy than expert knowledge. Historically and socially embedded lay knowledge exists of costs and losses, can result in a propensity by businesses to engage in "brownwash". Such lay knowledge includes understandings of the green premium, waste as a problem and reduced performance effects of products with pro-ESD characteristics.	Without acknowledging lay knowledge as legitimate evidence in the design of interventions to support transition, CE discourse and policy will lack credibility and urgency.
Credibility of CE discourse, evidence and action is influenced by how it resonates with, or mirrors, the psychologically close situational context of established manufacturing SMEs and lay knowledge and who delivers the message. Credibility is enhanced by consensus on the right options for established manufacturing SMEs, consistent, stable and coherent policy and legislation and delivery by those who share the vested interests of SMEs.	Without improving resonance of CE discourse, the proactive adoption of CBMs will be perceived as a risk object to the survival of established manufacturing SMEs with high uncertainty of positive consequences.

Table 23: Key research findings with implications for policy and research

10.2.1 Implications for policy

Regarding the influence of power and relationship dynamics, as demonstrated by the existing research presented in Section 3.2.2, there are embedded understandings that there is very little that researchers and policymakers can do to change the dynamics of how SME-customer relationships develop. I support an argument that continuing "responsible innovation" value creation support as one tool can help established manufacturing SMEs to create stronger customer dependency relationships on their products and services. However, in line with arguments presented by researchers in section 3.1, my findings demonstrate how such support would benefit from recognising that established manufacturing SMEs are not a homogenous entity, are constrained by existing relationship dynamics and need more than a "one size fits all" approach or signposting to online information. Just as SMEs tailor their products and services for success, this would support a position argued by researchers presented in Section 3.2.3, that value creation support needs to become less generic and less about "red tape" or ticking boxes. The implications for Governments are that the nature of support must align with SME business preferences. These preferences being for individually tailored support involving long term relationships and flexibility that involves peers, trusted industry leaders and organisations with extensive knowledge of local and regional situational context *(Blackburn, 2002; Elster & Phipps, 2013; Fandrich & Kivinen, 2011; Street, 2006)*. Furthermore, as identified in existing research on engagement of SMEs with support services, perceptions of the competency and trustworthiness of providers is an issue. Therefore, to maximise trust in support services, working through industry leadership bodies, such as trade associations, who are understood to have the vested interests of UK SMEs and manufacturing foremost on their agenda, is to be encouraged more strongly.

On prioritisation of values, as part of the values and ideology mechanism, whilst changing the values enacted in society is extremely complex, further action is needed to create and stabilise market demand and address the "governance trap". In policy discourse, I argue that a first step would be to de-emphasise the prioritisation of cost savings for society and emphasise the role of consumption practices and the responsibilities and power of citizens. As already identified in a range of research outlined in Section 3.2, public procurement should be used as a major structure to start undermining the prioritisation of cost savings and create market demand for CE products and services.

In addressing the governance trap, the implications for policy are that stronger regulatory measures and economic instruments are required to create a "level playing field" that economically value CE practice and disadvantage linear practice. This would help address lay knowledge of the existence of a green premium but may result in higher costs for society,

political unpopularity, and a move away from free market economy principles. Fundamentally, there is the need for policy to address how commodification structures and rules economically advantages linear economy production. Furthermore, in recognition of knowledge of additional logistics cost of reuse, repair and remanufacture models and encouraging moves beyond recycling, policy interventions need to de-emphasis the value of recycling and limit investment in collection infrastructure just for recycling. The implications are that policy must move from measuring CE success in terms of recycling collection targets as embedded in policy since 1975 and encouraging more recycling (Section 3.4). Instead, investment in new infrastructure, or changing existing public funded recycling collection systems to focus on reuse, repair and remanufacture logistics support would address salient costs and losses concerns of businesses in moving beyond recycling.

Addressing the governance trap and green premium in this way, including stronger governance of public procurement to embed the prioritisation of CBMs, will also help negate scepticism of government funded activities and uncertainty regarding market demand for CBMs. However, to address wider CE cynicism, embedded in the trust and truth causal mechanism, policy also need to move away from reliance and promotion of voluntary reporting instruments, that allow selectivity of aims in line with market actors' vested interests, as legitimate indicators of pro-ESD values and demand for CBMs. Through such actions the aim is to build trust in the CE discourse and alleviate uncertainty. The implication for policy is that universally applicable product and service performance and reporting standards that define strong normative rules for ESD values to be embedded in practice, need to be developed, promoted and actively independently governed to reduce uncertainty. This has the potential to limit the ability for greenwash and undermine low cost in favour of quality. Furthermore, to address perceptions of the attitude-behaviour gap, policy would benefit from using research that demonstrates what citizens do in practice rather than relying on what citizens say about their ESD values and practices. For example, the development of CBM market demand in practice information in relation to overall market demand from trusted sources.

Building on recognising the importance and trust in lay knowledge, diversification of the range of case studies used in policy would not only build trust in CE discourse but reduce psychological distancing. A key implication is for the provision of greater transparency on the situational context of the case study businesses and which products, services, markets the actions carried out are suited to. As identified in my findings and supported by previous research outlined in Section 3.2.1, many SMEs are potentially already involved in CBMs as business as usual, and use of these case studies may be more salient than case studies resulting from funded support programmes.

To address lay knowledge of waste as problem, policy first needs to avoid positioning waste as a valuable resource whilst also positioning it as low cost resulting in cost savings, given that low cost is perceived as relating to inferior quality and influences purchasing practices. Furthermore, to overcome perceptions of negative performance effects of using waste as a resource, there is a major role for policy to prove performance effects in practice and alleviate additional costs of putting in place CBMs, as demonstrated by the effectiveness of the WRAPCymru CE fund[86].

Finally, regarding credibility of CE discourse, a simple change in CE discourse is insufficient to increase trust. A more "*honest conversation which is clear on both the costs and benefits*" *(CBI, 2017)* in policy would help alleviate fear in established SMEs of taking the wrong action and perceptions of CE policy as "policy-based evidence". However, the implications of my findings are that CE evidence of value for businesses in policy needs to be practice-based and co-created with trusted manufacturing representative bodies that recognise the situational context of established manufacturing SMEs and their lay knowledge, ass carried out in the development of a CE action plan for Scotland *(Whicher et al., 2017)*. .

These policy implications are summarised in Table 24.

[86] https://wrapcymru.org.uk/taking-action/grants

Mechanism	Policy implications
Power and relationship dynamics	• SME value creation support provision to be tailored, flexible and delivered over long timeframes working with trusted intermediaries who understand the vested interests of SMEs.
Values and ideology	• Policy to de-emphasise the prioritisation of cost savings. • Policy to emphasise the role of consumption practices, responsibilities and power of citizens. • Stronger governance of public procurement to advantage the adoption of CBMs and create market demand. • Policy to address how commodification structures and rules economically advantage linear economy production. • Policy to de-emphasise the value of recycling and invest in transforming recycling infrastructure to reuse, repair and remanufacturing logistics infrastructure.
Trust and truth	• Policy to move away from reliance and promotion of voluntary instruments, supporting development of universally applicable independently verified standards. • Policy to focus on use of evidence of citizens' purchasing practices rather than what they say. • Policy to diversity range of case studies used as evidence and the level of transparency of evidence. • Policy to avoid positioning using waste as resulting on cost savings. • Policy to prove performance effects of CBM products and services. • Evidence of value of transition for SMEs in policy to be co-created with trusted manufacturing representative bodies.

Table 24: Key policy implications

These policy implications have implications for research as presented in section 10.2.2.

10.2.2 Implications for research

The implications for research in this section follow on from the implications for policy presented in section 10.2.1.

Firstly, recognising the power and relationship dynamics mechanism, I argued the need for policy to include support tailored to individual SME needs. However, tailored support that recognises the heterogeneity of SMEs and complexity of SME-customer relationship dynamics could be a costly exercise. Therefore, compromises need to be investigated. This could be in terms of the focus of support being on manufacturing processes that are "common" within or across sectors or types of expertise or products and services that are more conducible to aligning with CBM principles. This aligns with arguments of innovation researchers presented in Section 3.2.2. However, to do this, questions still need answering on which processes, products or types of expertise in manufacturing SMEs can be transformed to be circular in some capacity and how such change would be valued by customers in existing markets. In addition, this requires better understandings of the

relationship status of established SMEs with their customers, how these have been developed and what is understood to be valued by customers in practice in those relationships.

Secondly, I argued the need for policy development and implementation to address the governance trap and put in place strong governance. The aims being to change how CBMs are valued in society, remove the green premium and address organisational greenwash and knowledge of citizens' attitude-behaviour gap. This is not a simple task, however further work would be of value in gaining depth of understanding of the relationships of salient concerns of SMEs and the governance trap. First and foremost, there is a need to understand the governance trap specifically in relation to transitioning to a CE to understand the extent of the social license governments have in practice. This includes understanding how far governments must go in changing the entities, structures and rules underpinning a political ideology that in practice prioritises low cost and economic advantage to linear economy production and citizens responses to such changes. More detailed analysis is required to determine the balance between incentive and penalty, the unintended consequences and rebound effect of using economic instruments to address the green premium. In addition, I argued for moving away from a focus on developing additional recycling capacity and infrastructure to transforming existing infrastructure to a reuse, repair and remanufacturing logistics service to address the green premium. However, questions still need answering on the adaptability of existing recycling infrastructure, and for which products in which markets such infrastructure is needed.

On addressing greenwash, I argued for a move away from voluntary instruments and development and use of universally applicable independently verified standards. However, as Flynn and Hacking *(2019)* highlight, this is problematic and complex and is therefore an area where further research is required. How existing voluntary instruments can be transformed to limit their use as greenwash by having stronger governance and build trust is also an area that has research potential.

To undermine perceptions of an attitude-behaviour gap in citizens purchasing practices, I argued for policy to use research that focuses on demonstrating citizens' practices rather than citizens' discourses. This is an area where research is currently limited, including how to determine practice metrics and understand and test interventions aimed at bridging the gap for a wide range of products and services. This could build on the way that IPSOS carried out their "Simstore" trial *(Ipsos Mori, 2020; I. Payne et al., 2020)*.

Recognising the need to address salient knowledge of SMEs and build trust in CE discourse, I also made the case for policymakers and proponents of the CE to be more transparent regarding evidence of value and the diversity and use of case studies in CE discourse. This

evidence being co-created with trusted intermediaries. However, work is required to identify a more diverse range of case studies and to gather the data necessary to make case studies more transparent on costs and benefits. Acknowledging lay knowledge of costs and losses, case studies would benefit from including funding and support made available, time and capital costs involved, timeframes, options considered, additional training costs, customer responses, effects on product performance, market reasons for looking at options as well as things that went wrong etc. It would be advantageous to first investigate what established SMEs want to see in case studies. In addition, identifying and providing case studies of CBMs that haven't gained traction with customers, such as those in Blomsma's work summarised in Section 3.3 *(Blomsma, 2016, 2018; Blomsma & Brennan, 2017)*, would also provide greater transparency on pitfalls to avoid and help improve trust in CE discourse being truthful. On the aspect of co-creation, understanding who is trusted by SMEs to provide the "truth" would be valuable research.

I also argued that the prevalence of understandings of waste as a problem, and therefore CBM products being of lower quality, means proof of performance or "quality" of CBM products and services needs to be demonstrated by policymakers. This is an area where researchers can contribute significantly by demonstrating the quality of recycled materials, repaired and remanufactured products. However, citizens' perceptions of waste and sustainable products need to be investigated further, particularly the value of introducing "quality" and safety standards or labels for products generated from waste.

These research implications are summarised in Table 25.

Mechanism	Research requirements
Power and relationship dynamics	• Determine which processes, products or types of expertise in manufacturing SMEs can be transformed to be circular and how such change would be valued by customers in existing markets. • Deepen knowledge of relationship dynamics, how they have been developed and what is of value to customers in the relationships.
Values and ideology	• Analysis of the governance trap, achieving a transition to a CE and the extent of social license to act governments have. • Develop a depth of understanding of the relationships of salient concerns of SMEs and the governance trap. • Perform detailed analysis of the balance between incentive and penalty, the unintended consequences and rebound effect to address the green premium. • Investigate the adaptability of recycling infrastructure to a reuse, repair and remanufacturing logistics service.
Trust and truth	• Research the development and use of universally applicable performance and reporting standards and their governance. • Investigate how existing voluntary instruments can be transformed to limit their use as greenwash. • Collate evidence of citizens' purchasing practices in support of pro-ESD values and CBMs in comparison to overall product/ service markets. • Develop metrics for measuring citizens' purchasing practices. • Develop and test interventions to understand citizens' purchasing practices. • Identify and develop a diverse range of case studies incorporating high degrees of transparency of costs and benefits. • Expand understandings of who is trusted by SMEs. • Demonstrate the performance and "quality" of CBM products and services. • Investigate citizens' perceptions of the performance effects of using sustainable materials. • Study the value of introducing quality and safety standards/ labels for products generated from waste.

Table 25: Key research implications

The implications for policy and research have been informed by the approach to analysis and scope of data collected. Therefore, reflections on the analytical framework, the focus on SMEs, the data sample and influence of external conditions are provided in Section 10.3 to support arguments for the robustness of the interpretations in this thesis.

10.3 Reflections on the research

As stated in Chapter 2, the researcher is an active agent with their assumptions, *a priori* knowledge, experiences and problem definitions defining the scope of research *(Henwood et al., 2008)*. The adoption of a critical realist (CR) ontological perspective was central to the

research and informed the underpinning theoretical assumptions and conceptualisations that bounded the methodological strategy and framework and data collection strategy.

It can be argued that, inevitably, findings in a thesis would always be supportive of the underlying assumptions brought to the research, given that such assumptions determine the scope of research. However, I suggest that the perspective I brought and the theoretical underpinnings brought to the research, reinforced by the research findings, did not limit the scope and credibility of findings. Instead, I argue that they enabled the opening out of the original research questions and different ways of thinking about what it means to be an SME, risk and transitioning to a CE. What I mean by this is that for every assumption validated, or correlation that was found, questions were then asked of why these discursive findings exist. More importantly, what effect they have and therefore what conditions are necessary from an established manufacturing SME perspective to make development of CBMs a reality could be explained.

However, I acknowledge that I made inferences regarding the findings and theory in their ability to apply to discourse not studied and to other individuals and organisations. Therefore, I accept that my explanation of perceptions of risks and the influence of the situational context of established SMEs is just one interpretation. Even so, I position that my interpretation is a "less false" explanation of the lived reality of established manufacturing SMEs in the current socio-political-economic climate *(Ezzy, 2002)*.

10.3.1 Reflections on the implementation of the methodological strategy and analytical framework

The methodological strategy and analytical framework developed and used in this thesis is the first time such an approach has been used in investigating perceptions of risk and makes a major contribution to the research methods literature. This is important in that, as presented in Chapter 4, these forms of discourse analysis are at an early stage of application and lack a systematic approach *(Engelbert, 2012; Flatschart, 2016; J. Parker, 2003; Reed, 2000; Sims-Schouten et al., 2007)*. Empirical examples of research carried out from the ontological perspective adopted in this thesis are also limited *(Bunt, 2016; Oliver, 2011)*. Not only do I present a systematic approach, but I also demonstrate how such an approach has been put into practice and yielded substantive findings regarding understandings of the CE, risk and SMEs. This being in terms of identifying historically developed and socially, politically and culturally embedded causal mechanisms and their effects.

However, the robustness of findings from qualitative research can often be questioned *(Bryman, 2001)*. This is because the concepts of reliability, validity, replicability and generalisability are inherently associated with measurement and numbers and quantitative

research. As such, since the 1980s there has been much work on translating these concepts into meaningful terms for qualitative research or developing alternative criteria *(Flick, 2007, Chapter 28)*. I am not going to add to the debate on this issue, but simply to demonstrate how the approach I've adopted, described in Chapters 4 to 6, gives confidence in the research findings being both theoretically and empirically robust.

As demonstrated in Chapter 5, a mixed methods research strategy was adopted that not only provided flexibility in timings of data collection but the type and source of discourse data I could use. By purposefully building in the use of different type of discourse data from different settings, adopting different methods, iterative testing and forms of reasoning, I position that my findings are robust due to theory, method and data "triangulation", analytical induction and constant comparison *(Denzin, 2009; Flick, 2007)*.

The first step of the framework, as explained in Section 6.1, is gaining theoretical sensitivity. This step enabled theory triangulation, in terms of ensuring I approached data with "multiple perspectives and hypotheses in mind" *(Denzin, 2009, p. 303)*. Furthermore, this enabled the identification of areas of theory resonation that are understood to add strength to theoretical robustness of analysis *(Tibben, 2015)*. Even so, I accept that theories identified were still limited by my own interpretations of concepts and what I deemed salient. However, my mixed method approach to data collection that formed Step 2 of the framework, was designed to ensure method and data triangulation.

In support of method triangulation, as described in Chapter 5, different methods within the same qualitative paradigm were used to collect data *(Morse, 2010)*. By adopting this triangulation perspective, where multiple methods of data collection provide converging empirical results, including similarities and differences, whilst ensuring the researcher continues to asks questions of findings, gives greater confidence in the results *(Heesen et al., 2019)*. However, I accept other methods, quantitative or qualitative, could also have been of value.

In terms of data triangulation, discourse data were collected from different types of actors at different times and in different places *(Flick, 2007)*. However, as presented in Chapter 5, the purpose and scope of discourse, the role of the researcher and relationships with individuals in the different settings and roles of participants varied. I acknowledge that critics could argue that this lack of consistency undermines the validity of findings. However, what was important in this thesis was the identification and use of existing consistent and conflicting knowledge of entities, structures and rules of the manufacturing regime that were used to give meaning to the concept of SMEs, risk and the CE. Therefore different standpoints and time allows biases

and changes to be identified and accounted for and what similarities and differences were common across settings and time *(Denzin, 2009)*.

On analytical induction and constant comparison, these were embedded aspects of the approach to analysis, given that the focus was on identifying and analysing repertoires that incorporated “contrary maxims”, the conflicting and concurring interpretations of the same entities, structures and rules (see Sections 4.1 and 6.6). This was achieved by analysing similarities and differences and taking account of what was not evident in discourse as well as what was evident. By going through cycles of inductive, abductive and retroductive reasoning (see Sections 4.3 & 6.6) and adopting a grounded theory analytical framework in formulation of theory, findings were constantly questioned until saturation was deemed to have been achieved.

However, as explained in Chapter 5, I originally intended to use the extant material to supplement the interview and workshop data and enable testing, elaboration and expansion of interpretations *(Brannen, 2005; Morse, 2010)*. It is to be noted that due to Covid-19, I had to stop carrying out interviews and running workshops, such that in later cycles of analysis and data collection I became more reliant on using the extant data. Unfortunately, this meant that the findings could not be tested further through engagement with a wider range of manufacturing SMEs and production value chain influencers. Further testing using a range of methods would be of value.

10.3.2 Reflections on the focus on SMEs

As introduced in section 1.2, CE literature calls upon the need to consider system transition more holistically, as a whole rather than the sum of its parts. This builds on understandings that production and consumption practices are inherently intertwined and take place in an existing interdependent and complex socio-technical-political-economic landscape that has developed over centuries *(Cherp et al., 2018; Geels et al., 2017)*. On reflection, it could be argued that by focusing on only one part of the system, i.e., production, and only one group of institutional actors, i.e., manufacturing SMEs, recommendations remain focused on compartmentalising the whole, thus treating only one set of symptoms, and not understanding and addressing the complex interconnectedness of a problem in its entirety. However, a key underpinning of the research was to work to better understand the situational context of SMEs in relation to the bigger picture problem of the arrangement of entities, structures and rules that reinforce and stabilise the linear economy system. In this way, I argue that taking manufacturing SMEs as the unit of analysis, rather than individuals or a single organisation, with a focus on understanding the situational context of the group provides opportunities to address transition more holistically. However, there are a diversity of groups whose situational

context will be different to manufacturing SMEs that have a role in the linear economy system, as indicated in Figure 2 in Section 1.4, e.g., multinational enterprises, policy-makers, regulators, retailers, consumers. Therefore, I acknowledge that taking manufacturing SMEs as the unit of analysis has inherent limitations in understanding how transition can be achieved holistically. However, the approach adopted in this thesis would be of value in applying to other groups of actors to build a bigger picture of the entities, structures and rules that influence the ability to transition to a CE more holistically. My findings demonstrate the significant role of customers of SMEs, including citizens, in supporting or inhibiting transition. Research on perceptions of risks for citizens and multinational enterprises would therefore help refine and test the findings presented in this thesis and increase the potential for understanding how transition can be approached more holistically.

10.3.3 Reflections on the sample

As discussed in section 10.3.2, the unit of analysis was SME manufacturers, such that data collection was informed by my overarching objective, i.e., the investigation of perceptions of risk *for* UK SME manufacturing businesses. However, I purposefully used the term *for* instead of *in*, as it was the institutionalised entities, structures and rules associated with being an established SME that were of primary importance to this thesis and not an individual or a specific organisation. Therefore, I deemed all types of organisations and roles of individuals of value in being able to provide useful data.

As shown in section 5.3, in the first phase of data collection a larger number of individuals were approached to be interviewed or to support workshops than became active participants in the research. Therefore, individuals who participated self-selected to be included in the research and can be assumed to have had some vested interest in agreeing to be involved, in the same way as those not agreeing to be involved. The reason for being involved or refusing was not questioned, although notes were made of arguments put forward why people did not opt to be involved in interviews. This was on the basis that choosing not to be involved could also be of value in understanding perceptions of the CE concept and what discourses are called upon and for what purpose. Many of the contacts, from meeting at events or existing social media networks, did not reply to follow up requests to be interviewed or be involved in workshops. Where responses were obtained, they constructed decision-makers in SMEs as busy, whilst positioning support for the research and/or the CE as not being of sufficient salience and urgency in relation to manufacturing business activities to be carried out at the time of contact. The limited CE-related published materials from those without a vested interest in the CE, could also be interpreted as demonstrating how the CE concept had little salience during the period of production of this thesis. I do not consider this to be a surprising result given three major influencing factors. Firstly, as discussed in Section 5.3, engaging

SMEs and others with ESD issues is generally understood to be complex and difficult at the best of times, other than those who actively position themselves as addressing ESD issues. Secondly, responses from SMEs align with the analysis in this thesis regarding the presence of a “SMEs as resource constrained” repertoire that is called upon to warrant lack of engagement with activities that do not provide immediate benefit (see section 6.4). Thirdly, as discussed in Section 10.1.4, throughout 2018 and 2019 Brexit was the salient issue informing activity, support and political and media discourse associated with businesses and manufacturing and the UK.

However, it was anticipated that once clarity in Brexit negotiations had emerged there would be opportunities to engage actors on the basis that throughout 2019 climate change and environmental issues such as plastic pollution became highly salient political and societal issues. Unfortunately, the Covid-19 pandemic, as outlined in Section 10.1.5, then took centre-stage throughout 2020 and influenced my ability to follow the original research plan in terms of engaging a larger number of manufacturing SMEs.

The approach to data collection described in Chapter 5 accordingly led to a non-random sample of sources of interview, workshop, event and published data. I recognize that such an approach may be considered to incorporate bias. Even so, I refer back to the aim of the research: to provide insights and understandings of shared and conflicting discourses and develop interpretative theoretical accounts that explain the use of such discourses, rather than “prove” the validity of particular hypotheses or theories. The methods adopted and choice of data sources are considered an appropriate approach to providing a sample illustrative of the diversity of organisations and influences of entities, structures and rules of the UK SME manufacturing regime *(Lavrakas, 2008)*. This is not to say that it would not have been preferential to have carried out further testing.

Overall, I argue that the approach adopted gives confidence that the mechanisms identified will hold up to scrutiny and testing by other researchers, potentially using different methods, data and analytical approaches. The findings should be tested further through interviews, workshops and investigations of social media discourse, newspapers and manufacturing trade publications.

10.3.4 Reflections on the influence of Brexit

As outlined in Section 5.2, Brexit and Covid-19 were two major events having a significant influence on UK manufacturing during the production of this thesis. Both Brexit and Covid-19 can be understood to be times of acute and prolonged high levels of political, social and economic uncertainty “shock” or crisis for businesses in the UK *(Bloom et al., 2019; Krzyżanowski, 2019)*. The UK Brexit referendum result in June 2016 heralded a significant

period of uncertainty given that UK manufacturing exports and imports are connected to the EU, leading to the need to renegotiate trade and skills arrangements *(Deloitte, 2017; Gasiorek et al., 2018)*. During 2019 there were significant closures of manufacturing facilities associated with the automotive industry and the fastest rate of manufacturing contraction in seven years, due to a number of reasons including Brexit *(UKANDEU, 2020)*. The UK Government published a series of impact assessments of Brexit on a range of industry sectors that positioned Brexit as a major risk object for businesses *(UK Parliament, 2020)*.

Research on the impacts of Brexit on established SMEs in the UK is currently limited. However, a longitudinal survey of SMEs carried out by the UK Government in 2017 indicated that concerns increased significantly between 2016 and 2017 and that at that time over one million SMEs were significantly concerned *(R. Brown et al., 2019)*. Concerns and scaling back of activities as described by Brown et al. *(2019)* can be understood to potentially influence the willingness of actors involved in production value chain networks to engage in activities promoting changing business models, customers and markets. On this basis I argue that Brexit can reasonably be assumed to have influenced the engagement of actors in this research and the scope of discourse. Furthermore, Brexit may also continue to impact upon the salience of the CE and perceptions of risk in manufacturing businesses in the UK.

10.3.5 Reflections on the influence of Covid-19

As with Brexit, the Covid-19 pandemic not only affected my research plan but is likely to impact business aspirations in transitioning to a CE.

The Phase 3 data collection activities planned for January to June 2020 (Section 5.2) envisaged collecting further interview data from established SMEs and their influencers and running workshops working with intermediary organisations to allow comparison with the findings of the initial analysis. Based on the experience in phase 1, participants were to be recruited at targeted trade fairs, conferences and events they would usually attend as part of their rights and duties of being part of production value chain networks. I had also arranged for two workshops to be held in May 2020. Due to the Covid-19 pandemic all such interactive activities were postponed or cancelled.

In addition to the uncertainty of Brexit, based on a survey of members it was reported by MAKE UK that the Covid-19 pandemic had already had detrimental impacts upon manufacturers in the UK as of May 2020. This included four out of five UK manufacturers seeing a reduction in orders and sales, of which one in four saw orders fall by 50%, with significant numbers of staff being furloughed, and over a third of all businesses expecting it to take over a year to return to “normal trading conditions” *(MAKE UK, 2020)*. Covid-19 was also widely reported as leading to a global economic recession. In times of recession, established SMEs face major threats

not only to their operating performance but to their survival. This was demonstrated in the 2008 recession, that resulted in the rate of SMEs going bankrupt increasing two-fold compared with the average of the previous ten years *(Pal et al., 2014)*. Similarly in the UK, during 2008, four in ten SMEs reduced employment, five in ten had a fall in sales and the decline in the number of SMEs was 12% higher than the previous year *(Cowling et al., 2015; Smallbone et al., 2012)*. Cowling et al. also showed that being in the manufacturing sector, being smaller and having declining demand of products and limited access to financial resources in a recession overwhelms internal growth orientations of management in SMEs, with survival ending up being the primary objective. Overall, in times of crisis, SMEs were found to act to immediately conserve assets, work to boost sales of existing products and services and carry out cost cutting measures. Butler and Sullivan *(2005)* highlight that during such times, many SME businesses suffer "threat rigidity" due to information overload and centralising of responsibility on individual senior staff, leading to inertia and a passive endurance response rather than proactively taking action to change their business operations. Such conditions can be interpreted as making it particularly difficult to engage SME manufacturers in activities beyond meeting their immediate needs for survival in times of high uncertainty and crisis. Therefore, it was considered inappropriate to "cold call" existing SME manufacturers during a time of crisis to engage in online interviews as part of research not related directly to immediate needs, when day to day survival was a more acute issue, as highlighted in SME manufacturing industry reports *(CBI, 2020; SWMAS, 2020)*.

10.4 Conclusions

This thesis contributes methodologically, theoretically and empirically to understandings of the contingent arrangement of conditions necessary for established manufacturing SMEs in the UK to engage with transitioning to a circular economy. Methodologically, this thesis provides a detailed account of how a critical realist informed critical discursive psychology methodological framework and strategy can be adopted in investigating perceptions and why such perceptions exist. Theoretically, this thesis explains how and why historically constituted and socially, culturally and politically enacted power and relationship dynamics, values and ideology and trust and truth mechanisms influence perceptions of risk. Empirically, my findings make the case for attending to investigating the concept of risk more broadly, in place of a continuing focus on investigating preconceived drivers, barriers and enablers. In addition to contributing to the literature on risk, SMEs and the circular economy, the findings have implications for how the circular economy is communicated to established manufacturing SMEs. But more importantly, it has implications for the nature of interventions and policies aimed at encouraging a transition to a circular economy that make a meaningful contribution to addressing global environmental and sustainable development issues.

Overall, aligning with transitions literature, I argue that proactively developing CBMs will be perceived as a risk object, with high uncertainty of positive consequences and consequences being perceived as negative, for established manufacturing SMEs if the current socio-political-economic landscape and underpinning regime that supports the linear economy is maintained and defended *(Geels, 2018)*. To encourage established SMEs to engage more actively with CBMs, there is primarily the need to acknowledge the freedoms and constraints on SMEs and how the existing historically established socio-political-economic landscape reinforces such constraints and influences prioritisation of values in society whilst advantaging the linear economy system. As highlighted by research on the "net zero" concept and SMEs, I argue that my findings mean questioning assumptions about SMEs, understanding more about the influence of the situational context and relationships SMEs are embedded in, and the effect of using and addressing drivers, barriers and enablers as a proxy for strong governance *(Blundel & Hampton, 2021)*.

The implications presented in Section 10.2, highlights not only the gaps in empirical evidence that is needed to convince established manufacturing SMEs to engage more actively with transitioning to CE, but the role that governments must play to address cross-cutting salient issues of the governance trap, prioritisation of values in society and political ideology in practice advantaging the linear economy. Without acknowledging the influence of the power and relationship dynamics, values and ideology and trust and truth mechanisms and changing entities, structures and rules associated with political ideology in practice that underpins these causal mechanisms, the CE will suffer being perceived as a higher "*ideology in its own right*" *(TechUK, 2015, p. 8)* beyond normative expectations and action will continue to be limited. In the words of Albus Dumbledore:

***"Dark and difficult times lie ahead**. Soon we must all face the choice between what is right and what is easy."(Rowling, 2000)*

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APPENDICES

APPENDIX 1: EVOLUTION OF WASTE AND CE POLICY 1960-2019

In this Appendix an overview of the development of waste policy from "waste as a problem" to embedding the concept of the CE is provided. A detailed account of waste management in the UK between 1960 and 2000 is provided in the transcript of a Witness Seminar *(E. M. Jones & Tansey, 2015)*. Following a brief account of policy in this period the remainder of this section discusses policy development in the EU, UK and Wales from 2000 to 2019 following the chronology presented in Table A1.1.

	EU	England	Wales
"Waste as a resource"			
2000		National Waste Strategy *(RBKC, 2000)* Climate change programme *(Defra, 2000)*	
2001	Strategy for sustainable development *(EC, 2001)*		
2002			Wise About Waste national strategy *(NAW, 2005)*
2003		Low carbon energy strategy *(DTI, 2003)*	
2004			
2005	Thematic strategy for the prevention and recycling of waste *(EC, 2005)*		
2006	European Directive on waste *(EC, 2006)* Renewed sustainable development scheme *(EC, 2009b)*	Revised climate change programme *(HMG, 2006)*	
2007		Waste strategy for England 2007 *(Defra, 2007)*	
2008	EU Waste Framework Directive *(EC, 2008a)* Sustainable production and consumption action plan*(EC, 2008b)*	Climate Change Act *(HMG, 2008)*	
			Waste management review *(NAW, 2008)*
"Decoupling economic growth from the use of resources"			
2009	Review of sustainable development scheme *(EC, 2009b)*	UK low carbon industrial strategy *(HMG, 2009a)* Low Carbon Transition Plan *(HMG, 2009b)* UK renewable energy strategy *(HMG, 2009c)*	

	Greenhouse gas emission reduction commitments directive *(EC, 2009a)*		One Wales: One Planet sustainable development scheme *(WG, 2009)*
2010	A European strategy for smart, sustainable and inclusive growth *(EC, 2010)*		Towards Zero Waste: One Wales One Planet *(WG, 2010)*
2011	Roadmap to a resource efficient Europe *(EC, 2011)*	Waste (England and Wales) Regulations 2011 *(HMG, 2011)*	
		Government review of waste policy in England: 2011 *(Defra, 2011a, 2011b)* Guidance on applying the waste hierarchy *(Defra, 2011c)*	
2012		Waste strategy commitments review *(Defra, 2012a)* Resource security action plan *(Defra, 2012b)*	
2013	Environment action programme to 2020 *(EC, 2013)*	Recyclate quality action plan *(Defra, 2013b)* Waste management plan for England *(Defra, 2013c)* Waste prevention plan *(Defra, 2013a)*	Towards Zero Waste: Waste prevention programme *(WG, 2013)*
"Towards a circular economy"			
2014	Proposal for the amendment of the waste directive *(EC, 2014)*	Review of waste management plan, *(Defra, 2014)*	Low carbon transition policy and plans *(WG, 2014)*
2015	Circular economy action plan *(EC, 2015)*	UK-wide response to the EU CE action plan *(Defra, 2015a, 2015b)*	
			The Well-being of Future Generations Act (WoFGA) 2015 *(WG, 2015)*
2016			Commitment to a CE *(NAW, 2017; Seargeant, 2016)*
2017	Review of the CE action plan *(EC, 2017)*	Industrial strategy *(HMG, 2017)* Clean growth strategy *(BEIS, 2017)*	
2018	CE package of measures *(EC, 2018)*	25 year Environmental plan *(Defra, 2018a)* Resources and waste strategy for a CE *(Defra, 2018c)*	
2019	Report on CE package of measures *(EC, 2019)*		Consultation on developing a CE strategy for Wales *(WG, 2019)*

Table A1.1: Chronology of waste policy 2000-2019

"Waste as a problem" policy 1960 to 2000

Although waste was deemed a problem and there were calls for it to be managed better throughout the 1960s, up until the mid-1970s uncontrolled landfill was the norm, so that 90% of all waste generated in the UK went to landfill. The first European Union waste framework directive came into force in the UK in 1975 after the UK joined the EU in 1973 *(CEC, 1975)*. The discourse of a "waste hierarchy" evolved during this period, allowing a range of disposal options to have a role in dealing with the problem of waste. Although prevention of waste is at the top of the hierarchy, most emphasis in policy was placed on increasing the lifespan of resources in the use phase to delay or prevent landfill. *(Blomsma & Brennan, 2017; Hultman & Corvellec, 2012)*. The EU directive introduced the requirement for permits for the collection of waste and promoted the "polluter pays principle"[87]. This resulted in the start of a rapid growth in the establishment of waste collection activities undertaken by local authorities in the UK, although landfill remained the primary disposal route. However, it wasn't until the introduction of the 1990 Environmental Protection Act that things began to change regarding quantities and types of waste being sent to landfill. The Act required waste management strategies and plans to be prepared, landfill sites and waste management activity to be licensed and for separate collections of recyclable material to be established, with waste reduction schemes being an optional activity *(HMG, 1990)*. The Act resulted in the establishment of large-scale business support programmes in the UK such as the Envirowise[88] programme in 1994 as well as the introduction of the Environment Agency in 1996, Landfill tax in 1996[89] and a major push on recycling.

During this period, waste management and recycling systems reliant on technological innovation were heavily invested in to deal with products at their end-of-life *(Friant et al., 2020)*. However, landfill remained the dominant disposal route until the 1999 EU directive on landfill of waste came into force. The directive required member states to strengthen permitting and control of landfill sites, reduce waste to landfill, ban certain wastes from landfill, encourage the prevention, recycling and recovery of waste and meet targets for reductions in "biodegradable municipal waste" being sent to landfill *(EC, 1999)*. Article 1 of the directive brought in a relationship between waste and GHG. This reflected the rising political focus on climate change during the 1990s, that followed the production of the first summary report of the IPCC, where reduction of GHG, promotion of renewable energy and energy efficiency became dominant policy areas across the EU *(Climate Policy Info Hub, 2020)*.

[87] Those who produce pollution are to bear the costs of managing the prevention of harm to human health or the environment.
[88] https://webarchive.nationalarchives.gov.uk/20090122000050/http://www.envirowise.gov.uk/uk.html
[89] https://www.letsrecycle.com/news/latest-news/landfill-tax-rate-rises-to-91-35-per-tonne

"Waste as a resource" policy 2000 to 2008

Whereas up until the end of the 1990s, waste and pollution were deemed the biggest environmental problems and where policy and regulation focused, from 2000 onwards waste policy evolved in relation to climate change and sustainable development policy and regulation. A summary of the key policies in relation to waste and the CE from 2000 to 2019 for the EU and the UK is included at the end of this Appendix.

Since 2000, policy and regulation in the UK has aligned closely with that of the EU and the move to address climate change. For example the first national waste policy for England and Wales published in 2000 aimed to fulfil EU waste related legal obligations up to this date but to also contribute to *sustainable development* goals that were in development *(RBKC, 2000)*. At this time, the Waste and Resources Action Programme (WRAP)[90] was set up, funded by UK Government to promote "sustainable waste management" in terms of "creating markets for recycled products" *(NAW, 2005)*. "Waste as a resource", "waste as a fuel" and "cyclical production and consumption processes" were concepts incorporated into the 2000 UK policy as was sustainability related terminology. However, the primary focus of the policy was in meeting targets for diversion of waste from landfill and for recycling and composting of household waste as in the Wales Wise about Waste strategy, although the Wales strategy outlined commitment to a waste hierarchy *(NAW, 2005)*. The waste as a resource, waste as a fuel, waste hierarchy and sustainability concepts were also embedded in EU policy in this period whilst also recognising that waste was still a problem and that "limited progress" has been made on waste prevention *(EC, 2005)*.

A key strengthening of a move from a focus on waste as a problem to waste as a resource was the 2005 EU thematic strategy. Waste as having significant economic value in terms of turnover, jobs and "business opportunities" was introduced *(EC, 2005)*. The European waste directive that followed in 2006 built upon iterations of the 1975 directive, but placed more emphasis on the waste hierarchy, with waste prevention to be achieved through adoption of *cleaner technologies* and "recycled and reusable products" *(EC, 2006)*.

These moves were copied by the UK Government in their 2007 waste strategy, introducing the *One Planet Living* concept into policy along with the concept of "decoupling economic growth from waste growth" and producer responsibility *(Defra, 2013c)*.

The EC Waste Framework Directive in 2008 brought all the previous discourses together. The waste hierarchy was positioned as a priority and the polluter pays principle strengthened. Discourses of targets and the waste as a resource discourse became prominent and the EPR discourse was introduced into EU policy *(EC, 2008a)*. Discourses of industrial symbiosis,

[90] https://wrap.org.uk/

“product service systems*”* and “reverse logistics*”* began to be embedded into the discourse of waste at this time *(Friant et al., 2020)*.

However, a major departure from what had gone before was to distinguish between “waste and non-waste” and “by-products” and include definitions of each aspect of the waste hierarchy. This move aligns with understandings that the discourse of the waste hierarchy made waste an ambiguous concept, creating problems for how waste was to be defined and where the focus of activity was to be *(Hultman & Corvellec, 2012)*. At the same time a sustainable consumption and production (SCP) action plan was produced that acted to embed the concept of sustainability into waste-related policy. Solutions were defined in terms of using eco-design and ecolabel standards, “green public procurement” using voluntary measures, *leaner production*, eco-innovation of supply chains and informing consumers *(EC, 2008b)*.

“Decoupling economic growth from the use of resources” policy 2009 to 2013

Following the economic crisis of 2008 and concerns over scarcity and price volatility of materials and *globalisation*, the EU produced a revised sustainable development strategy. The strategy focussed on growth, creating jobs and improving the quality of lives through 7 initiatives, one being a “Resource Efficient Europe to help decouple economic growth from the use of resources” *(EC, 2010, 2011)*. The discourse of decoupling growth from resource use was a major component in these documents, as was an emphasis on improving business competitiveness and profitability, a focus on the *green economy* and one planet living *(EC, 2011)*.

As with policy developments in 2000-2009, the Welsh and UK Governments reacted to EU documents, producing new waste policy and legislation and reviewing existing commitments. The change from waste as a problem to waste as a resource and decoupling growth from resource became embedded in the UK policies and strategies at this point. The focus of the strategies was on developing voluntary approaches with industry, increasing competitive advantage and innovation and a green economy and promoting “resource efficient product design and manufacture” and waste as a resource and working towards zero waste to landfill. The Quality Action Plan for England brought in the concept of waste as a valuable “tradeable commodity” in a global market, positioning recycling as an environmental success *(Defra, 2013b)*. Despite the waste hierarchy discourse being part of EU policy since 1975 and legislation since 2008, the dominant focus of policy in the UK during this period remained recycling. Recycling was positioned as a means to reducing waste to landfill and meeting targets established in EU directives, in line with the zero waste repertoire that emerged in this period *(Silva et al., 2015)*.

Up to 2013 discourses now commonly associated with the concept of the CE can be seen to be developing in waste policy and regulation. This included decoupling economic growth from resource use and waste as a resource. However, the term circular economy only started to appear in such policies in 2013, four times in the European Environment action plan *(EC, 2013)*, 16 times in the waste prevention plan for England *(Defra, 2013a)* and once in the waste prevention strategy for Wales *(WG, 2013)*. Each time the term was used in conjunction with resource efficiency or waste as a resource and innovation and was positioned as something to work towards although definitions were not provided. The sustainable materials management repertoire can be understood to have started to become dominant from this point, avoiding defining materials as waste *(Silva et al., 2015)*.

"Towards a circular economy" 2014-2019

At the beginning of 2014 the EC proposed amendments to existing waste legislation. However, late in 2014, they withdrew the proposal and opted to present a new "Circular Economy Package" of measures, replaced by the "Closing the Loop" action plan by the end of 2015 *(EC, 2020b)*. At this time, the EC acted to integrate the UN Sustainable Development Goals *(UN, 2015)* into future directives and activities including the CE action plan. The Welsh Government did the same in the production of their Well-being of Future Generations Act (WoFGA) 2015 *(WG, 2015)*. The scope of the EU action plan, building on existing policies and legal frameworks, went out for consultation with the plan being put in place at the end of 2015 *(EC, 2015)*. The CE action plan positioned transitioning to a CE as essential. Competitiveness, business opportunities, innovation, job creation, saving energy, avoiding pollution, climate change and biodiversity loss, reducing waste and sustainable development were all positioned as resulting from transitioning to a CE in the action plan.

The 2015 action plan was reviewed in 2017 *(EC, 2017)* and a CE package of measures established in 2018. This amended the earlier waste framework, landfill, packaging waste and extended producer responsibility directives *(EC, 2018)*. The latest report on the CE action plan and package was produced in March 2019 *(EC, 2019)*. The UK responses to the action plan follow similar activities of the EU.

APPENDIX 2: CORPUS OF PUBLISHED MATERIALS

Documents marked * were coded as part of the first stage of analysis (the number of pages fully or partially coded is included).

Category	Title, author, published date	Accessed
Government - UK	• Our waste our resources: A strategy for England (2018) • Clean growth strategy: executive summary. BEIS (Apr 2018)*(6) • Industrial strategy. BEIS (Nov 2017)*(26) • Postnote: Designing a circular economy. Parliamentary Office of Science and Technology (Sept 2016)*(100%,4) • UK response to European Commission consultation of member states on the circular economy. DEFRA (Oct 2015)*(100%,12) • Growing a circular economy: ending the throwaway society. House of Commons Environmental Audit Committee (July 2014)*(100%,21) • Resource security action plan: making the most of valuable materials. BIS[91] and DEFRA[92] (Mar 2012)*(20) • Low carbon industrial strategy (March 2009)*(4) **Sources:** https://www.gov.uk/government/publications/	21 Jan 2019 18 May 2018
Government - Wales	• Beyond Recycling: a strategy to make the circular economy a reality in Wales. Consultation document (Dec 2019) • Wales and the circular economy. Report produced by EMF for WRAP and the Welsh Government. • Debate: The circular economy. National Assembly for Wales (Oct 2017)*(100%) • In Brief: Assembly to debate the circular economy. Senedd Research (Oct 2017)*(100%) • Circular economy capital investment fund news. Cabinet Secretary for Environment and Rural Affairs (Mar 2017)* • Written statement: Achieving a more circular economy for Wales. Minister for Natural Resources (Mar 2016)*(100%) • Towards Zero Waste 2010-2050 progress report (July 2015) **Sources:**	11 Mar 2020 18 May 2018

[91] BIS, DBERR and DECC became BEIS (Department for Business, Energy and Industrial Strategy)
[92] Referred to by (Hobson, 2016)

	National Assembly for Wales Plenary transcripts: http://www.assembly.wales/en/bus-home/Pages/cofnod.aspx Welsh Government: https://gov.wales/	
Government - Scotland	• Making things last: a circular economy strategy for Scotland (Feb 2016)*(14) **Source:** https://www.gov.scot/publications/	18 May 2018
Standards	• Executive briefing: BS8001 – a guide. BIS (Dec 2017)*(100%,5) • BS8001 (webpage) **Source:** https://www.bsigroup.com/en-GB/standards/benefits-of-using-standards/becoming-more-sustainable-with-standards/BS8001-Circular-Economy/	18 May 2018
Think tanks & policy influencers (alphabetical)	Chatham House: • Briefing paper: A global redesign? Shaping the circular economy (Mar 2012) Ellen MacArthur Foundation: • Completing the picture: How the circular economy tackles climate change (Sept 2019) • Achieving growth within (Jan 2017) • Towards a circular economy: business rationale for an accelerated transition (Nov 2015) • Delivering the circular economy: a toolkit for policymakers (June 2015) • Towards the circular economy: Accelerating the scale-up across global supply chains (Aug 2013) Green Alliance & Circular Economy Task Force: • Fixing the system: Why a circular economy for all materials is the only way to solve the plastic problem (Mar 2020) • Building a circular economy: How a new approach to infrastructure can put an end to waste (Nov 2019) • Less in more out (May 2018) • Lean and clean building manufacturing excellence in the UK (Oct 2017) • Getting it right from the start: developing a circular economy for novel materials (Feb 2017) **Sources:** https://www.chathamhouse.org/research/topics/ https://www.ellenmacarthurfoundation.org/publications https://www.green-alliance.org.uk/publications.php	18 May 2018 11 Mar 2020 18 May 2018 7 Mar 2020 18 May 2018

Industry membership bodies (alphabetical)	Aldersgate Group: • Beyond the circular economy package: maintaining momentum on resource efficiency (Dec 2017)*(100%,23) Business in the Community: • Economic case for the circular economy (2018) • Resource productivity and the circular economy: The opportunities for the UK economy (May 2018)*(8) • The UK in 2030: Key Trends for Manufacturing (July 2015)*(8) CBI: • Stepping up to the challenge: Creating a globally competitive low-carbon economy in 2030 (Feb 2017)*(8) The Manufacturers Organisation (Make UK, formerly EEF): • Manufacturing: stepping up to the sustainability challenge. • The low-carbon economy: In need of a fresh approach? (Blog, Oct 2017) • A never ending cycle: can a circular economy truly deliver? (Blog, Feb 2016) • How UK manufacturers can prepare for the EU's circular economy strategy. (Blog, Nov 2015) Tech UK: • Tech UK panel to debate circular economy (2016) • The circular economy: A perspective from the technology sector (Sept 2015) **Sources:** http://www.aldersgategroup.org.uk/our-reports https://www.bitc.org.uk/ http://www.cbi.org.uk/ https://www.ciwm.co.uk/ https://www.makeuk.org/ https://www.techuk.org/	18 Dec 2017 23 Oct 2018 18 May 2018 18 May 2018 23 Oct 2018 12 Dec 2017
Consultants (alphabetical)	Accenture: • Circular advantage innovative business models and technologies to create value in a world without limits to growth (2014) Deloitte: • Breaking the barriers to the circular economy (Oct 2017) • Circular economy potential for climate change mitigation (Nov 2016)	30 Nov 2017

	EY: • Are you ready for the circular economy? The necessity of an integrated approach. (2015) KPMG: • Circular economy (webpage) • Your journey to a circular business (2017) McKinsey&Company: • Developing products for a circular economy (web page) • The circular economy: moving from theory to practice (Oct 2016) PWc: • Spinning around. Taking control in a circular economy (2017) • Setting your direction in the circular economy (web page) • Corporate sustainability lessons Learned. Going circular: Towards 100% reuse and recycling (Sept 2016) **Sources:** https://www.accenture.com/t20150523t053139__w__/us-en/_acnmedia/accenture/conversion-assets/dotcom/documents/global/pdf/strategy_6/accenture-circular-advantage-innovative-business-models-technologies-value-growth.pdf https://www2.deloitte.com/ http://www.ey.com/Publication/ https://home.kpmg.com/lu/en/home/insights/2017/02/circular-economy.html https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/ https://www.pwc.com/gx/en/sustainability/assets/taking-control-in-a-circular-economy.pdf	18 May 2018 30 Nov 2017 18 May 2018 30 Nov 2017 18 May 2018 30 Nov 2017
Financial institutions	• Circular economy finance guidelines. ING (July 2018) • ABN AMRO, ING and Rabobank launch finance guidelines for circular economy. News (July 2018) • Is the circular economy the economy of the future? AXA News (Apr 2018) • Rethinking finance in a circular economy (Financial implications of circular business models). Exec summary ING (May 2015) **Sources:** https://www.ing.com/Newsroom https://www.axa.com/en/newsroom	23 Oct 2018
WRAP	• About WRAP (web page) • WRAP and the circular economy (web page)	18 May 2018

	• How WRAP supports a circular economy (web page) • WRAP's vision for a circular economy (web page) • Economic growth potential of more circular economies (Sept 2015) • Employment and the circular economy. Job creation in a more resource efficient Britain WRAP and Green Alliance (2015) **Sources:** https://wrap.org.uk/about-us/about/wrap-and-circular-economy https://www.wrap.org.uk/about-us/what-we-do/key-publications	
Academia	• Circular Business: collaborate and circulate. Circular Collaboration (2016)	18 May 2018
European institutions	CESME: • Circular economy for SMEs (web page) • Circular economy, benefits and good practice (2017) • 1st, 2nd and 3rd newsletters for SMEs and policymakers (Sept 2016, March 2017, Sept 2017) EU: • Critical Raw Materials and the circular economy (Jan 2018) • Flash Eurobarometer 456: SMEs, resource efficiency and green markets (Sept 2017) • Implementation of the circular economy action plan (Jan 2017) • Closing the loop – an EU action plan for the circular economy (Dec 2015) European Environment Agency • Circular by design (June 2017) • Circular economy in Europe (Feb 2016) **Sources:** https://www.interregeurope.eu/cesme/ https://ec.europa.eu/environment/circular-economy/ https://data.europa.eu/euodp/en/data/dataset/S2151_456_ENG https://www.eea.europa.eu/	18 May 2018

APPENDIX 3: QUESTIONNAIRES, WORKSHOP DESIGN AND ETHICS DOCUMENTATION

In this Appendix the interview topic guide incorporating potential questions is provided along with notes for interviewees. The scope of the facilitated workshops is also provided. Copies of information sheets and consent forms conforming with ethics requirements are also provided.

Interview topic guide

Background

Business

- Just to start, please tell me about yourself and the business

Influencer

- Just to start, please tell me about yourself and your organisation.
- What do you consider to be your organisations role in relation to SME manufacturers

Risk evaluation in decision-making

Business

- The first topic I'd like us to talk about, is innovation management decision-making in your business. What are your thoughts on how risks are evaluated in the decision-making process of the business?
- Thinking of a process or product change decision that had to be made recently, could you talk me through what happened and the rationale for the decision made?

Influencer

- The first topic I'd like us to talk about, is risk evaluation in decision-making in UK SME manufacturing businesses. What are your views on how SMEs decide on changes to their materials, products and processes?
- What/who do you think influences decisions?
- Who do you think businesses look to for ideas and inspiration?
- In your opinion how do you think your organisation can influence decisions?

Climate change and the Environment

Business

- I'd now like to hear your thoughts on climate change and the business. What role do you think your business has in addressing climate change?
- How do you think the materials and energy you use and the products you make, act upon climate change?
- In your experience, what needs to be done by businesses in relation to climate change?
- What are your thoughts on what needs to be done about global material and energy resource issues?

Influencer

- I'd now like to hear your thoughts on climate change and business. How do you think businesses are addressing climate change?
- In your experience, what needs to be done by businesses in relation to climate change?

- How do you think businesses relate materials and products to climate change?
- What are your thoughts on what needs to be done about global material and energy resource issues?

Material use

Business

- Following the theme of materials and products in your business, what do you think is important about the key materials you use or supply and the products you make?
- What are your thoughts on environmental sustainability aspects of the key materials or products the business uses and supplies?
- How do you think energy relates to the materials and products in your business?
- What risks and opportunities do you see with material supply and use in your business?

Influencer

- Following up on theme of materials and products, what are your thoughts on the environmental sustainability of material use and consumption in the UK?
- What risks do you see for businesses relating to material use and consumption?
- What do you think needs to be done to address the risks?
- Where do you think responsibility lies for addressing environmental sustainability of material use and products?

Circular Economy

Business

- The concept of the Circular Economy to address material resource issues has been developed. How do you think the concept of the CE applies to your business? Why?
- If society were to transition to a circular economy what are your thoughts on how this would affect you?
- Do you know of any businesses that have applied any of the business model options that are seen to be part of the CE?
- Who do you look to for ideas and inspiration?
- What or who do you think is influential in transitioning to a circular economy? Why?

Influencer

- The concept of the Circular Economy to address material resource issues has been developed. What are your thoughts on the Circular Economy?
- If society were to transition to a circular economy what are your thoughts on how this would affect UK manufacturing SMEs?
- How do you feel about the way SME manufacturing businesses are engaging with the CE?
- Who or what do you think influences SME manufacturing businesses engagement with the CE?

- How do you think your organisation influences SME manufacturing business engagement with CE?

Changing business models

Business

- And finally, I'd like to discuss your thoughts on the adoption of different circular economy business models.
- Work through list of options and discuss in terms of risks and opportunities for them adopting the model and what if their competitors adopted or customers or suppliers.
- What do you think is needed to overcome risks and support opportunities?

Influencer

- I'd like to discuss your thoughts on the adoption of circular economy business models.
- What are your thoughts on the risks and opportunities for UK SME businesses in (work through list of business model options)?
- What do you think needs to be done to address the risks and opportunities?
- Do you know of any SME manufacturing businesses that have applied any CE business model options that are not associated with food, construction, packaging or textiles?

Closing questions

- Is there anything important that you think we've missed about what we've discussed today?
- Is there anyone else you would recommend that I contact for interview?

Interviewer notes

Note introductory questions to generally be open questions – tell me about, what do you think etc.

Note – some businesses/influencers may already be engaged with CE so need to change the questions to reflect this – i.e. talking in past tense or what think other businesses might be a problem with etc. But still to probe other options not adopted.

Introduction: 10 mins before interview begins

Explain that the format is a conversational style and not here to judge or persuade. Explain that the important thing for the research is getting their views and experiences in their own words on:

Businesses

- Evaluating risks when deciding on material, product, process, technology changes in the business
- The risks and opportunities for the business in relation to the circular economy.

Influencers

- The risks for UK SME manufacturing businesses along supply chains in changing material use and processes to transition to a circular economy.

Explain they are free to not answer questions posed or to curtail the discussion at any point – just need to tell me. Explain that may question a response they give but this doesn't mean I consider their response to be wrong but wanting to get a better understanding of the response. Explain that may need to stop a particular discussion thread due to time restrictions, but happy to follow up another time if they wish.

Explain that the conversation will be recorded & mention consent form.

Explain that if they prefer they can draw or write things if it helps them explain or put across something they want to say. They can also show pictures or access online resources if it helps.

Confirm how long they have.

Background details: 10 mins

Businesses

The aim is to determine the understanding of the role of the interviewee in the organisation and their perceived influence on decision making in their organisation.

Also obtain details that give context to the responses – their personal history, such as how long been with business, why they're with the organisation, their background, how got to the position they are, what they like about the business.

Also need information on what they see as their responsibilities and the level of influence they have in the organisation and how the business is structured.

Influencers

The aim is to obtain data on how they see their role in relation to businesses in the UK and how they engage and look to influence businesses, particularly SME manufacturers.

Obtain details that give context to the responses – their personal history, such as how long been with organisation, why they're with the organisation, their background, how got to the position they are, what they like about the organisation.

Also need information on what they see as their responsibilities and the level of influence they have in the organisation and how the organisation is structured and what they see as the role of the organisation in engaging with SME manufacturers.

Risk evaluation & decision-making: 10-15 mins

Businesses

The aim is to obtain information on how change management decisions come about and are made in businesses ***with a focus on how they evaluate risks***, obtain information on **product or proces**s change management/ innovation decisions that went ahead or those not taken forward.

Probing needed to understand the process of decision-making and what influences decisions. Need to understand if the process (who and how) is seen as the same for all decisions.

Need to put into context of risk evaluation and how they dealt with uncertainties and what the consequences of not going ahead or going ahead were for past example.

Also need to get idea of how the need to decide arose.

Influencers

The aim is to elicit data on how they view risk evaluation in SME manufacturing businesses and who or what they consider influence risk evaluation decisions.

Also, be explicit on how they see they can influence such decisions.

Climate change and environment

Businesses

The aim is to understand how they see the role of business in general and their business in addressing climate change. This includes getting an understanding of how they think about products, energy and material use in their organisation. The questions should give a sense of where they see agency and responsibility.

Influencers

The aim is to understand what they think needs to be done and how they think businesses view climate change and the roles of various actors. Particularly, to investigate what they think businesses should be doing and why?

Material use: 10 mins

Businesses

The aim is to obtain data on perceptions of the role materials play in reducing energy demand and use and addressing the causes of climate change.

To investigate the knowledge of material use in the organisation, risks associated with materials and actions undertaken to address material issues and the reasons behind the choice and use of the materials.

To obtain data on the perceived relationships between materials, products, supply chain and users/ consumers of products.

Influencers

The aim is to obtain data on perceptions of the role materials play in reducing energy demand and use and addressing the causes of climate change & to understand where they consider responsibilities to lie and the responses expected of businesses.

Circular economy: 10-15 mins

All

The aim is to investigate what is understood of the circular economy, transition options and business models, and the roles of different stakeholders (e.g. business, government, multinationals, general public, regulators etc.) and their reasons for their responses.

To identify who they perceive to be key influencers on transitioning to a circular economy.

Influencers

To understand what they think SME manufacturing businesses are doing in relation to the CE.

Changing business models: 15-20 mins

Businesses

To identify what is perceived as being the primary risks & opportunities to the organisation in transitions in material use occurring and how the organisation has addressed/ would look to address the risks. Need to look at it from the business taking action directly, their customers taking action, their competitors taking action and suppliers. Stay focussed on risk evaluation, tune into uncertainties and consequences and prompt to think about positives if come across as negatives and vice versa.

Work through list of highlighted options and discuss in terms of risks and opportunities for them adopting the model and what if their competitors adopted or customers or suppliers.

Influencers

The aim is to determine perceptions of what the risks are to SME manufacturing businesses in reducing material use, the ability of businesses to adopt new business models, the factors influencing action and the options for addressing such factors.

Also obtain information on what is understood to be successful transitions by UK manufacturing businesses and why.

Reduce quantity of material in product
Eliminate waste in production
Use renewable, sustainable and recycled materials and energy resources, processes and technologies.[93]
Extend product life/design for longevity
Design to optimise reuse and repair
Design for remanufacturing
Design for recyclability
Deliver utility virtually[94]
Product service systems (servitisation)[95]

[93] Reducing quantity of material, use recycled & sustainable material, reducing waste in production, more efficient processing technology
[94] No physical product
[95] Leasing, sharing, pay per function, service contracts, upgrading, etc.

Workshop 1:

Outline Agenda

- Registration & lunch
- Welcome & introduction
- Visions of the future – policy, people, business and the environment
- Collaboration and funding
- The Circular Economy - What does it mean for packaging in the food supply chain?
- Break
- Identifying sustainable packaging opportunities and uncertainties
- Taking forward sustainable packaging opportunities in a circular economy
- The next steps
- Close

Scope of workshop

Visions of the future - policy, people, business and the environment

Present key messages on material resources, climate change, people's expectations of businesses on environmental issues, consumer research findings, policy shifts. Note: manage positive and negative visions carefully.

Collaboration & funding

Introduction to funding: funding available, purpose, timescales and applicability and outline role or fund managers and scope of application to the fund.

The circular economy - What does it mean for packaging in the food supply chain?

An interactive session building on information from https://circulareconomy.fooddrinkeurope.eu/ and particularly the https://circulareconomy.fooddrinkeurope.eu/sustainable-packaging/ element.

First of all, using the simplified supply chain sheet, get attendees to create a packaging route map for the food supply chain. The route map to include where possible the type of packaging material used for what type of products, where product coming from & how, and its final destination.

Provide an introduction to the CE as seen as a solution to the material resource use problems identified in the visions particularly the following options:

- Extending product life
- Designing to optimise reuse and repair
- Remanufacturing
- Using renewable, sustainable and recycled materials
- Designing for recyclability

Explain that each of these models can be applied to packaging across the food supply chain. Then get attendees to look at their role in the supply chain and write on post its and stick up on sheets provided what options they have currently implemented regarding packaging, as specific as possible (e.g. 5% recycled content in packaging for product A, 2 product lines use RTP), where they think they will be in the next 5 years and where they think they could be longer term. Provide opportunity for attendee to talk about their responses (recorded?).

Identifying sustainable packaging opportunities and uncertainties

Interactive. Introduce the format of the session – as in looking at the 5 options and the aspiration/ long term responses in 2 parts: opportunities and uncertainties. Ask to write on post-its what the opportunities are for each of these options in relation to their value chain: Product, design & customer, Production & supply chain, Business value & performance and pin on to opportunities worksheet, e.g. extend packaging life – customer – enhanced customer loyalty, Re-use - Customer – new service opportunity)

Repeat the exercise looking at uncertainties (e.g. using recycled content - supply chain - don't know where to get from, Reliability of quality of supply. Extend packaging life - Customer – volume lower, price higher.) Take photo of worksheets.

Then for each option get attendees (in small groups?) to rank the post-its in order of importance on the grids supplied for both opportunities and uncertainties – leaving the discarded post-its on the worksheet, example grid.

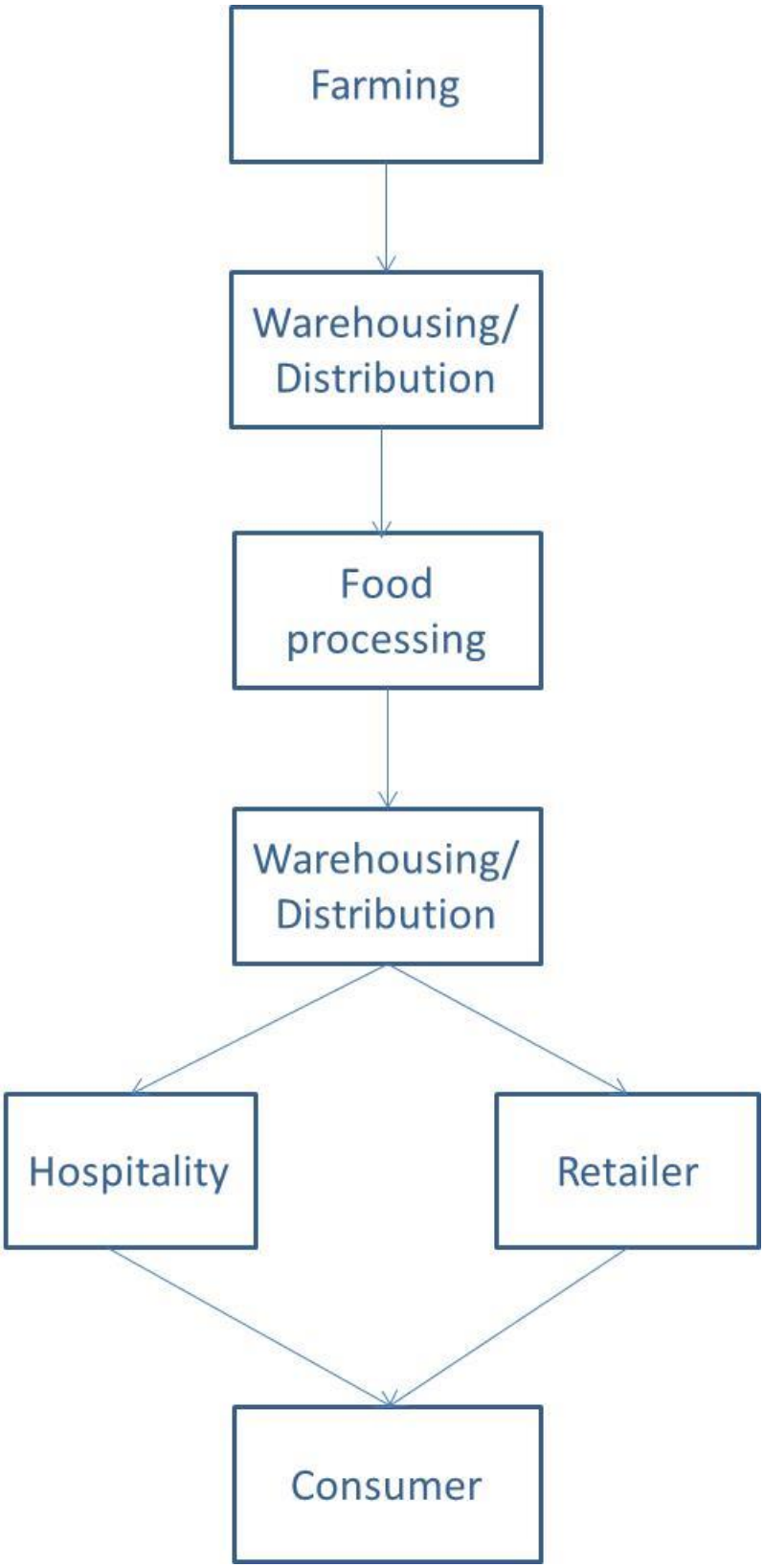
Least important	Extend packaging life Opportunities			Most important

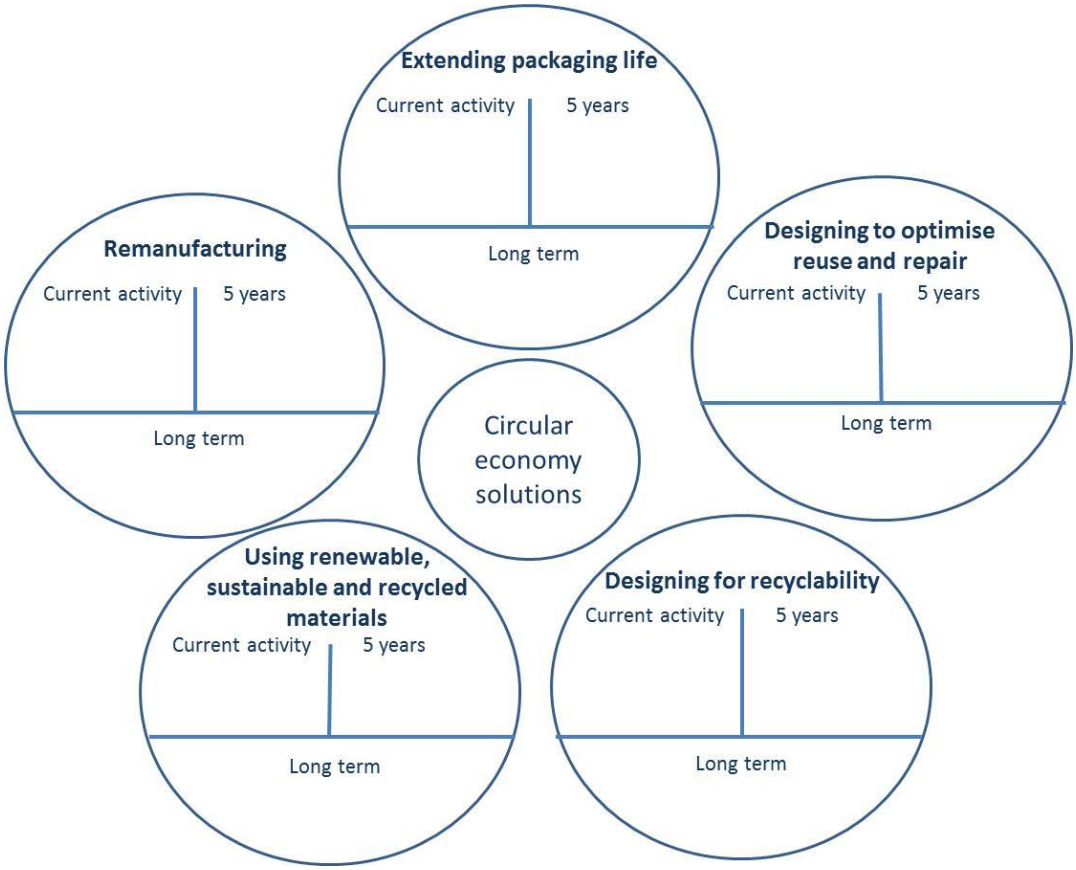
Least important	Extend packaging life Uncertainties			Most important

Feedback from attendees to room on ranking and any difficulties in coming to agreement.

Taking forward sustainable packaging opportunities in a circular economy

Using the ranking grids take the most important uncertainty and the most important opportunity and work in groups to develop an action plan




Extending packaging life
Current activity
5 years
Long term
Remanufacturing
Current activity
5 years
Long term
Designing to optimise reuse and repair
Current activity
5 years
Long term
Circular economy solutions
Using renewable, sustainable and recycled materials
Current activity
5 years
Long term
Designing for recyclability
Current activity
5 years
Long term

Options	Packaging		
	Product, design & customer	Production & supply chain	Business value & performance
Extend packaging life			
Design to optimise reuse and repair			
Remanufacturing			
Use renewable, sustainable and recycled materials			
Design for recyclability			

Workshop 2: Manufacturing the future, *Being resilient, taking opportunities*

This event is for business decision-makers in manufacturing SMEs. By attending the event you will have the opportunity to:

- Discuss your experiences and thoughts on being part of a circular economy.
- Identify areas in your business where you can build resilience, investigate opportunities and support the policy.
- Hear about services that can support you with your next steps.

Agenda

- Registration & tea/coffee
- Welcome & introduction
- Visions of the future – policy, people, business and the environment
- The Circular Economy - What does it mean for you?
- Break
- Resilience and opportunity in transitioning to a circular economy
- Future-proofing your business
- Manufacturing business support
- Close and lunch

Attendees will be given an action plan grid they can complete as they go along that they can take away with them to discuss with an advisor or colleagues back in work, e.g.

Options	**Questions and actions**		
Activity and aspirations			
	Current	**5 years**	**Aspirations**
Extend product life			
Design to optimise reuse and repair			

Remanufacturing			
Use renewable, sustainable and recycled materials			
Design for recyclability			

Options	Questions and actions		
Uncertainties and opportunities			
	Product, design & customer	**Production & supply chain**	**Business value & performance**
Extend product life			
Design to optimise reuse and repair			
Remanufacturing			
Use renewable, sustainable and recycled materials			

Design for recyclability			

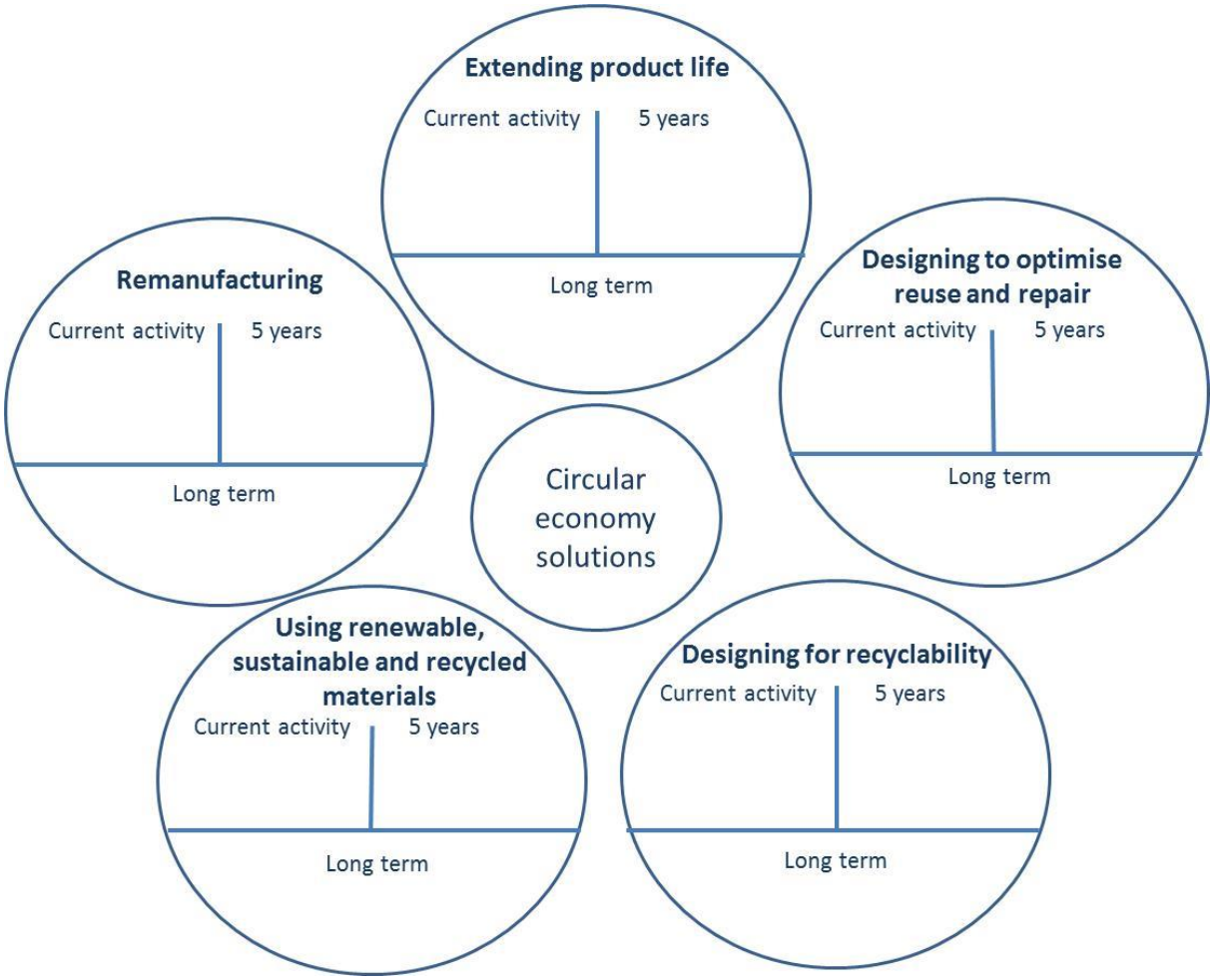
Event content

Visions of the future – present key messages on resources, climate change, people's expectations of businesses on environment, policy etc.

The circular economy – Interactive - get a picture of how attendees think they're currently engaged with different CE models and where they think they could be in 5 years' time and where they would like to be in the longer term. Provide an introduction to the CE as seen as a solution to the "wicked" problems identified in the visions of the future presentation - and the options that would like to look at:

- Extending product life
- Designing to optimise reuse and repair
- Remanufacturing
- Using renewable, sustainable and recycled materials
- Designing for recyclability

Ask attendees to write on post its and pin up on sheets what of their current activities they think fit these type of activities, as specific as possible (e.g. 5% recycled content in product A, 2 product lines designed for reparability etc.), where they think they will be in the next 5 years and where they think they'll be longer term. Provide opportunity for attendee to talk about their responses (recorded?).


Extending product life
Current activity
5 years
Long term
Remanufacturing
Current activity
5 years
Long term
Designing to optimise reuse and repair
Current activity
5 years
Long term
Circular economy solutions
Using renewable, sustainable and recycled materials
Current activity
5 years
Long term
Designing for recyclability
Current activity
5 years
Long term

Resilience and opportunities –interactive. Introduce the format of the session – looking at the 5 options and the aspiration/ long term responses in 2 parts: opportunities and uncertainties. Ask to write on post-its what the opportunities are for each of these options in relation to their value chain: Product, design & customer, Production & supply chain, Business value & performance and pin on to opportunities worksheet, e.g. extend product life – customer – enhanced customer trust, Re-use - Customer – new service opportunity)

Repeat the exercise looking at uncertainties (e.g. using recycled content - supply chain - don't know where to get from, Reliability of quality of supply. Extend product life - Customer – Don't want product to last, recycled material is more expensive.) Take photo of worksheets.

Options	Manufacturing		
	Product, design & customer	Production & supply chain	Business value & performance
Extend product life			
Options	Manufacturing		
	Product, design & customer	Production & supply chain	Business value & performance
Design to optimise reuse and repair			
Options	Manufacturing		
	Product, design & customer	Production & supply chain	Business value & performance
Remanufacturing			
Options	Manufacturing		
	Product, design & customer	Production & supply chain	Business value & performance
Use renewable, sustainable and recycled materials			
Options	Manufacturing		
	Product, design & customer	Production & supply chain	Business value & performance
Design for recyclability			

Then for each option (depending on time) get attendees (in small groups?) to rank the post-its in order of importance on the grids supplied for both opportunities and uncertainties – leaving the discarded post-its on the worksheet, example grid.

Least important	_____ Opportunities			Most important

Least important	_____ Uncertainties			Most important

Feedback from attendees to room on ranking and any difficulties in coming to agreement (recorded?).

Future-proofing business – Demonstration of tools

Manufacturing business support – RE advisor how they can help and expertise offerings etc. and case studies

Information sheet for participants - Interviews

Transitions in UK Energy and Materials Use: A Discourse Analysis

Research description and aims

The research is being undertaken by Ann Stevenson, a PhD researcher, based in the School of Psychology at Cardiff University. The aim of this research is gather discourse data on the perceived risks of changing business models and materials use in UK SME manufacturing businesses as steps in transitioning to a Circular Economy.

The UK Government has made a commitment to reducing national carbon dioxide (CO_2) emissions by 80% by 2050, compared to 1990 levels, as enshrined in the UK Climate Change Act (2008). Achieving this target will rely on major changes in the way we produce and use materials and energy, requiring new technologies, use of financial instruments and the encouragement of new ways of material and energy consumption and use.

The UK Government is encouraging a move towards a "Circular Economy". This transition encourages businesses in the UK to change their business model options to reduce material use along the complete product lifecycle. Such strategies will require changes, including reducing material use, the choice of materials used, optimisation of supply chain processes and product lifetimes, reducing in-use and end-of-life impacts and developing new business model concepts.

The purpose of this research is to add to the evidence base on perceptions of risk from a manufacturing business risk perspective that could potentially inform public policy on climate change mitigation and transitions to a Circular Economy.

The research aims to investigate what is understood of the Circular Economy, the adoption of Circular Economy business models in UK SME manufacturing businesses and perceptions of the risks associated with changing material use and transitioning to a Circular Economy.

What will your participation involve?

Should you decide to take part in the research, your participation will involve you taking part in an interview with Ann Stevenson that is expected to last for approximately 60 minutes.

The interview will take the form of a guided conversation. There are certain topics the interview will address, and the interviewer will deliver some broad questions to guide the conversation. The direction of the interview will however be largely determined by your answers and discussion. The interview will be conducted either face to face, via telephone or video call in agreement with yourself and in a location that is most convenient for you. With your permission the interview will be audio recorded.

The length of time for the interview will be dictated by you. At any point before, during or after the interview, you can change your mind about taking part in the research or your data being used by informing us using the details provided below.

At the end of the interview, the researcher will check that there are no issues that you consider important regarding the subject that have not been discussed. Arrangements will be made, where practical, if you wish to discuss issues further on the day or at a later date. You may also use the contact details provided to discuss any issues you think about later.

Who is being interviewed?

We are intending to interview individuals in manufacturing businesses who are part of the decision-making unit in their organisation and other stakeholders such as policy representative, members of non-governmental organisations, business support organisations, trade associations, industry representative bodies, supply chain businesses and academics.

Anonymity and confidentiality

All interview data will remain confidential in accordance with British Psychological Society (BPS) 'Ethical principles for conducting research on human participants'. Actual names will therefore be viewed only within the project team. All participants will be given an alias which will be used by the project team in day to day discussion of the research. In all related publications, participant's quotes will be made anonymous. In that context, only this pseudonym and non-identifying generic terms (*e.g.,* finance director, Government advisor), or if agreed to institutional affiliation, and the alias will be used to describe participants unless you wish your name and organisation to be included. The interview recordings will be stored in a secure location at Cardiff University.

Who will have access to the data?

The audio recordings and transcripts will be shared among the research team. Participants may ask to see the data or request that it be destroyed at any time, up until the date that the data is anonymised.

How will the data be used?

The data will be used in academic research and will be used to produce reports, presentations, conference papers, and academic publications. The data and/or subsequent publications may also be used for teaching purposes.

Privacy Notice

The information provided will be held in compliance with GDPR regulations. Cardiff University is the data controller and Matt Cooper is the data protection officer (inforequest@cardiff.ac.uk). The lawful basis for processing this information is public interest. This information is being collected by Ann Stevenson.

The information on the consent form will be held securely and separately from the research information. Only Ann Stevenson will have access to this form and it will be destroyed after 7 years.

The research information you provide will be used for the purposes of research only and will be stored securely. Only researchers in the Understanding Risk Group of the School of Psychology will have access to this information. After 4 years the data will be anonymised (any identifying elements removed) and this anonymous information may be kept indefinitely or published.

Who is funding the research?

This research is funded by the Engineering and Physical Sciences Research Council (EPSRC). The research is planned to complete by December 2020.

The research team

Ann Stevenson, PhD Researcher, Cardiff University

Prof. Nick Pidgeon, PhD Supervisor, Cardiff University

Contact details

Ann Stevenson

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Email: psychethics@cardiff.ac.uk

Phone: 02920 870360

School of Psychology, Cardiff University
Interview Consent Form - Anonymous Data

I understand that the purpose of this research is to add to the evidence base on perceptions of risk from a manufacturing business risk perspective that could potentially inform public policy on climate change mitigation and transitions to a Circular Economy.

I understand that the research aims to investigate what is understood of the Circular Economy, the adoption of Circular Economy business models in UK SME manufacturing businesses and perceptions of the risks associated with changing material use and transitioning to a Circular Economy.

I understand that my participation in this research will involve taking part in an in-depth interview that will take approximately 60 minutes of my time.

I understand that the interview will be recorded with audio equipment.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason.

I understand that I am free to ask any questions at any time. I am free to withdraw or discuss my concerns with Professor Nick Pidgeon.

I agree that data obtained in the interview subsequently made anonymous may be utilised in discussion with other researchers, in any ensuing presentations, reports, publications, websites, broadcasts, and in teaching.

I understand that upon completion of the research a fully anonymised transcript of the interview may be held indefinitely and shared among the research team, and with the permission of the research team, with other relevant researchers who are part of Professor Pidgeon's wider research group in the EU.

I understand that the identifying information provided by me will be held confidentially until 2025, such that only the research team can trace this information back to me individually. I understand that I can ask for the information I provide to be deleted/destroyed at any time. I understand that in all publications and discussion of the research all information I give will be made anonymous with only pseudonyms and generic identifying features (*e.g*., profession) or if agreed, my institutional affiliation, utilised for identification.

I *agree* that my institutional affiliation (name of organisation) may be used as a generic identifying feature if no other features (*e.g*., finance director, Government advisor) are used ☐

I would prefer that my institutional affiliation *is not used* as a generic identifying feature. ☐

I give my consent to have my contact details retained in a database until December 2025 so that I may be asked to take part in a follow up interview, or returned to on points requiring clarification. ☐

I understand that the personal data will be processed in accordance with GDPR regulations (see privacy statement below). ☐

I have been provided with sufficient information on the project to give *informed* consent to the interview session.

I, (PRINT NAME) _____ consent to participate in the study conducted by Ann Stevenson in the School of Psychology, Cardiff University under the supervision of Professor Nick Pidgeon.

Signed: Date:

Complaints to:

The School of Psychology Ethics Committee

Address: Tower Building

School of Psychology, Cardiff, CF10 3AT

Email: psychethics@cardiff.ac.uk

Phone: 02920 870360

Privacy Notice:

The information provided will be held in compliance with GDPR regulations. Cardiff University is the data controller and Matt Cooper is the data protection officer (inforequest@cardiff.ac.uk). The lawful basis for processing this information is consent. This information is being collected by Ann Stevenson.

The information on the consent form will be held securely and separately from the research information. Only the researcher will have access to this form and it will be destroyed after 7 years.

The research information you provide will be used for the purposes of research only and will be stored securely. Only researchers in the Understanding Risk Group of the School of Psychology will have access to this information. After 4 years the data will be anonymised (any identifying elements removed) and this anonymous information may be kept indefinitely or published.

Information sheet for participants - Workshops

Transitions in UK Energy and Materials Use: A Discourse Analysis

Research description and aims

The research is being undertaken by Ann Stevenson, a PhD researcher, based in the School of Psychology at Cardiff University. The aim of this research is gather discourse data on the perceived risks of changing business models and materials use in UK SME manufacturing businesses as steps in transitioning to a Circular Economy.

The UK Government has made a commitment to reducing national carbon dioxide (CO_2) emissions by 80% by 2050, compared to 1990 levels, as enshrined in the UK Climate Change Act (2008). Achieving this target will rely on major changes in the way we produce and use materials and energy, requiring new technologies, use of financial instruments and the encouragement of new ways of material and energy consumption and use.

The UK Government is encouraging a move towards a "Circular Economy". This transition encourages businesses in the UK to change their business model options to reduce material use along the complete product lifecycle. Such strategies will require changes, including reducing material use, the choice of materials used, optimisation of supply chain processes and product lifetimes, reducing in-use and end-of-life impacts and developing new business model concepts.

The purpose of this research is to add to the evidence base on perceptions of risk from a manufacturing business risk perspective that could potentially inform public policy on climate change mitigation and transitions to a Circular Economy.

The research aims to investigate what is understood of the Circular Economy, the adoption of Circular Economy business models in UK SME manufacturing businesses and perceptions of the risks associated with changing material use and transitioning to a Circular Economy.

What will your participation involve?

Should you decide to take part in the research, your participation will involve you taking part in interactive workshop sessions in line with the agenda provided for the day. Interactive sessions may be audio recorded and transcribed after the event and all collated outputs from the event will be considered data for the research.

At any point before, during or after the workshop, you can change your mind about taking part in the research or your data being used by informing us using the details provided below.

At the end of the workshop, the researcher will check that there are no issues that you consider important regarding the subject that have not been discussed. Arrangements will be made, where

practical, if you wish to discuss issues further on the day or at a later date. You may also use the contact details provided to discuss any issues you think about later.

Who is being invited?

We are intending to involve individuals in manufacturing businesses who are part of the decision-making unit in their organisation and other stakeholders such as policy representative, members of non-governmental organisations, business support organisations, trade associations, industry representative bodies, supply chain businesses and academics as appropriate.

Anonymity and confidentiality

All data will remain confidential in accordance with British Psychological Society (BPS) 'Ethical principles for conducting research on human participants'. Actual names will therefore be viewed only within the project team. All participants will be given an alias which will be used by the project team in day to day discussion of the research. In all related publications, participant's quotes will be made anonymous. In that context, only this pseudonym and non-identifying generic terms (*e.g.,* finance director, Government advisor), or if agreed to institutional affiliation, and the alias will be used to describe participants unless you wish your name and organisation to be included. The audio recordings and workshop outputs will be stored in a secure location at Cardiff University.

Who will have access to the data?

The audio recordings, transcripts and workshop outputs will be shared among the research team and Welsh Government. Participants may ask to see the data or request that it be destroyed at any time, up until the date that the data is anonymised.

How will the data be used?

The data will be used in academic research and by Welsh Government and will be used to produce reports, presentations, conference papers, and academic publications. The data and/or subsequent publications may also be used for teaching purposes.

Privacy Notice

The information provided will be held in compliance with GDPR regulations. Cardiff University is the data controller and Matt Cooper is the data protection officer (inforequest@cardiff.ac.uk). The lawful basis for processing this information is public interest. This information is being collected by Ann Stevenson. The information on the consent form will be held securely and separately from the research information. Only Ann Stevenson will have access to this form and it will be destroyed after 7 years.

The research information you provide will be used for the purposes of research only and will be stored securely. Only researchers in the Understanding Risk Group of the School of Psychology will have access to this information. After 4 years the data will be anonymised (any identifying elements removed) and this anonymous information may be kept indefinitely or published.

Who is funding the research?

This research is funded by the Engineering and Physical Sciences Research Council (EPSRC). The research is planned to complete by March 2021.

The research team

Ann Stevenson, PhD Researcher, Cardiff University

Prof. Nick Pidgeon, PhD Supervisor, Cardiff University

Contact details

Ann Stevenson

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Phone: 02920 874567

Complaints to:

The School of Psychology Ethics Committee

Address: Tower Building

School of Psychology, Cardiff, CF10 3AT

Email: psychethics@cardiff.ac.uk

Phone: 02920 870360

School of Psychology, Cardiff University
Consent Form - Anonymous Data - Workshops

I understand that the purpose of this research is to add to the evidence base on perceptions of risk from a manufacturing business risk perspective that could potentially inform public policy on climate change mitigation and transitions to a Circular Economy.

I understand that the research aims to investigate what is understood of the Circular Economy, the adoption of Circular Economy business models in UK SME manufacturing businesses and perceptions of the risks associated with changing material use and transitioning to a Circular Economy.

I understand that my participation in this research will involve taking part in interactive group sessions taking approximately 45 minutes to 60 minutes each.

I understand that the interactive sessions will be recorded with audio equipment.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason.

I understand that I am free to ask any questions at any time. I am free to withdraw or discuss my concerns with Professor Nick Pidgeon.

I agree that data obtained in the interactive sessions subsequently made anonymous may be utilised in discussion with other researchers, in any ensuing presentations, reports, publications, websites, broadcasts, and in teaching.

I understand that fully anonymised transcripts of the sessions will be held indefinitely and shared among the research team, and with the permission of the research team, with other relevant researchers who are part of Professor Pidgeon's wider research group.

I understand that the identifying information provided by me will be held confidentially until 2025, such that only the research team can trace this information back to me individually. I understand that I can ask for the information I provide to be deleted/destroyed at any time. I understand that in all publications and discussion of the research all information I give will be made anonymous with only pseudonyms and generic identifying features (*e.g.*, profession) or if agreed, my institutional affiliation, utilised for identification.

I *agree* that my institutional affiliation (name of organisation) may be used as a generic identifying feature if no other features (*e.g*., finance director, Government advisor) are used ☐

I would prefer that my institutional affiliation *is not used* as a generic identifying feature ☐

I give my consent to have my contact details retained in a database until December 2015 so that I may be asked to take part in a follow up interview, or returned to on points requiring clarification. ☐

I agree to abide by the "Chatham House Rule" ☐

"When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

I understand that the personal data will be processed in accordance with GDPR regulations (see privacy statement below). ☐

I have been provided with sufficient information on the project to give *informed* consent to being involved in the interactive sessions.

I, (PRINT NAME) _____ consent to participate in the study conducted by Ann Stevenson in the School of Psychology, Cardiff University under the supervision of Professor Nick Pidgeon.

Signed: Date:

Complaints to:

The School of Psychology Ethics Committee

Address: Tower Building

School of Psychology, Cardiff, CF10 3AT

Email: psychethics@cardiff.ac.uk

Phone: 02920 870360

Privacy Notice:

The information provided will be held in compliance with GDPR regulations. Cardiff University is the data controller and Matt Cooper is the data protection officer (inforequest@cardiff.ac.uk). The lawful basis for processing this information is consent. This information is being collected by Ann Stevenson.

The information on the consent form will be held securely and separately from the research information. Only the researcher will have access to this form and it will be destroyed after 7 years.

The research information you provide will be used for the purposes of research only and will be stored securely. Only researchers in the Understanding Risk Group of the School of Psychology will have access to this information. After 4 years the data will be anonymised (any identifying elements removed) and this anonymous information may be kept indefinitely or published.

ESNR External Collaboration Agreement

THIS AGREEMENT is dated xxxxxxxx

Parties

Ann Stevenson (the **Individual**)

Cardiff University Doctoral Academy (the **Employer**)

XXXXX

Welsh Government

XXXXX (the **Welsh Government**)

1. **Background**

1.1 The Individual is an employee of the Employer.

1.2 As part of the collaborative working between the Welsh Government and xxxxxxx, the parties have agreed that the Individual will be undertaking a temporary advisory role in the following project (the **Project**):

Project title: **EPSRC Industrial placement – circular economy and innovation**

Project commencement date: **24 February 2019**

Project completion date: **30 August 2019**

ESNR Directorate: **Innovation**

ESNR Contact/Responsible Officer: **xxxx**

1.3 Subject to the terms of this Agreement, the Welsh Government agrees to provide the Individual with temporary and ad-hoc access to the Welsh Government's facilities (including its premises and IT systems) as they may reasonably require to enable them to carry out the advisory role in respect of the Project.

1.4 The Welsh Government and the Individual each agree with the Employer that the Employer is, and will remain, exclusively entitled to the services of the Individual and that nothing in this Agreement shall have the effect of creating an employment relationship between the Welsh Government and the Individual either during or upon the completion of the Project.

1.5 The Employer has the right to make the Individual available to the Welsh Government and will continue to employ the Individual under their employment contract which applies at the date of this agreement (the "Employment Contract") during and upon the completion of the Project.

2. **The Individual's employment and management**

2.1 The Individual acknowledges the temporary nature of the Project, which provides them temporary and ad-hoc access to the Welsh Government's premises and facilities for the duration of the Project.

2.2 The Individual agrees that their temporary and ad-hoc access referred to in clause 2.1 shall cease immediately upon completion of their involvement in the Project or in accordance with clause 8.2, whichever is the earlier.

2.3 The Individual agrees that they will remain exclusively employed by the Employer under the Employment Contract during and upon completion of the Project.

2.4 It is acknowledged that no employer/employee or employer/worker relationship exists between the Individual and the Welsh Government either during or upon completion of the Project and that nothing in this Agreement shall have the effect of constituting or creating any relationship of employer and employee or worker between the Welsh Government and the Individual.

2.5 The Welsh Government shall have no authority to vary the terms of the Employment Contract between the Individual and the Employer, and the Individual shall be responsible for complying with the terms of the Employment Contract for the duration of the Project or upon its completion.

2.6 Reflecting the ad-hoc nature of the Project, the Individual shall decide when and how often it is appropriate to attend the Welsh Government for the purposes of carrying out their role as a temporary advisor in connection with the Project.

2.7 The Individual agrees that they shall act in a professional and courteous manner at all times whilst on the Welsh Government's premises, and shall carry out their role as a temporary advisor with reasonable skill and care during the Project.

2.8 The Employer shall in accordance with its Employment Contract with the Individual, continue to have full day-to-day control of the Individual's activities during and upon the completion of the Project.

3. Payments

3.1 The Individual will receive no form of payment from the Welsh Government in return for his/her temporary advisory role in the Project but shall continue to receive their salary and benefits from the Employer who will also continue to meet the employer's NI contribution during the period of the Project and upon its completion along with all other benefits payable to the Individual including employer pension contributions.

3.2 The Individual shall reclaim from the Employer any travel [and subsistence related] costs reasonably incurred by the Individual in connection with their temporary advisory role in the Project, and shall make all arrangements for leave, including sick pay, holiday pay and absence entitlements, with the Employer, in accordance with the Employer's standard procedures.

4. Data Protection

4.1 The Individual consents to the Welsh Government processing data relating to the Individual for legal, administrative and security purposes.

4.2 The Employer and the Individual confirm that the Individual has consented to the Welsh Government making such information available to those who provide products or services to the Welsh Government (such as advisers and insurers), regulatory authorities and other governmental or quasi governmental organisations.

5. Security and Confidential Information

5.1 This Agreement is dependent upon the Individual passing the Welsh Government's security vetting.

5.2 The Individual will be required to undertake security vetting to Baseline Personnel Security Standard or National Security Vetting level, unless they are able to prove to the satisfaction of the Welsh Government that they already have the required clearance in place, or they obtain dispensation from the Welsh Government's Security Officer ("Security Vetting"). The Individual must immediately notify the ESNR contact / responsible officer of any

changes to the information provided as part of the Security Vetting, including details of any convictions subsequently received.

5.3 The Individual acknowledges that as part of their involvement in the Project, they may be exposed to politically sensitive matters and/or restricted information in the course of their temporary advisory role ("Confidential Information").

5.4 Confidential Information includes information in whatever medium relating to the business, policies, programmes, affairs and finances of the Welsh Government and/or to any discussions, negotiations or any form of commercial, contractual or inter-governmental association to which the Welsh Government is a party, which is confidential to the Welsh Government including without limitation, information relating to the development of policy by the Welsh Government, relations between the Welsh Government and the UK government or any other devolved administration, any personal information of any of the Welsh Government's employees, suppliers, clients, customers, agents, management or persons with whom it is in discussion, negotiation or any form of commercial, contractual or inter-governmental association.

5.5 The Individual agrees that they shall not use or disclose, use or publish any Confidential Information to any person, company or other organisation, other than for the authorised purposes of the Project.

5.6 On completion of the Project the Individual shall return all copies of any Confidential Information in their possession and shall irretrievably delete any Confidential Information stored on any magnetic or optical disk or memory, or any other sources under their control outside the Welsh Government's premises. The Individual shall provide a signed statement that they have fully complied with this obligation on completion of the Project.

5.7 The Individual may have access to email and Internet facilities at the Welsh Government premises, including remote IT access. The Individual therefore agrees to comply with the following Welsh Government policies for the duration of this Agreement and for any period following its completion where relevant:

Security Policy

Data Protection Policy

5.8 The Individual must read each of the policies carefully before accessing the Welsh Government's IT systems.

6. Property

6.1 All documents, manuals, hardware and software to which the Individual is given access, including any data or documents (including copies) produced, maintained or stored on the Individual's computer system or other electronic equipment (including mobile phones), or any such device loaned by the Welsh Government to the Individual, remain the exclusive property of the Welsh Government and must be returned to the Welsh Government at the end of the Project, or at the earlier request of the Welsh Government, unless agreed otherwise.

7. Liabilities

7.1 The Individual will not assume, create or incur any liability or obligation on behalf of the Welsh Government, and acknowledges that they have no right to do so unless as specifically authorised in writing.

7.2 The Employer shall indemnify the Welsh Government fully and keep the Welsh Government indemnified fully at all times against any claim or demand made by the Individual arising out of their employment by the Employer or its termination during the period of the Project

7.3 The Welsh Government will maintain a duty of care towards the Individual for the duration of the Project under the Health and Safety at Work etc Act 1974 as appropriate. Should any injury arise to the Individual in the provision of his/her services under this Agreement as a result of any act or omission on the part of the Welsh Government or any Welsh Government employee or authorised agent of the Welsh Government, in the event that liability for the act or omission is established on the part of the Welsh Government or any Welsh Government employee or authorised agent of Welsh Government, the Welsh Government will reimburse the Employer for reasonable losses suffered, sustained and incurred by the Individual as paid by the Employer to the Individual arising out of any act or omission on the part of the Welsh Government or any Welsh Government employee or authorised agent of the Welsh Government during the period of the Project, subject to the production, review and verification of all relevant receipts.

8. **Termination**

8.1 Any party may terminate this Agreement at any time in writing to the other parties with immediate effect without the need for prior notice to be given.

8.2 In the event the Individual should cease to be employed by the Employer at any time prior to the completion of the Project, this Agreement shall automatically terminate at the same time.

9. **Agreement**

9.1 The Parties acknowledge that this is the whole agreement governing the contractual relationship between them with the exception of any subsequent written variations signed by all the parties.

9.2 This Agreement must be signed in triplicate by the Individual, the Employer and the ESNR Contact / Responsible Officer. One signed copy should be sent to the ESNR HR Business Partner team and one signed copy should be retained by both the Individual and the Employer.

I have read and understood this document:

Individual:

Signed:

Name (Printed): **Ann Stevenson**

Date: 28 Feb 2019

Employer:

Signed:

Name (Printed): **xxxxx**

Date: xxxxx

WG Contact:

Signed:

Name (Printed):

Date

APPENDIX 4: CODING FOR ANALYSIS AND WORKED EXAMPLE OF CODING PROCESS

In this Appendix a table is first presented showing the parent and child nodes[96] defined and used to code the data. In addition, a description is the three-stage coding process built into the methodological strategy is provided using worked examples..

Parent node	Child nodes	Description
Being an SME	• Business structures & concepts • Strategy	Talk of the concept of an SME and characteristics of running a business, e.g. culture, strategy, decision-making process, including when businesses were interpreted as talking of themselves as being an SME
Causal relationships	• Contingent • Necessary	Talk of the relationship between two or more entities or concepts. Contingent relationship interpreted when a level of uncertainty was presented, e.g. indicated by terms such as could, may, depends, c.f. a necessary relationship where a level of certainty was presented, e.g. indicated by terms such as will, always, need.
Circular economy	• CE business models (nodes: design for longevity; design for recyclability; design for repair and reuse; ecodesign; product service systems; reduce quantity of materials; reduce variety of materials; remanufacturing; replication & scalability; sustainable, recycled, renewable materials) • Consumption • Decoupling • Growth • Knowledge and understanding • Linear economy • Ownership	Talk of concepts related to the concept of the circular economy, including knowledge and understanding and specific CEBM
Dilemmas and trade-offs	• Qualifying statements	An explicit argument between two or more positions, including talk of alternative options and their features, compromises, priorities.
Energy, materials & products	• Energy • Materials • Products & components	Explicit and implicit talk of production, use of and characteristics of energy and material resources.

[96] Parent and child nodes is terminology used in NVIVO to describe a hierarchy of nodes. A parent node is a concept that would be understood to encompass a range of other concepts (child nodes), for example Time is a parent node with child nodes being lifecycle, pace or speed, urgency.

	• Packaging • Technology, science and infrastructure	
Environment and sustainability	N/A	Talk of "the environment" and concepts considered part of the environment such as land use, CO2, air quality, pollution, emissions, nature, climate change, sustainability, sustainable development etc.
Experiences	• Dealing with support organisations • Decision-making experiences • Experience of businesses • Experience of problems • Experiences of change • Experiences of environmental products • Experience of others knowledge and awareness	Talk of individual's or organisations direct experience of engagement with a range of entities including decision-making, change management, circular economy, support provision, customers etc.
Figures of speech	N/A	Reference to a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable or to a thing regarded as representative or symbolic of something else.
Ideology	N/A	Talk of politically, morally or ethically informed ideals, systems, ideology or discourse that refers to doctrines or taken for granted principles, e.g. capitalism, communism, ethical or moral philosophy
Innovation	N/A	Talk of innovation and entrepreneurship.
Positioning	• Ambition • Commitments and objectives • Control • Cynicism or scepticism • Hero or villain • Priorities • Responsibilities and leadership • Rules • Subject position others • Subject position self • Taken for granted (assumptions) • Trust & credibility	Action-orientation of talk in terms of positioning actors and entities, including responsibilities, blame, trustworthiness, agency and power, beliefs, motives, ideology, truth, fact.
Power, influence and roles	• Academia • Business & brands • Business consultants • Consumers • Government (nodes: funded organisations & structures; funding; policy,strategy,action plans and consultations; voluntary instruments) • Legislation and regulation • Markets & customers • Media, TV, newspapers, social • Partnership and collaboration	Talk of relationships, roles, responsibilities, agency, expectations, commitments, accountability, influence and power of organisational entities

	• Rhetoric (nodes: change; choice; responsibility) • Society	
Psychological entities	N/A	Talk making reference to psychological entities such as feelings, memories, concerns, beliefs, attitudes, imaginations etc.
Risk	• Consequences (nodes: jobs; national security; opportunities; resilience; safety and protection) • Rhetoric problem and solution • Situational uncertainties: (nodes: Brexit; Buyer customer uncertainties; Customer engagement uncertainties; Competition & competitiveness; Complexity; Development uncertainties; Efficiency & productivity; Distribution uncertainties; Material supply uncertainties; Money (sub node – profit); Production uncertainties; Skills and staff; Scale; Stability (sub node - level playing field); Standards, standardisation, quality, guarantees; Systems and data (sub-node - measurement & targets)	Talk of concepts related to the concept of risk, including talk of risk, consequences of action or inaction (positive and negative), problems and solutions and situational uncertainties. Situation uncertainty categories informed by Roger More paper *(1982)* on uncertainty "factors" for businesses - covering marketing, distribution, production, development, competitive advantage and buyer risk.
The economy	N/A	Talk incorporating references to the concept of "the economy" and other concepts interpreted as being associated with “the economy” such as market trends, austerity, recession on a global, local or regional scale.
Time	• Lifecycle • Pace or speed • Urgency	Talk of aspects of time specifically or generically, e.g. a year point 2030 or references to the past, the future, present
Waste	N/A	Talk of waste in relation to material resources, including waste management technologies and infrastructure, e.g. recycling, energy from waste.

Coding process

The methodological framework in this thesis draws upon principles of Grounded Theory Methodology (GTM). A key component of GTM is the organisation and "coding" of data to facilitate systematic analysis of data, that goes beyond simply transcribing interview data *(Pidgeon et al., 1991; Tracy, 2013)*. In this Appendix, how the data collected was organised is first described before each stage of the three-stage coding process undertaken is presented through worked examples. As explained in Chapters 4 and 6 in the main thesis, this three-stage process involved creating low level nodes to order the data, followed by developing second-level interpretative descriptions to the creation of analytical repertoires. These three stages form Steps 3 to 5 of the methodological framework defined in Chapter 4, i.e., Initial Coding, Initial Interpretation and Repertoires.

A computer aided data management and analysis tool NVIVO was used to store and organise the data and facilitate initial coding in Step 3. This Appendix will not be presenting a "how to" guide to using NVIVO. Online and downloadable resources and training are available for this purpose. The focus is on demonstrating the process adopted in organising the data and subsequent coding.

Organising the data

All material collected was added to NVIVO. This included the recordings of interviews and events, materials used at workshops, published materials and materials obtained about events attended or from events (e.g., agendas, presentations, reports). As a first step I organised the data by collection method and creating a separate sub-file for each "case". I defined a case at an organisational level, rather than an individual level, e.g., DEFRA, to which a number of data sources could apply. This was on the basis that I was interested in the shared, institutionalised discourses and could choose to review all data collected for a particular institution. For each case I applied a classification, e.g., Academia. Under each case the data files were added, with each data file also provided a classification, e.g., audio-visual material, ethnographic notes etc. The purpose of the classification approach was to provide the ability to bring together data under a single organisation, a type of institution or type of material for analysis if I wished to do so. A truncated schematic of the data organisation is provided below. Although in my working copy of NVIVO identifying labels of interviewees and workshops are included, they are anonymised in the schematic to maintain confidentiality.

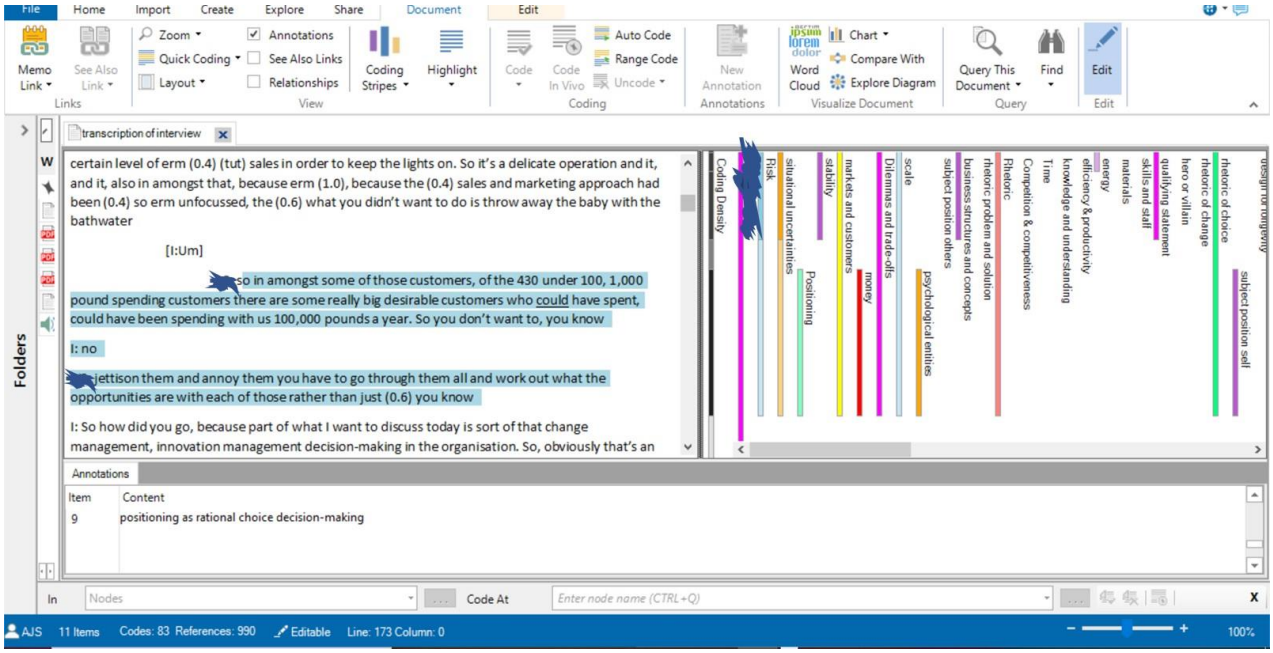
Files	Case classifications	File classifications

CE Workshops
• Workshop 1
• Workshop 2
Events & conferences
• Advances London
• CE in Wales 28 Feb 2020
• Ditch throwaway society
• Future Earth
• Etc.
Interviews
• Academia
• Business support
  ○ Consultancies
  ○ Name 1
  ○ Etc.
• Businesses
  ○ SME1
  ○ SME2
  ○ Etc.
• Trade association
• Government
• Mach 2018
Published discourse
• Academia for business
• Business support orgs
• Consultants
• European programmes
• Financial institutions
• Global bodies
• Industry membership bodies
  ○ Aldersgate group
  ○ BiTC
  ○ Etc.
• Policy & legislation
• Etc.
	• Academia
	• Advisor
	• Business
	• Events
	• Financial institution
	• Government/regulatory
	• Think tank
		• Audio-visual material
		• Blog or company news
		• Case study
		• Ethnographic notes
		• Event materials
		• Government document
		• Images
		• Interview
		• Magazine article
		• Marketing product
		• Minutes
		• Newsletter
		• Newspaper article
		• Regulation or legislation
		• Report
		• Social media
		• Standard
		• Webpage
		• Workshops

Initial Coding

The main aim of this process was to create labels that would enable the aggregation of data extracts from a range of sources or type of material, or the same source and material, under broad themes. These broad themes were my interpretations of what the content of the extract was about and not how the discourse in the extract was produced *(Pidgeon et al., 1991)*. How the discourse was produced is the primary function of the Initial Interpretation step.

I started creating low level codes on the first completed transcript I produced. As I worked through this first transcript, paragraph by paragraph, I created a node, e.g., customer, based on my interpretation of what the content was about. However, just because a paragraph had been coded at a node it did not mean that I was to move immediately on to another paragraph. A sentence or a paragraph could equally be coded at other nodes. For example, a paragraph having content about customers, could also have content about money or positioning of the individual or organisation in their role with customers. Therefore, each paragraph would end up being coded at a number of nodes. As I worked through the transcript subsequent paragraphs would be coded at a node already defined or a new node added. In addition, annotations could be added to give further detail of my thinking. The example below gives an idea of how application of nodes and annotation was applied using the NVIVO tool.



After each subsequent piece of discourse data had been coded, such as a new interview transcript, the nodes being created and applied were reflected upon, in terms of commonality or differences between the nodes. This iterative approach is not mechanistic where data is made to fit the thematic node. Instead it is a reflexive process where nodes and their descriptions are expected to develop and become progressively refined *(Tracy, 2013)*. For example, a paragraph would end up being coded at the node "Time" when it involved content referring to aspects of time specifically or generically, even though initially it may have been

coded at "Dates” when a year point was included. The concept of Time could be understood to be an important element of discourse with a wide range of other concepts such as lifecycle, pace or speed, urgency being part of such discourse. This process resulted in the aggregation or renaming of nodes and the creation of parent and child nodes, where the parent node is a concept that encompasses a range of other concepts. For example, the original node “SMEs” was used to denote content focussed on SMEs and there were separate nodes to depict content relating to the way an SME was structured, i.e.: “business structures and concepts”, or what the focus of the business was, i.e.: “strategy”. However, I reclassified these latter two nodes as child nodes of the SME node, with the SME node becoming “being an SME”, as I interpreted the nature of this content as constructing what makes SMEs different to other types of organisations.

Initial Interpretation

Whereas the aim of the initial coding step was to label sections of data by what I had interpreted the content to be about, the focus of this step was analysing how content was constructed in each extract from the data. Having chosen to analyse content coded at the parent node “being an SME”, I downloaded the node file document created by NVIVO and extracted the content into an Excel workbook. A “data” worksheet was created where all the extracts (sections of data) were placed. The extracts were structured by case, with each column containing the different extracts coded at the node for that case. An example is shown on the next page.

SME1	Reference 1 - 4.40% Coverage	Reference 2 - 2.76% Coverage	Reference 3 - 2.12% Coverage
Interview question	Um, so how, so how are the decisions made? Who makes the decisions in the business on what you're going to do?	(laugh) OK. So and again, you know this is a broad question. In your experience what do you think needs to be done by business in relation to climate change?	What, what, what if your customers, cos you talked earlier that your customers tend to say look we want you to use this material and we want you to do that, [SME1: um um] What if your customers said look we want you to use (0.2) materials that are more sustainable [SME1: yep] How would you, how would you assess (0.4) whether you could
Response	Well it depends <how big the decision is> [I: Oh OK] It's quite a, a shallow (0.2) business (laugh), in terms of management levels not in terms of attitude erm. [I: (laugh)] And so the, the key person in the business is the managing director Kevin, I don't know whether you saw him when you were there, and he, he does like to know what's going on. Which is obviously a challenge when you've got 38 people [I: um] doing stuff at the same time. Erm, er but, once, you know like everything, once he's confident that er his managers will make decision that are in line with the business philosophy which obviously he has to communicate to them, he will then er leave them to things. So if it's day to day, [I: yeah] if it's ordering a tool, if it's er deciding on a yes we can, no we can't, bit of a price discussion that sort of thing, we'll all make the decisions. Erm, obviously, as it gets bigger and more significant, we have erm, a big project at the moment, somebody wants us to make, and one of the parts is, is extremely challenging [I: um] and so everybody's involved in that discussion because we can't take it on if somebody's saying that's not possible, erm. So he would take that <view>, he looks at the, er you know, the work that we've been asked to quote for, we tend to say are you happy that we proceed down a route, er for example, the machine that does the ultra-precision [I; um] will make extremely tiny parts but the problem is you can't see them, you need special toolings, so you're, you can't just say yes we can make them because the machine can make them, you have to say (0.2) are we happy to pursue this customer because er, it you know we'll need additional resources. So it varies is the quick answer to that, but it is.	(0.2) Well I think (0.2) it's, it's a sort of big to small approach in that sense [I: Um] because as we've just been discussing, if the bigger boys say right then, we expect our suppliers to do this, to do that, to do the other. Erm even if those suppliers think it's a complete waste of time, they'll have to do it because they want the business from the bigger customers. So that <certainly makes a difference> erm. We did have a, a er customer wanting some specific requirements, and it was sort of, to a degree, it was well we'll worry about that later, until that customer rang up and said unless this is resolved in 30 days we're taking all the business away. [I: OK] So, you know, whilst everybody can talk about it, [I: um] sometimes you know there's plenty of erm demands on the business and time and money that, err, some of the higher ideals might not make it to the list but if, if, if the bigger fish say (0.2) no this is what we're doing, then it does, it does have an effect through the chain.	Well, err, the, the quick answer is we'd go out to our material suppliers and say can we have some of this new material and they'll go (0.2) yes no problem, that's fine isn't it. If they say don't be daft you need to buy (0.2) 10 tonnes [I: yeah] We want, we want you know err, err a couple of kilos, that tends to be (0.4) an issue whatever it is, so again I say if, if, if there's <a big enough driver for a mill> to make enough material for us to buy bits of but we don't buy anything (0.2) in quantities that mean we can demand what we're having

Once all the data was organised in this worksheet I created two more worksheets, distinguishing between interview data and published data. This was on the basis that I had chosen interviews as my core method whilst published data was a supplementary method. For each extract, answers to the six questions defined in the methodology were constructed and written into the spreadsheet. Here is an example of the type of analysis carried out on an extract from an interview with a business support provider. The extract is a response to a question on how they are finding working with SMEs in which both the researcher and interviewee are familiar with the concepts of SME.

Extract *Ermm. It's, the SME markets probably, is quite a tough one because (0.4)*[97] *obviously there's a charge for our services [Researcher: Um] the, the, the critical (1.0) issue is, is defining the value that we're gonna add to a company. [Researcher: Right]*
What is the discourse doing? Financial gain is “the critical” value for SME decision making
How is the discourse constructed to make this happen The discourse centres on a discourse of a *market economy*. This is achieved by first positioning SMEs as a collective "market" that is difficult to work with “tough”. The cause of such difficulties is explicitly defined as being associated with payment, by reference to "a charge" thus implicitly linking money and SMEs. It can be interpreted that the respondent first understands that the difficulty for SMEs is accessing money to pay for the “charge”. The concept of *added value* is called upon and given the earlier utterance “value” can be interpreted as relating to money in which *added value* can be understood to mean the money gained must be more than the “charge”, which is positioned as “the critical" value to SMEs when deciding on the use of services. The account can be understood to be assuming that physical “charges” are the only costs - *rational choice* - to be considered in relation to the financial gain.
What resources are available to perform this activity? The speaker is understood to be using an experience narrative of providing support services to SMEs with reference to the design and structure of the support provision and an assumption of the motives and financial resources of SMEs operating within an existing market economy systems.

[97] [ ] denotes an interruption, ( ) denotes a relative indicator of a length of a pause compared to a usual end of sentence or comma (breath) pause for the speaker.

What is the action orientation of the discourse? The respondent is working to place any perceived lack of engagement of SMEs being due to SMEs lack of access to financial resources. This acts to orient away from questioning the appropriateness of the support provision on offer, the way the organisation or the respondent engages SMEs or the non “charge” costs that will have to be borne by the SME to take action.
What versions of the world are being constructed/ stabilised? In relation to SMEs, SMEs are being constructed as lacking access to finance. Implicitly they are different to larger businesses, where it is understood that larger businesses can access finance. In addition, the support provision being provided is implicitly constructed as being appropriate for SMEs with “value” in business stabilised as being financial. In addition, decision-making on the basis of if “charges” are lower than projected financial gains this is the rational choice.
Whose interests are being served by the discourse? It can be interpreted that the primary interest being served is that of support providers by orientating lack of success with SMEs to characteristics of SMEs and not the nature of support provision. However, the discourse of money could serve the interests of SMEs in being able to use lack of access to finance and financial gain being insufficient to outweigh cost as unquestionable valid reasons for not engaging with service provision offered.

Following completion of this form of analysis for all the extracts, “patterns” worksheets were created (interviews and published material) to bring all the interpretations of extracts into one place and as a first step to noting patterns. The interpretations were organised by type of organisation. I adopted this approach as I was interested in shared institutional discourses. The following truncated worked example demonstrates some of the different constructions of SMEs from different interview extracts.

Type of Organisation	Constructions of being an SME
Business support organisation	Money as central to SME decision making
	SMEs as looking for and requiring expert help to address a lack of available skills.
	SMEs as lacking long term vision and needing external technical expertise.
	SMEs as lacking reasons (desire, need, advantage or power) to change current customer/ SME relationships.
	Action on CE in SMEs as contingent upon a positive financial "return on investment".
	Focus on meeting customer demands as common sense SME business practice
	Majority of SMEs as lacking influence in the design of products they make.
	Behaviours of SMEs as being "just the way it is"
	SMEs as being "too small" to have access to funding and support for CE activities
	SMEs lack of action on CE is valid as "there needs to be some proof" that the CE "are good things for business".
	SMEs focus on the "here and now" making pragmatic business sense with decisions not being morally information
	SMEs action is determined by the demands of customers
	SMEs are cynical of CE claims from large corporates and are seen as "nothing to do with me".
SMEs	SMEs have to act "commercially"
	SMEs lack physical human "resources" to engage with CE
	Actions in SMEs determined by technical, customer and staff resource impacts of decisions
	SMEs do what "bigger boys" say
	SMEs have no choice in good business practice but to adopt the lowest cost option in a "market economy"
Business representative body	Big businesses have the power to make SMEs take action
	SMEs have no choice
	SMEs focus on short term costs and have no strategy for the long term future
	SMEs are not environmentally sustainable companies
	SMEs choose to focus on the day to day
	SMEs CE function is to respond to legislation and customer demands
Government	SMEs engagement in CE must lead to "profit"
	SMEs don't have "time", "money" and the knowledge for CE action
	SMEs engage in CE when there is financial benefit
	SMEs powerless to influence CE activity but have got to gear up and anticipate CE action by customers
Academics	SMEs unknowing of the bigger picture, not doing things right and failing to advance.
	SMEs have no choice but to focus effort on the quickest or least complex options for survival
	SMEs as lacking knowledge of climate change impacts and requiring a focus on financial benefits achieved through minimal effort to engage with climate change.
	SMEs as lacking time, money, CE knowledge and resources to change current practices unless there is legislation.

Having identified the different constructions of being an SME, in both interviews and in published extracts, the next step was to identify how these different constructions and the discourses called upon linked together and could be interpreted as forming patterns.

Repertoires

In developing the repertoires, i.e., the patterns of constructions and discourses, I created a matrix in the patterns worksheet where the discourses called upon in the construction were included as column labels as I worked down through each construction. Where a discourse was used in a construction, the worksheet cell was coloured. The next construction was then reviewed and either an additional discourse was added as a column label, or a cell coloured to depict the construction calling on the same discourse as the previous construct. Below is a truncated example of how the worksheet looked.

This enabled a first indication of where there may be consistent or diverging use of discourses. This process continued until all constructions had been reviewed and the matrix complete.

Following completion of the matrix, a diagrammatic process was then undertaken using powerpoint to show the flow of discourse and connections to constructions of concepts coded at other nodes included in the extracts. The transition to defining repertoires was an iterative process in that some emerged from this stage of coding, e.g. SMEs as resource constrained, SMEs as unknowledgeable, competitive environment, CE proof of value, whilst others developed as the dominant discourses underwent detailed analysis, i.e. the asymmetric power relations and the CE as a higher ideal repertoire. For example, the first detailed analysis was carried out on extracts associated with the “if the bigger fish say” emic descriptor as this was interpreted as being fundamental to understanding constraints on the actions of SMEs. Whilst undertaking the analysis, asymmetry and power became more pronounced aspects of the discourse and led to the identification of the asymmetric power relations repertoire as a primary discursive resource.


Unknowing of bigger picture
Struggle for survival
Knowledge from external experts/ big businesses
Least effort to change
Financial gains
Access to time, money, skills and resources
Influence or control
Knowledge of the CE
Reactive to customers and legislation

APPENDIX 5: ANALYSIS OF INTERVIEW, WORKSHOP AND PUBLISHED EXTRACTS

In this appendix examples are provided of the data used for analysis. The full range of coded extracts, workshop and event transcripts used is not included as it amounts to 210 pages. As detailed in section 6.5, interview extracts and published policy extracts coded at a range of nodes interpreted as relating to the repertoire being investigated were collated together as demonstrated in Table A5.1. In Tables A5.2 and A5.3, examples are provided of how exchanges between participants were transcribed at the two different types of workshops. In Table A5.4, an example of the fieldnotes information collected and part transcript of an event attended is provided.

Asymmetric power relationships repertoire		
Question or published context	**Ref:**	**Transcription[98] or published text**
Interviews – node "being an SME"		
Businesses (SME1)		
Is there anything that you, with us having this conversation, that you want to raise that we haven't covered?	1 2 3 4 5 6	E1: SME1: (….) It comes down to, for a business like us, the size of us, we have to think commercially.[I: Um.] And the circular economy <u>really</u> only comes into play if we're <u>driven</u> (0.2) to do that, or if it's something whereby we get a commercial edge, (….) But I think, you know I've <u>never</u> had a conversation with a customer in the <u>last</u> 7 years of {} existence where they've said (0.4) yeh I'll pay an extra 10 percent if you can show it's ethically sourced, or if, you know, you're not disposing of it, if your waste rates are lower than others, you know. <<u>Never</u>> (0.2) have I had anything like that.
Businesses (SME3)		
Um, so how, so how are the decisions made? Who makes the decisions in the business on what you're going to do?	1 2 3 4 5 6 7 8 9 10 11	E1: SME3: Well it depends <how big the decision is> [I: Oh OK] (….) Erm, er but, once, you know like everything, once he's confident that er his managers will make decision that are in line with the business philosophy (….) So if it's day to day, [I: yeah] if it's ordering a tool, if it's er deciding on a yes we can, no we can't, bit of a price discussion that sort of thing, we'll all make the decisions. Erm, obviously, as it gets bigger and more significant, we have erm, a big project at the moment, somebody wants us to make, and one of the parts is, is extremely challenging [I: um] and so everybody's involved in that discussion because we can't take it on if somebody's saying that's not possible, erm. So he would take that <view>, THEY looks at the, er you know, the work that we've been asked to quote for, we tend to say are you happy that we proceed down a route, er for example, (….) you need special toolings, so you're, you can't just say yes we can make them because the machine can make them, you have to say (0.2) are we happy to pursue this customer because er, it you know we'll need additional resources. So it varies is the quick answer to that, but it is.

[98] Transcription conventions. (….) transcript deliberately omitted. <u>Never</u> a word of phrase underlined indicates additional emphasis in speech. [] Indicates an interruption by another person. (1.0) a relative indicator of a length of a pause compared to a usual end of sentence or comma (breath) pause for the speaker. <> slower pace of speaking.>< quickened pace of speaking.? Speech pattern (usually incorporates rising intonation in the sentence) indicates a question, CAPITALISED words are replacements to avoid identity, including gender.

Business representative body (BRB1)		
So what's the role of business then in all this?	1 2 3 4	E1: BRB1: (1.0) ha, ha, what's the role of business? Erm, (0.4) [I: (laugh) Sorry. (0.2)] You're, yeah, it's coming back, I mean, no, if you're looking at your SMEs, the role of, the role of most SMEs are to follow.[I: Um] Legislation, and to do things, and to do things that the corp', again unless the public expects things of them, they'll not be doing it.
Government representative (G)		
So, (0.6) we've talked about businesses and the circular economy but the way we've been talking about it is sort of businesses who appear to have control of what they're making. [G1: um, good question yeah] What about the majority of SMEs [G1: yeah yeah, yep], who are?	1 2 3 4 5 6 7 8 9 10 11	E1: G1: (….) or any piece of equipment these days has a massive long supply chain. Erm And you're right. The SMEs have very little chance of influencing that unless they have something really, really clever. And it doesn't cost any extra money. Erm, but gives functionality. But then also when you are making, putting the final product together as the, as the brand owner, then trying to get your supply chain to change is a challenge. However, you do have quite a lot of power to make that change [I: um]. And that's something we've been saying to SMEs is these changes will happen and will cascade down. And timing is all the, they can't make the change until they're told to [I: yeah] but they've got to gear up for it and anticipate it. …and that's important to support our SMEs and which is why I think what we're doing through our innovation colleagues. When I first talked about two years ago they said they'd worked on something like fifteen hundred products and resource efficiency hadn't featured once [I: Yeah] in their conversations but now it does. And it's embedded all the way through. Erm, so they're putting in a big focus on that cos they can see that that demand and pressure is coming from customers down through the supply chain.
Business support provider (BSP1)		
What are your thoughts on the concept of the circular economy?	1 2 3 4 5 6	E1: BSP1: It goes back to the original that I said before, a lot of SMEs are (0.6) manufacture to print so they're effectively, (0.4) the circular economy (0.4), they have to buy into it because that's, that's what their customers dictate, but they've, they've no desire to change or influence it as long as they conform to it. [I: Um] I mean, a circular economy has probably got to be driven by the OEMs, to some degree, and then the SMEs fall into line (0.6). So unless there's actually an advantage of (0.4) using a particular material in their process (0.2). [I: Yeah] Or you know (1.0), like I said there's no reason for them to change. [I: OK]

Interviews – node “subject position self” referring to customers		
Business SME3		
What role do you think your business has in addressing climate change?	1 2	E5:SME3 (….) We have some customers who say you can't use this from there and you can't use that from there, (0.2) and it's driven as well from a customer approach.
And have you had many customers sort of bring those themes up in discussions, (0.4) in relation to [yeah] Oh, OK.	1 2 3 4 5	E6:SME3 Well not, climate's a bit <broader> [I: OK] we certainly get asked, when we're asked for certification, if we have an environmental policy, if we have [I: Um um] relevant TS or whatever specification you know, certification and that sort of thing. So it is discussed and it is on the management (0.4) erm plan [I: Um]<to add those things to it>, partly because we're (0.2) obviously jolly nice folk[I: (laugh)] (amusingly) and partly because if customers are asking for it we need to have it.

Interviews – node “customers and markets”		
Businesses (RB1) – AN INDUSTRIAL REPAIR BUSINESS		
And what are the factors do you think your customers consider when they’re deciding whether to use your services or not?	1 2 3 4 5 6 7 8	E2:RB1: Quality (0.6). Being a one stop shop as well, so having one supplier rather than having to go to (0.2) one (1.0) company to repair a COMPONENT and then you have a broken down PART, I have to go there now where do I go for this? No, actually there is one supplier who can help us with everything. And that’s where we really distinguish ourselves from the competition. Coming back to the quality side we’ve got a lot of testing facilities available [I: Um, um] So we can actually functionally test the items. So when they come back, to the customer we haven’t just solved the defects we functionally tested it as well included in that is preventative maintenance. Changing all the time critical components (*rising intonation*) [I: OK] So that’s when we can provide a warranty on the complete item as well rather than just the defects.

Interviews – Phase 3 uncoded extracts		
Business (SME4)		
going back to, at the beginning you were saying about, you know, being circular and I'm just interested in how did you come across this concept of the circular economy in the first place?	1 2 3 4 5 6 7 8 9	E3:SME4: Well I suppose through my own business, through the, through the PRODUCT1 business I've been looking at trying to implement reusable supply chains for the PRODUCT1. But, because PRODUCT1, quite a few PRODUCT1 get reused in a, in a circular system…[I:Yeah.] … but, but, but only really within, you know, the UK…[I:Yeah.] … rather than being sent back to the, the Far East. And so, so I, I, I suppose I've become a bit frustrated with, with that current, that current system and…[I:Yeah.] … you know, I wanted to find something where we could, you know, get, get into, you know, a, a reusable model, rather than just making more, more stuff…[I:Yeah.] … and not having the control. So, for, for instance, you know, with CUSTOMER1 they're really good at collecting the PRODUCT1…[I:Yeah.] … and recycling them. CUSTOMER2 don't collect them at all, because to them it's just another cost.[I:Right, okay.]
Consultant (C1)		
But what about when, when you look at policy and it's sort of saying, you know, SMEs <u>particularly</u> have to come up and innovate our way out of this <u>for us</u>. Why, why, why should they do that?	1 2 3 4 5 6 7 8 9	E3:C1: I don't think it's fair to… no, it's not <u>fair</u> to expect SMEs to do that, because they've got the least ability to, to withstand the… any shocks, you know, any, any risk or any… and also the least erm (0.2) <u>buying</u> power, if you like. So the reason the linear economy works so well is because it's all based on volume in. You know, you can't expect a business that's selling a thousand units a year to be operating in the same space as a business selling millions. So I think the reason why people look to the SMEs is because they can innovate (0.2) quicker. They're not, you know, they're, they're more, fleet of foot. So even some of the, you know, electric, erm stuff that's happening around <u>smart</u> grids and stuff, a lot…[I: Yeah.] … you know, some of that's SME based. (2.0) The… I actually think the risk is that in… what would tend to happen is the SME comes up with a great idea, big company comes in and buys SME. [I: Yeah.] (1.0) <But>, I don't know whether that's a bad thing….

Published text – node "being an SME"		
Government PG		
Transcript of debate on the circular economy by ministers in the National Assembly	1 2 3 4 5 6 7 8	E1: The Welsh Government has allocated capital funding of £6.5 million to develop a significant number of small-scale capital projects to assist SMEs in making the transformation towards a circular economy approach. We need to see more circular economy business models developed in Wales. Through procurement activities, the Welsh Government and the public sector can lead by example by saving money as a result of sustainable product selection, waste prevention, reuse and recycling. The Welsh Government is working with public sector bodies to drive cost-effective, sustainable outcomes in Welsh businesses in the public sector supply chain, so they can develop more sustainable products and services, using resources more efficiently, including products using high recycled content, designed for reuse, ease of repair, disassembly and recycling.
UK response to EU consultation on the Circular Economy package	1 2 3 4 5	E1: Improving business resource efficiency has a key role in delivering the benefits of a circular economy - saving money while reducing the impact on the environment. There are real opportunities to be had, for example through resource efficient production techniques which can reduce costs and increase competitiveness, and growth in new markets for technological or service solutions. Large businesses can work with their value chains to make savings for themselves as well as for SMEs with whom they do business.

Table A5.1: Examples of coded interview and published policy extracts used for analysis

Workshop 1: Food and packaging sector workshop, exercise 1

Note: Names are pseudonyms

Exercise 1: *Attendees gathered round a simplified flow chart of the F&D supply chain and were asked to discuss and write down on the flowsheet where packaging occurs, what type and what for. A couple of the attendees picked up pens and starting writing on the chart while others looked on in silence. The facilitator (Ann) interjected with questions to encourage discussion and engagement with the exercise.*

1	Adam: Can we just sort out we've got boxes and cartons here, is this, I understand that that's driven by err supermarkets because they err want to maximise (0.4) shelving. Is that, is that very much still the case? And transportation as well isn't it?
2	Ben: communication
3	Adam: right.
4	Ben: it's kinda the whole package isn't it. there's a lot of information by law that that is depicted that has to transfer [Adam: yep] from the food manufacturer (0.2) to the consumer [Adam: yeah] regulatory requirements [Adam: yeah] recyclability [Adam: yeh, yeh] what it actually is. A nice picture for the marketeers. Then you've got the box that it comes in.
5	Adam: It's gotta be. (0.2) It's gotta be principles and weighing up I guess.
6	Ben: Some of it, internal or individual units yeh, but then everything comes in and out in corrugate box too. So there's a distinction between
7	Adam: yeh, I were thinking geometrically as well, I remember a few years ago in Japan the, err cuboidal water melons [Ben: yeah] Anyone else remember those? Cos they could stack them up and err and they got, you know, better carriage, you know. Plus they looked really weird, huh
8	Charlie: It's quite difficult to palletise a plastic bag (1.0)
9	Adam: Say that again, it's quite difficult t'?
10	Charlie: palletise a plastic bag [Adam: Right] boxes are alright, you can stack them
11	Adam: yeah, yeah, yeah. Right yeah I'm with you yeah. (5.0)
12	Ann: So in terms of packaging, (1.0) you know from retailers, what kind of packaging is involved in this (1.0) aspect *(pointing at retailer to consumer section*)? (5.0) Surely we all know? Come on then right it down.
13	*joint laughter*
14	Ben: labels, cartons, boxes, shrinkwrap again
15	Diane: Don't you think there's a very limited actual responsibility between there (*pointing to retailer*) and there (*pointing to consumer*) cos they push it back up here (*indicating up the supply chain at manufacturing/processing*).
16	Ben: Yes
17	Diane: It's from here (*pointing to retailer*) to here (*pointing to consumer*) that they've got the obligation but push it back up the supply chain that they have to take that. They have to have all those things but actually from here (*retailer*) to here (*consumer*) they have very minimal responsibility for packaging. They don't put anything in to that (0.2) system and product they deliver, they push it back up.
18	Charlie: The retailers
19	Ben: They determine
20	Charlie: Absolutely
21	Ben: But whether they take any responsibility
22	Charlie: yeah, yeah, they won't take any responsibility but they certainly, yeah
23	Ben: Like Andy said earlier you know, or it was on one of the presentations, how the feedback from consumers was that they want the people manufacturing (0.1) the product to take responsibility and pay for it where actually that's being dictated to by the retailer.

Table A5.2: Example of exchange at workshop 1 during an exercise used for analysis

Workshop 2: Open workshop, exercise 3

Names are pseudonyms

Gary: SME manufacturing Director
Harry: Academic
John: Academic
Kate: Government
Larry: Government business support provider
Marie: SME support provider

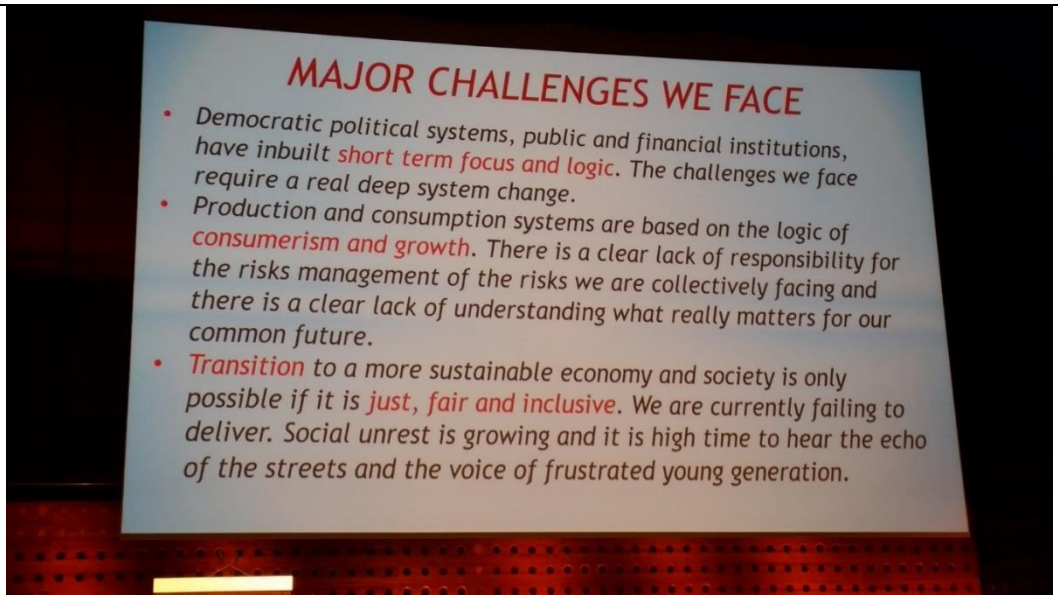
Attendees were asked to take post it notes produced as part of Exercise 2 and rank them in a grid from least important to most important. The following transcript is part of the discussion during the exercise.

306	Ann: So is that important? So is the cust-, so what we're questioning here is, is the customer more important?
307	Kate: Well, I think they are
308	Ann: …than the process? (3.0)
309	Kate: But the- it's a bit of a catch-22, isn't it. But the, the customers needs will drive the process.
310	Marie: Absolutely.
311	John: Yeah.
312	Harry: But that's, that's the basis of any design, hah.[Kate: Yeah.] Like, you have to know the customer needs.[Kate: Yeah.] And then you (0.4) design. You don't design and then create..
313	Marie: And then go, "You're going to want this."
314	Harry: Yeah.
315	Kate: Mind you, it- that does happen, though.
316	John: Well, that's what Apple do, basically, you know.
317	Harry: You give the need anyway through media and advertisement.[Kate: Yeah.] And that's when you, you give...
318	Kate: And that's where it comes up to that, is that kind of, you know, the, the marketing and the behavioural change elements sort of thing. But it is <what you need>.

Table A5.3: Example of exchange at workshop 2 during an exercise used for analysis

Closing Loops: transitions at work, 24th-27th February 2019, World Resources Forum

Reference	Notes/ transcript
WRF1	**UNEP representative:** looked to present the case for CE within the context of current economics language, where they positioned that we cannot keep looking short term and putting the market signals that financial capital is the most important thing. Presented financial capital as being overvalued, human capital undervalued and natural capital not valued at all. The current economic system has built in economic, social and environmental imbalances and that we are seen to be growing globally because we have not taken into account all the costs. Positioned that there will be trade-offs between the SDGs but goal 12 – sustainable production and consumption is essential for all other goals, where there would be no sustainable future without decoupling economic growth from resource use. Positioned that resource shortages will not be the core factor affecting production and consumption, but the environmental and health consequences of excessive resource use. Went on to talk of current climate change activities focused on carbon management - the energy supply aside solutions but there is an urgent need to look at the demand side and nature-based solutions.
WRF2	

WRF3	
WRF4	*Today we have a global economy. Global trade. Global media. Global internet connections. Global transport systems. So we are definitely interdependent. Which means that also our individual and collective responsibility for the future has increased That's the way how the climate problem has explained the changes in the world. (....) Like everything where labour and infrastructure were the limiting factors of human well-being. Today natural resources and environment are the limiting factors of human well-being. (....) In the 21st century we can simply not afford any more to think and act on the basis of short term logic and economy and resource use are definitely at the heart of the problems we face. And one of the solutions we need. So if that is true let us look to the economy and some of the major problems which we have in the economic system in which we live.* *…. There is no sustainable future without decoupling. (....) What is interesting is that actually this shortage of resources may not only in the short term the major driver which will change our behaviour in production and consumption. It will be actually the fact that the consequences of our use of those resources will force us to change our behaviour.*
WRF5	*First of all some data from the report which was issued by the commission. In the last 50 years consumption has been stronger drive than material use than population growth. So it's in the first place partly the economy. Second, high income countries are currently consuming 10 times more per person than low income countries. So global material use productivity has actually from the year 2000 more or less remains stable, it has more or less decreased to a certain extent. Even if it's increasing in all the countries. The problem is that from the year 2000 the production of physical goods is quickly shifting from resource efficient countries like Europe, like Japan to resource less efficient countries. Like India, like China. Global materials resource use is expected to more than double in the middle of the century. Unfortunately we do not see the way this could actually physically happen. So here is where I see the essence of the problem. This is a bit simplified but it's easy to be understood because you know we are living in market economies. And in market economies, the price signals are deciding the (....) with the quantities which they make. let us look to the signals which we are understanding of the market economy. Financial capital over valued. Human capital undervalued. (....) And what is the most tragic in that is that natural capital is not valued at all. If you send these signals in the markets where producers and consumers are currently pointing to behave rationally. Even if one has to think carefully and the directional assumption, because the human history is the history of irrational behaviour.*
WRF6	*What is the real problem. (…) because this will create additional cost to the business sector. In essence, those costs are externalities. They are not capital. (....) So, to a certain extent we are privatizing the profits and the costs are social. (....) We have created a system where the producers they destroy nature, because they have higher profits because that is not part of their calculation and costs. So that's pretty much very much keeping the sentiment of the*

	questions here, dealing with economics. So if we calculate the growth business (....) Gross domestic product GDP to calculate, that the figure is showing that the global economy is actually growing for a bit more than 2 percent yearly. But then if you use other kind of indicators, (....) human progress indicators inclusive of well being which included more of social and natural calculations and costs. We find out that actually that is the problem. That a lot of the growth which we are recording was not actually positive growth, due to the fact that a lot of the costs we have never captured. So my conclusion would be, from the economic point of view. It's not better to go faster if you're walking in the wrong direction. And too many times this is the case of our reality.

Table A5.4: Example of fieldnotes and partial transcript of an event used for analysis

APPENDIX 6: CONSTRUCTIONS OF RISK AT EVENTS

12 events were attended that enabled collection of discourse data. Based on a review of the data, constructions of risk aligned with institutional roles of individuals as summarised in Tables A6.1 to Table A6.4. Shared understandings from other actors' perspectives of what is understood to be the risks for the institutional role are also included in the tables.

In the tables, for each event an indication of the number of times that the discourse was called upon is indicated, e.g., WRF3 refers to 3 instances at the World Resources Forum event. The following nomenclature is used in relation to the events:

Label	Event
PFW	Policy on waste in Wales - next steps for management, energy generation and the circular economy
AL	Circular innovation for SMEs, Advances London
UKERC	SMEs and energy workshop, UKERC
iLEGO	Innovation in Lean Enterprise and Green Operations (iLEGO)
WRF	Closing Loops: Transitions at work, World Resources Forum
W2W	Waste to Wealth summit, BiTC
STBAH	Keep products and materials in use, STBAH
WMW	Waste management in Wales: Creating a circular economy in Wales: Networking event, Welsh Government and Tata Steel
GA	How can we ditch the throwaway society?, Green Alliance
FE	An equitable, inclusive, and environmentally sound circular economy in a post COVID-19 environment, Future Earth
GB	How to Get Your Supply Chain to Embrace Circularity - webinar, GreenBiz
IChemE	SCP virtual conference, IChemE

Institutional role	Value & stake, objects at risk	Risk objects, uncertainties & consequences
ESD organisations	• **Poverty, justice and inequality** *(PFW1, AL2, WRF2, W2W1, FE3)* • **Human wellbeing** *(WRF4, FE1)* • **Protecting the environment** *(PFW1, WRF3, W2W2, STBAH1, GA1, FE1)*	• **Legislation & incentives** *(PFW4,WRF1)* • **Conceptualisation of waste** *(PFW1)* • **Political-economic system** *(WRF5, W2W2, GA1, FE3)* • **Behaviours** *(WRF2, W2W1, GA17, FE1)* • **Commodification of nature & people** *(WRF2, FE2)* • **Shortage of resources** *(WRF1)* • **Morality** *(WRF2)* • **Growing population** *(WRF1, IChemE1)* • **Rebound effect** *(FE1)* • **Human ingenuity** *(W2W1)*
Policymaking & regulation	• **Effective CE policy** *(PFW2)* • **Competitiveness** *(PFW1, WMW1)* • **Jobs** *(PFW2, WRF1, W2W1, WMW2)* • **GDP, economy & growth** *(PFW1, W2W1, WMW2)* • **Security of material supply** *(WMW1, FE1)*	• **Policy and legislative stability, consistency & priorities** *(PFW4, WRF3, STBAH1, FE1)* • **Global influence** *(PFW1, FE2)* • **Legislation vs voluntary/incentive** *(PFW4, WRF1, W2W1, WMW3, GA3)* • **Socio-economic-political ideology & landscape** *(PFW4, iLEGO1, WRF2, GA1)* • **Citizens values, choices, practices & expectations** *(PFW4, WMW1, GA10)* • **Heterogeneity of businesses** *(W2W2, IChemE1)* • **Innovation** *(PFW3, AL1, iLEGO1, WRF3, W2W4, STBAH2, WMW5, FE1, IChemE1)* • **Greenwash** *(PFW1, WRF1, GA1, FE1)* • **Business knowledge** *(PFW1, FE1, WMW1)*

Table A6.1: ESD and policymaker organisations constructions of risk at CE-related events

Institutional role	Value & stake, objects at risk	Risk objects, uncertainties & consequences
Waste management	• **Waste service delivery progress** (*PFW1*) • **Availability of reprocessing facilities** *(PFW1)*	• **Citizens behaviours, responses, knowledge & choice** *(PFW3, WMW3)* • **Legislation vs voluntary/incentive** *(PFW2)* • **Funding and consistency of collection services & infrastructure** *(PFW6, WMW2, GA3)* • **Markets for waste/products** *(PFW2, WRF3, W2W1, STBAH1, WMW3)* • **Business cost benefit** *(PFW2, WMW2)* • **Legislative consistency** *(PFW1)*

Table A6.2: Waste management organisations constructions of risk at CE-related events

Institutional role	Value & stake, objects at risk	Risk objects, uncertainties & consequences
Businesses (MNEs & general)	• **Quality and material/product consistency, performance & access** (*PFW8, WRF5, W2W1, WMW1, IChemE1)* • **Markets & competition** *(PFW2, iLEGO2, W2W1, STBAH2, WMW3, FE1,IChemE1)* • **Economic value** *(PFW6, iLEGO2,WRF5, W2W4, STBAH3, IChemE1*) • **Access to future material resources** (*PFW2, WRF1)* • **Maintaining customer relationships** *(PFW1, WRF2, W2W1)* • **ESD strategy/commitments** *(W2W4, GB1)*	• **Customer/citizens practices, expectations, responses and choice** *(PFW6, iLEGO1, WRF6, W2W5, STBAH1, WMW1)* • **Effect on/for customers** (*PFW2, WRF2)* • **Legislation vs voluntary** *(PFW7, WRF2,W2W1, STBAH2)* • **Policy & legislative consistency/applicability/ universality** *(PFW9, WRF3, W2W1, STBAH2, IChemE1)* • **Waste infrastructure, logistics & reprocessing** *(PFW6,WRF5, STBAH1)* • **Costs & losses incl. green premium** *(PFW6,WRF4, W2W5, STBAH2, WMW1, GA2)* • **Cost savings/financial benefit** *(PFW2, iLEGO4, WRF4, W2W4, WMW1, FE1, IChemE1)* • **Scale up** *(PFW3, WRF2, W2W1, STBAH1, WMW1, FE1, IChemE1)* • **Technological advancement** *(iLEGO1, WRF1)* • **Decision-maker values** *(W2W2, WMW1, GB2, IChemE2)* • **Knowledge & data** *(GB1, IChemE1)*

Table A6.3: Constructions of risk for businesses and MNEs at CE-related events

Institutional role	Value & stake, objects at risk	Risk objects, uncertainties & consequences
Businesses (SMEs)	• **Economic value** *(PFW2, AL2, UKERC2, WRF1, IChemE4)* • **Access to future material resources** *(PFW1)* • **Markets & competitiveness** *(PFW1, AL2, UKERC2, WRF2, GB1, IChemE4)* • **Quality of products** *(PFW1, AL1)* • **Long term customer relationships** *(PFW2, AL1, GB3, IChemE1)* • **Reputation** *(UKERC3, IChemE2)*	• **Costs & finance - green premium** *(PFW2, UKERC2, WRF1, GB1, IChemE3)* • **Cost savings or financial benefits/opportunities** *(AL1, UKERC3, W2W1, WMW1, IChemE1)* • **Waste infrastructure & logistics** *(PFW3)* • **Customer product price-performance expectations, demands, practices & knowledge** *(PFW2, AL1, UKERC1, WRF1, W2W1, GB4,IChemE5)* • **Policy & legislation** *(PFW1, AL1, UKERC4, WRF1, W2W1, GB1, IChemE4)* • **Research capacity** *(PFW3)* • **Production capability** *(PFW1)* • **Staff resources** *(IChemE3)* • **Legislation vs voluntary** *(UKERC1)* • **Sector "coherence"** *(UKERC1, IChemE1)* • **SME attitudes, values, social norms** *(UKERC1, W2W2, IChemE3)* • **SME knowledge** *(W2W1, GB4)* • **"degrees of freedom"** *(WRF1, W2W1, GB1)* • **Scepticism** *(GB3)* • **Scale** *(IChemE1)* • **IP** *(IChemE1)*

Table A6.4: Constructions of risk for SMEs at CE-related events