



# Scotland's Circular Economy Practices Ecosystem

**Barriers to businesses being  
more circular**

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**Authors: Simon Amos, Zero Waste  
Scotland & Dr Michaela Hruskova,  
University of Stirling**

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## CEO Foreword

This report, *'Scotland's Circular Economy Practices Ecosystem – Barriers to businesses being more circular'*, developed in an academic partnership between Zero Waste Scotland and the University of Stirling, is significant in its transcendence of traditional thinking and approaches to the development of the circular economy in Scotland.

As a new, innovative, and ground-breaking piece of work, our report marks a sea-change in emerging thought as to how change can be affected towards our mission to rewire Scotland's economy in more circular terms.

The report explores a systems-thinking approach to the challenge of increasing the prevalence of businesses adopting circular practices within Scotland.

Through applying an ecosystem approach, we recognise that society and the structure of the economy influence how businesses operate and the decisions that they make.

The Report then draws out **actionable insights** which will inform future activities for Zero Waste Scotland and our stakeholders.

This is the beginning of an exciting journey towards a more sophisticated understanding of the environment within which Scottish businesses currently operate and the aspects of that environment which present challenges to the adoption of circular business practices.

Crucially, adopting a system-wide approach, based on the research within our report, will allow for more strategic interventions to be identified within the ecosystem, and an exploration of how influencing changes in one ecosystem element has causal effects in another.

In so doing, we aim to influence change which removes barriers preventing the adoption of circular economy practices and, instead, create positive reinforcing 'loops' tipping the system towards increased sustainability and circularity.

This report presents a unique body of work which is set to play a foundational role in Zero Waste Scotland's strategic delivery in future years.



Iain Gulland

Chief Executive Officer, Zero Waste Scotland



# Executive Summary

Scotland has a progressive reputation in the area of circular economy but the “Circularity Gap Report Scotland 2022” found that Scotland’s economy is only 1.3% ‘circular’<sup>1</sup>. Given the scale of contribution that a more circular economy can make to tackling climate change and other environmental and social issues, it is vital to understand why the current level of activity is not translating into a greater impact on the Scottish economy. This project therefore seeks to answer the question of ‘What affects the uptake of Circular Economy Practices by businesses in the Scottish Economy and why?’.

The term “circular economy” can be open to misunderstanding<sup>2</sup> so this project focuses on Circular Economy Practices (“CEPs”), defined as initiatives and activities a business can adopt that are consistent with decreasing the input of virgin resources into the economy by using less, using for longer, using again, and switching to regenerative material use. This allows for a clearer link to be drawn from business action to environmental results in simple, accessible language. Additionally, breaking the concept of circularity down into practices makes clear that linear or circular is not a binary choice.

This project employs an ecosystem approach to recognise that businesses are subject to external influences that can impact their practices. This approach looks at the entire business environment, its actors, and their dependencies by breaking it down into 11 ‘elements’ such as Culture, Finance, and Networks to build up a picture of the current situation.

Data was collected from semi-structured interviews with trusted intermediaries<sup>3</sup>, subject matter experts, and key contacts in trade associations, business support organisations, finance, knowledge centres, and academia. The semi-structured nature of the interviews allowed a flexible approach to gaining insight into each participant’s area of expertise whilst also building up a holistic understanding of the barriers to the uptake of CEPs.

Findings demonstrate that conditions within Scotland’s economy are not conducive to the adoption of CEPs by businesses for a number of reasons that together form a negative reinforcing loop in favour of existing linear practices.

The market value of products and services generally fails to capture major negative environmental and social externalities, meaning the price of products and services from existing linear production is artificially low. This gives them a financial advantage over production including CEPs in the majority of cases that extends into the investment market, where ESG factors remain secondary to return on investment. Existing infrastructure is also designed to serve the market value of the economy in its broadly linear state.

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<sup>1</sup> Circle Economy Foundation (2023) *The Circularity Gap Report: Scotland*. Available at: <https://www.circularity-gap.world/scotland> (Accessed 23 April 2024)

<sup>2</sup> Droubi, S. & Fernandes, F.L. (2023) *Sustainable citizen decision-making: Impact of the cost-of-living crisis on the energy and circular economy transitions in urban Scotland*. Available at: <https://cdn.zerowastescotland.org.uk/managed-downloads/mf-5-jtogoh-1701955827d> (Accessed 23 April 2024)

<sup>3</sup> Organisations who are understood to have earned the trust of businesses through effective relationship building and long-term engagement. These organisations are likely to be called upon by businesses as sources of information support or resources on legal, strategic, and practical matters.

Whilst the language, methods, and values associated with a linear economy have been engrained into Scottish culture over time, the same is not true of CEPs. Language and concepts explaining what CEPs are and why they are valuable are still developing. Consequently, they are inconsistently used and understood across the economy. CEPs therefore suffer from a Cultural Void, meaning they are not considered part of the mainstream. This lack of understanding makes CEPs and their resultant products and services appear riskier when compared with linear alternatives.

Peer to peer networking and support is weak as the Cultural Void makes it hard for a community to form, which is why the connections do not exist for the activity to take place. As a consequence, businesses look to government for support – as opposed to each other – despite low levels of trust in government information. Whilst recognising the generally positive actions of the Scottish Government to date, there remains a large gap between the measures currently implemented by the Scottish and UK Governments and those required to make the necessary changes to market value and to address the cultural gap.

CEPs are perceived as unproven by customers. The resulting low level of demand for CEPs has two consequences for the labour market. Firstly, there is little understanding as to precisely what training and skills are required to support CEPs adoption. Secondly, there is low demand for people possessing these skills.

Consumers when purchasing tend to be presented with linear products and services that are cheaper than their CEPs based alternatives. This again puts CEPs at a financial disadvantage. Additional information regarding the value of the product or service could help offset the price signal. However, the Cultural Void results in a lack of consistent information from authoritative, trustworthy sources that would communicate the wider environmental and social additional value of CEPs based products and services. Personal views are then relied upon to justify additional cost which therefore limits the available consumer base.

The CEPs Ecosystem model suggests that interventions in relation to market value, culture, leadership, and knowledge are likely to be most impactful in improving the conditions for the increased adoption of CEPs by businesses. Whilst there will be some variation in their influence from sector to sector, these elements are expected to always be the foundation of the ecosystem and interventions at these levels should therefore have broad impact across the economy. However, neither intervention in a single element nor action by a single actor alone will bring a lasting increase in CEPs adoption. Instead, the CEPs Ecosystem perspective emphasises that action in one element can facilitate progress in others and it is together that a critical mass can be achieved, creating a positive reinforcement loop to a more circular economy.

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# Glossary

Term	Definition
CEPs Ecosystem	A circular economy practices ecosystem is a complex network of individuals and organisations whose actions support the adoption of business practices that are consistent with decreasing the input of virgin resources into the economy by using less, using for longer, using again, and switching to regenerative material use.
Circular	Consistent with decreasing the input of virgin resources into the economy by using less, using for longer, using again, and switching to regenerative material use.
Circular Economy Practices (CEPs)	Initiatives and activities that a business can adopt that are consistent with decreasing the input of virgin resources into the economy by using less, using for longer, using again, and switching to regenerative material use.
Cultural Void	The lack of shared understanding in relation to CEPs which prevents their mainstream adoption due to the inconsistent use and underdevelopment of CEPs related language and concepts.
Economic Actor	An entity – typically businesses, households, or the government – that engages in economic activity.
Entrepreneurial Ecosystem	A set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship. <sup>4</sup>
ESG (Environmental, Social & Governance)	A collection of corporate performance evaluation criteria that assess the robustness of a company's governance mechanisms and its ability to effectively manage its environmental and social impacts. <sup>5</sup>
Externalities	The costs and benefits related to the production or consumption of a product or service that are not reflected in its price.  Negative externalities are additional unrecognised costs and positive externalities are additional unrecognised benefits.
Market Value	The value (costs and benefits) related to the production or consumption of a product or service that is captured in its price.
UKETS (UK Emissions Trading Scheme)	The UK's cap and trade scheme for carbon emissions, whereby there is a limited allowance of carbon emissions for certain sectors but companies may sell or buy their allowance to achieve compliance.

<sup>4</sup> Stam, E. (2015) Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1765. Available at: <https://doi.org/10.1080/09654313.2015.1061484>

<sup>5</sup> Gartner (n.d.) Glossary: Environmental, Social and Governance (ESG). Available at: <https://www.gartner.com/en/finance/glossary/environmental-social-and-governance-esg>. (Accessed 23 April 2024)



# 1 Aims & Objectives

The concept of a circular economy is well-established amongst sustainability professionals and within academic literature, but Scotland's journey to a more circular economy remains in its early stages in terms of mainstream delivery. The "Circularity Gap Report Scotland 2022" ("CGR")<sup>6</sup> outlines four strategies to increasing circularity based on using less, using for longer, using again, and switching to regenerative material use, but found that Scotland's economy is only 1.3% 'circular'.

Increasing the adoption of approaches that a business can employ in line with the CGR strategies – referred to collectively in this Project as Circular Economy Practices ("CEPs") – will not only help increase the circularity of Scotland's economy but is expected to have a positive environmental and social impact, and play a significant part in Scotland's journey to Net Zero.

This project seeks to understand the barriers and constraints, both real and perceived, that prevent linear businesses from moving to a more circular operating model, or start-ups from adopting CEPs from the outset, and to provide an answer to the question:

## **What affects the uptake of Circular Economy Practices by businesses in the Scottish Economy and why?**

This project uses an ecosystem approach to look beyond businesses to the external influences upon them and build up a picture of the whole environment in which businesses exist. This provides context to the actions that a business can take and their likely effectiveness. Similarly, it provides a structure to understand the likely ease and impact of interventions to improve conditions for CEPs in Scotland.

Using an ecosystem approach allows us to investigate all key influences on businesses and their interplay rather than just focusing on the businesses themselves. By exploring each of the elements within the ecosystem we can build a picture of where the greatest challenges are and at what level intervention is required.

The project then seeks to:

- Define the Scottish CEPs ecosystem;
- Understand the current business conditions for CEPs in Scotland;
- Investigate the main barriers preventing businesses from adopting CEPs;
- Explore the interplay among the barriers and their impact on the business environment.

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<sup>6</sup> Circle Economy Foundation (2023) *The Circularity Gap Report: Scotland*. Available at: <https://www.circularity-gap.world/scotland> (Accessed 23 April 2024)

## 2 Introduction

### 2.1 Circular Economy vs Circular Economy Practices

The Circular Economy ("CE") can be defined as:

"The circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources."<sup>7</sup>

The above definition makes clear that the shift to a more circular economy is a means to deliver significant progress towards resolving many of the major challenges that the world faces. Reducing the scale of virgin resource consumption and moving to a more collaborative and sustainable economic model delivers environmental and social benefits, better aligning human activity with the needs of the planet and the wellbeing of its citizens.

Unfortunately, the extent or scale of the above definition can prove challenging for a business to convert into action. Therefore, for this project, we adopt the term Circular Economy Practices ("CEPs") which we define as:

**Initiatives and activities that a business can adopt that are consistent with decreasing the input of virgin resources into the economy by using less, using for longer, using again, and switching to regenerative material use.**

This is based on the four strategies for increasing circularity detailed in the Circularity Gap Report Scotland 2022<sup>8</sup> ("CGR"). Any practice that aligns with this definition would qualify as a CEP. Below is a non-exhaustive list of examples of CEPs:

- Designing for CEPs by considering the full lifecycle of a product or service at the design stage;
- Alternative business models, e.g., product as a service, leasing, sharing, rental, etc.;
- Resource use reduction/efficiency;
- Switching to materials and energy sources that regenerate and maintain stock levels;
- Reuse, Repair, Refurbish;
- Remanufacture, Recycling.

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<sup>7</sup> Ellen MacArthur Foundation (n.d.) What is a circular economy? Available at: <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview> (Accessed 23 April 2024)

<sup>8</sup> Circle Economy Foundation (2023) *The Circularity Gap Report: Scotland*. Available at: <https://www.circularity-gap.world/scotland> (Accessed 23 April 2024)

Whilst all CEPs are beneficial in increasing the level of circularity of the economy, changes at the point of design and manufacture will tend to be more impactful than downstream only interventions. Upstream measures have a greater capacity to be more fundamental, positively change the nature of processes, and reduce the scale of downstream issues.

Focusing on CEPs rather than CE has several benefits in this project. Using a clear term with a simple definition and examples reduces the potential for misunderstanding with participants. The examples of practices are relatable at business level and through the definition of CEPs allow for a more direct link to positive environmental impact. Finally, breaking the concept of circularity down into practices makes clear that linear or circular is not a binary choice. Businesses can become more circular over time through multiple smaller steps to change their business model and practices.

## 2.2 Entrepreneurial Ecosystems

Businesses are a product of their environment. The society around a business helps shape it and indeed businesses can, to varying degrees, provide influence back. To understand businesses and the challenges they face it is not sufficient to look only at the business but rather to look wider at all the interactions between the business and the society in which it exists.

The use of an entrepreneurial ecosystem<sup>9</sup> model when studying levels of entrepreneurship - how businesses start and progress - has arisen from both business strategy and regional development literatures.<sup>10</sup> It can be defined as

“a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship”<sup>11</sup>

It provides a framework in which to arrange the factors that influence the central entity - here the business - and to consider all those factors and the relationships between them. There is no single agreed framework within the academic literature, but that proposed by Isenberg (2011) is representative:

“six general domains: a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital, venture-friendly markets for products, and a range of institutional and infrastructural supports.”<sup>12</sup>

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<sup>9</sup> In ecology “an ecosystem includes all the living things (plants, animals and organisms) in a given area, interacting with each other, and with their non-living environments (weather, earth, sun, soil, climate, atmosphere). In an ecosystem, each organism has its own niche or role to play.” Australian Museum (2018) What is an ecosystem? Available at: <https://australian.museum/learn/species-identification/ask-an-expert/what-is-an-ecosystem/> (Accessed 23 April 2024). This concept of interdependency has resulted in the use of the term in a wider sense.

<sup>10</sup> Acs, Z. J., Stam, E., Audretsch, D. B., and O'Connor, A. (2017) The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, 49(1), 1–10. Available at: <https://doi.org/10.1007/S11187-017-9864-8>

<sup>11</sup> Stam, E. (2015). Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1765. Available at: <https://doi.org/10.1080/09654313.2015.1061484>

<sup>12</sup> Isenberg, D. (2011) Introducing the Entrepreneurship Ecosystem: Four Defining Characteristics, *Forbes*. Available at: <https://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics/> (Accessed 23 April 2024)

Scholars continue to re-work the structure, re-organising and re-naming the components (e.g. domains<sup>13</sup>, attributes<sup>14</sup>, pillars<sup>15</sup>, elements<sup>16,17</sup>) to better address different situations or to reflect their view. In this project, we adopt the term “element” to name the components of our ecosystem following the work of Stam (2015), which also informs the structure of our ecosystem (2.4.1). Across the world entrepreneurship arises in many different circumstances (e.g. sector, geography, market) and its analysis can be conducted at many different levels from individual business through to the global economy (micro, meso, and macro levels) and so some adjustment is to be expected. However, the usefulness of an ecosystem structure as a framework to analyse entrepreneurship has gained significant popularity since 2010<sup>18</sup> and has been applied in the Scottish context in several research projects.<sup>19,20</sup>

## 2.3 A Circular Economy Ecosystem

The concept of an ecosystem has been used to explain and study a variety of situations related to the circular economy. Previous work in this area is summarised by Aarikka-Stenroos et al (2021) who recognise that the systemic change required to transition to a circular economy is well represented by an ecosystem model<sup>21</sup>.

"To enable circularity, resource efficiency, and environmental sustainability in markets and society, flows of material, energy, and value must change at the system level. This systemic change requires multiple different actors, such as diverse organizations, cities and municipalities, and consumer–citizens, to interact in a complex multi-actor setting.

To address this setting, the notion of the “ecosystem” has become important in understanding how linear models can be transformed into circular ones, representing resource efficiencies and material flows typified by feedback loops and interdependencies among different actors.”<sup>22</sup>

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<sup>13</sup> Isenberg, D. (2011) Introducing the Entrepreneurship Ecosystem: Four Defining Characteristics, *Forbes*. Available at: <https://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics/> (Accessed 23 April 2024)

<sup>14</sup> Spigel, B. (2017). The Relational Organization of Entrepreneurial Ecosystems. *Entrepreneurship: Theory and Practice*, 41(1), 49–72. Available at: <https://doi.org/10.1111/ETAP.12167>

<sup>15</sup> World Economic Forum (2013) *Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics*. Available at: [http://www3.weforum.org/docs/WEF\\_EntrepreneurialEcosystems\\_Report\\_2013.pdf](http://www3.weforum.org/docs/WEF_EntrepreneurialEcosystems_Report_2013.pdf) (Accessed 23 April 2024)

<sup>16</sup> Stam, E. (2015) Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1759–1769. Available at: <https://doi.org/10.1080/09654313.2015.1061484>

<sup>17</sup> Stam, E. & van de Ven, A. (2019) Entrepreneurial ecosystem elements. *Small Business Economics*, 56, 809–832. Available at: <https://doi.org/10.1007/s11187-019-00270-6>

<sup>18</sup> Malecki, E. J. (2018) Entrepreneurship and entrepreneurial ecosystems. *Geography Compass*, 12(3). Available at: <https://doi.org/10.1111/gec3.12359>

<sup>19</sup> Hruskova, M., Mason, C., and Herzog, S. (2023) Mapping entrepreneurship support organisations: An examination of the ‘cluttered landscape’ critique, *Local Economy*, 37(7), 541–563. Available at: <https://doi.org/10.1177/02690942231173655>

<sup>20</sup> Hruskova, M. (2024) Ecosystem pipelines: Collective action in entrepreneurial ecosystems, *International Small Business Journal*, 42(1), 39–66. Available at: <https://doi.org/10.1177/02662426231178381>

<sup>21</sup> Aarikka-Stenroos, L., Ritala, P., and Thomas, L. D. W. (2021) Circular economy ecosystems: A typology, definitions, and implications. *Research Handbook of Sustainability Agency*, 260. Available at: <https://doi.org/10.4337/9781789906035.00024>

<sup>22</sup> Aarikka-Stenroos, L., Ritala, P., & Thomas, L. D. W. (2021) Circular economy ecosystems: A typology, definitions, and implications. *Research Handbook of Sustainability Agency*, 260. Available at: <https://doi.org/10.4337/9781789906035.00024>

They define a circular economy ecosystem as:

“a multi-actor entity in which interdependent actors play complementary roles. Actors include for-profit companies, public services, governmental bodies such as ministries, municipalities and cities, universities, non-profit organizations, and citizen-consumers. A CE ecosystem emerges or is created around a common, system-level goal related to resource circularity, and may involve the creation of CE knowledge, CE businesses, and economic value. Agency varies from focal actor-driven ecosystems to being widely distributed, and the ecosystem structure varies from tightly coordinated CE business models to loosely coupled affiliation structures oriented around CE goals.”<sup>23</sup>

They propose five different types of CE Ecosystem including an Entrepreneurial Ecosystem but also recognise that real world situations may be reflected by a combination of the types they identify.

CE Ecosystems models are useful to describe an existing situation, but there remains work to be done to study how CE Ecosystems emerge and evolve. Actors within a CE Ecosystem have differing levels of agency depending on their role within the ecosystem. This is an important consideration both when analysing a specific ecosystem and when designing policy interventions to improve business conditions.

## 2.4 The CEPs Ecosystem Framework

### 2.4.1 Elements from Entrepreneurial Ecosystem

The Entrepreneurial Ecosystem framework, in particular the models developed by Stam<sup>24</sup> and Spigel<sup>25</sup>, are highly applicable to the CEPs Ecosystem. In this project, we conceptualise the CEPs Ecosystem to comprise similar elements as the underpinning Entrepreneurial Ecosystem framework but re-contextualised for the adoption of CEPs, as shown in Table 1 (2.4.2). The most notable revision of the framework relates to the Markets element, which replaces Demand, because a CEPs Ecosystem requires not only the markets in which businesses can sell their products or services, but also the supply chains through which companies obtain the necessary secondary and regenerative materials. Culture and Leadership are merged into a single element as the demonstration of leadership by actors across the economy (business community, government, and society) proved hard to isolate from prevailing culture in relation to CEPs. Finally, Intermediate Services has been removed as this relates to other support services such as legal and financial services that will be less relevant to CEPs adoption than to startup businesses and business support is captured under Networks.

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<sup>23</sup> Aarikka-Stenroos, L., Ritala, P., & Thomas, L. D. W. (2021) Circular economy ecosystems: A typology, definitions, and implications. *Research Handbook of Sustainability Agency*, 271. Available at: <https://doi.org/10.4337/9781789906035.00024>

<sup>24</sup> Stam, E. (2015) Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1759–1769. Available at: <https://doi.org/10.1080/09654313.2015.1061484>

<sup>25</sup> Spigel, B. (2017) The Relational Organization of Entrepreneurial Ecosystems. *Entrepreneurship: Theory and Practice*, 41(1), 49–72. Available at: <https://doi.org/10.1111/ETAP.12167>

## 2.4.2 CEPs Specific Element

In addition to the elements translated across from an entrepreneurial ecosystem there is an additional element to be considered in the case of a CEPs Ecosystem – Prevailing Measure of Value.

Value in society and its economy falls into two categories – market value and externalities. Market value measures the costs and benefits of the production or consumption of a product or service that is captured in its price. Externalities, on the contrary, are costs and benefits related to the production or consumption of a product or service that are not reflected in its price. This occurs because market value has an explicit monetary value whereas externalities do not. Governments can enforce the recognition of externalities by giving them a monetary value (e.g. tax), such that they are reflected in prices, or by introducing other interventions that change production or consumption patterns (e.g. ban or restriction). Having the economy rely upon a measure of market value that does not fully reflect environmental and social costs impacts upon actor incentives and decision making.

Given that wider environmental benefits are a major reason for moving to a more circular economy, this then causes an issue. Some CEPs are cost reducing for a business (e.g. those relating to resource efficiency – wasting less), meaning that whilst there is a wider unmonetised environmental benefit, there is also a monetary benefit to the business in terms of lower inputs costs. Other CEPs are cost increasing for a business (e.g. the use of a more sustainable and more expensive input), meaning that there is still a wider unmonetised environmental benefit, but the monetary impact to the business is increased cost. In this second case the adoption of the CEPs increases costs and makes the business less profitable, all other things equal.<sup>26</sup> In simple terms, where CEPs increase business costs without the ability to gain the wider benefit, this is likely to be a barrier to their adoption.

Businesses or consumers may informally recognise the value through accepting smaller profit margins or paying a higher price, but this is likely to be a barrier to success at scale. Certainly, lenders will wish to see loans repaid in monetary terms and any investors will wish to see a monetary return on their investment.

The Prevailing Measure of Value element therefore considers the impact of externalities on the adoption of CEPs.

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<sup>26</sup> This is a simplified example, it is of course possible that the new sustainable input moves the business' product into a different market segment and sales increase at a higher price point, but that in itself is a risk with which the business would have to be comfortable and may therefore also present a barrier.

Element	Definition
Prevailing Measure of Value	The failure of the economy to include the full environmental and social costs of business activity
Culture & Leadership	Cultural attitudes which support and normalise CEPs and innovation
Knowledge	Understanding of CEPs and how to incorporate them into operating models
Institutions	State-run programmes or regulations that either support the adoption of CEPs through direct funding or by removing barriers to their use
Markets	Presence of sufficient commercial opportunities to enable CEPs adoption and unimpeded access to global markets
Networks	Presence of social networks that connect entrepreneurs, advisors, investors, workers, and customers, and that allow the free flow of knowledge and skills relating to CEPs, including business support
Infrastructure	Availability of sufficient physical and digital facilities to enable CEPs adoption
Finance	Availability of investment capital for businesses adopting CEPs from family and friends, angel investors, and venture capitalists
Talent	Presence of skilled workers who are willing to adopt CEPs

Table 1: CEPs Ecosystem elements

### 2.4.3 The CEPs Ecosystem

Grouping similar elements together helps to clarify the relationships between them. Spigel (2017) uses Cultural, Social, and Material groups<sup>27</sup> which, with some re-definition, are applicable for the CEPs Ecosystem.

- **Cultural elements** are fundamental values within society, beliefs, and ideals that pervade all economic actors.
  - Culture & Leadership, Prevailing Measure of Value
- **Social elements** are the networks within society and the resources and information that flow across those networks.
  - Networks, Finance, Talent, Knowledge
- **Material elements** define the space in which the business operates both physically and conceptually.
  - Institutions, Markets, Infrastructure

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<sup>27</sup> Spigel, B. (2017) The Relational Organization of Entrepreneurial Ecosystems. *Entrepreneurship: Theory and Practice*, 41(1), 49–72. Available at: <https://doi.org/10.1111/ETAP.12167>

In this group arrangement, the cultural elements support the social elements that in turn support the material elements. Conversely, the material reinforces the social that reinforces the cultural, as shown in Figure 1.



Figure 1: Initial CEPs Ecosystem

There is no single template for ecosystem success<sup>28</sup>. An ecosystem that provides the conditions for the desired behaviour to flourish (in this case CEPs adoption) will have a critical mass across all elements, however, its distribution will vary from situation to situation (e.g. from sector to sector, from location to location, from micro to macro). Though, the following generalisation can be used as a guide:

- A flourishing ecosystem typically requires strength across multiple elements.
- Where strength is across multiple elements, then co-ordination and collaboration are likely to enhance that strength.
- The Cultural elements are the foundation on which the ecosystem is built.
- A notable deficit in one or more of the element groups is likely to prove a substantial impediment.

The move to a more circular economy will mean a move to a more collaborative and co-operative economy to ensure the circulation of products and materials. This also makes it more likely that the necessary critical mass will need to be distributed across multiple elements.

<sup>28</sup> Spigel, B. (2017) The Relational Organization of Entrepreneurial Ecosystems. *Entrepreneurship: Theory and Practice*, 41(1), 49–72. Available at: <https://doi.org/10.1111/ETAP.12167>



## 3 Methodology

To understand whether Scotland's businesses are adopting CEPs and the factors that support or hinder their adoption, this research draws on primary interview data from a wide range of stakeholders, ranging from organisations with experience of providing support to businesses to subject matter experts in Scotland. There were four stages to the methodology adopted, as shown in Figure 2.

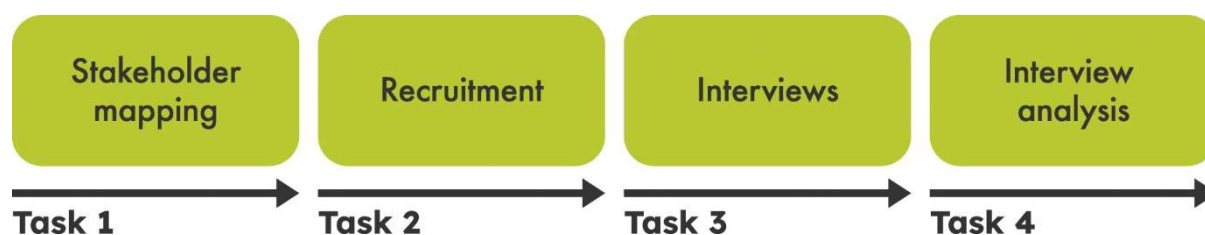


Figure 2: Qualitative research design methodology

The project was scoped and designed by the authors. An external research organisation<sup>29</sup> was then tasked with undertaking the data collection process and initial analysis. The authors fed into the stakeholder mapping process to ensure all key actors were included in the list of potential interviewees. Participant recruitment and subsequent interviews were conducted by the research organisation which allowed participants to express candid opinions about any organisation in the circular economy domain. An initial analysis was provided by the research organisation, which helped identify emergent patterns, but the transcripts were further analysed by the authors with the ecosystem framework in mind. The process is detailed in sections 3.1 to 3.4.

### 3.1 Task 1: Stakeholder mapping

The aim of this task was to establish a database of stakeholders to act as the sampling frame for recruitment for interviews.

A map of stakeholders who could provide insights into one or more CEPs ecosystem elements was created through a combination of existing knowledge and contacts of actors in the system as well as a short desk-based research exercise. The focus was on trusted intermediaries<sup>30</sup>, subject matter experts, and key contacts in trade associations, business support sectors, finance, knowledge centres, and academia. To fit within the timescales for delivery, the stakeholder mapping methodology centred on adopting a purposive sampling<sup>31</sup> methodology.

A spreadsheet containing a list of 80 stakeholder organisations and individuals was collated and each stakeholder was cross referenced against their anticipated knowledge of each ecosystem element. This stakeholder map also took into consideration their geographic

<sup>29</sup> Resource Futures

<sup>30</sup> Organisations who are understood to have earned the trust of businesses through effective relationship building and long-term engagement. These organisations are likely to be called upon by businesses as sources of information support or resources on legal, strategic, and practical matters.

<sup>31</sup> Potential stakeholders were selected because they had characteristics that were needed in the sample, specifically the ability to provide breadth or depth of insight into ecosystem elements from their roles and experiences.

location and primary sector in the economy. The stakeholder map was used iteratively as data was collected, enabling a dynamic approach to recruitment.

## 3.2 Task 2: Recruitment

The aim of this task was to recruit a breadth of participants for interviews who could collectively provide an insight into all ecosystem elements. The methodology for recruitment was built upon convenience<sup>32</sup> and snowball<sup>33</sup> sampling. This approach provided the greatest opportunity for timely delivery within challenging timescales. By drawing on the stakeholder database, 60 prospective participants were invited for an interview. Of those, 27 were interviewed, representing a positive response rate of 45%, with interview times ranging from 32 minutes to 52 minutes. The interviewees' backgrounds spanned trade associations, business support, finance, knowledge centres, and academia, but many of them held other relevant roles in the past so they frequently answered questions based on their cumulative experience rather than solely based on their current role. An overview of interview participants and the main ecosystem elements they discussed is provided in Appendix A.

As part of the recruitment process, each participant was provided with an information sheet and a consent form. The information sheet outlined the purpose of the work and relevance to the potential interviewees, explaining the purpose of the project and why their input was important. The information sheet and consent form are included in Appendices B and C, respectively.

In selecting organisations to contact, priority was given to organisations that could provide insights across multiple ecosystem elements. A recruitment log was maintained, and interviews were carried out on a "first come first served" basis to ensure data gathering was completed during the delivery timeframe. As such, participants interviewed are not representative of Scotland's entire business population or discrete actor groups in the ecosystem. However, through the recruitment log, the range of participants recruited were monitored and where there were potential major gaps in sector or ecosystem element insights, other stakeholders on the list were purposively prioritised.

## 3.3 Task 3: Interviews

The aim of this task was to carry out 30-minute semi-structured interviews with each interviewee. Interviewees were found to be highly engaged with the topic, with interviews lasting longer than 30 minutes. The longest meeting was 52 minutes and the shortest meeting lasted 32 minutes. A total of 27 interviews were conducted in Autumn 2023.

To enable effective analysis, a topic guide was developed as provided in Appendix D to give an element of consistency to questioning. At the outset, all interviewees were provided with a comprehensive definition of CEPs in addition to a range of examples to ensure that all participants had a similar understanding of CEPs. Given the breadth of the ecosystem elements being investigated, the questions asked of each interviewee varied according to their responses to the open question: *"What do you think affects the uptake of circular economy practices by businesses particularly in the Scottish economy?"*

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<sup>32</sup> A non-probability sampling method where potential respondents are selected for inclusion because they are potentially the easiest to access, due to availability in the project timescales, likely willingness to participate, and existing relationships.

<sup>33</sup> A non-probability sampling method where existing respondents provide referrals or support in recruiting others that they have existing relationships with or influence over.

Interviews were conducted virtually using an auto transcription tool. Each transcribed interview was checked for accuracy and anonymised by a member of the contracted research organisation.

### 3.4 Task 4: Interview coding and analysis

The aim of this task was to consistently apply an analytical framework that would support the identification of barrier themes for each ecosystem element and the relationships between barrier themes identified in each ecosystem element.

The software programme NVivo was used to efficiently organise, analyse, and visualise the semi-structured qualitative data. In particular, NVivo allowed for the development of a clear coding structure to develop themes and search through the interview data. Under each theme, the relevant extracts from each interview were stored to help identify sub-themes and show the depth and propensity of each theme, i.e. how widespread the view was.

Braun and Clarke's six step approach was used as a guiding principle for the thematic analysis to dive into the insights provided by the interviewees.<sup>34</sup> The six steps include (1) becoming familiar with the data, (2) generating codes, (3) generating themes, (4) defining, naming, and reviewing themes, (5) developing linkages between themes, and (6) producing the report. This framework is both a popular and compelling qualitative analysis method. The approach adopted is summarised in Table 2. Table 2: Application of the Braun & Clarke's six step approach

Multiple team members conducted the analytical process. Internal workshops took place to discuss coding and emerging themes from each element and identify key similarities, crossovers, and differences across the ecosystem elements. Conducting the internal workshops ensured that the analysis was undertaken with replicability in mind. It also allowed the interpretations and analysis of the data to be sense checked and challenged where necessary.

The resulting analysis was reviewed by the second author with expertise in entrepreneurship and ecosystems. By comparing the empirical data with mainstream entrepreneurship theory, several contradictions and overlaps were revealed which offered valuable insights. Specifically, the contradictions highlighted areas where CEPs fundamentally depart from the underlying linear economic model, while the similarities indicated how some of the characteristics of the Scottish business environment, such as fear of failure, shape and reinforce some of the barriers faced by not only CEPs-adopting but also non-CEPs businesses. Subsequently, drawing on ecosystem theory provided additional insights into the nuanced interplay between individual themes, beyond what was initially evident from the empirical data. At this stage, the research team transferred the analysis into a series of diagrams which helped to not only identify the key barriers but also identify how and why they hinder the adoption of CEPs (Figure 3).

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<sup>34</sup> Braun, V. & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. Available at: <https://www.tandfonline.com/doi/abs/10.1191/1478088706qp0630a>

#	Step	Action(s)
1	Familiarity with data	Transcripts for the different questions were consolidated into a single folder. The team immersed themselves in the data through iterative cycles of reading.
2	Code generation	Initial coding was carried out on all transcripts to identify sections of data associated with each ecosystem element. Responses were coded at a particular element when discussed in the context of answers to questions not specific to the ecosystem element, e.g. prevailing measure of value when discussing markets. All data coded at an ecosystem element was collated together into one file. For each ecosystem element areas of importance and reoccurring concepts relating to that ecosystem element were identified through line-by-line coding.
3	Theme generation	As patterns emerged for each ecosystem element, codes were clustered into higher level topics (sub themes), that were then reviewed to determine candidate themes for each ecosystem element.
4	Theme review	The team came together regularly to review approach to coding and the developing themes, revisiting the data coded as required. The main themes relating to each of the ecosystem elements were brought together and reviewed for similarities with other barriers identified in different ecosystem elements.
5	Theme linkages	The main themes were reviewed through the entrepreneurship and ecosystem lenses. This led to the identification of notable contrasts and similarities with the mainstream linear economic model. It also provided further explanation of the relationship between themes and how they reinforce or undermine one another.
6	Producing the report	Key insights were summarised in a diagram, which aided the explanation of key themes and relationships throughout this report.

Table 2: Application of the Braun &amp; Clarke's six step approach

### 3.5 Limitations of the study

The relatively tight timeframe for this study is reflected in its limitations. First of all, the focus of this project is to capture a systemic overview of the key factors affecting the uptake of CEPs by businesses in Scotland. Therefore, the stakeholder mapping and selection process emphasised participants who have a broad understanding of the issue. This has meant that the participants interviewed were not businesses, but organisations who have experience of working with or researching businesses. Consequently, their responses reflected their views of barriers for businesses and were not necessarily based on first-hand experience as business leaders. Furthermore, priority was given to participants who responded quickest and could accommodate an interview in the very short timeframe which has meant that it was not possible to guarantee a good balance of expertise across the various ecosystem elements.

Instead, the focus of each interview was adapted to each participant's area of expertise, determined by their response to the open question on what they thought affected the uptake of CEPs by businesses. Overall, it must be emphasised that the subsequent findings are exploratory rather than generalisable, but this is a common feature of qualitative research.

## 4 Findings

All the findings presented within 4.1 are derived directly from the views expressed by the interviewees and the research team's interpretation of them. Further analysis was required to produce the narrative presented in 4.2 but it also links directly back to the interview data.

### 4.1 Evidence by element

Analysis of the interview data suggests that the CEPs Ecosystem model would benefit from some minor re-structuring to better reflect the evidence gathered. This is detailed in Table 3 and reflected in the presentation of findings that follows.<sup>35</sup> Leadership and Support are now separate elements as they emerged as clear themes from the interviews. The former splits out from Culture & Leadership and the latter previously formed part of Networks.

Element	Definition
Prevailing Measure of Value	The failure of the economy to include the full environmental and social costs of business activity
Culture	Cultural attitudes which support and normalise CEPs and innovation (including language and risk)
Leadership	Leading by example, through championing a vision for a circular economy and modelling behaviour
Knowledge	Understanding of CEPs and how to incorporate them into operating models
Institutions	State-run programmes or regulations that either support the adoption of CEPs or remove barriers to their use
Markets	Presence of sufficient commercial opportunities to enable CEPs adoption and unimpeded access to global markets
Networks	Presence of social networks that connect entrepreneurs, advisors, investors, workers, and customers, and that allow the free flow of knowledge and skills relating to CEPs
Infrastructure	Availability of sufficient physical and digital facilities to enable CEPs adoption
Finance	Availability of investment capital for businesses adopting CEPs from family and friends, angel investors, and venture capitalists
Talent	Presence of skilled workers who are willing to adopt CEPs
Support	Programmes and initiatives that provide support for businesses interested in introducing CEPs

Table 3: CEPs Ecosystem elements redefined in light of research findings

All quotations from the interviews are attributed to the relevant interviewee participants. The background of each participant is noted in Appendix A.

<sup>35</sup> The evolution of the elements included in the ecosystem during the project is shown in Appendix E.

#### 4.1.1 Prevailing Measure of Value

According to participants, businesses are primarily driven by the bottom line, emphasising the importance of managing cash flow effectively and prioritising survival, particularly when the economic environment is uncertain.

"I guess a general observation that probably four years ago, circularity and sustainability as a whole had really increased in priority for businesses and consumers, and then COVID hit and actually survival became the key thing. And, actually, people just wanted things at the lowest cost because, you know, they had to survive." (Participant 15)

However, businesses are open to operating in a more societally and environmentally enhancing way, but these ambitions are hindered by a significant fear of failure<sup>36</sup>.

"Most people want to do the right thing. They just don't know how sometimes, and sometimes they might try something, and they'll fail. And they'll be hesitant in trying again. So, I feel like sometimes people have their right idea, but their timing maybe is not there, so yeah, I don't know. How can we incentivize people that have already tried and failed to try again?" (Participant 10)

While businesses value growth and see the potential of CEPs, making a profit and the need for short-term focus in times of uncertainty often hinders adoption, since change is perceived as costly. CEPs are being treated as an addition rather than the norm.

"it's almost like the circular economy is its own concept rather than something that should be embedded into everything" (Participant 19)

Society's linear economic model means the full cost of resources in terms of carbon emissions and pollution, for example, is not recognised by businesses and customers. As these externalities are not accounted for in pricing and businesses value making profit, changing their mindset and approach to resource use is not on the agenda.

"I think one of the main things that discourages [businesses] is just that the linear economy is so entrenched and the full cost of using resources is not part of our economic system. So, if you don't have to pay the full cost of the resources in terms of pollution and biodiversity loss and carbon emissions and things like that, you don't necessarily realize how important it is to reduce these, to reduce resources and to opt for something like a more circular option. And so, I think in the absence of that and in the presence of needing to make a profit and to potentially deliver profit for shareholders or just to have a viable business resource, resources won't necessarily feature in the front of anyone's mind in terms of what they need to do." (Participant 9)

As a consequence, there is a lack of clarity on how CEPs align with the priorities of businesses and their existing strategies. For example, a predominantly environmental rationale may be perceived to conflict with business objectives. Indeed, businesses lack clarity on specific or tangible actions and benefits associated with adopting CEPs. At present, the circular economy

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<sup>36</sup> Hruskova, M. (2022) The governance of entrepreneurial ecosystems: greater than the sum of their parts. PhD thesis, University of Glasgow. Available at: <https://theses.gla.ac.uk/82794/>

and CEPs are seldom seen as being associated with an economic rationale, which restricts internal buy-in and investment. Therefore, the way the circular economy is framed affects the level of embeddedness in business strategy.

“It can't always just be an environmental narrative. There has to be a strong economic rationale... Focusing on those upstream solutions is crucial. Why is it important to the business not just to the environment itself? So, things related to the resilience of a business and longevity, stability in turbulent economic times, the impact of climate change on the business itself. Putting it in the frame of the business is really helpful.” (Participant 8)

#### 4.1.2 Culture

The circular economy concept is not deeply engrained in Scottish culture. The interviews with participants suggest a lack of shared understanding and language across the economy in relation to what CEPs are, why they are important at a societal level, and what value they bring to individual actors in the economy. This presents a notable barrier to effective communication between actors that likely manifests across all elements and discourages CEPs adoption.

From a wider society point of view, the public appear to not understand the role they need to play in the transition to a circular economy. They think they are acting responsibly, particularly in relation to recycling, but are unaware of the key changes that are required to the culture of consumption embedded in society, as highlighted in the following quote.

“...the culture is not there because our culture is consumption for growth. That is our culture and this kind of rat race to have what everyone else has ... have the house, have the car, have the family, have all the latest trends ... and until that changes, the culture of a circular economy will not be embedded within Scotland.” (Participant 7)

Overall, the findings suggest that there are societal cultural views and values that inhibit customers' adoption and acceptance of CEPs. There is a strong connection between consumerism and societal perceptions of success. Social pressure exists to conform to materialistic trends, and the prevailing messaging encourages people to buy new, communicating that choosing sustainable options may have a negative impact on one's life.

“It is this whole narrative of to be sustainable is to lack or is to be different or is to be annoying or is to make me feel like I can't live the life the way I want to live.” (Participant 7)

##### 4.1.2.1 Language

There is a general perception amongst participants that circularity is an ambiguous term without a commonly shared definition. This prevents individuals and businesses from understanding what it means to be circular, what the benefits are, and how they can adopt CEPs in practice.

The current language of the circular economy is perceived by businesses as technical and potentially alienating. Confusion is compounded by an influx of technical terms associated with improved environmental management, including net zero, ESG, and carbon neutrality, which is positioned as de-emphasising CEPs.



“Trying to connect all these different concepts and requirements affects the understanding how circular economy fits into the wider narrative” (Participant 23)

“I think businesses don't necessarily understand what is even meant by circular economy if they're not already in it.” (Participant 24)

The language used in relation to actors within the economy can also be unhelpful. In particular, labelling individuals as ‘consumers’ has a negative impact, as it implies a lack of identity beyond purchasing behaviour.

“... which is all just like pushing consumption for growth and that is what we are all told. Like we are not referred to as citizens or people, we are referred to as consumers. And until that changes, we are not going to change... But I think it needs to be this consumer push as well as the government push if industry are going to change.” (Participant 7)

This is also apparent in terms of the language and value communication between actor groups, for instance, the attempts by businesses to communicate positive environmental features of their products and services. The public lacks understanding of the sustainability labels and credentials used by businesses, although the level of this can vary dependent on the type of product. In general, there are too many certification schemes, and this negatively impacts customers’ understanding of products and services developed through the adoption of CEPs.

“The plethora of those [sustainability] schemes is really not helpful for understanding at the moment and it is difficult in terms of labelling. Does the Better Cotton Initiative mean that you are getting a more sustainable garment?” (Participant 5)

In addition, when businesses communicate with investors CEPs are seldom framed and pitched in a way that is consistent with the need for a return on investment. Not engaging with the language and concepts of the target audience can result in CEPs being perceived to lack commercial viability.

“[businesses] expected the finance institutions to understand what the circular economy was, whereas the view of the finance institutes was that the circular economy businesses have to understand how the finance institutions work and therefore communicate the benefit of circular economy practices or circular products in a way that attracted them rather than expecting them to understand. [...] I think the finance landscape is supportive, but the projects and the products have to be pitched in the right way to be able to attract that investment” (Participant 15)

#### 4.1.2.2 Risk

The level of risk associated with CEPs adoption is relevant to most economic actors. For example, participants express the view that businesses are concerned about the risk to their brands and reputations when implementing particular CEPs that involve reused or remanufactured items or materials. There is a potential culture of fear associated with providing such products or services that customers perceive as being lower quality and having the potential to fail earlier than new products.

"I think it is that fear of failure, of a product, of the ability to provide a warranty, to have confidence that something that has been previously used and has, you know the value retained in it" (Participant 15)

CEPs can be considered to represent more experimental models which are not yet proven or sufficiently tested. As a result, businesses adopting CEPs are more likely to be seen to sit at the riskier end of the market. The lack of investor openness towards CEP innovations unproven in a market is reinforced by a typical association with early-stage businesses which are yet to demonstrate scale.

The public sector and local authorities can play a role in driving considerations of sustainability through public sector contracts and in leading the transition in cities and regions. However, the public sector tends to be risk averse. In discussing the culture of risk aversion in big organisations, an interviewee noted how the same culture extends to the public sector.

"..I think cultures are important ... as companies get bigger, particularly and people don't want to rock the boat, they don't want to introduce change. They don't want to make decisions that are wrong. .... and certainly in the public sector. I've seen where people are so worried about making the wrong decision, they make no decision" (Participant 14)

#### 4.1.3 Knowledge

In the view of participants, businesses commonly err in only understanding circular economy in downstream terms (e.g. recycling and reuse of waste and unwanted goods). This limits the range of CEPs considered for adoption. Even in cases where businesses fully understand the circular economy concept, an awareness of disconnect between theory and practice is evident.

"My experience is that it [circular economy] is just not on the table and it's not being talked about at all. In certain sectors they might be talking about limited elements within that definition [of CEPs]." (Participant 14)

A knowledge gap exists in relation to CEPs. Due to the language challenges mentioned previously, many businesses lack clarity on how CEPs apply to specific businesses and specific sectors. Leaders are then prone to taking a view that the circular economy is something that doesn't apply to them.

"It's really difficult to show [businesses] what the opportunities are. There is no mapping of the opportunities. There's one-off case studies... but almost nothing to say, here's where some opportunities might be. That just doesn't exist at the moment. We are probably waiting too much on people approaching us about it. ... Once we've got a better idea of right, well, here you're this kind of business and this is what we've identified for you as like a really great opportunity or this part of the supply chain, you know, here's what it looks like, here's what the steps you need to take, here's the potential funding, these are the potential savings and benefits, here's what the end result would look like, and here's what the outcome of that would be, then we can really start to actually talk to them about tangible things." (Participant 19)

Case studies can provide examples of what activities constitute CEPs, how other companies adopted them, the challenges they faced, and how they benefited. They can also offer

guidance on the practical implementation of CEPs. As such, they serve as proof of concept that de-risks CEPs adoption both in technical and commercial terms.

“There aren't enough case studies for a company to look at and say, yes that's a company similar to us... and here's something they've done that can make a significant difference” (Participant 20)

#### 4.1.4 Institutions

The adoption of CEPs can be driven by the intrinsic motivation of both customers and businesses, but participants emphasise that there is also a strong need for external incentives, especially in the form of regulations and policies.

“I think there needs to be of a strong regulatory framework to make this happen, and I think voluntary here and there might work for certain defined sectors or waste streams. But if you're looking for change across the board, I think you need to go down the regulatory route.” (Participant 16)

However, these regulations also need to be enforced otherwise not all businesses will comply. Even though businesses do not like to spend large sums of money on regulatory compliance, “if it costs all our competitors, it's less of an issue” (Participant 1).

Due to Scotland's devolved status, Scottish companies are subject to regulations from both UK and Scottish governments, with the latter seeking to maintain alignment with the EU. A key challenge is that the different governments do not always have aligned priorities, which impacts the businesses on the ground.

“It depends which government we're talking about. Because some of the regulations relating to food production are reserved to Westminster and some are obviously devolved to Scotland, and then you have the situation where the current Scottish Government wants to remain aligned to what Europe's doing in terms of circular economy and there's a commitment to that. They've signed a commitment to that and the Westminster Government as it stands at the moment certainly have not. So you've got potentially 3 different layers of regulation, 3 different sets of ambitions. And that makes it quite challenging. ... You can come up with some very interesting clashes where [...] one government wants to go one way and another government wants to go another way. And if you're a food manufacturer, you're kind of stuck in the middle of that.” (Participant 25)

Overall, participants identify a need for a broad range of co-ordinated policy measures to support CEPs adoption at scale and speed, but do not believe they are currently in place.

#### 4.1.5 Leadership

On the whole, participants express concern about the lack of clear ownership and responsibility for driving change and therefore a lack of an overarching and ambitious vision regarding what a circular economy for Scotland looks like. No clear economic rationale for the circular economy yet exists at a national level which is likely to be holding back the circular agenda. This, in turn, is likely affected by the view of participants that within the Scottish Government, the remit for the circular economy seems narrowly defined to waste rather than as a fundamental approach to the economic system.

“Within the Scottish Government, one of our things we've been trying to push for is to get the circular economy beyond the Scottish Government's waste portfolio. We need to be making the economic argument for a circular economy and making a stronger case than we have been at the moment. So, it's engaging with other departments within the Scottish Government to ensure that they're tapped into this and yeah, that the full economic benefits go beyond. It's not just something that is part of the waste division of Scottish Government to deal with.” (Participant 16)

Participants also note deficiencies in leadership in this space at a global and UK level which, given the level of trade across Scotland's borders, represent a notable barrier.

The Scottish Government is ahead of many other governments with regard to its interventions in the circular economy sphere to date and there are differing views about its approach to policy making. Although it can be seen as demonstrating “quite strong leadership when it comes to the circular economy” (Participant 16), for some this is seen as “quite aggressive” (Participant 1). Without an overarching vision that would contextualise governmental regulations, any interventions are likely to lead to such polarised opinions, with some considering them excessive, meanwhile others seeing them as a first step towards championing CEPs.

What is more, due to Scotland being somewhat of an early adopter, this inevitably means that some course correction is necessary which can be seen as a reputational risk.

“But just finding that balance and I think that we're not necessarily in that space, particularly in Scotland, which tends to be quite aggressive in policy making in this area. And as a consequence, Scotland is seen within the wider UK as this is where lots of these things come out with and often with that we have to fix them before they can actually be adopted elsewhere, which is not ideal for the reputation of the nation.” (Participant 1)

The uncertainty about the government's implementation of new regulations is heavily criticised among the business community. Though, some of it may be due to the fact that “policies have been designed for the existing linear system that we have” (Participant 8).

“I think sometimes some of the implementation of the regulations and the legislation isn't that great, and that can be a bit of a problem. [...] so we'll get geared up for deposit return then that itself was shelved and I think for two or three years at least. So, it's been like considerable uncertainty in this space. That means sometimes it's quite tricky to understand what's going on at this Scottish Government/Zero Waste Scotland level, making sure the various bits and component parts are all aligned with each other.” (Participant 16)

Some businesses feel insufficiently consulted about the introduction and implementation of new regulations. Some policies “don't consider well enough the impact on businesses” (Participant 24) who can then get overwhelmed by “a barrage of things all coming out at once” (Participant 22). This undermines the relationship between the government and the business community, who “end up arguing rather than delivering” (Participant 1). Although it is recognised that everyone has responsibility for championing CEPs and therefore leadership needs to come not only from government but also entrepreneur role models, this research suggests there is currently a leadership void in the business community.

#### 4.1.6 Networks

A recurring theme amongst participants is the notable absence of a strong network among businesses in relation to CEPs, with most actors typically operating in siloes. Competition between businesses poses challenges in terms of both trust and the potential for collaboration.

*“the competition can be quite fierce, so some people are very gracious with their knowledge and happy to collaborate, but more often than not, you know, it can be a bit sort of cagey” (Participant 18)*

A well-connected business community often functions as an integral source of support. However, there does not seem to be a CEPs community, which hinders peer-to-peer learning and information sharing in general.

*“I think there's a little bit of work that needs to be done around relationship building in a different way for a circular economy, so less transactional, more collaborative ... but also there's a kind of information spreading exercise ... circular economy is not necessarily something that's on the radar for all businesses.” (Participant 8)*

Building a community typically requires one or more actors to act as role models who can galvanise the community at the grassroots level and bring them to the table. The interviews do not offer any compelling evidence of community leadership, but there are multiple calls for the government to lead through legislation instead.

#### 4.1.7 Support

In the absence of a peer community, participants note that businesses rely on support from public agencies. However, they find the landscape of support organisations is cluttered and therefore difficult to navigate<sup>37,38</sup> and they do not necessarily trust the public sector.<sup>39</sup>

*“I think networks are going to be a huge thing ... having worked for an economic development agency, which is essentially public sector, there is a lot of distrust around, you know, the support government can offer.” (Participant 19)*

*“a business may not want to have a conversation with the local authority that then opens them up to something, you know, like, for example, imagine if I was a business and I said to local authority “So I've got all this waste and I'm really interested in finding somebody or finding something myself to do with this waste” and the local authority says “Oh really, have you got all that waste? How do you dispose of it at the moment?” Or, you know, “you shouldn't have. You can't hang on to that waste.” You then just opened up a little bit of a Pandora's box sometimes depending on who you have a conversation with.” (Participant 24)*

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<sup>37</sup> Hruskova, M., Mason, C., and Herzog, S. (2023) Mapping entrepreneurship support organisations: An examination of the 'cluttered landscape' critique, *Local Economy*, 37(7), 541-563. Available at: <https://doi.org/10.1177/02690942231173655>

<sup>38</sup> Hruskova, M. (2024) Ecosystem pipelines: Collective action in entrepreneurial ecosystems, *International Small Business Journal*, 42(1), 39-66. Available at: <https://doi.org/10.1177/02662426231178381>

<sup>39</sup> Hruskova, M. (2022) The governance of entrepreneurial ecosystems: greater than the sum of their parts. PhD thesis, University of Glasgow. Available at: <https://theses.gla.ac.uk/82794/>

There seems to be little support specifically targeted at businesses adopting CEPs, compared to mainstream commercial businesses, though this may reflect the fact that they can come from any sector so there is not a one-size-fits-all template of support. It was noted that there is low engagement with existing support provision, which may be a consequence of the cluttered landscape that does not offer the necessary signposting.

“...there is support out there but people are not understanding it, they're not applying to it, and it kind of needs to be more targeted” (Participant 19)

However, this does require the businesses to already have a degree of interest in CEPs.

“...there has to be a little bit of initial spark. They have to want to be there and talk to you about it. Otherwise, the conversation is going to go nowhere. Selling sustainability to someone who doesn't want to hear it is not pointless but it's a challenge, and there's a lot more of that mindset should they have to go for through before they can be ready to sort of start saying, OK, I really want to implement change in my business. Can you help me figure out how to do that?” (Participant 23)

If the right support is identified, even then many businesses do not have the time or resources to fully engage with the support on offer.

“I think there's loads of information out there, but the reality is you know business owners and staff do not have time to sit and look at online resources or information packs. They won't consume it. You need somebody or a team of people out there and engaging with them directly because you can create as many tools and resources as you want, but unless you actually build up a personal relationship with these businesses and support them in their understanding in terms of how it's actually going to benefit their business, why would they create time to look at a resource or tools or information? They haven't time to sift through all of that and then try and work out what they do with that and how they translate that into something that's going to work for their business.” (Participant 4)

In fact, it was reported that some support providers are already inquiring about businesses' ambitions for adopting CEPs and having conversations about their commitment to CEPs.

“I know certainly the enterprise agencies are looking at it as being a criteria now, asking the businesses if they are committed to becoming or achieving net zero as an organisation. We also ask them about fair work. We don't currently ask them to evidence that, but I think that we probably will and I would imagine that within the next couple of years we will be seeing, you know, hard evidence of this and looking for that commitment from businesses. We also challenge them on how the project will benefit society or the environment or equality and diversity [...] Currently it's not a criteria [for us] but we are asking the question and then I think it probably will eventually become a criteria.” (Participant 12)

Funding is one of the most requested forms of support. However, the funding and public procurement schemes available are seen as time and effort consuming which prevents companies from applying, especially the small ones that may not have enough resources to develop their applications.

“...small businesses [...] don't have teams of people just working on these potential bids for funding” (Participant 22)

#### **4.1.8 Finance**

The financial landscape is becoming more aware of CEPs but return on investment remains the primary driver for most investment decisions according to participants. At an institutional level, CEPs require patient capital which conflicts with how capital markets are structured, with a relatively short-term outlook.

“Money is always going to be the primary driver... it will always be at the core. The reason somebody is an investor is because they want to make money, make more money for them” (Participant 14)

Given the riskiness of CEPs combined with post-Covid economic challenges, businesses are seeking financial support to fund the upfront investment of piloting and implementing CEPs.

“I'm not saying you know every business has to have funding but if you've got a circular economy project ... or you've got something that needs an upfront cost then that funding is key I think for businesses.” (Participant 3)

Some businesses consider funding to be the default form of support when, in fact, support providers argue that many applicants are not yet ready to make the most out of the funding. Many businesses would instead benefit more from other types of support, such as a waste audit or market research, which would in turn help them develop stronger business models and funding applications.

A lot of the time businesses are rejected for funding because their business case or what they're actually going to do with that funding isn't established. So, it's like actually you would have benefited a lot more from expertise than you would from funding at this point” (Participant 19)

#### **4.1.9 Markets**

Participants note that some sectors have shown a greater ability than others to adopt CEPs. The level of success achieved will be influenced by how responsive their customer base is and the availability of similarly minded businesses in their supply chains. A lack of alignment between businesses, their suppliers, and their customers with regard to CEPs introduces risk and a disincentive to adoption.

##### **4.1.9.1 Demand**

Participants identify a lack of public understanding and awareness of the circular economy, and this negatively impacts their engagement with and acceptance of businesses that have adopted CEPs. The public do not tend to understand, or they are not aware of, the benefits of the circular economy. They also lack understanding in general regarding how the products they purchase are made and what happens to them when they are disposed.

Businesses have difficulties communicating the value proposition of CEPs to their customers. There is a perception that they are not being open and transparent enough with their customers, and instances of (intentional or unintentional) greenwashing are having a negative impact in terms of trust and confidence in sustainability claims.

“There is a healthy dose of scepticism amongst most consumers around lots of the information that's being provided within the kind of sustainability field,

and well-known cases of greenwashing kind of haven't helped with that perception." (Participant 5)

Customers value the ability to compare products and businesses themselves when deciding how to spend their money. Currently, some customers find it difficult to make decisions regarding the repairability and durability of the products as not all businesses provide that information.

"In a study I conducted I uncovered that cost and quality are sort of very determining factors and then things like circular economy credentials, for example, repairability and durability, they came in second, but they came in second because consumers felt they couldn't really make well rounded decisions on them. Some sense that they wouldn't know how durable or how repairable a product would be in comparison to others. So, it's just something that they find hard to take into consideration". (Participant 11)

#### **4.1.9.2 Supply**

Participants express the view that there are challenges with the supply of materials consistent with CEPs and with the complexity of supply chains. Examples include difficulties around the consistency, variety, and cost of circular supplies, which make it challenging for businesses to plan. There is also the instability of the second-hand materials market, and the risk of complex supply chains with a lack of engagement between actors.

"There's definitely a perception that when businesses want more circular materials, you know whether they are, let's say, new innovative replacements for plastics or whether they are used goods in the cases where they remanufacture and reuse products, they struggle to find in the quantities they need when they need. And maybe the quality they need as well. So, you know, I think on this issue of supply, it will take some time. I feel that there is demand for circular product out there and but there's not necessarily supply all of the time." (Participant 10)

#### **4.1.10 Infrastructure**

Existing physical infrastructure is optimised for a linear economy according to participants, thus presenting a clear barrier to CEPs.

"Infrastructure is set up to be linear... for things to flow in one direction, and so that is a major challenge to circulation as it restricts things like reverse logistics. A lot of our infrastructure is not fit for purpose in a circular economy." (Participant 8)

With no existing system to enable reverse logistics, companies are often unwilling or lack the incentive to proactively take such an approach. Businesses are said to be unwilling to be the first movers in pioneering infrastructure changes, linked to higher perceived cost.

"Infrastructure needs to be realigned because it's not ready [for a more circular economy]. So, I think the main challenge is who takes responsibility for which activities. A circular business may start vertically integrating activities... bypassing current retailers or suppliers. So, it requires a bit of a rethink and renegotiation as well." (Participant 13)



### 4.1.11 Talent

Participants see that circularity and sustainability are expected to be part of all future jobs with design, engineering, problem solving, entrepreneurship, and data skills all viewed as important to the implementation of CEPs. A mix of new and existing roles and skills are needed with both facing issues.

The education and training systems that would provide these new skills currently focus on linear economy models of production and consumption. Circular design and engineering and generally CEPs enabling skills and knowledge are currently mainly optional additions (e.g. elective modules in higher education institutions).

“The reason is that our education and business schools, engineering schools, and design schools have been largely focused on the linear economy model, ...For instance, we have masters' programmes in circular engineering design with circular business electives. But those degrees are only a few years old. ...But the mainstream programmes like business, law, engineering etc. are teaching the linear model.” (Participant 13)

The use and adaptation of existing skills is hindered by a lack of understanding of CEPs and their application and implementation. Additionally, there are not enough opportunities for individuals to apply their skills which prevents Scotland from attracting and retaining top-class CEPs talent.

## 4.2 Narrative

Although the findings presented the key barriers to CEPs adoption categorised based on the corresponding element, the interviews and analysis demonstrated complex interactions and interdependencies between the various elements. These are captured in a system diagram (Figure 3). The orange coloured boxes provide a simplified summary of the economy and the way consumers and businesses make decisions. The turquoise boxes show the state of different elements of the CEPs Ecosystem drawn from the evidence presented in 4.1. The yellow boxes then summarise the behaviour of consumers and businesses given the state of the CEPs Ecosystem.

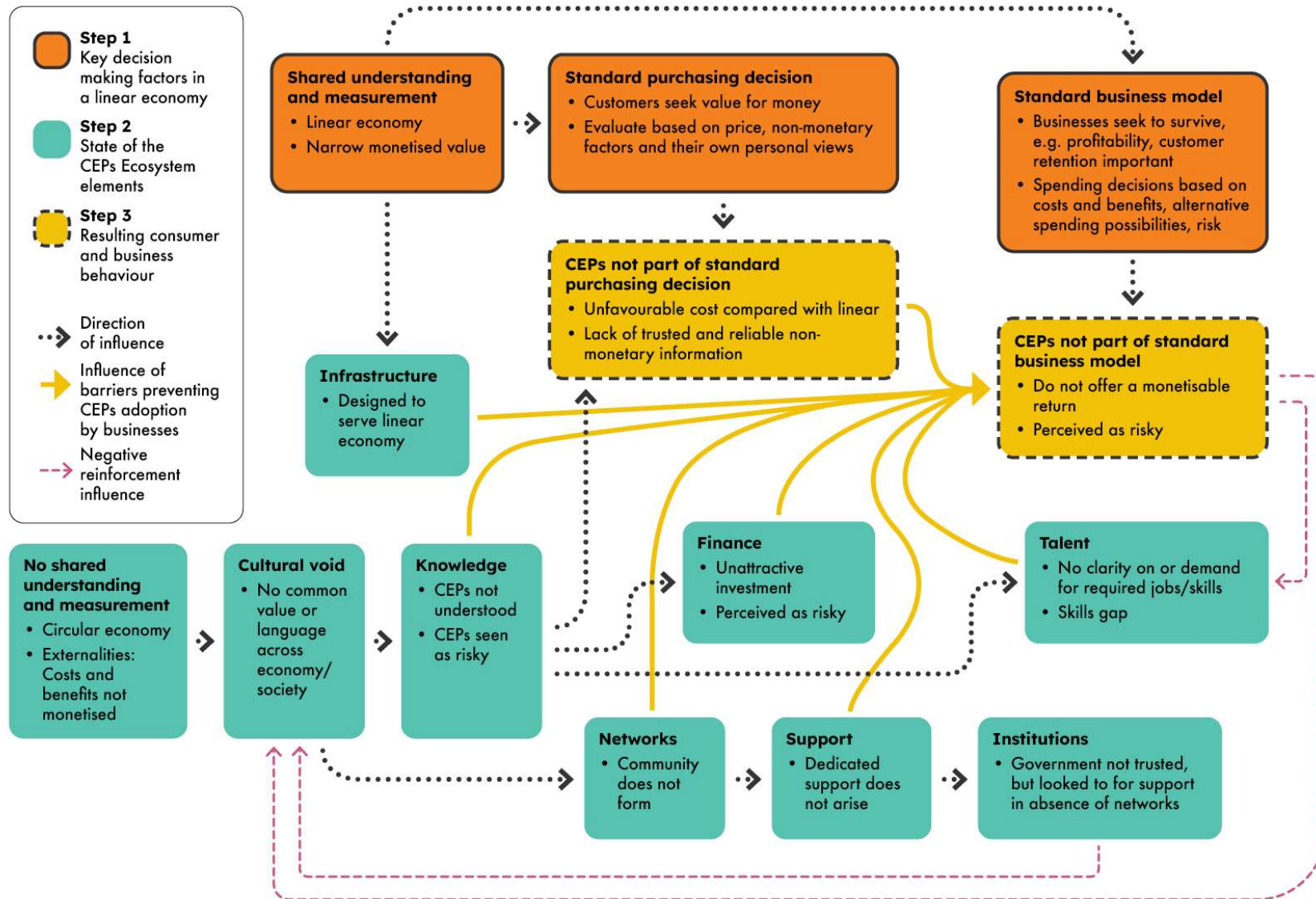


Figure 3: System diagram of findings

## Key decision making factors in a linear economy

Scotland's economy is broadly linear. The market value of its products and services excludes many environmental and social externalities. There is a high degree of shared understanding across all economic actors (businesses, consumers, and government) of the values, concepts, and language relating to the mainstream linear economy reinforced by centuries of use.

Consumers when making purchasing decisions can be assumed to seek value for money. When making those decisions they weigh up monetary factors (e.g. price) and non-monetary factors (e.g. objective information, convenience). In this situation, objective information may be provided by the business or another third party and acts to further explain the product or service on offer. This could take a variety of forms, for example a warranty, a certification (e.g. energy rating, environmental scheme), or a product review, but formally or informally provides additional information regarding the value of the product or service. Finally, the consumer processes the price and objective information subjectively in light of their own personal views<sup>40</sup>.

A key driver for businesses is their own survival. To achieve this, they need to be financially stable – profitable with a positive cashflow – and need to retain a customer base to trade with. When making a decision on investment or spending, the costs and benefits of adopting any CEPs are firstly considered in isolation. If they are deemed economical, the finances required to implement the CEPs are then weighed up against alternative uses of the money whilst taking into account the risk related to each to make a final choice. In some businesses this is a formal process and in others it may be very informal. There will be varying degrees of accuracy from business to business and decision to decision, but it is reasonable to assume that a process akin to this is used to decide how money is spent.

## State of the CEPs Ecosystem elements

The interview data shows that when considering CEPs within Scotland's economy there are clear barriers to adoption (summarised in the turquoise boxes in Figure 3<sup>41</sup>).

As market value generally fails to capture major negative environmental and social externalities, then the price of products and services from linear production is artificially low, giving a financial advantage over production including CEPs in the majority of cases [*Prevailing Measure of Value*]. Infrastructure is also designed to serve the market value of the economy in its broadly linear state [*Infrastructure*].

Whilst the language, methods, and values associated with a linear economy have been engrained into Scottish culture over time, the same is not true of CEPs. Language and concepts explaining what CEPs are and why they are valuable are still developing. Consequently, they are inconsistently used and understood across the economy. CEPs therefore suffer from a Cultural Void, meaning that they are not considered part of the mainstream [*Culture &*

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<sup>40</sup> In the case of a business or organisation these would be the views of the company, e.g. guidelines around procurement influenced by company ethos.

<sup>41</sup> Throughout this section references to CEPs Ecosystem elements are italicised in square brackets. All elements are referred to within the text, however, as Figure 3: System diagram of findings is a visual interpretation it only focuses on key elements of the narrative.

*Knowledge*]. This lack of understanding makes CEPs and their resultant products and services appear riskier when compared with linear alternatives.

Peer to peer networking and support is weak as the Cultural Void makes it hard for a community to form, which is why the connections do not exist for the activity to take place *[Networks & Support]*. As a consequence, businesses look to government for support – as opposed to each other – despite low levels of trust in government information. Whilst recognising the generally positive actions of the Scottish Government to date, there remains a large gap between the measures currently implemented by the Scottish and UK Governments and those required to make the necessary changes to the Prevailing Measure of Value and to address the cultural gap *[Institutions]*. Indeed, the lack of significant action reinforces the status quo *[Leadership]*.

For investors, return on investment understandably remains the priority. ESG considerations are taken into account but remain a secondary factor. This immediately places CEPs adopting businesses at a disadvantage given the environmental and social costs and benefits not captured by market value in the Scottish economy. Investors are also not averse to risk and innovation, however, the Cultural Void results in CEPs-related investment appearing riskier than they would be otherwise *[Finance]*.

The low level of demand for CEPs has two consequences for the labour market. Firstly, there is little understanding as to precisely what training and skills are required to support CEPs adoption. Secondly, even if the skills were clear then there is low demand for people possessing these skills. Training and education providers then find themselves with little clarity on what is desired and few people wanting to obtain the skills and, consequently, there is little provision *[Talent]*.

### Resulting Consumer & Business Behaviour

Consumers when purchasing tend to be presented with linear products and services that are cheaper than their CEPs based alternatives, meaning that, as with investors, CEPs are at a financial disadvantage. Objective information could help offset the price signal, however the Cultural Void results in a lack of consistent information from authoritative, trustworthy sources that would communicate the additional wider environmental and social value of CEPs based products and services. Personal views are then relied upon to justify additional cost which therefore limits the available consumer base *[Markets]*.

## 5 Discussion

The findings demonstrate that the conditions in Scotland's economy are not conducive to the adoption of CEPs by businesses:

- a) CEPs and their importance are poorly understood by businesses;
- b) The Prevailing Measure of Value diminishes the relative financial value of CEPs;
- c) The Cultural Void makes CEPs hard to understand so they appear riskier;
- d) Products and services based on CEPs are generally harder to sell to the majority of consumers;
- e) The economy's infrastructure is designed to serve linear methods of production;
- f) The finance community see CEPs based investments as less attractive due to perceptions of lower returns on investment and higher risk; and
- g) There is no widespread business community for CEPs to provide support and role models.

Therefore, CEPs tend to not be adopted by businesses and this results in a reinforcement of the linear economy and an acceptance of the Cultural Void. This in turn prevents progress towards wider environmental and social goals (e.g. reduction of carbon emissions).

However, whilst the current situation is far from ideal, the common underlying themes and reinforcing loop identified in the narrative (4.2) present a real opportunity to influence, effect change, and make the reinforcement loop work for the adoption of CEPs. Based on the findings, the structure of Scotland's CEPs Ecosystem now appears slightly different to that set out in the Introduction (2.4.3) and is illustrated in Figure 4 below.

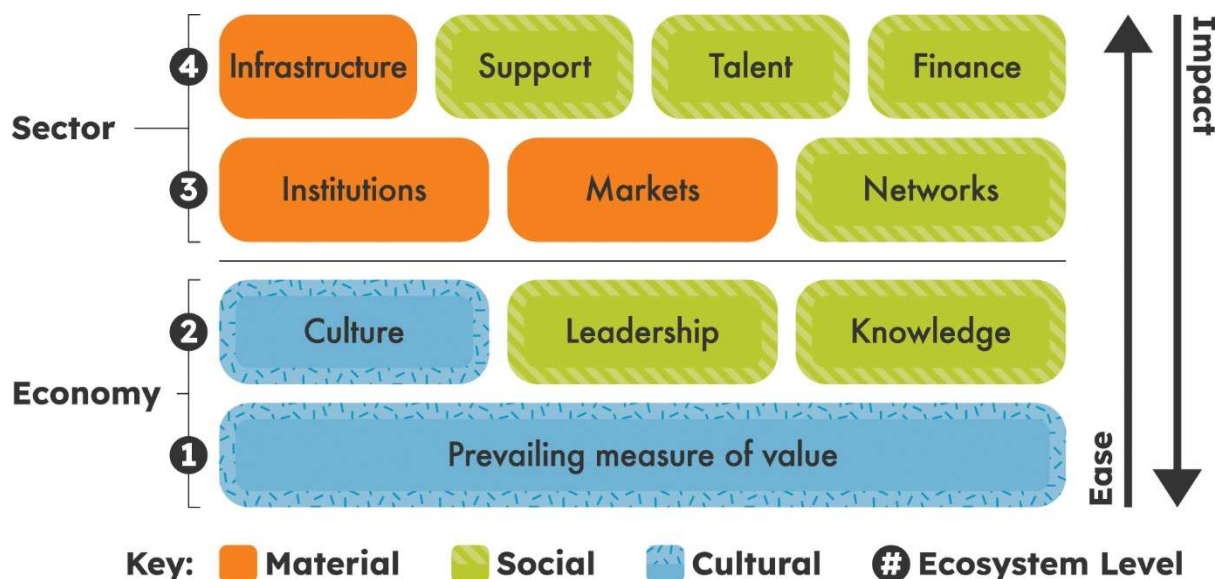


Figure 4: Scotland's CEPs Ecosystem

The elements are now arranged into 4 levels (1 to 4 from the base up). Those at the bottom are more fundamental and have a greater impact on the ecosystem, but intervening at those

levels to effect change is harder. The elements further up the diagram are easier to influence in the short term, but the impact of any intervention is likely to be low and struggle to take hold in any pervasive fashion without support from the elements below.

There are four elements in the bottom two levels: Prevailing Measure of Value at the base (Level 1) and Culture, Leadership, and Knowledge one step up (Level 2). Whilst there will be some variation in their influence from sector to sector, these elements are expected to always be the foundation of the ecosystem and interventions at these levels should therefore have broad impact across the economy.

The ordering of the remaining seven elements in the top two levels (Level 3 & 4) is expected to change from sector to sector. Sectoral investigations, which were not part of this project, will be required to clarify this. The arrangement shown is the most likely structure based on the general evidence collected.

The findings show clear and fundamental barriers to CEPs in relation to the communication of and consistent understanding of knowledge and value across the economy. The bottom four elements are those with the greatest potential to address these barriers, facilitate progress in the other elements, and thereby create the conditions for CEPs and the circular economy to flourish.

## **5.1 Level 1: Prevailing Measure of Value**

The clearest communication channel for value in the economy is price. It is universally understood by all actors but it is currently not communicating a fully informed message between actors due to environmental and social externalities. Intervening to place a monetary value on environmental and social harms (e.g. in the form of a tax) forces costs to be recognised within the economy. Prices then more accurately reflect the wider costs of production and this existing and well understood means of value communication works for the adoption of CEPs rather than against it. Interventions will immediately ripple through and begin to improve communication between actors. A failure to intervene here makes progress in the other elements much harder as more new lines of communication are then required to compensate.

## **5.2 Level 2: Culture / Leadership / Knowledge**

Considered together, the barriers at this level can be summarised as a lack of alignment amongst actors within the economy towards CEPs, and a lack of the means to achieve it. The case for why individual actors should adopt CEPs or seek products produced using them is not consistently made across the economy, and a lack of shared understanding around what CEPs are and why they are valuable makes conveying this difficult.

In the case of CEPs, as externalities distort price signals then the economy is relying on non-monetary information for communication of the related value. The Cultural Void though means the pockets of knowledge and understanding that do exist are not able to coalesce into something coherent across the economy, resulting in a reliance upon individual actors' own understanding and personal views to act. Businesses, households, government, and indeed

subsets within each group speak different languages around CEPs<sup>42</sup> leading to confusion, elevated risk, and the hindrance of progress.

Corroboratory research published by Zero Waste Scotland in 2023<sup>43,44</sup> exploring sustainable consumer decision making during a cost of living crisis found that whilst there was some understanding of a circular economy, it was inconsistent and individuals had little confidence in their understanding of associated language and concepts. There was a desire for genuine leadership and commitment expressed in easily understood terms to connect individual action to society level issues and goals.

Wider research suggests that the development of a well-functioning ecosystem for businesses, such as those adopting CEPs, can be seen as a two-stage process.<sup>45</sup> The first stage involves the development of shared understanding, language, concepts, and community on a relatively organic and informal basis. A marked increase in growth then occurs in the second stage as these cultural foundations provide the basis for the formalisation of structures and connections which can pervade the ecosystem and become self-reinforcing. From this point of view, it seems likely that Scotland, as much of the rest of the world, is struggling to move on to stage two as it has yet to complete stage one.

Alignment towards a common purpose requires a defined goal that all actors can buy into and understand their place in. Government and circular economy leaders are not succeeding in doing this and in making the case for CEPs across the Scottish economy. The Cultural Void and existence of externalities is a factor in this but the shortfall in leadership to address those issues compounds the problem. Consequently, the necessary business leaders and role models are not emerging to champion mainstream CEPs adoption.

### 5.3 Levels 3 & 4

The barriers within the remaining elements are all exacerbated by the barriers in Levels 1 and 2.

Scotland's laws and regulations (including those set at a UK level and those influenced by global trade) define the playing field for the economy and it is currently not conducive to the wide adoption of CEPs. In particular, there is little progress in addressing externalities which will be required to create the economic conditions for CEPs.

The supply side of the economy has been the focus to date with regards to CEPs and the lack of an informed demand side is holding back progress. Addressing the Cultural Void can have a clear and immediate impact on the demand side of the Markets element of the ecosystem

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<sup>42</sup> and indeed wider environmental and social issues

<sup>43</sup> Russell, Z., Macaulay, B. & Todd, M. (2023) *Just Transition: Sustainable Decision-Making in a Time of Economic Crises*. Available at: <https://cdn.zerowastescotland.org.uk/managed-downloads/mf-h-3umruc-1701955521d> (Accessed 23 April 2024)

<sup>44</sup> Droubi, S. & Fernandes, F.L. (2023) *Sustainable citizen decision-making: Impact of the cost-of-living crisis on the energy and circular economy transitions in urban Scotland*. Available at: <https://cdn.zerowastescotland.org.uk/managed-downloads/mf-5-jtogoh-1701955827d> (Accessed 23 April 2024)

<sup>45</sup> Thompson, T., Purdy, J., and Ventresca, M. (2018) How entrepreneurial ecosystems take form: Evidence from social impact initiatives in Seattle. *Strategic Entrepreneurship Journal*, 12 (1), 96–116. Available at: <https://doi.org/10.1002/sej.1285>

and demand leads supply better than the other way round. Increasing the wider understanding of CEPs across the economy in turn increases the level of relevant non-monetary information available to consumers. It would therefore be expected to lead to a higher level of demand for the products and services of CEPs adopting businesses.

The lack of a business community around CEPs presents a sizeable barrier to improving the level of circularity across the Scottish economy as these networks are a vital source of peer leadership and support and drive the movement of knowledge, finance, and talent. In particular, the shortfall in peer-to-peer support, role models, and case studies is particularly damaging given the perceived lack of trust in government and the scale of the task in hand.

The lack of networks and clear information to flow through them leads to poor communication with those who would provide financial support and a lack of clarity for those who could provide and undertake the required education and training to develop the skills to support CEPs adoption.

Progressing private sector investment in the necessary infrastructure to support CEPs is hindered by the market's inability to provide the conditions for individual companies to take on the risk of building infrastructure that would benefit many other actors. Collaboration between businesses across sectors and the economy could address this and the public sector has a part to play in promoting this collaboration, doing its part in delivery, and addressing the market risk reward equation.



## 6 Actionable Insights & Conclusion

Viewing the question of CEPs adoption in Scottish businesses through the lens of an ecosystem framework provides a way to understand both the nature of the problem and the broad structure of the solution. The elements within the ecosystem and the actors within the economy are heavily interdependent. As such, neither intervention in a single element nor action by a single actor alone will bring a lasting increase in CEPs adoption. A more circular economy will also be a more collaborative one and that is similarly true for the path towards one.

### Vision

Mainstream adoption of CEPs and the associated environmental and social benefits from reduced virgin resource use are a whole society project. A clear and simple vision setting out the value of CEPs in all economic activity is required from government that the rest of the economy can engage with, understand their part in, and work to deliver. The vision should set out the steps that government will take to create the conditions for CEPs to flourish but this is not a project for government to deliver alone. All actors will play their part but must feel empowered, trusted, and supported to do so – the vision is a means to define a common purpose that businesses and wider society can collaborate towards.

### Language

Simplify the language around CEPs and use it consistently. This is to provide a foundation that actors can rely upon to work from and trust. This begins to address the Cultural Void and whilst there is a role for government leadership, all leaders across the economy have a responsibility to collaborate and use their influence and authority to do this.

### Move beyond GDP

Government action is hindered by the continued reliance upon GDP as the economic measure of success for society. Broadening the definition of success to encompass wellbeing has the effect of internalising externalities for government decision making whilst providing a vital means of communicating with citizens. It must be simple though – if not a single measure, then a few clear quantifiable metrics measuring the health of citizens, the environment, and society itself with equal standing to that of GDP. In addition to supporting the adoption of CEPs, these metrics will also support a just transition towards a more circular economy. As is still the case with GDP, these figures will not be perfect but will provide a focus for action and communication.

### Reset the playing field – address externalities

Businesses and customers (supply and demand) must broadly move together but can only go as far as the Scottish economy and society will allow. Government interventions are required to address the internalisation of externalities, simplify the path to greater CEPs adoption, and thereby set the playing field for the economy. Where government lacks the powers to move independently it should collaborate with those who can support and deliver change as quickly as possible.

There are many different ways to influence the economy and the interventions should be appropriate to the situation and take into account both impact and the ease of implementation. These may include the taxation of low circularity products/materials or environmental/social harms to directly put a price on the externality, the restriction of quantity of low circularity products and materials via quotas or trading schemes (UKETS), or bans on use of or sale of low circularity products and materials.<sup>46</sup>

### Data

In addition to consistency of language there is a need for consistency in value measurement. Developing interventions requires data to inform them. This data can also be used as it emerges as non-monetary information to support the communication of value in advance of legislation.

### Stimulate demand

There is a tendency for action around CEPs to focus on the supply side of the economy, e.g. how things are made. Focus is required on stimulating demand for CEPs adopting products and services so that progressive businesses can find a consumer base. Interventions to internalise externalities will do this but will take time. In the short term, action can be taken to both simplify the non-monetary information that accompanies goods and services and make it more robust. Increasing transparency in relation to the consumption decision will aid both consumers and businesses in communicating the value of CEPs and their role in addressing environmental and social issues.

### Commitment & Stability

Businesses and consumers need time to process information, plan on the basis of it, make decisions, and enact them. CEPs business models take time to prove and collaboration between businesses does not happen overnight. Actors need to be able to trust that leaders will give them the time to deliver and where course corrections are required that they are led by or designed in collaboration with the actors themselves. This means a clear and consistent vision coupled with a reliable pathway of intervention. Ecosystems work bottom up and they must be given the time and space to do so.

### Urgency, decisiveness, and learning through failure

The wider issues that CEPs adoption can address, such as climate change, have short timetables now. There is then a clear need for prioritisation and prompt decision making. Gold plating and 100% certainty will not be possible; choices must be made on the evidence available and the understanding that wrong paths will be taken. The fear of failure identified in actors must be addressed and failure reframed as a necessary learning step to progress.

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<sup>46</sup> Further relevant discussion on this subject can found in Barnes, D. et al (2023) *Reducing Resource Extraction and Use: Producer Responsibility for the Circular Economy* Available at: <https://cdn.zerowastescotland.org.uk/managed-downloads/mf-es8gnm1w-1697117783d> (Accessed 23 April 2024)

### Role Models & Case Studies

Businesses are seeking proof of concept to de-risk the adoption of CEPs. Whilst acknowledging the need to reframe failure, many in the business community are operating in difficult financial circumstances and so the individual consequences of failure can be significant. Case studies to demonstrate the value of CEPs play a part in reducing the risk of adoption. Case studies may need financial support and where they can be undertaken across more than one business to help develop community and the sharing of successes and failures then that will potentially have wider benefit.

Beyond case studies all actors in the economy benefit from the existence of respected role models sharing CEPs related successes and failures as part of collective learning and promoting collaboration. Those in authority have a responsibility to demonstrate this, but role models need to exist at all levels, including grassroots, and encouraging this behaviour will further help in the development of communities.

### Partnerships

To facilitate the move of CEPs into the mainstream, partnerships must be built between those active in the circular economy space and actors in the economy at large. Find common ground, communicate in terms with which the target audience is already familiar, and seek to make progress. It will likely be necessary to accept that the journey may require many short steps but that by operating more broadly incremental steps add up to much more.

### Networks & Community

Peer to peer networks and communities are vital for the CEPs Ecosystem to function and for knowledge, people, and money to flow and make CEPs adoption self-sustaining. All the actions outlined above make it easier for stronger connections to exist and opportunities should be sought to facilitate their development, whether that be in person or online, and foster the collaboration and trust that a more circular economy requires.

### Sector analysis

The arrangement of the top half of the CEPs Ecosystem is expected to be sector specific in terms of element influence and barriers. Further work applying the CEPs Ecosystem framework to individual sectors will provide greater understanding of sector ecosystem structures and thereby inform the development of sector level interventions.

### Conclusion

The actionable insights outlined above indicate a general pathway for increasing the adoption of CEPs by businesses in Scotland. A focus on the base of the CEPs Ecosystem will pay dividends in the long run but that is not intended to exclude work elsewhere. Businesses and consumers can be viewed as sitting on a continuum where small steps can unlock a change in behaviour in the next actor along, allowing progress to be made and communities built now even if support from larger interventions take more time. The development of the CEPs Ecosystem makes clear that action in one element can facilitate progress in others and it is together that a critical mass can be achieved creating positive reinforcement loops to a more circular economy.

# 7 Appendices

## Appendix A: Interview participants

KEY	
	Element covered
	Element part covered

Participant #	Ecosystem elements										
	Organisation type	Job title	Material			Social				Cultural	
			Institutions	Infrastructure	Markets	Networks	Finance	Knowledge	Human capital and talent	Culture and Leadership	Prevailing Measure of Value
1	Trade association	Sustainability Policy Advisor									
2	Waste management taskforce	Principal Commercial Manager									
3	Regional circular business support	Project Officer									
4	Regional circular business support	Senior Project Advisor									
5	Consumer research	Research Manager									
6	Sector business support	Climate Emergency and Sustainability Lead									
7	Intermediary	Business Development Executive - CE									
8	Knowledge institute	Senior Design Manager									

Scotland's Circular Economy Practices Ecosystem

9	Knowledge institute	Head of Resource Policy											
10	Academic institute	Assistant Prof in Sustainable Businesses											
11	Consumer research	Behavioural Economist											
12	Intermediary	Business Engagement Manager											
13	Academic institute	Professor in Sustainable Business											
14	Trade association	CEO											
15	Business support	Sustainability Team Lead											
16	Business support	Policy Advisor											
17	Finance	Executive Director - Innovation											
18	Trade association	Head of Sustainability											
19	Regional business support	Circular Economy Advisor											
20	Trade association	Skills Director											
21	Business support	Director											
22	Trade association	Head of Policy and External Affairs (Scotland)											
23	Academic institute	Research Associate											
24	Trade association	CEO											
25	Trade association	Head Of Policy and Public Affairs											
26	Business support	COO											
27	Financial institution	Local Enterprise Manager											

## Appendix B: Information sheet

Dear recipient,

You have been invited to take part in a study to understand what affects the uptake of Circular Economy Practices (CEPs) in businesses in the Scottish Economy.

The study has been commissioned by Zero Waste Scotland to gain an understanding of the nature, size and type of barriers faced by Scotland's businesses across cultural, social, and material elements of a Circular Economy ecosystem. By investigating all key influences on businesses, we aim to build a picture of where the greatest challenges are and what level and type of intervention is required to be most effective in supporting Scottish Businesses.

Adopting CEPs is seen as a way to increase the Scottish economy's circularity, have a positive environmental benefit and to support Scotland's journey to Net Zero.

### About us

Resource Futures are an environmental consultancy with 30 years' experience in the waste and resources sector. We work with businesses, NGOs, and governments in the UK and globally, and are a non-profit distributing B-Corp. We have been selected by Zero Waste Scotland to conduct this study on their behalf.

### What the research is about

The study will seek to answer the following research questions:

- What affects the uptake of CEPs by businesses operating within the Scottish economy, and why?
- What barriers to adoption of CEPs exist?

### Why you have been chosen

You have been invited to participate as you are a stakeholder with experience of or influence on the adoption of CEPs, either directly or through your clients or networks. You may be able to offer insights across several elements that influence businesses' adoption of CEPs, or have specialist knowledge of a particular element.

### How we will gather information

The study will involve semi-structured interviews with a range of organisations, mapped to Ecosystem elements to ensure the whole system is investigated and understood.

### Confidentiality and anonymity

If you are happy to take part, please complete the consent form, making clear if there are any parts of the research you would prefer not to take part in. The outputs from the study will be the Intellectual Property of Zero Waste Scotland, who will use the anonymised data in publications and in developing support and policy. You can ask for feedback about our findings if you would like. All the information that we collect during the interview will be kept confidential and used only for the purposes set out in this Information Sheet. You (or your company) will not be able to be identified in any reports or publications unless you give your permission.

### Recording

We will ask to record any interviews to assist with data collection and enable transcription of the interview. Anonymised transcripts will be used to analyse data and provided to Zero Waste Scotland as an output of the research project.

**Right to withdraw**

You have the right to stop taking part in the research at any time, including during the data collection or afterwards up to the point at which the data is analysed. You also have a right not to answer specific questions or to ask for audio and videorecording to stop.

**Ethical and Data Management**

This research is conducted under Resource Futures' Integrated Management System and their Data Management policy, which is available on request.

**Queries, Concerns or Complaints**

If you are dissatisfied with the way the research is conducted, please contact the Project Manager or Zero Waste Scotland

**Thank you for taking the time to read this information sheet.**

**We very much hope you will take part.**



## Appendix C: Consent form

- I have read the participant information sheet on the **Understanding adoption of Circular Economy Practices in Scottish Businesses** .
- The objectives of this research have been explained to me.
- I understand that I am free to withdraw from the research and ask for my data to be destroyed if I wish by notifying the investigator by 30.11.23.
- I understand that my anonymity is guaranteed unless I expressly state otherwise (see below).
- All material from the interview will be stored securely and treated confidentially by the investigator. A recording of the conversation will be made for transcription purposes.
- I confirm that I am 18 or over.
- I understand that the investigator of this work will have attempted, as far as possible, to avoid any risks.
- Under these circumstances, I agree to participate in the research and give my permission for:
  - The recording of conversation
  - Written records of the research and its findings being held by Zero Waste Scotland for a period of 10 years (in which all participants will be anonymous, unidentifiable, and unnamed)
  - The use of this written research data for reports, presentations, and publications

**I do/do not (please delete) consent to waiving my anonymity and being identified in the report.**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Print name: \_\_\_\_\_

Organisation: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_

**Please return a copy of this form to the investigator  
Please keep a copy of this form and the information sheet for your own records.**

## Appendix D: Interview topic guide

### Interviewer notes

Note questions to generally be open questions – tell me about, what do you think etc.

Note – interviewees will have different specialist knowledge or understandings of different elements of the circular economy ecosystem. Questions will need to be adapted and selected to reflect this to obtain quality responses for analysis.

### At the beginning

- 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 what affects the uptake of circular economy practices by businesses particularly in the Scottish economy.
- Explain that the interview will be auto-transcribed and how their data will be stored and managed.
- Explain they are free to not answer questions posed or to curtail the discussion at any point – just need to tell you.
- Explain that you may question a response they give but this doesn't mean you consider their response to be wrong but wanting to get a better understanding of the response.
- Explain that you may need to stop a particular discussion thread due to time restrictions, but happy to follow up another time if they wish.
- Confirm how long they have.
- Confirm they are giving consent for the information they provide to be used for the purposes of the research.

### Introductory questions (ask of all interviewees)

The aim is to obtain data to help assess their area of expertise and which questions relating to the ecosystem elements to delve into further within the time restrictions. You will need to engage in active listening and make notes of areas of focus.

***Q1: To start, we'd like to set out what we mean by Circular Economy Practices. Do you have any questions or clarifications about the following?***

Circular Economy Practices ("CEPs") are any approaches that a business can adopt that are consistent with the aims of using less, using for longer, using again and switching to regenerative material use, such as:

- Using regenerative and non-toxic materials in product designs
- Designing products that are durable, modular, designed for disassembly or lightweighted
- Providing or enabling repair, refurbishment or reuse services
- Product service systems such as leasing, sharing and digitisation of products and services
- Supporting resource recovery through recycling, industrial symbiosis and using recycled content materials

***Q2: What do you think affects the uptake of circular economy practices by businesses particularly in the Scottish economy?***

Ecosystem elements (variable for interviewees)

The aim is to build on the responses to Q1 and Q2 and select ecosystem elements topics for further discussion to gain a depth of understanding of their perspective on the element.

For each topic being explored deeper, reflect back to the interviewee their response to Q1 and Q2, before delving into the topic area e.g

- You mentioned access to finance, legislation, consumers, policy, etc.
- Thinking further on your experience of businesses engaging/ not engaging etc.
- After providing a response follow up with questions such as the following if the interviewee has not already covered:
  - Why do think that
  - What do you think is needed that is different to how things currently are
  - what evidence (sources) do you think people (businesses) call upon in making judgments about....
  - If an interview focuses on negative aspects, ask What about positive aspects and vice versa.

### **Institutions**

The aim is to gain insights on established systems, processes and structures of influence and control that may be seen as supporting or inhibiting the adoption of CEPs.

***Q1: How do you think the work of governments support businesses putting in place circular economy practices? (note interviewee might talk about Scotland, UK, EU or international influences)***

***Q2: What are your thoughts on regulatory and voluntary measures in supporting the uptake of circular economy practices?***

### **Markets**

The aim is to gain views on the relationships between businesses and their customer bases, the demand for circular economy practices and prevailing measures of value across the value chain.

***Q1: What do you think businesses see as priority values for their customers? And how do these affect the adoption of circular economy practices?***

***Q2: What are your thoughts on how social, environmental and economic values are measured and prioritised by different actors in the value chain?***

***Q3: How do you see businesses addressing these different measures of value throughout the value chain in adopting CEPs? (note interviews may focus on end users B2C, supply chain customers B2B, internal stakeholders or suppliers B2B)***

If focus on certain stakeholders ask about others in the value chain

***Q4: What are your thoughts on the value to businesses of adopting circular economy practices?***

If focus on economic value ask what about social or environmental value?

***Q5: What are your thoughts on the market conditions for different circular economy practices by end users (consumers) (If immaturity of these markets is not raised, skip Q6)***

***Q6: What are your thoughts on the market conditions for different circular economy practices across the value chain?***

How does the immaturity of specific markets for these affect the adoption of CEPs?

Note an interviewee may only focus on one model, e.g. sustainable supplies, recyclability or recycle content in their initial response. Look to investigate thoughts on other models by asking directly about them, i.e

- Q6: What about:
- Q6a: Improving recyclability
- Q6b: Increasing recycled content
- Q6c: Increasing sustainability of raw materials
- Q6b: Repair and remanufacturing models
- Q6b: Refill or reuse models
- Q6c: Product service system models

### **Infrastructure**

The aim is to obtain insights into the availability of sufficient access to physical and digital facilities to enable CEP adoption.

***Q1: How does the existing supply chain and material management physical infrastructure support circular economy practices throughout the value chain?***

Note interviewees may only focus on one element of the value chain, e.g. recycling infrastructure. Look to investigate other infrastructure elements, i.e.:

- Q1a: Reverse logistics maturity and accessibility
- Q1b: Recycling infrastructure
- Q1c: Repair and reuse infrastructure and supply chains
- Q1d: Supply chain collaborations

***Q2: What are your thoughts on how digital infrastructures affect the uptake of circular economy practices?***

### **Networks**

The aim is to gather insights into the social network of influence of businesses and how this affects decisions to engage with circular economy practices.

***Q1: Who or what do businesses call upon in when considering engagement with circular economy practices?***

***Q2: What are your thoughts on circular economy focused networks and the engagement of businesses in Scotland in these?***

***Q3: What do you think businesses are looking for from networks to enable them to engage with circular economy practices?***

***Q4: How do you think businesses collaborate with each other and what supports collaboration?***

### **Finance**

The aim is to gain views on the nature and access to investment capital and funding (personal, public and private investors) and how it affects the uptake of circular economy practices.

***Q1: How do businesses access finance for adopting circular economy practices?***

***Q2: What are your thoughts on the finance landscape and how it supports businesses uptake of circular economy practices? (Note if discusses risk do not ask Q4)***

***Q3: How do financial institutions use or assess circular economy measures of value? Note if discusses risk do not ask Q4***

***Q4: How do you think financial institutions perceive or assess risk relating to businesses looking to adopt circular economy practices? And what do they call upon to determine risk?***

***Q5: Are there financial instruments that you consider most suitable for supporting the uptake of circular economy practices?***

Delve into which CEPs any identified funding sources focus on.

### **Knowledge**

The aim is to obtain insights on what interviewees think businesses understand of the circular economy and CEPs and how they fit with businesses existing operating models.

***Q1: How do you think businesses perceive the concept of the circular economy and adoption of circular economy practices?***

***Q2: What are your thoughts on the nature and availability of knowledge on how to make circular economy practices effective models of success for businesses?***

***Q3: How effective is circular economy and circular economy practices messaging for businesses? Note: interviewees may focus on global, UK or Scotland level. If focus at level outside of Scotland ask:***

Is this different for businesses in Scotland.

***Q4: What messaging do you think works?***

### **Human Capital and Talent**

The aim is to gain insights into understandings of skills that support circular economy practices.

***Q1: What skills do you think are needed by businesses for adopting circular economy practices?***

***Q2: How do you see these skills differing from existing skills?***

***Q3: What are your thoughts on the supply and demand of skills for developing circular economy practices?***

### **Culture and Leadership**

The aim is to gain insights on what are thought as the prevailing cultural attitudes that support or inhibit the adoption of CEPs across the economy and the nature and role of leadership in influencing CEPs

***Q1: What are your thoughts on the cultural aspects of the business environment in relation to supporting the adoption of circular economy practices in businesses?***

***Q2: How engrained and consistent is the concept of the circular economy in culture across Scotland (in households, government and business)?***

***Q3: What do you think is understood of leadership and responsibility for circular economy practices in Scotland?***

**Prevailing Measure of Value**

The aim is to gain insights on how profitability is calculated, and whether non-monetary value is captured and has a material benefit to the business.

***Q1: To what extent are positive externalities (social and environmental value) captured within businesses when they adopt CEPs?***

***Q2: How do investors and lenders measure the value of circular business models? What do they focus on?***

***Q3: How do customers weigh up non-monetary or immeasurable value and economics when making acquisition decisions?***

**Closing question (for all interviewees) (save minutes for this!)**

The aim is to gain insights into how interviewees see the different elements of the ecosystem interacting and affecting each other and the uptake of CEPs.

***Q1: Given the focus of this discussion how do you think the different aspects you've described influence each other and affect the adoption of circular economy practices?***

**At the end**

Thank interviewee for their time and ask if they can suggest other stakeholders that we could contact for further interviews.

## Appendix E: Evolution of Ecosystem elements

Table showing the evolution of the elements from initial review of literature through those used as a basis for the interviews to the final elements based on the qualitative data collected.

Initial elements based on previous work (Stam 2015)	Initial elements before interviews	Elements in the context of findings
Formal Institutions	Institutions	Institutions
Demand	Markets	Markets
Knowledge	Knowledge	Knowledge
Talent	Talent	Talent
Finance	Finance	Finance
Culture	Culture & Leadership	Culture
Leadership		Leadership
Physical Infrastructure	Infrastructure (Physical & Digital)	Infrastructure (Physical & Digital)
Networks	Networks (incl. Support)	Networks
		Support
Intermediaries		
	Prevailing Measure of Value	Prevailing Measure of Value

Table 4: Evolution of CEPs Ecosystem elements



Zero Waste Scotland is Scotland's circular economy expert. We exist to lead our nation to use products and resources responsibly - focusing on where we can have the greatest impact on climate change.

A not-for-profit environmental organisation, funded by the Scottish Government and European Regional Development Fund, we have the ear of the government and the voice of the people. Because of this we can play a key role in connecting communities, businesses, and public bodies - using evidence and insight to inform, inspire, and enable them to embrace the environmental, economic, and social benefits of a circular economy.

More than ever, Zero Waste Scotland is in a unique position to encourage vital shifts in behaviours to accelerate progress towards zero waste and a global circular economy. Together, we can all move towards a circular economy, restore our natural systems, and regenerate our communities in a fair and equal way.

More information on all Zero Waste Scotland's programmes can be found at <https://www.zerowastescotland.org.uk/>. You can also keep up to date with the latest from Zero Waste Scotland via our social media channels - [Twitter](#) | [Facebook](#) | [LinkedIn](#)

