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Abstract

The global economic system for material flows follows a standard 'make, take, dispose' model. Alternatively, a circular economy system keeps materials within a closed loop, eliminating the concept of 'waste' and requires a fundamental revaluation of materials. This qualitative research study seeks to answer the question 'what factors led to the fruition of a circular economy project in Glasgow, U.K.?' Through a review of resource and waste policies at the European, U.K. and Scottish levels, and through an assessment of public policy and agenda-setting theory, this research explores the environment leading up to the creation of Circular Glasgow. Semi-structured interviews conducted with individuals representing key stakeholder organisations provide the data from which themes and insights about the origins of Circular Glasgow emerge. Results indicated that collaboration, incremental policy changes, and the receptiveness of government were the leading perceived factors in the development of Circular Glasgow. This study's main conclusions suggest that the idea behind Circular Glasgow stems from a complex array of sources and can best be described through evolutionary policy theories such as 'primeval soup'.

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I.   Introduction

"Greater than the tread of mighty armies is an idea whose time has come"

-Victor Hugo (Kingdon, 1995, p. 1).

It is December 2017. The final episode of the British Broadcasting Corporation's "Blue Planet II" nature documentary is set to air, and Britons – along with millions of international viewers – will be guided through a harrowing account of the daily struggles of sea life, birds, and marine mammals against the permeation of plastic waste. Sir David Attenborough, a prominent public figure known for his broadcasting of environmental specials with the BBC, delivers a plea to humanity, citing the "toxic soup of industrial waste and plastic," and calls for action to cease this large-scale pollution (Knapton, 2017). The international popularity of Blue Planet II coincided with environmental movements for waste reduction, particularly in Europe and the U.K. In 2015, the U.K. introduced the Single Use Carrier Bags Charge legislation, mandating a 5 pence charge per plastic bag (U.K. Parliament, 2015). In 2017, national chain JD Wetherspoon ceased automatically offering plastic straws in drinks, joining the 'Refuse the Straw' movement and stoking the debate surrounding single-use plastics (Palmer, 2017). January 2018, U.K. MPs explored a 25 pence 'latte levy' on disposable hot beverage cups, stirring international discussion among corporations such as Starbucks, Costa, and McDonalds (Smithers, 2018). To cap it off, in December 2017, China announced that it would no longer be "the world's garbage dump" for recycling material (Freytas-Tamura, 2018). Michael Gove, U.K. environmental secretary, appeared caught off guard by China's move, citing lack of information in his understanding of how the ban will impact Britain's waste sector. Gove described being "haunted" by scenes from Blue Planet II leading to a shift in his proposed waste strategies, moving away from the weight-based measurements for recycling and instead encouraging city councils to focus on recycling by material (Rawlinson, 2017). With a large-scale bottleneck and potential trash pile-up now in sight, western policymakers have an economic and public-pressure policy issue at hand, ripe for a solution.

John W. Kingdon, political science scholar known for his multiple-stream analysis and policy window theories, refers to Victor Hugo's famous quote from "Histoire d'un Crime" (1877) to describe the powerful momentum of ideas. Applied

in the context of the international plastic waste crisis, society appears to have deemed "time's up" for single-use materials, and the "time has come" for a new way of thinking about waste. This is how advocates of the circular economy describe our current waste predicament. The traditional "take, make, dispose" system for material goods is at odds with the natural environment, and policymakers, businesses, and consumers recognise the need for an alternative system.

i. Defining circular economy

The circular economy concept emerged in the late 1970s from the culmination of several thought leaders' academic and business theories applied to economic and industrial systems. The Ellen MacArthur Foundation, a British charity founded in 2009 with the mission of inspiring a rethinking and redesigning of the future economic system as restorative and regenerative, is the largest organization and knowledge hub promoting the adoption of a circular economy. Contrary to a linear economy, a circular economy considers waste as food for cycles of materials, and as "restoring capital and enables additional flows of goods and services," where money and finance are recirculated to all parts of the economy to facilitate the exchange of ideas and wealth (Webster, 2017, p. 11). The economy is regarded as a metabolism, instead of a machine, valuing social factors such as quality of life and relationships, and aims to keep products, components and materials at their highest utility and value, at all times.
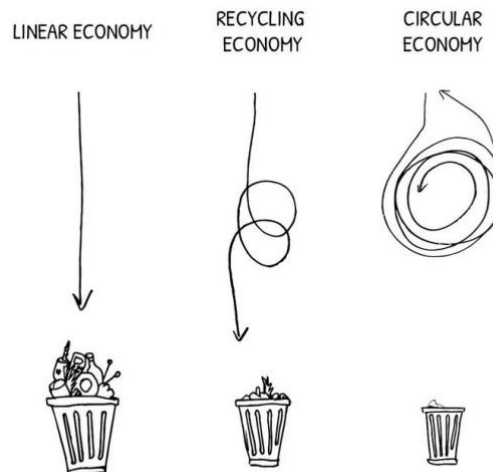

Figure I: "A Circular Economy and your role as the consumer," (Lubbers, 2017)

The Ellen MacArthur Foundation provides an elaborate 5-pronged definition of a circular economy:

1) "The circular economy is a global economic model that progressively decouples economic growth and development from the consumption of finite resources;

2) It distinguishes between and separates technical and biological materials, keeping them at their highest value at all times;

3) It focuses on effective design and use of materials to optimise their flow and maintain or increase technical and natural resource stocks;

4) It provides new opportunities for innovation across fields such as product design, service and business models, food, farming, biological feedstocks and products;

5) And it establishes a framework and building blocks for a resilient system able to work in the longer term," (Ellen Macarthur Foundation, 2017).

The Waste Resources Action Programme (WRAP), another registered charity working with businesses, individuals and communities, defines a circular economy more concisely as "an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life," (Barlow, 2013, p. 8). The definition of a circular economy can be more specific per each economic sector. Terminology can vary, such as "servicing, overhauling, reconditioning, refurbishing" yet all describe a system in which product life is extended. For example, in the remanufacturing sector, the Scottish Institute for Remanufacture (SIR)'s definition of a circular process is "the resulting product has the same quality as an equivalent new product," (SIR, 2018). (Further analysis of the concept is provided in the Literature Review section.)

A circular economy does not simply address the issue of excess waste material polluting our oceans, it is a highly integrative, systems-based approach to the design, use, and consumption of materials. As a practicable idea, its long-term implications are still under speculation as there are only a handful of case studies. This research examines the development of a city-wide circular economy project and seeks to understand catalysing factors which led to its fruition.

ii. Objectives:

- Answer the question: "What factors led to the fruition of a circular economy project in Glasgow, U.K.?"
- Understand the collaborative approach to introducing and implementing Circular Glasgow through the lens of public policy theory.
- Analyse the qualitative data from interviews with key stakeholders for themes pertaining to the creation and introduction of a circular economy project
- Discuss how an idea becomes a policy, through the lens of policy theory and by the case example of Circular Glasgow

iii. Structure

This paper strives to clearly connect the different stages of research and summarised literature in a coherent and concise manner. In the next section, the circular economy concept is expounded upon through a review of relevant literature and timeline of related policies in Europe and the U.K. over the past few decades. Public policy theory is introduced as the lens of analysis, with the analysis of agenda-setting and the promulgation of ideas in the policy sphere. The third section details the qualitative interviewing methodology used by this researcher and includes the ethical considerations made during the planning and interviewing process. In section four, data in the form of interview quotations are analysed by the themes they elicited. This section concludes with a recognition of the potential bias this researcher had throughout the study. The conclusion, section five, makes a final assessment of the factors leading to the creation of Circular Glasgow and forecasts how future studies of city-wide circular economy projects could further this field of research.

II. Literature Review

i. Tracing circular economy

The Ellen MacArthur Foundation identifies 7 schools of thought that have contributed to the definition of a circular economy, originating with Walter Stahel's "performance economy." In 1976, Walter Stahel, Swiss architect and co-founder of the Product Life Institute, sketched out an 'economy in loops' for a research report to the European Commission entitled "The Potential for Substituting Manpower for Energy," (Webster, 2017, p. 50). In this report, Stahel identifies people as intrinsic to

the model where consumers become both users and creators. 'Labour, he argues, "is the most versatile and adaptable of all resources, with a strong but perishable qualitative edge," (Webster, 2017, p. 87). He believed people to be an undervalued resource when considering economic processes. For example, industries such as remanufacturing require a substitution of skilled labour for energy "which can be undertaken in comparatively small workshops scattered widely throughout the country wherever there are goods in need of renovation and customers for them, as is still the case with car-repair workshops," (Stahel, 1981). He coined the concept "performance economy" and described it as the "selling of goods as services through rent, lease, and share business models." Manufacturers still own the product but are responsible for its maintenance costs and thus own the burden for any inefficiencies (Stahel, 2016). The performance economy and rethinking of product design and end-life provided the groundwork for how circular economy is conceptualized today. "[Stahel] showed that most sustainable solutions are intersectoral and interdisciplinary and thus contradict existing regulations, do not fit into academic career structures and demand a 'new think," (Webster, 2017, p. 79).

Other thought leaders include Michael Braungart and Bill McDonough who, in the 1990s, conceived the 'Cradle to Cradle' design concept and certification process. This philosophy considers all material involved in industrial and commercial processes as 'food' or inputs, which are divided into technical and biological nutrients. Cradle to Cradle focuses on effectiveness and efficiency, where predominant attention is given to the design phase of a product's creation (Webster, 2017, p. 16). The influence of Cradle to Cradle on the circular economy concept can be seen in the 'Butterfly Diagram' below. Another philosophy which shaped the circular economy is 'Industrial Ecology', primarily discussed by Amory Lovins, founder of the Rocky Mountain Institute. Industrial Ecology is the study of material and energy flows through an industrial system and is aimed at 'closing the loop'. By this, he means waste serves as an input, and in any instance where waste escapes the system, it is corrected by repurposing it. Lovins' concept emphasises natural capital restoration, but also includes an element of social well-being (Webster, 2017, p. 14-16). While only three of the seven thought leaders behind circular economy are discussed here, the remaining four philosophies (biomimicry, natural capitalism, blue economy, and regenerative design) share elements of the three explained. The

common feature between all of these schools of thought include an element of 'waste equals food'.

The Ellen MacArthur Foundation, with the consultation of McKinsey & Company, an international consulting firm, combined the thought leadership of architects and engineers such as Stahel and others into a systems diagram illustrating the flow of technical and biological materials through a series of loops (See Figure 1 below). Consider the linear economy as the central flow downwards on the diagram where the added feedback loops keep technical and biological materials in use resulting in a more circular flow.
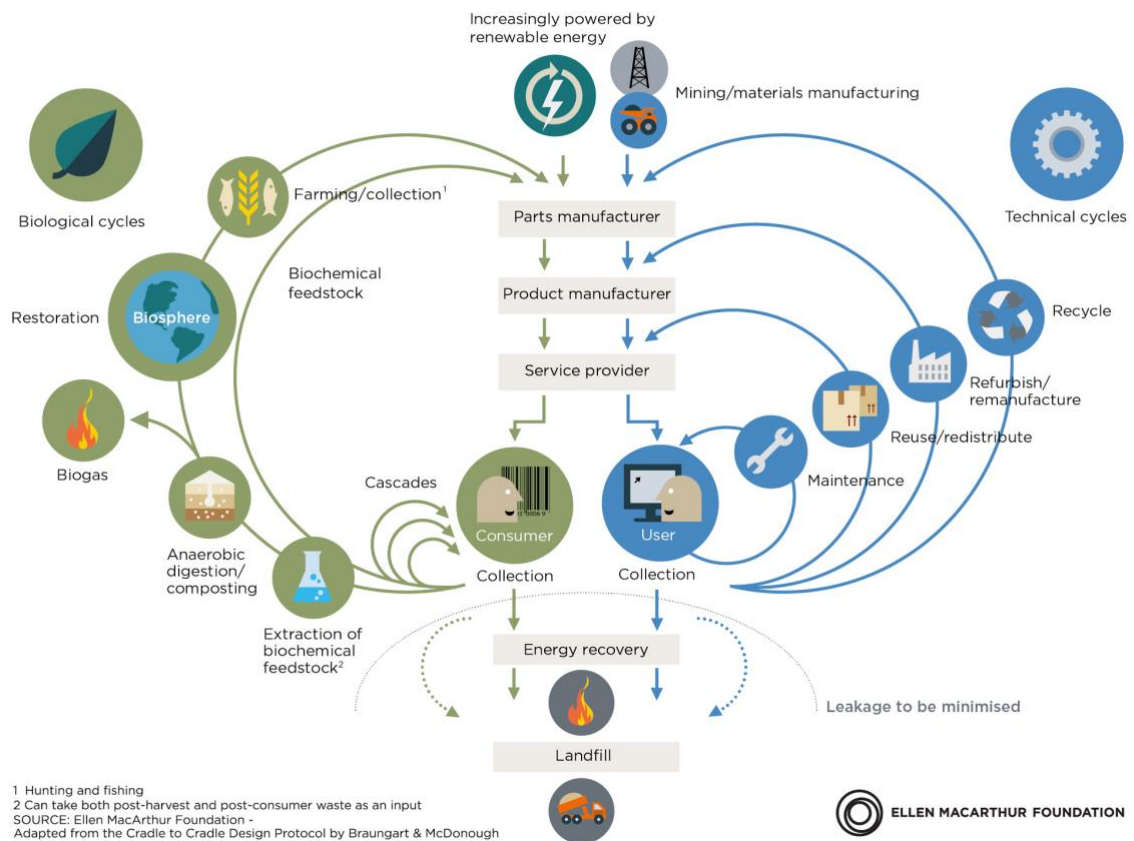
Figure II: The Butterfly Diagram (Ellen MacArthur Foundation, 2017)

The circular economy model ideally eliminates the final landfill destination, thus eradicating the concept of waste. The Butterfly Diagram is the most referenced visual used to illustrate the many possibilities of flows and loops, however it does not provide metrics for scale. Presently, circular economy literature lacks comprehensive cost-saving and profit-potential figures. "The Circularity Gap" (Circle Economy,

2018), explains the key challenge of implementing a circular economy as the lack of a standard, consistent framework for measurement. Citing 'fear of the unknown' as the primary reason for economist's hesitation in studying the circular economy, Stahel points to Gross Domestic Product as incongruent with a circular system. "For economists who work with GDP, creating a wealth by making things last is the opposite of what they learned in school. GDP measures a financial flow over a period of time; circular economy preserves physical stocks," (Stahel, 2016). As resources become more stressed, however, Stahel believes a shift in valuation will nudge economic forecasts and revised metrics to account for a potential circular economy. Throughout a review of circular economy literature, authors count upon the increase in case studies over time to provide benchmark data for the scalability, cost-savings, and value-creating opportunities.

In 2015, the Ellen MacArthur Foundation published "Delivering the Circular Economy: A Toolkit for Policymakers." This report provides a step-by-step methodology in assessing a country's circular economy 'starting position', describes how to screen sector-by-sector opportunities, identify policy options to overcome barriers, and how to assess economy-wide implications of circular economy adoption. One of the first steps, assessing a country's "circularity baseline" involves understanding the broader landscape of existing "related policies," (Ellen MacArthur, 2015, p. 42). These policies include the categories of resource productivity, waste generation and reduction, energy consumption, and greenhouse gas emissions. When estimating the economic opportunity of a circular economy transition, collaboration between business, regulatory and policy bodies, and third-party consultancies has proven to be the strategy of choice in order to provide the most accurate picture of possibilities (Ellen MacArthur, 2015).

ii. **Implementing a circular economy in Scotland**

In Scotland, policymakers began prioritising the linkage of sustainable economic growth with the reduction of carbon emissions and resource use in the early-mid 2000s (and, earlier, see Appendix I). As described in the 2015 Toolkit for Policymakers, low-carbon and resource conservation policies created a baseline from which circularity initiatives and programmes developed. In a 2013 Scottish Parliament's Information Centre (SPICe) publication, Dan Barlow provides a chronological approach to Scotland's focus on resource use and low-carbon policies

culminating in the Scottish Government's support for a circular model. The Scottish Government introduced an outcomes-based national performance framework to measure the delivery of policies cultivating economic growth (Barlow, 2017, p. 163). Initially, outcomes did not explicitly refer to a circular economy, but instead referred to the reduction of resource consumption and increased resource efficiency. In his June 2013 speech to the Scottish Parliament's Committee on Rural Affairs, Climate Change and the Environment, the 2009-2014 European Commissioner for Environment Janez Potocnik introduced the term 'circular economy' as the solution to an economy clashing with physical resource constraints.

> "The global competition for resources will mean that we will be obliged to increase resource productivity…but resource scarcity will also mean that we will have to move away from our linear model of resource consumption where we consider it normal to 'take make-use, then throw away'…the transition to resource efficiency and a circular economic model is inevitable, particularly for Europe,"
> (Potocnik, 2013, p. 155).

As a result, in October 2013 the Scottish Parliament committee invited Walter Stahel to provide evidence on the circular economy concept where benefits, opportunities and barriers of implementation were discussed. The agenda meeting minutes conclude with referral to the Scottish Government's stance in "Low Carbon Scotland: Meeting Emissions Reduction Targets 2013-2027 as stating "[a more circular model] isn't simply about using less and recycling more. It's about supporting new forms of manufacturing, redesigning products and packaging, reshaping supply chains and stimulating innovative new ways to transform recyclables into new, higher value materials," (The Scottish Government, 2013, p. 200). This report indicated the tri-fold engagement of the Scottish Government, Zero Waste Scotland, and Scottish Enterprise in exploring new possibilities for building a circular economy but did not formalize a specific plan or strategy.

Following the October committee meeting, the November 2013 SPICe report was published further detailing opportunities and barriers for a circular economy. It represented the official commencement of the government's 3-year study for such a model implemented in Scotland.

Benefit/Opportunity	**Barrier**
Resource use and competitiveness	Business models
Job Opportunities	Consumer acceptance
Environment	Infrastructure
Users/consumers	Procurement
	Environmental externalities
	Inertia
	Metrics
	Data and knowledge gaps

Table I: SPICe briefing's 'Benefits, Opportunities and Barriers.' (Barlow, 2013, p. 12-14).

The SPICe briefing and the Scottish Government's formal inquiry into a circular economy undertaking indicated a shift in accomplishing national waste reduction targets. Echoing tones of Webster's 'new think' about interdisciplinary sustainability solutions, "establishing a circular economy for Scotland would require the engagement of many different stakeholders and deployment of a range of levers spanning public and private investment, land use planning, procurement, accounting and reporting systems and skills development" (Barlow, p. 19). One example of such levers includes the Resource Efficient Scotland Programme, created on behalf of Zero Waste Scotland and the Scottish Government in order to provide advice and support to businesses, third sector and public-sector organisations on resource efficiency. It combined three previous programmes addressing resource use, waste water use and energy, and includes specific sector initiatives for a more tailored approach to circularity (Ellen MacArthur Foundation, 2013, p. 14).

In congruency with SPICe's call for multi-stakeholder engagement, the Ellen MacArthur Foundation, Scottish Enterprise, and Zero Waste Scotland published "Scotland and the Circular Economy," another paper examining Scotland's potential opportunities and barriers in transitioning to a circular economy. On the national level, as early-adopters with a small and adaptable economy, Scotland's public and private entities had created momentum and a sense of synergy in achieving resource efficiency and waste reduction targets. The Ellen MacArthur paper illustrated how the collaboration on circular economy programmes coincided with Scotland's policy agenda.

> "Scotland has also already made good progress on its transition to a circular economy through its ambitious plans to achieve zero waste and a 100% renewable energy-powered electricity grid.

Zero Waste Scotland and the Resource Efficient Scotland programme are important enablers for this transition, with the enterprise agencies able to help companies grasp the opportunities to stimulate innovation and business growth," (Ellen MacArthur Foundation, 2013, p. 6).

Scottish Enterprise, another organisation supporting small-medium enterprises (SMEs), created a loan fund to help establish "new closed loop reprocessing industries" through innovation. Concluding remarks identified 'next steps' for a circular economy in Scotland:

1) Undertaking a detailed analysis to assess the economic, social, and environmental impacts of a circular economy. Research should analyse material flows across the Scottish economy and highlight the sectors and supply chains offering greatest economic potential.

2) Developing a strong industry-led approach to help overcome barriers to action.

3) Creating a supportive business environment in addition to a strong policy approach. This would include raising business awareness, supporting collaboration between firms, using public procurement to incentivise change, and promote innovation and investment while stimulating consumer demand.

(Ellen MacArthur, 2013, p. 19-20).

2013 marked a turning point in the Scottish Government's approach towards the circular economy, eventually culminating in the implementation of local initiatives such as Circular Glasgow in 2016.

The Scottish Government's three-year consultation concluded with "Making Things Last: A Circular Economy Strategy for Scotland," the Government's official circular economy strategy. Its two key elements are to 1) "set up a single framework for all product types that drives choices for reuse, repair, and remanufacture while more fully exposing and addressing the costs of recycling and disposal" and 2) "reduce all food waste by 33% by 2025," (The Scottish Government, 2016). The consultation included responses from more than 78 representatives of industry, academia, community organisations, local government, trade organisations, and individuals. It incorporates educational material from the Ellen MacArthur

foundation, utilising the Butterfly Diagram and Ken Webster's & Walter Stahel's reuse, refurbish, and recycle hierarchy. The Scottish Government stated it will deliver this strategy in conjunction with a multitude of private and business organisations, with several coming on board over the next couple years.

> "Through the Enterprise Agencies, SEPA, Zero Waste
> Scotland, and other partners we will take a holistic approach
> to supporting innovation in delivering this strategy. We will
> offer support in integrated ways that recognises, for example,
> that companies may wish to consider opportunities in design,
> repair, and remanufacturing at the same time…through cross-
> agency collaboration," (The Scottish Government, 2016, p.
> 9).

"Making Things Last" also corresponded with other waste reduction policies such as the Scottish Household Recycling Charter, Safeguarding Scotland's Resources, and the Scottish Manufacturing Action Plan, and will overlap in some of its target areas (The Scottish Government, 2016). The circular economy strategy is supported by £73 million of investment, including £30 million of European Structural Funds, and is delivered by Zero Waste Scotland with the intention of saving 1 million tonnes of lifetime CO2 equivalent and generating £100 million of cumulative economic benefit (Zero Waste Scotland, 2018). An examination of the chronological development of U.K. waste reduction and resource conservation programmes and policies helps set the stage for Circular Glasgow.

iii. Circular Glasgow

After establishing its loan fund for circular projects, Scottish Enterprise indicated three 'next steps' for implementing a circular economy in Scotland. After thorough research of material flows, economic sectors, and identifying the greatest starting point for maximum impact, Scottish Enterprise called for an industry-led movement partnered with "a strong policy approach." This paper explores the collaborative approach to introducing and implementing Circular Glasgow between policymakers, business and industry associations, and delivery agencies.

Circular Glasgow is an initiative of the Glasgow Chamber of Commerce, described as "a movement to inspire businesses of all sizes to innovate and become future-proof by adopting circular strategies. Connecting companies across the city, we

help them to open up new revenue streams, increase competitive advantage and realise financial savings using a range of practical initiatives," (Circular Glasgow, 2018). It cultivates these ideas through workshops and events, allowing businesses to share knowledge regarding waste streams and opportunities. Circular Glasgow is delivered through the partnership of several key stakeholders: Zero Waste Scotland, Circle Economy (a Netherlands-based consultancy), Glasgow City Council, and the University of Strathclyde. It is primarily supported by the European Regional Development Fund as dispensed through Zero Waste Scotland. Circle Economy offers memberships, strategic partnerships, and consulting services for cities, regions, and industries. It provides tools such as 'circular marketplaces', online decision-making tools for manufacturers and designers, and a 'circularity assessment tool' in order to achieve their mission of "accelerating the practical and scalable implementation of the circular economy," (Circle Economy, 2018).

Circle Economy supported the Glasgow Chamber of Commerce in the development of an assessment tool to be utilised by SMEs as well as their "Circular Glasgow: A Vision and Action Plan for the City of Glasgow," a 'city scan' assessment. This Dutch social enterprise's services complement the support provided by Zero Waste Scotland and the Scottish Government in terms of aims and objectives (Circle Economy, 2017). The Circle City Scan report was the preliminary stage of Circular Glasgow, identifying areas of circularity (industry sectors), dividing up the project goals into four stages, and kickstarting the implementation phase of the programme. The first stage involved assessing the economic and political environment for a circular economy initiative (see Figure III). It identified three key sectors (education, manufacturing and health) which, altogether provide over 117,500 jobs and over a quarter of Glasgow's economic value (Circle Economy, 2016, p. 6).

Next, the environmental impact of the material flows per each sector were identified. This second stage considers the five major resources used in production: energy, water, biomass, chemicals/minerals, and metals (See Figure IV).
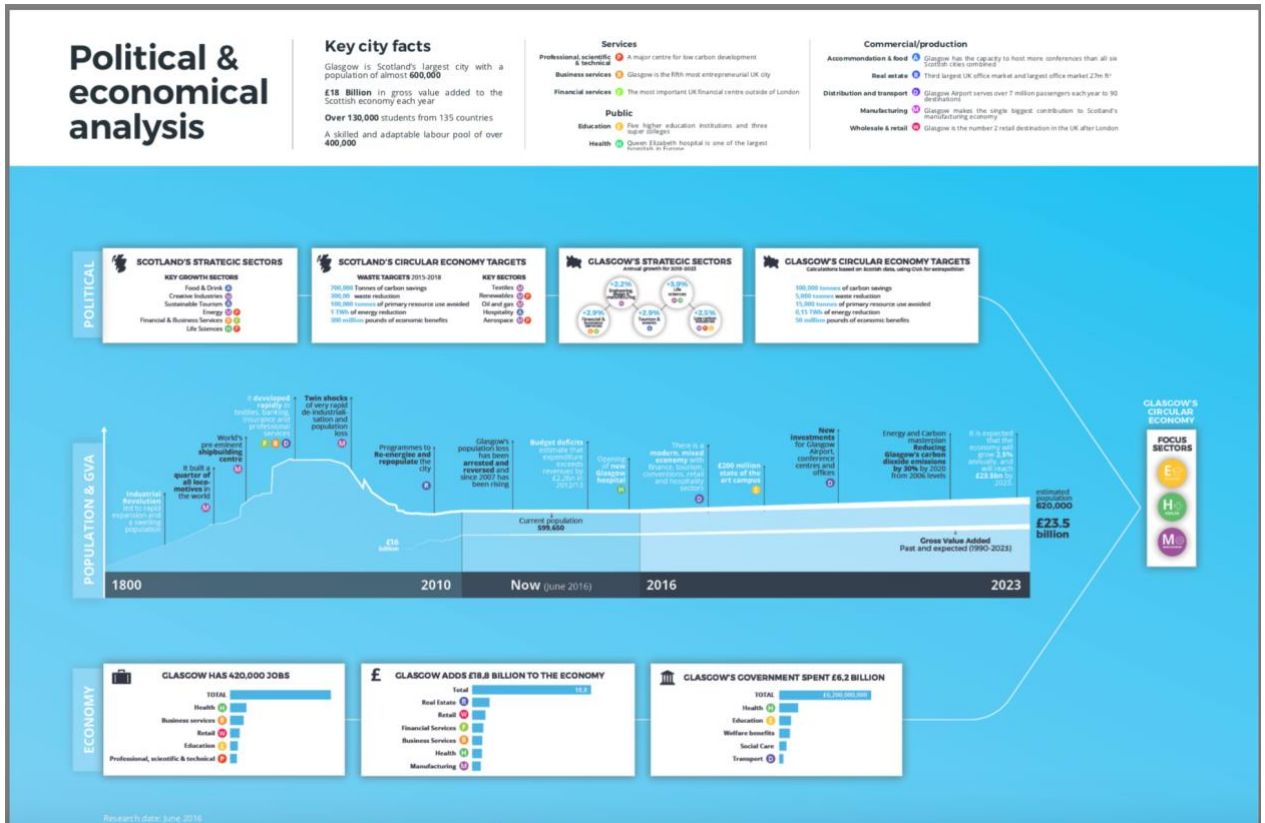
Figure IV: Mapping the political and economic environment (Circular Economy, 2016, p. 8)

Figure V: Material inputs and outputs of healthcare sector (Circle Economy, 2016, p. 11).

The manufacturing sector – particularly within food and beverage businesses – proved to have the greatest circularity potential with approximately £329.7 million in economic value and more than 31,000 tonnes of material headed towards the landfill per year.

The third stage of the Circle City Scan report involves identifying tangible circular strategies to apply to the three most viable sectors of Glasgow's economy (education, healthcare, manufacturing/food and beverage). "The vision for the food and beverage sector includes nine practical and scalable circular economy strategies designed to optimise the flow of resources throughout the industry. It highlighted the specific inputs, processes and outputs within companies in each category mentioned above" (Circle Economy, 2016, p. 16). Four pilot projects were created from the strategies: heat recovery, aquaponics, bread to beer, and beer to bread. These four projects are also expected to inspire and motivate other businesses to pursue circular models of operation.

Finally, the fourth stage involves setting achievable targets for the first year of implementation. At the end of 2016, Circular Glasgow set the goal to complete more than 50 circular assessments for SMEs. The Circle City Scan report indicates that through workshops, information events, and by conducting these circular assessments, enough momentum will be created to move on to an additional phase involving the scaling up of ongoing projects. As of this writing (Summer of 2018), Circular Glasgow is still conducting circle assessments. A recent example is an event aimed towards construction industry SMEs in February 2018. In cooperation with Building Contractors Training Group, a consortium of industrialists and designers, Circular Glasgow held a training and workshop session explaining how the circle assessment tool could benefit construction SMEs and about how "Circular Glasgow can provide you with the support, tools, knowledge and access to funding streams necessary to create a business model that is fit for the future," (BCTG Construct, 2018).

The Circle City Scan serves as a baseline report addressing where to begin to make Glasgow more circular. From the beginning, Circular Glasgow is rooted in the collaboration of policy-makers and businesses. When introducing Circular Glasgow, Ian Gulland, Chief Executive of Zero Waste Scotland said, "We recently became one of the first countries in the world to have a government strategy called 'Making Things Last', which aims to accelerate the circular economy and lead the way with

practical projects, pilots, and business support," (Circle Economy, 2016, p. 3). The momentum generated by government-led waste reduction and resource conservation programmes such as 'Making Things Last', as well as the cross-sector collaboration of Scotland and, more specifically, Glasgow's circular economy project have created a compelling platform for potential long-term success.

At the time of this paper, Circular Glasgow was in the midst of a crowdsourcing challenge, Circle Lab, asking citizens and companies internationally "how local businesses can improve the economic, environmental and social legacy of major city events and conferences," (Circular Glasgow, 2018). Using the circular economy as a framework, Circle Lab is how Circular Glasgow will attempt to address wasteful impacts of major city events such as conferences, concerts, and sporting events.

> "Glasgow regularly hosts major events such as the 2014 Commonwealth Games, Celtic Connections to this year's European Championships, and has recently achieved a hat-trick of events industry award successes, reinforcing the city's reputation. Whilst these events undoubtedly already benefit the city, there is still a significant financial opportunity for businesses to embrace and to prolong the impact made by these events," said Alison McRae, Senior Director at Glasgow Chamber of Commerce (Circular Glasgow, 2018)

Circular Glasgow will attempt to use the results of the Circle Lab challenge to engage local SMEs involved in the coordination of events and conferences and provide crowdsourced examples of solutions for achieving circularity.

iv. **Theoretical Framework: Circular Glasgow & policy theory**

A study of Glasgow's circular economy origins necessitates an understanding of the policy environment it has developed from. Several policy theories offer hypotheses for how policies emerge and can be tailored to explaining Circular Glasgow. One policy scholar, however, offers a cautionary preamble to the analysis of public policy processes. "There is a need to recognise that it is not easy to generalise about the policy process, inasmuch as different policy issues emerge in different ways in different institutional contexts," (Hill, 2013, p. 318). In a brief study, this research attempts to make helpful connections while remaining wary of over-generalisations.

Choosing where to begin in policy analysis treads a fine path encroaching upon triviality. However, this study begins with Lindblom's recognised applied theory, acknowledging that Circular Glasgow is the result of small changes in environmental and resource-use policies at international and national levels.

Political scientist Charles E. Lindblom's applied theory, incrementalism, demonstrates how 'muddling through' is a useful approach for understanding the progression of environmental and resource-use policy in Scotland. Instead of broad, 'one-size-fits-all' policies, incrementalism is the succession of gradual changes "based on lessons of past decisions, (Cairney, 2012, p. 95)". Over the past decades, as climate change became acknowledged as an urgent problem, regulatory solutions emerged to address the different detrimental effects (i.e. rising sea level leads to coastal planning policies, carbon emissions from food waste leads to supermarket's excess food standards). Circular Glasgow, either directly or indirectly, developed from international policies such as "Resource Efficient Europe" (2011), leading to Scotland's "Making Things Last" (2016). In situations where policymakers lack key ingredients such as political consensus on goals precise enough to guide policy choice, knowledge about consequences of many alternatives, and the time needed to fix the problem (as in the case of climate change policymaking), a sweeping, comprehensive approach cannot work (Bendor, 2015, p. 196). For example, policymakers gain access to better information, new data, and as a result terminology changes. "Zero waste" shifted to "circular economy" (see 2010 Scotland Zero Waste Plan on timeline, Appendix I).

Bendor (2015) also notes how the distributed intelligence of multiple groups and organizations can bring different perspectives in incremental policymaking (p. 196). Natural systems are interwoven and interdependent, and "solutions" in nature occur through the incremental process of evolution. In the 2011 "Resource Efficient Europe", the interdependence of natural systems is referenced as an example for addressing man-made problems of overconsumption:

"The role of biodiversity, ecosystems and their services is largely

undervalued, the costs of waste are often not reflected in prices,

current markets and public policies cannot fully deal with

competing demands on strategic resources such as minerals, land,

water and biomass. This calls for a coherent and integrated

response over a wide range of policies in order to deal with

expected resource constraints and to sustain our prosperity in the

long run." (European Commission, 2011).

With complex problems such as environmental policy issues, Webster argues holistic solutions are impeded by traditional "silo structures of public administrations, academia, and many corporations," (2017, p. 79). Therefore, an incremental approach coupled with an interdisciplinary and deductive methodology are perhaps viewed as optimal routes for implementing environmental and resource-use policy.

v. "An idea whose time has come": Kingdon & circular economy

One policy scholar who has been described as embracing the comparison of policy-making and natural systems is John Kingdon. Kingdon's work culminated in several theories more broadly described under the terms "biological" or "evolutionary" approaches to public policymaking.

"Whereas many in political science took inspiration from

Newtonian physics, classical economics, and linear algebra, one of

the most distinguishing characteristics of Kingdon's book

["Agendas, Alternatives, and Public Policies"] is its use of

biological metaphors and the concept of natural selection and

randomness as essential drivers of the policy process,"

(Baumgartner, 2016, p. 58).

During the time of Kingdon's research, he was considered radical and his methods not traditionally accepted in the political science field, since most theories are tested at the individual case level. Kingdon, however, was concerned with how random effects and chaos alter the individual, and thus alter the process of inquiry across the board.

"…the inclusion of randomness has not turned biology and

genetics into unscientific areas of research; it has merely changed

the unit of analysis at which scientists seek to test their theories. It

is the difference between genetics and medicine, population

ecology and veterinary science, climate science and meteorology.

Whereas the doctor cannot predict if a child will be born with a

genetic mutation, a geneticist can tell how often various mutations

occur across a population…." (Baumgartner, 2016, p. 58).

Kingdon's theories are fluid and often basis for criticism. Yet they lay important groundwork in understanding messy political processes that capture diversity in behaviours, random events, and windows of policy opportunity. These characteristics fall into the first phase of the nebulous policy cycle: agenda-setting.

The "policy cycle" is a simple model for complex processes, and, as Carney states, "is used to represent the policy process in multiple political processes" (Cairney, 2012, p. 32). Circular Glasgow, two years into existence, is in the second phase of the policy cycle: implementation. Therefore, this research only assesses the first stage, agenda-setting, in order to understand how Circular Glasgow came to fruition. Baumgartner and Jones' "punctuated equilibrium" theory suggests that results from prior policy decisions culminate and instigate a need for solutions in key moments (Baumgartner and Jones, 1993, p. 13-18). During agenda-setting, policymakers explore the nature of problems, and, sociology scholar Joseph Gusfield, explains the differentiation between social problems and 'public problems,' and how this distinction shapes policy creation (1981, p. 4-10). Sometimes, the processes of agenda-setting are not clear-cut, where policies emerge just as the problem being addressed evolves into something different, thus perpetuating a cycle (Hill, 2013, p. 167.) March and Olsen's 1984 article corroborates this ambiguity in agenda-setting, referring to the process as similar to how trash gathers in a 'garbage can.'

> "The garbage-can model assumes that problems, solutions, decision makers, and choice opportunities are independent, exogenous streams flowing through a system (Cohen et al. 1972)…Thus, solutions are linked to problems primarily by their simultaneity, relatively few problems are solved, and choices are made for the most part either before any problems are connected to them or after the problems have abandoned one choice to associate themselves with another. (March and Olsen, 1984, p. 746)."

While many policy scholars offer strong theories explaining agenda-setting, this research relies most heavily upon Kingdon's work in analysing the power of ideas and public policies.

The first chapter of Kingdon's "Agendas, Alternatives, and Public Policies" describes the phrase "an idea whose time has come," as the vague yet compelling

reason for why a policy idea can feel like a sweeping movement marked by "changes in public opinion, repeated mobilizations of people with intensely held preferences and bandwagons onto which politicians of all persuasions climb," (Kingdon, 1995, p. 1). During the 2017-2018-time span of this research, conducted while residing in Glasgow, United Kingdom, one could make a strong case concurring with this sentiment that the circular economy as implemented in Glasgow was certainly "an idea whose time has come." As described in the Introduction, the concluding episode of Blue Planet II, the 'Refuse the Straw,' and 'Latte Levy' discussions were all quite prevalent forces nudging the circular economy idea. This perspective is not without its biases, which are addressed later in this paper. Kingdon's publications delineate why the "idea" is only the starting point.

Ideas become ingrained as policy solutions during a brief window of opportunity. According to Kingdon, and compounded by Birkland (1998), focussing events such as natural disasters or catastrophes bring attention to a gap in policy. However, "an event is more likely to be focal if an interest group or groups are available to exploit the event…" (Birkland, 1998, p. 72). During this window, there are three separate "streams" which must come together simultaneously. Once the first, the problem stream, receives attention, Kingdon's theory is activated. The second, policy stream, evolves in a "policy primeval soup," modified by many actors over time and developed to anticipate future problems (Cairney, 2012, p. 234). Third, policymakers must be receptive to the proposed policy and willing to exercise their decision-making authority; Kingdon refers to this as the politics stream.

This paper explores the emergence of the Circular Glasgow "policy solution" through Kingdon's multiple streams theory. Many policy scholars value multiple streams theory for a variety of reasons. Peter John (2003) finds it helpful due to its ability to explain the combined role of five core factors in the political sphere: "institutions, networks, socioeconomic processes, choices, and ideas," (2003, p. 487). Cairney and Jones (2016) devote an entire journal article exploring the impact of Kingdon's approach, explaining its "low barrier to entry" and how scholars can avoid utilising it superficially. As noted earlier, an exploration of the emergence of Circular Glasgow is well-suited for scrutiny under Kingdon's multiple streams theory and evolutionary policy theory due to the incremental and natural-systems themes of this case study. "Kingdon argues that possibilities and limits of combinations create

unique outcomes because 'everything cannot interact with everything else," (John, 2003, p. 488). Just as in biological natural selection, Kingdon describes new policies emerging only when they find the right environment within the 'primeval soup'. Applying this concept to Circular Glasgow, the different delivery agents and decisionmakers (i.e. Zero Waste Scotland, Chamber of Commerce) and individual business owners and associations all serve as ingredients in this soup. Depending on the conditions for their interactions, the strategies which emerge may be unpredictable and nuanced. To apply Kingdon's theories to this study's main question – What factors led to the fruition of a circular economy project in Glasgow? – interviews with key actors and stakeholders proved critical in better understanding the nature of collaboration.

III. Methodology

Delving further than a review of significant circular economy literature, this research seeks to create a new understanding of how city-wide projects come to be. Circular Glasgow is one of few such initiatives calling for the collaboration between businesses, public officials, and circular economy specialists. To gain a richer understanding of how the appropriate conditions emerge, qualitative data was collected in the form of interviews with these 'key players' of Circular Glasgow.

i.   **Qualitative method: semi-structured interviews**

Qualitative research methods are rooted in a constructionist understanding of the world. Constructionism acknowledges there is more than one way of generating knowledge, especially through interpretivist approaches (Warren, 2001, p. 83). This research paper seeks to understand the emergence of Glasgow's circular economy project through the experiences of individual decisionmakers who played a role in its fruition. Qualitative interviewing methods align with Kingdon's multiple-streams approach due to its messy, chaotic nature. Unlike quantitative positivist approaches, qualitative methods are most apt for measuring and assessing an array of informal factors such as "public mood" and political decision-making. In Kingdon's "Agendas, Alternatives and Public Policies" (1995) Appendix, he details his interview procedures which have been described as very broad with only a few questions but are led by the interviewee through a conversational style.

"This was the right way to do these interviews in areas where the research questions were general probes, not precise measurements of narrowly defined questions deduced from a previously refined theoretical model. As the first to study these topics, he needed a more inductive and open research approach to allow the respondents to convey what they knew, as if to a peer," (Baumgartner, 2016, p. 62).

Kingdon's method of elite interviewing values the raw, inductive style of gathering information. Warren (2001) comments that "the design of qualitative interview research necessarily places limits on standardization and the working relevance of existing literature," and "qualitative interviewing is designed with the aim of thematising the respondent's experience, as well as the researcher's," (p. 86). For statistical analysis, small-scale, semi-structured interviews are virtually useless. Yet for the type of study seeking to understand the *why* and *how* of a topic, such as a better understanding of the fruition of a city-wide circular economy project, interviews with key stakeholders who had both direct and indirect roles in furthering Circular Glasgow can provide all the data necessary for drawing conclusions.

Semi-structured interviews were the selected method for gathering information regarding Circular Glasgow. Following Rubin and Rubin's methodology and style of interviewing, there were three types of questions: main, probes, and follow-ups, used to clarify the answers to main questions, (Rubin & Rubin, 2005, p. 140-148). They consisted of no more than four pre-determined questions which were shared with the participant prior to the interview and ranged in length from eight minutes to thirty-five minutes. In an attempt to mirror Kingdon's style, interviews were conversational. Probing questions were not predetermined and followed the interview depending on where both parties led it. The approach was to "hear the meaning" and allow the significance of dialogue to emerge (Rubin and Rubin, 2005). Describing the methodology of this research serves the larger goal of closing a gap in an understanding of the fruition of city-wide circular economy projects such as Circular Glasgow. While conditions for the emergence of a similar project could vary between cities, understanding some of the variables through the experiences of participants may provide useful for future research. The following section outlines the procedure used in selecting interviewees.

ii. Interview participant selection

First, background research and a period of observation were necessary to understand the status of Circular Glasgow, its origins, and the pertinent players involved. Informally, this research originated from and was inspired by following news stories, press releases, event alerts, and news letters sent by Zero Waste Scotland and Circular Glasgow. This researcher had a pre-existing interest in the topic and the potential implications for bias are addressed in a later section. By following news updates and scanning the websites of attributed organisations, relevant contributors to the program were identified.

According to the Circular Glasgow website, Circular Glasgow is a "Glasgow Chamber of Commerce led collaboration, supported by Zero Waste Scotland, Glasgow City Council and Circle Economy," (2018). Additionally, the Scottish Government and European Union's insignia are displayed alongside these listed contributors due to the financial support of the European Regional Development Fund. The criteria for selecting interview participants relied on the self-attributed collaborators of Circular Glasgow. Background research on circular economy and the Scottish Government's policy priorities supported the aforementioned organisations as the optimal "starting point" for seeking interview participants. Through a combination of reviewing the literature and seeking the names and contact information of individuals cited by Circular Glasgow, interview participants were identified.

Limiting factors when selecting interview participants involved time constraints for both the researcher and the individuals who were selected for interviews. Interviews were restricted to who responded to email inquiries requesting access, with a short window available for collecting information (approximately one and a half months). "In qualitative interview studies, respondents may be chosen based on a priori research design, theoretical sampling, 'snowball' or convenience design," (Warren, 2001, p. 86,). Due to limiting factors, this research adopts the theoretical sampling of a convenience design, where participants were sought out due to their likelihood of "epitomizing the analytic criteria in which [the researcher] is interested," (Warren, 2001, p. 86). The interview subjects were targeted based on their direct affiliation (employment or reference in news articles or other sources) with the organisations listed by Circular Glasgow. Participants assisted in connecting this researcher to other candidates via email correspondence.

Interviews were conducted in-person and via telephone calls. All interviews were recorded with interviewee's consent, and were used to generate transcriptions for analysis. All transcriptions and recordings are to be carefully destroyed following the conclusion of this research.

iii. Analysis of data

The methodology utilised for assessing interview transcriptions follows Kingdon's style in his "Agendas, Alternatives, and Public Policies." Conversations were coded for recurring themes related to the multiple streams theory and agenda-setting. The frequency of these themes was summarized and is further discussed in the Results and Analysis section. Rubin & Rubin (2005) describe these codes as "data units," or information that is examined together. "To figure out what a specific concept means, you look at all the data units where that concept is discussed and then bring together in one file the separate definitions, examples, and refinements," (Rubin & Rubin, 2005, pg. 204). This research emulated this method of analysis.

Data was categorized by the organisation or institution each interviewee represented. Individual names or job titles were not used for purposes of maintaining anonymity. Therefore, the organisation's name was used as the identifying noun to represent data from each interview.

An important difference between this paper's analysis methodology and Kingdon's research is the scale and scope of the subjects. Kingdon's case studies in "Agendas, Alternatives, and Public Policies" include two different agendas (health and transportation) and include the analysis of 247 interviews over the course of four years. They are thorough and have the luxury of assessing the policy process and agenda-setting process through comprehensive research methods. This research was limited to five interviews over a four-month research period.

iv. Ethical Considerations

Before initiating contact with interview participants, this project underwent a review of research design and ethical consideration. According to the University of Glasgow College of Social Sciences research guidelines, a thorough application describing the intent, methods and consideration of risk and ethical implications must be submitted prior to commencement of any project. Supplementing the application, this research proposal included a Plain Language Statement and Consent Form for interview participants to review prior to the interview.

The Plain Language Statement describes the intent of the study, explaining why interview participants are valuable for the research. Participants of this study were selected due to their professional association with Circular Glasgow – a distinct feature that was emphasised in multiple points throughout this statement. Establishing a division between personal and professional capacity is an important element of this research, as interviewees were identified due to their role in their line of work. The Plain Language Statement reminds participants of their ability and right to withdraw from the process at any point, also explaining that audio recordings and transcripts are to be destroyed six months following the project's conclusion.

The Consent Form delineated four points of agreement for interview participants to review. These items address the comprehension of participants' rights and understanding of the scope of the research project, as well as this researcher's attempt at anonymising the interview. The fourth item serves as the only potential ethical concern. Due to a small sample size, and a small number of individuals working on the Circular Glasgow project, statements and comments made by participants may identify them. While every attempt was made to anonymise by use of vague descriptors and the avoidance of gender pronouns, affiliation with an organisation may be all the information needed to identify someone. Fortunately, by nature of this field of study and project topic, Circular Glasgow does not involve controversial events or subjects that would put an individual in professional stress.

This research proposal was developed in accordance with the European Union Economic and Social Research Council's guidelines and received full ethical approval on May 21st, 2018.

IV. Results & Analysis

As aforementioned, the analysis of interview transcriptions is modelled after Kingdon's approach in his "Agendas, Alternatives, and Public Policies" research. Themes were elicited based upon their frequency in occurrence, but also in their relevance to Kingdon's multiple streams theory. The focus of this research was upon understanding what causes led to the fruition of Circular Glasgow, therefore interviews were analysed for themes related to possible creative forces. Coding provided a measure of the importance or status of themes. "If respondents mentioned a given subject, and if they discussed that subject in a way that indicated they and

others were giving it some serious attention, then we would say it was relatively high on the agenda," (Kingdon, 1995, p. 237) If interviewees repeated key points regarding the fruition of Circular Glasgow, it was coded. Rubin & Rubin (2005) refer to this method as more important than attempting to simulate concepts and themes from pre-existing literature. Instead, allow themes to emerge from the literature and "look for the concepts and themes in several ways, ranging from using common sense to more complicated approaches," (p. 201-233). Additionally, the following themes emerged which were coded for in frequency of occurrence.

Total Comments by Code						
<u>Code</u>	Circular Glasgow	Convention Bureau	SIR	SPICe	Zero Waste Scotland	<u>Total</u>
Ideas about origins	2	1	2	1	4	10
Receptiveness of government	0	0	3	2	3	8
Incremental progress	3	4	3	4	2	16
Collaboration	15	13	6	0	7	41
Problem stream	6	5	6	0	0	17
Politics Stream	3	4	2	1	8	18
Policy stream	7	5	0	2	9	23

Table II: Interview data categorised by comment code

Table III provides a brief description of the different organisations interviewees represented, as well as an explanation for their relationships with one another.

	Number of Staff:	Involvement in Circular Glasgow
SPICe *(Scottish Parliament Information Centre)*	~ 40	Provided a briefing in 2013 giving evidence for Scottish Parliament regarding the circular economy concept
Zero Waste Scotland	29	-Funds Circular Glasgow through the European Regional Development Fund's Resource Efficiency Circular Economy Accelerator Programme. Provides expertise and resources in order to complement their nation-wide goal of providing support for SMEs seeking to develop circular economy business ideas. -Funds SIR as part of their goal to support industries looking to increase, reuse, repair and remanufacture in their manufacturing operations
SIR *(Scottish Institute for Remanufacture)*	4	Funded by the Scottish Funding Council and Zero Waste Scotland, SIR seeks to address industry challenges and enable companies to increase reuse, repair and remanufacture- key tenets of the circular economy concept.
Glasgow Chamber of Commerce	23	Launched Circular Glasgow in 2016 and has two full-time staff committed solely to the project.
Glasgow Convention Bureau	18	Approached by Circular Glasgow in 2017, the Convention Bureau was asked to be a partner to help connect SMEs within the events and conferences sector in trialling circular economy practices.

Table III: Description of the organisation's interviewees represent and their role in Circular Glasgow

i. **Thematic analysis**

a. "Ideas about origins"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	4	1	2	2	1

The first, and perhaps most straightforward theme identified during interviews emerged from comments alluding to the participant's ideas or hypothesis about how Circular Glasgow came to be. These 'ideas of origins' varied between being public-sector driven and market-led. For example, Zero Waste Scotland's representative attributed the circular economy movement in Scotland to strong political backing compared to the rest of the U.K.

> *"There's a little bit going on in Wales, but not to the same extent in terms of policy and legislative type of things. Plus the funding and resource to actually deliver it, which is what Zero Waste Scotland is. [Additionally] there's cross-party support for Circular Economy. It's not just the SNP, it's across the board."*

This participant indicated a key feature in Scotland's circular economy movement as being political support and willpower, while also noting the importance of economic incentive:

> *"We've done some research with the Ellen MacArthur Foundation a few years ago that the circular economy is a £3 billion opportunity for Scotland- I think that's been very much been seen as an opportunity for economic growth in Scotland and Wales."*

Interpreting this comment, the £3 billion opportunity is hypothesised to be enticement for policymakers and business-leaders alike.

The representative from Circular Glasgow's response to a question regarding other city-wide circular economy projects seems to indicate that Circular Glasgow relies more heavily upon business leadership.

> *"I think on the Scottish-based perspective we were certainly the first ones to take such a big look on the Circular Economy. There was an impact on productivity- I think both of them [Peterborough and London projects] were in the public-sector, whereas this is more business-based, the first business-led. As opposed to being led by public sector."*

This respondent's answer is logical due to Circular Glasgow's (and thus the Glasgow Chamber of Commerce's) mission statement. This interviewee elaborated upon the Chamber's initial interest in the circular economy project, explaining that they began exploring sustainability and environmental initiatives back in 2014 after the

Commonwealth Games were held in Glasgow. The Chamber noticed several members' involvement and interest in the construction of the Athletes' Village, which later earned the prestigious Queen's Award for Enterprise in Sustainable Development (Glasgow Chamber of Commerce, 2018). The Chamber then began exploring environmental projects by hosting initial workshops.

> *"As that sort of grew and developed, we wanted to try and focus on something more tangible and at that time, other aspects in terms of we knew that Zero Waste Scotland had been speaking to folks over in the Netherlands who'd been looking at city-based [circular economy] approach as opposed to sectoral. It became a conversation about what could we do, is there something there? And [Circular Glasgow] became a sort of scoping exercise for the Chamber, and foreseeably Scotland."*

Another interview participant, a representative from the Glasgow Convention Bureau, corroborated, explaining that as Chamber of Commerce members, the Convention Bureau was asked to participate in Circular Glasgow.

> *"[The Chamber] knew that we were already working with our industry, the hotels, the restaurants, the venues to encourage them to be greener and to go for the green tourism awards. They approached us to see if we could be ambassadors to their Circular Glasgow project."*

This interviewee explained how the conference and events sector contributes over £130 million to Glasgow's local economy, and how the Bureau was already carving a niche in the "green events" and sustainability sphere, having earned Silver in the Green Tourism Award, and coming in 4th on the Global Destination Sustainability Index in 2017.

The interview participant from the Scottish Institute for Remanufacturing (SIR) expressed a more nuanced view, noting the complexity in determining the 'origins' of circular economy projects in Scotland:

> *"I believe that the circular economy was popularised, if not invented by the around-the-world yachtswoman Ellen MacArthur. Chicken-or-the-egg? I don't know when the Scottish government picked up on this, I think it was the civil servants, not the politicians, who identified this as a future direction for a growth*

> *area for manufacturing. They were tasked with identifying how*
> *this could be encouraged in Scotland."*

Whether by public or private impetus, interview participants expressed a variety of views regarding the origins of Circular Glasgow. Several indicated that their organisation's introduction to the circular economy concept aligned with pre-existing sustainability initiatives and goals. The SIR comment referenced a causality dilemma ("Which came first: the chicken or the egg?"), as to whether politicians or the public professionals serving the government were responsible for promoting circular economy projects. This research hypothesised about this question and the role of civil servants. When designing the project, a representative from the Scottish Parliament Information Centre (SPICe) was contacted and participated in an interview, providing this comment:

> *"I was aware that the Scottish government was discussing circular*
> *economy and, in a context, particularly in the development of e-*
> *pollution and their waste framework. At that point I thought it would*
> *be helpful that the Scottish Parliamentarians could draw knowledge*
> *upon an issue that was live in both Europe and Scotland and a*
> *variety of things that would come up in Scottish Parliament.*
> *Members of parliament could then be familiar with the concept of*
> *circular economy, what some of the issues are that it relates to, or*
> *how some of the developments of policy in Scotland to date relates to*
> *issues in the circular economy."*

The circular economy SPICe report is an example of how civil servants may have introduced the concept in the public sector.

b. "Incremental progress"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	2	4	3	3	4

A review of circular economy literature and a historical analysis of related policies within the Scottish Government shed light on how environmental and sustainability initiatives evolved into resource and waste reduction policies. This incremental progress or shifting was referenced by some interview participants and

was coded for. Some participants indicated specific dates or years that they noticed a progression:

> *"Sometime around February 2016 I think we [SIR] had a grand opening and then someone came and made a speech. Where Glasgow was going at that point, I got the feeling that the circular initiative was probably after 2015. We got money in 2015, so there had been easily a year before that would have been the first approaches of some sort of centre for remanufacturing in 2014."*

In response to a question asking how long Zero Waste Scotland had circular economy positions and project teams, the interviewee responded:

> *"It could be like three years? I mean, I suppose since we have a circular economy team it's been about three years… Obviously, circular economy seeps into other bits of our work as well as in our work with efficiency, in our work with local authorities around recycling counting and trying to make them more consistent in how they collect recycling and things like that."*

These two comments, particularly the 'where Glasgow is going' and the Zero Waste Scotland mention of how circular economy already fit into their ongoing initiatives are important pieces in understanding the broader narrative of Circular Glasgow. They describe both momentum and the building upon a pre-laid framework.

In the interview with the Circular Glasgow representative, this sense of incremental change is described through specific waste-reduction examples the team has had to use in order to educate the public about circular economy as a concept:

> *"We've constantly been trying to defend the message, but actually people are starting to be a bit more sophisticated about it. Saying well, 'what's the difference between [circular economy] and sustainability'? A lot of campaigns…for example, the coffee cups: '[coffee cups] were a big thing, now it's your plastic waste- no straws.'…I imagine legislation and things, deposit-returns and things, are coming. So we're trying to encourage businesses to be at the forefront. Ahead of the curve, dealing with impacts and policy after."*

This excerpt touches upon the kinds of barriers the Circular Glasgow project team faced working alongside the constantly-evolving nature of 'sustainability' in the public sphere. Public outreach and promotion were key elements of Circular Glasgow and entailed educating business owners about how circular economy principles could be combined or added to existing practices.

c. "Receptiveness of government"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	3	0	0	3	2

The code "Receptiveness of Government" is a rough descriptor for interview comments that point to how interested and amenable the Scottish government (at either national or local level) seems to circular economy projects. The Zero Waste Scotland interview contains three comments of this nature- notably when the interviewee explained the organisation:

> *"We're not quite an NGO just now, we're a not for profit, we're really funded by the Scottish government. So we're a kind of broad body for Scottish government policy in making things last,"*

The Scottish government directly funding an organisation indicates a willingness and purpose in addressing waste issues. The Zero Waste Scotland representative also discussed how the trickle-down effect from national funding and interest has resulted in local authorities beginning to implement circular economy through writing the concept into their policies and strategies, as well as demonstrating it through their procurement of goods and services. The SPICe representative reiterated this point when asked about the key drivers of Circular Glasgow, commenting that it

> *"was probably a combination of factors, whether it's being high level political commitments made or Scottish government commitments to develop programmes of work almost sets the scene and provides a context for their local initiatives to fit in."*

The theme of combination, or collaboration between the various forces behind Circular Glasgow was significant and worth coding for, resulting in 41 total comments.

d. "Collaboration"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	7	13	15	6	0

Interview participants overwhelmingly described the fruition of Circular Glasgow through adjectives such as 'cooperation', 'partnerships', and 'networks.'

> *"I think Circular Glasgow has been a really great initiative in that you have Chamber of Commerce who are working in partnership with Zero Waste Scotland as funder. We work with Glasgow City Council really closely. We work predominantly with Circle Lab, we also work really closely with Sustainable Glasgow team. We work really closely with their team and bringing them into the fold, with economic development side as well. We also work with people at University of Strathclyde as well…as well as partnership with the guys over in the Netherlands [Circle Economy]. It's built around that sort of that collaboration. Because you are always sort of adapting and collaborating and looking to what the next steps will be."* (Circular Glasgow representative)

The Zero Waste Scotland representative emphasised the point that while Circular Glasgow was primarily funded by ZWS:

> *"We don't view it as that, we view it as more of a partnership with the Chamber of Commerce and local authority.*"

Interview participants seemed to all acknowledge the necessity for partnerships due to the overlapping nature of circular economy projects. Sectors are interwoven and interdependent, thus forming the bigger picture of the economy. Both Circular

Glasgow and the Scottish Institute for Remanufacturing rely upon networks in order to promote their concept. While SIR is not directly part of Circular Glasgow, the interview participant from SIR explained that they are a sort of conduit for 're-branding' remanufacturing:

> "One of SIR's objectives, as well as funding, is to create a community. So we tweet, we have newsletters, we have annual events and this group of people for the first time think 'oh, you know, the only people who called themselves remanufacturers were doing car components, it's more than that,"

By reaching SMEs in the car part re-manufacturing sector, SIR assists these businesses in re-valuing, or create new value out of their services through the Circular Economy lens. Circular Glasgow and ZWS rely upon the Chamber of Commerce's pre-established business network. The Glasgow Convention Bureau was contacted for their ability to tap in to the events sector:

> "[Circular Glasgow] comes in and helps with the promotion of the Circle Lab activities, we send it to our members-give some names of people who run conferences, organisers, get them involved. So that's what – almost like an ambassador to the Circle Lab – we were asked to be, to give our backing, so that when the Chamber goes to a local professional conference organiser or a local venue they could say 'the Convention Bureau says you might want to get involved with this…' To show that the team of Glasgow is working together."

The theme of collaboration and networks in the creation of Circular Glasgow project was an anticipated result when embarking upon this research. The near-identical statements from interview participants regarding their sentiments about the necessity for collaboration in this kind of project is an essential result from the interview data.

The following three codes are based upon Kingdon's three streams of policy analysis. Interviews were reviewed for comments that indicated the 'problem stream', the 'policy stream', and the 'politics stream'.

e. "Problem stream"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	0	5	6	6	0

Some of the coded comments in these three categories overlapped with existing coding. For example, 'ideas about origins', and 'incremental progress' also coincide with identifying the problem stream. When the Circular Glasgow interview participant was describing Chamber members' interest in sustainability projects during the 2014 Commonwealth Games, an opportunity was identified through the attention to environmental building and construction practices. When analysing the Circular Glasgow initiative through Kingdon's multiple streams analysis, it may be more appropriate to refer to the 'problem stream' as the 'opportunity stream.' This initial spark to the policy process involved identifying opportunities for collaboration, economic incentives, and creativity.

The Convention Bureau representative discussed how through the conference and events sector, an opportunity arose:

> *"The fact that thousands of people arrive and are encouraged to have coffees and waters and red carpets and certain aspects that typically seem quite wasteful. So [Circular Glasgow] wanted to target predominantly the meetings industry and events industry and asked for our help from a conference perspective to promote the Circle Lab competition to come up with ideas for businesses to either work together to reduce waste, or how somebody's waste might be useful for somebody else."*

Prior to The Convention Bureau's involvement, the Glasgow Chamber of Commerce members encountered the 'opportunity stream' through their early exposure to the circular economy concept in the Netherlands.

> *"We had their director of business development and program development speaking. Circle Economy produced a report back towards the start of the year called Circularity Gap.*

Basically, it shows that their research has found the world is only 9% circular. Therefore, there's a massive gap that needs to be addressed."

According to Cairney (2012), in Kingdon's 'problem stream', the introduction or emergence of problems is surrounded in ambiguity. They only get attention depending upon how they are framed. One could argue that Circle Economy provided the evidence the Glasgow Chamber of Commerce needed to present the 'circularity gap' in Glasgow. "Getting attention is a major achievement which must be acted upon quickly…this might be achieved by demonstrating that a well-thought out solution already exists" (Cairney, 2012, p. 244-264). Thus, circular economy, creates value and improves the local economy while solving environmental issues of wasted resources, presenting as an 'opportunity stream'.

f. "Policy stream"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	9	5	7	0	2

In Chapter six and seven of Kingdon's "Agendas, Alternatives and Public Policies, he describes the second stream, policy, along with the 'policy primeval soup' concept. After a problem has become known, gained traction through public attention, discussed amongst policymakers, Kingdon argues it only progresses if a solution has been proposed and attached. "The development of policy proposals is a little bit like biological natural selection…molecules floated around in the primeval soup before life came into being. Similarly, ideas float around in what I call the policy primeval soup," (Kingdon, 2001, p. 333). According to this concept, ideas about circular economy are proposed, analysed, proffered as solutions, and reactions gauged. This research loosely mapped this process through a timeline in the Appendix section. One particular case example emerged through the interviews to exemplify the importance of the policy stream.

Just prior to the 'hard-launch' of Circular Glasgow, Zero Waste Scotland facilitated the partnership between a brewery and bakery, who exchange waste by-product to create a valuable new product. Surplus bread rolls are given to the brewery

to produce an award-winning blonde ale (Zero Waste Scotland, 2018). This tangible example is easily cited as a proposed solution to a waste problem, applying the circular economy concept.

> *"We went for bread-to-beer to start for food and drink [sector]*
> *in the first instance, because everyone eats and drinks, but it*
> *just so happened that bread-to beer took off and that's an easy*
> *story for people to grasp. It was really successful for the*
> *companies involved in terms of their PR and marketing,"*
> *(Circular Glasgow representative).*

In some instances, Zero Waste Scotland served to assist SMEs in recognising the solution to their waste problem:

> *"...In construction, manufacturing, infrastructure, we'll work*
> *with industry bodies to try and help businesses understand*
> *what circular economy is, what the benefits are and so and*
> *then, if they need support to develop a circular economy*
> *approach, then they'll be referred in to our business support*
> *service or into our investment fund." (ZWS representative)*

The ZWS representative elaborated, explaining how they deliver the solution when the Scottish government identifies a problem and drafts policy targeting the issue: *"We make an operational prime, say what we're going to do to try and deliver that and get funding, then run a series of projects to achieve it."* ZWS plays an interesting role when assessing circular economy through Kingdon's three-streams lens. In the policy stream, they could be considered 'policy entrepreneurs,' willing to invest their resources in pursuing their focus area, and responsible for "coupling solutions to problems," (Kingdon, 2001, p. 20).

After the Circle Lab crowdsourcing event, Circular Glasgow also served to help nudge solutions along. The Chamber of Commerce worked with the Convention Bureau and the Scottish Events Campus to incubate the winning solutions in conjunction with Glasgow-based businesses

> *"We always had interesting projects from circle economy*
> *employments to green e-commerce funds. We do like to look at*
> *some of the future trends and see what's going to meet some of*
> *the business needs that actually champion Glasgow and*

support Glasgow as a pioneering city." (Circular Glasgow representative)

When policy entrepreneurs are able to attach solutions to a problem that has caught public attention and gained traction amongst decisionmakers, they help catalyse the interactions within Kingdon's 'primeval soup'. Circular Glasgow and ZWS bolster the stories and successes of a city-wide circular economy project through their initiatives.

g. "Politics stream"					
	Zero Waste Scotland	Convention Bureau	Circular Glasgow	SIR	SPICe
Number of comments per interview:	8	4	3	2	1

The third stream completes the circle to form the policy window. When policymakers combine factors such as public attitude towards a problem, information from interest groups and experts, and their own willingness to act, policy may come to fruition (Kingdon, 1995, p. 165-175).

As mentioned in a previous paragraph regarding the 'receptiveness of government' coded comments, when responding to a question about what the biggest drive for a circular economy in Scotland is, the representative from SPICe referred to "high level political commitments." The 2013 speech by European Commissioner for Environment, resulting in the Scottish Government's 2016 'Making Things Last' strategy, is an example of policymakers' motivation to implement circular strategies at national and local levels.

The ZWS representative alluded to policymakers' motivation in Glasgow, coupled with the economic incentives and value-creation a circular economy could bring.

> *"[Chambers of Commerce] are all broadly involved in a similar process where we have done some base research to build up a bit of evidence and a bit of a business case for circularity in the region. And that's just understanding what the opportunities are. So, we've looked at in Glasgow, what's been described as like political will but it's looking at what the sort of strategic priorities are for the area." (ZWS)*

This comment suggests that policymakers' willingness, or receptiveness to circular economy projects is steered by Chamber of Commerce interest. If a city's Chamber of Commerce is studying the value-creation opportunities for local SMEs, political leaders may become interested in endorsing circular economy initiatives.

The 'politics stream' category of coded comments proved the most imprecise. Many of these coded comments were also categorised under other codes ('ideas of origins', 'collaboration', and 'receptiveness of government' specifically). To best understand the politics stream, a policymaker at the national or local level may have been the ideal interview participant. However, this research could not feasibly access Scottish policymakers, who, could perhaps have provided stronger interview data in understanding Circular Glasgow through Kingdon's third stream.

ii.   Significance of coded comments

Understanding the origins of a policy idea, or the fruition of a circular economy project, is inextricably interconnected to understanding the public policy agenda of the circular economy topic. Seven themes in total emerged from the interviews, however, many comments overlapped one another and could fit within multiple codes. The most frequently coded theme, "collaboration," perhaps confirms the obvious about Circular Glasgow: The Chamber of Commerce facilitates partnerships between businesses, writing collaboration into the program from the very beginning. The second most frequently coded comments related to the "policy stream", where solutions to identified problems are attached. In Circular Glasgow, the answer to the problem of wasting resources and materials is by making the waste valuable and saving businesses money. The solution is therefore coupled with two key topics: reducing waste and encouraging economic growth. Through Kingdon's multiple streams lens, the circular economy provides a solution to the problems of materials waste and economic stagnation. The interview data gathered during this research supports Kingdon's multiple streams framework and helps explain the window of opportunity for Circular Glasgow, as demonstrated by the frequency of comments about collaboration and facilitating partnerships.

iii. Reflexivity & bias

Qualitative interviewing requires meticulous reflexivity. From the initial phase of this research, fine-tuning the subject and selecting the particular scope, I had to assess my behaviours and reasoning for my choices. The circular economy topic is of

particular personal interest to me, and thus I had to be aware of my predisposition and desire for the success of circular economy initiatives. This interest also had to be controlled during interviews. Rubin and Rubin discuss the challenge of exuding too much interest, or over empathising with interview participants. "Rather than pretend to have no biases, it makes more sense to examine your preconceptions and work out how your feelings might slant the research and then with this understanding in mind, work to formulate questions to offset your biases," (2005, pg. 82). I made every attempt to remain level and address my excitement during interviews. In one instance, I slowed the conversation, explained my background and interest to the interviewee, and resumed the discussion after checking myself.

A potential bias and confounding factor relates to my citizenship. As an international student with a very short experience of Scotland, the frame through which I examined the policy process and administration of local initiatives may have been tinged with a sense of novelty. For example, government delivery agencies such as Zero Waste Scotland are not as prevalent in the U.S., and are surrounded by a very different set of stigmas or beliefs as they would be in the U.K. My experience as a researcher, however, is not unique in that every study holds a sense of this kind of reflective bias: the relationship between the subject and the object.

An additional noteworthy bias emerged while conducting a review of the public policy literature. Much of this work's theoretical framework relies upon John Kingdon's multiple streams and evolutionary theories. Also a U.S. citizen, Kingdon's research was rooted in an "Americanist" public policy tradition. Baumgartner (2016) commented on Kingdon's perspective and research style as helpful when understanding the role of political elites. "This linkage of American and comparative studies of public policy, policy processes, and elites in general…was one major element of the environment that generated 'Agendas and Alternatives," (Baumgartner, 2016 p. 56). In Kingdon's seminal work, he interviewed members of U.S. Congress and the elite policymakers and influencers of Capitol Hill. This study of Circular Glasgow cannot feign the same scope and scale as Kingdon's research subjects and must also acknowledge the slight differences between the governing systems of U.S. and U.K. politics.

VI. Conclusion
i. The fruition of Circular Glasgow

Like the imminent march of infantry ready for battle, a strong idea is difficult to counter. In the concluding chapter of Hugo's "Histoire d'un Crime," he reflects on his conviction of the inevitability of the French Revolution. "One resists the invasion of armies; one does not resist the invasion of ideas," (Hugo, 1877, Chapter X). Hugo then describes France's plight for truth, justice, and the better nature of humanity. It is an idea that triumphs because it is *right*. While one can intuitively understand this feeling of right and wrong, good ideas and bad, this research sought to examine the factors lending power to the idea of Circular Glasgow. The circular economy may seem like a grand solution yet bringing it to fruition requires a combination of objective factors and circumstances.

This research attempted to tease out these factors through the scrutiny of interviews with key stakeholders of Circular Glasgow. As detailed in the Results section, interview respondents had varying ideas about Circular Glasgow's origins, ranging from public-sector driven forces to economically incentivised reasons among the key organisations leading various programmes and initiatives. However, when looking at the tangible steps made in Glasgow, the Chamber of Commerce appears to have been the strongest catalyst. As a project of the Chamber of Commerce, Circular Glasgow came about due to their close monitoring of opportunity, serving as the 'policy entrepreneur', and their early efforts of gauging interest and making connections amongst Chamber members. Zero Waste Scotland, a publicly-funded entity, provided support in the form of expertise and funding. Both the Chamber of Commerce and Zero Waste Scotland had it in their best interest to form partnerships. Other results indicate interviewees felt a sense of receptiveness from regional and national government towards the circular economy concept. The availability of funding from the European Union, trickling down through the U.K. and Scottish governments signalled the prioritisation of resource conservation and waste reduction initiatives such as Circular Glasgow. The most overwhelming conclusion from the interview data came from the theme of collaboration. The Chamber of Commerce, Zero Waste Scotland, the Convention Bureau, and the Scottish Institute for Remanufacture all had it in their best interest to contribute staff resources and project investment into the emergence of a circular economy in Glasgow. Organisations

shared information, assisted one another in connecting contacts and funding opportunities, and each leveraged their own networks and institutional knowledge to contribute to the initiative.

While interview data allowed for a more refined analysis of the origins of Circular Glasgow, this researcher believes it only began to scratch the surface of an understanding for how such an idea could take root and flourish in Glasgow. Themes from interviews (collaboration, receptiveness of government, and incremental progress) coupled with a literature review of public policy and agenda-setting theory provide a cursory study of a much deeper question about human nature and social change: how do we trace the origins of ideas? Like an army comprising of rows and rows of weapon-bearing soldiers, ideas gain strength and power due to each individual's understanding of the idea or cause they are fighting for.

ii.   Rain, soil and luck

As referenced in the Literature Review section, the works of public policy scholars such as Baumgartner, Kingdon, and March and Olsen were influenced by natural selection and biological metaphors. To comprehend how Circular Glasgow came to fruition, at a deeper level than the scope of this study, the theories such as 'policy primeval soup' and the 'garbage can theory' may help further research with more sophisticated methods delineate the precise catalysts at individual levels. For example, the Glasgow Convention Bureau representative described how they were seeking ways to reduce their environmental impact and were competing for green tourism awards. When approached by the Chamber of Commerce to be a partner in Circular Glasgow, the opportunity seemed to be a natural progression. Taking this research a step further would entail deeper analysis of the Convention Bureau's past initiatives and internal decision-making procedures regarding waste reduction and resource conservation goals.

Through an evolutionary theory lens, to better promote and grow the Convention Bureau, Circular Glasgow was a way to be more competitive within the industry's sector, to further their own goals, and acquiesce with the "survival of the fittest" outlook of the standard economy. Baumgartner and Jones' theory, "punctuated equilibrium" suggests that results from prior policy decisions culminate and instigate a need for solutions in key moments (1993, p. 13-18). The public policy framework of incrementalism also insinuates an evolutionary, gradual development of policy ideas.

Such ideas become powerful due to a variety of factors: the snowballing effect of popular opinion, current events, and the availability of the most competitive policy ideas to address them (Cairney, 2012).

Instead of inquiring about the origins of an idea, or what makes the idea powerful, a thorough examination of the individual catalysts involved may be necessary for a deeper understanding. To further study the stakeholders and various stimuli of Circular Glasgow is to learn what led to the most opportune conditions of the 'policy primeval soup'. In Chapter Four of Kingdon's "Agendas, Alternatives, and Public Policies," he delves into the heart of this topic, seeking the origins of ideas which lead to public policies.

> "Thus the critical thing to understand is not where the seed comes from, but what makes the soil fertile…I can trace the paths of ideas. But my personal theory is that people plant seeds every day. There are a lot of ideas around, and there is no lacking for ideas. The real question is, which of these ideas will catch hold? When you plant a seed, you need rain, soil, and luck," (1995, p. 77).

This research project was crafted to examine the broad factors which led to the fruition of Circular Glasgow. It did not thoroughly investigate what made the soil fertile, or what primed each individual organisation and actor for a circular economy project in Glasgow but provided the preliminary groundwork for further research to delve deeper.

iii. Further study

While this study provided a distillation of individual organization's understandings of the fruition of Circular Glasgow, it was limited in scope and depth due to time restrictions. Interviews were conducted with individuals who were speaking on behalf of their organization and of their understanding for why circular economy came about in Glasgow. A deeper and more impactful study would ideally interview multiple individuals from each organization and would also include a longer interview to inquire about the individual's personal ideas about resource conservation and waste reduction.

Future research could compare case studies of other city-wide circular economy projects and assessments of the factors which led to their introduction of

such programmes. At the time of this research, there is one other U.K. city-wide circular economy initiative in Peterborough, Cambridgeshire. According to the Ellen MacArthur website, city-wide circular economy projects are emerging across Europe, North and Latin America, and Asia. Interesting insights could be gleaned through the comparison of circular economy initiatives within differing governing systems (i.e. socialist republic and constitutional monarchy).
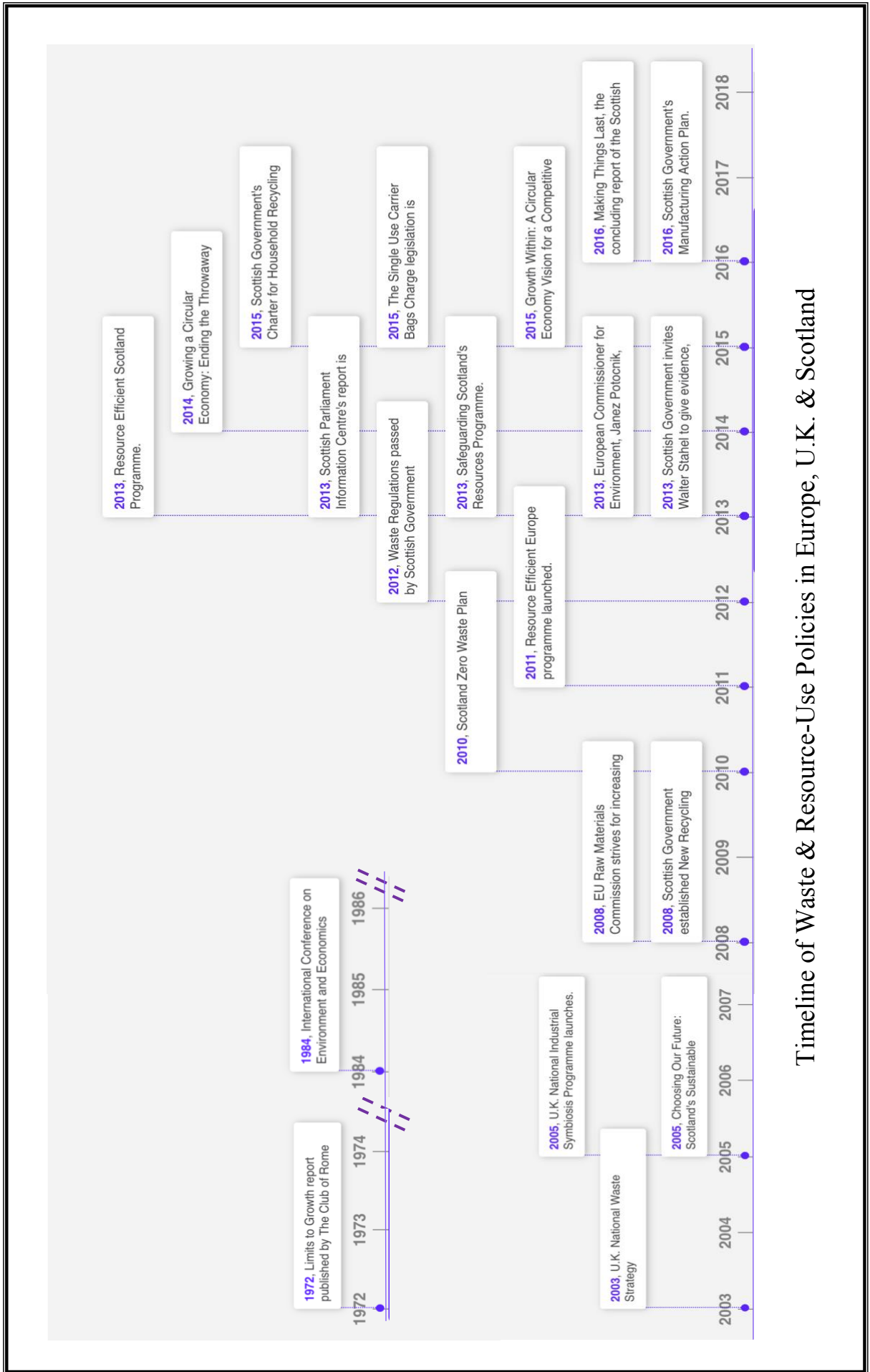
In Glasgow, a complementary study could trace the successes and failures of Circular Glasgow through the policy cycle tool: analysing the policy adoption, implementation and evaluation stages. Across the city, the aim of the project is to "open new revenue streams, increase competitive advantage, and realise financial savings" (Circular Glasgow, 2018). By the end of 2018, the project intends to complete 50 'circular assessments,' and will host a 'Circular Economy Hotspot: Scotland' between October and November of 2018. The Chamber of Commerce continues to grow the program and facilitate collaborations among Scottish businesses. Future studies would have ample opportunities and case studies within Circular Glasgow to assess the impacts of a city-wide circular economy policy.

iv. Final remarks

Our traditional economic system ('take, make, dispose') contradicts the realities of increasingly finite natural resources and environmental constraints. The current flow of material goods is progressively recognised as unsustainable, and policymakers, businesses, and consumers alike are beginning to seek alternative systems. At the European Recycling Industries' Confederation in Brussels, Emmanel Katrakis, Secretary General, stated "there may be alternative markets but they're not ready today," (Freytas-Tamura, 2018). Katrakis' point describes one of the spurring factors leading nations, global corporations, and thinktanks to devote resources to the funding and research of alternative economic systems. Waste has caught public attention. Plastic bans, levies, and the search for single-use alternatives has opened a window for a new way of thinking. The circular economy model may be a 'new think' solution to the current waste crisis. Initiatives such as Circular Glasgow can provide a blueprint for the way forward, yet a deep analysis of its instigating factors will be necessary if seeking to replicate such an initiative in other cities.

Various policy scholars offer strong theories about how items rise to prominence in the agenda-setting stage of policymaking. Policy studies indicate there

is no clear equation, and perhaps, with limited information due to a narrowly-scoped study, the interview data from this research corroborates the chaotic nature of the fruition of Circular Glasgow. This scholar argues that Kingdon's evolutionary theory and multiple streams theory best explains its fruition. With a little rain, fertile soil, and luck, ideas can grow to surmount the imminent social, political, and economic challenges we shall face in the years to come.

Timeline of Waste & Resource-Use Policies in Europe, U.K. & Scotland

1972, Limits to Growth report published by The Club of Rome

1984, International Conference on Environment and Economics

2003, U.K. National Waste Strategy

2005, U.K. National Industrial Symbiosis Programme launches.

2005, Choosing Our Future: Scotland's Sustainable

2008, EU Raw Materials Commission strives for increasing

2008, Scottish Government established New Recycling

2010, Scotland Zero Waste Plan

2011, Resource Efficient Europe programme launched.

2012, Waste Regulations passed by Scottish Government

2013, Resource Efficient Scotland Programme.

2013, Scottish Parliament Information Centre's report is

2013, Safeguarding Scotland's Resources Programme.

2013, European Commissioner for Environment, Janez Potocnik,

2013, Scottish Government invites Walter Stahel to give evidence,

2014, Growing a Circular Economy: Ending the Throwaway

2015, Scottish Government's Charter for Household Recycling

2015, The Single Use Carrier Bags Charge legislation is

2015, Growth Within: A Circular Economy Vision for a Competitive

2016, Making Things Last, the concluding report of the Scottish

2016, Scottish Government's Manufacturing Action Plan.

1972 1973 1974 1984 1985 1986

2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

Figure III: Timeline of Waste & Resource-Use Policies

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