

Circularity: a material development in economic innovation

A think piece by Zero Waste Scotland and Economic Development Association Scotland



1. INTRODUCTION

This think piece is jointly produced by Economic Development Association of Scotland (EDAS) and Zero Waste Scotland. It explores the central role that the circular economy should increasingly play in economic policy, strategy, and practice, and in advancing an innovative, prosperous, fair, and green Scottish economy.

In working through our mutuality, we very briefly return to a principle of economics. In this, the Scottish founder of modern economics, Adam Smith, in his book *Wealth of Nations*, points out that the economy is the organisation of interdependent people who socially provide for their needs and wants (McMaster, 2023). Smith's 'social provisioning' lies at the core of what an economy should be doing, and this tells us today that we should view the economy and its development as an intrinsic part of society (and nature) and not separate from it. In this we reverse the idea that society operates for the benefit of the economy to one which ensures the economy's purpose is to ensure benefit for the people and the planet.

To invoke Smith's idea of social provisioning is important today: we stand at an inflexion point moving from a long-standing fossil-fuelled economic growth model, with unacceptable levels of poverty and inequality with unsustainable and linear material and resource use, - to an emerging circular, greener, more universally generous wellbeing economic model. One which must effectively organise itself accordingly to societies needs and wants. We need a rewiring of the economy which is not just tinkering at edges. We must embrace real reform.

This partnership between Zero Waste Scotland and EDAS plays into this inflexion point and the need to effectively create an innovative, sustainable, and successful Scottish economy. Both organisations deeply recognise that this is not just about end use 'waste' but rather the full circularity of material and resource use and central to economic strategy and our future.

And, whilst awareness and some progressive practices are there, it is essential to further pivot and go much deeper in placing circular material and resource use at the heart of economic development activity. As such, we need a renewed focus on place, local economics, supply chains, building community wealth, growing health, and wellbeing, while dramatically reducing environmental impacts.

Critically, this think piece - whilst partly surfacing - is not about dwelling on the polar extremes or at times adversarial nature or poles between economic growth versus no growth, or a cost versus gain which can often characterise debate. Instead, we seek to debunk notions that the adoption of a greater circularity of material and resource means additional costs and, thus, a drag on the economy. Indeed, we assert the reverse, with the adoption of a circular system as a key innovation for these times, in which a full extraction of value, from all stages of production, serves to give many businesses a competitive edge and, in turn, boost the Scottish economy, whilst socially providing for all.

Therefore, through a consideration of innovation and value in a circular economic approach, we are operating ‘inside the poles’, offering a fruitful, mutually reinforcing, pathway with significant opportunities. This is about an honest and mature dialogue - thinking through the issues and a positive, hopeful, way forward.

2. CONTEXT: CIRCULARITY, POLICY, AND SYSTEM APPROACH

2.1 The Circularity Gap

The essential need to address the circularity gap in our economic system is pressing. This year, the International Resource Panel reported that “increasing resource use is the main driver of the triple planetary crises” (IRP, 2024:15) – climate change, nature and biodiversity loss, and pollution and waste. According to the Global Circularity Gap Report, we have collectively “consumed over half a trillion tonnes of materials – nearly as much as the entirety of the twentieth century” in just the last 6 years (2024:8). The necessity of an urgent and accelerated reduction in material extraction and consumption is clear.

Additionally, it has been observed that, while resource use is the basis for the social provisioning of basic needs, material extraction and consumption has consistently increased faster than any improvements in wellbeing at a global level (IRP, 2024). This means we are drastically overconsuming beyond our planetary means, and yet still failing to improve wellbeing, social equity, and quality of life around the world.

Overall, the average material footprint per person in Scotland is 21.7 tonnes per year, well above the global average of 11.9 tonnes. Additionally, our material extraction rates vastly exceed the rest of the UK and most other high-income countries, largely due to continued fossil fuel exploitation (CGR, 2022). Inequality, fuel poverty, and food insecurity continue to afflict Scottish society. This is despite intensive resource extraction and consumption, all while we are actively exacerbating the global inequality that prevents the ecologically safe improvement of living standards in low-income nations. Plus, with only 1.3% of all materials in Scotland emerging from the circular economy, we still have an immense gap to bridge in order to overthrow the linear ‘take-make-waste’ economy in favour of true circularity (CGR, 2022:6).

2.1. A supportive policy landscape

While there is this huge circularity gap and associated challenges for a large-scale transformation of Scotland’s economy, the national policy landscape is well positioned to support the integration of circular economy principles into economic development frameworks and practice. These should be seen as a set of interconnected drivers, whereby we create one cohesive ‘overarching’ framework for our ambition, with these policy drives ‘braided’ more effectively together.

In this, the key policy frameworks include:

National Strategy for Economic Transformation (NSET) - As the principal strategy at the heart of Scotland's economic development, NSET lays out an overarching vision for the Scottish economy is to develop a 'Wellbeing Economy', (NSET, 2022). This points to the need for a wider measure of economic value beyond GDP, one which is centred on growing the overall wellbeing of people and our environments. There are great opportunities for the circular economy to fully embed itself across all aspects of this plan. For example, circular strategies and technologies for resource efficiency, and material reuse, frequently require entrepreneurial actors to develop and perfect them. As the circular economy expands in its scope, across new and emerging industries, it can and should offer well-paid, inclusive, and meaningful jobs.

Circular Economy Act - In 2024, the Scottish Government past the landmark Circular Economy (Scotland) Act. The Act gives Scotland the powers and solutions to help us to consume differently, use resources efficiently, tackle waste, and boost our wellbeing economy. The Act provides the legislative framework required to support Scotland's transition to a zero waste and circular economy, significantly increase reuse and recycling rates, and modernise and improve waste and recycling services. The legislation and attendant Circular Economy Strategy recognises that we need to move from the linear economy to a circular one, and gives a clear sign that we need to talk about consumption and rethink our economic systems so that we can start to consume differently.

Wellbeing Economy - The 'Wellbeing Economy' lies at the heart of NSET's vision and the circular economy has a key role to play in delivering it, particularly when it comes to 'tackling the root causes of problems to prevent harm'. The linear economy model is, itself, a root cause of harm to people and the planet. Notably, 'Nature' is one of the five needs for a Wellbeing Economy, which the circular economy will be vital in ensuring the protection and restoration of, through minimising resource consumption as far as possible.

Green Industrial Strategy - The purpose of this targeted strategy is to maximise the economic benefit realised from the transition to a net zero society. The strategy recognises the need for coordinated policy development to facilitate the development of green industries in a way that delivers not only economic benefits, but social and community prosperity via fair work, equality, poverty eradication, and environmental protection. This drive, to establish Scotland as a leader in the global transition to net zero economies, is a brilliant opportunity for the circular economy to embed itself into industrial practices, particularly within the renewable energy sector.

Just Transition - The need for a Just Transition to net zero has been clearly outlined by the Scottish Government, who are developing Just Transition Plans for sectors likely to be most impacted and transformed by the societal transition to net zero. The Just Transition framework envisions a society in which economic activity drives collective wellbeing, there is widespread employment in "good, green jobs" with Fair Work practices, investment in skills needed for a green economy, and low

carbon infrastructure that meets community needs (e.g. insulation, public transport, etc.). (Scottish Government, 2021)

Community Wealth Building (CWB) - A practical approach to economic development, championed by EDAS, which has also been adopted by the Scottish Government. Overall CWB, is about a new approach to economic development, which ensures flows of wealth and associated materials and resources are harnessed sustainability and benefit for all. Specifically, short supply chains support community enterprises as well as environmental sustainability. Where circularity can be embedded within localised supply chains, both social & ecological goals could be met through a united public spending strategy. Furthermore, where CWB is based upon environmentally sustainable businesses and practices, they are much more likely to achieve long-term economic sustainability for local communities. The points of alignment between circular economy and CWB should be further developed through discussion and collaborative strategic planning between Zero Waste Scotland, EDAS and other relevant stakeholders.

2.3. Systems Thinking for the Circular Economy

Critically, whilst the above circularity gap is recognised, and there is a supportive policy landscape, they are inadequate. The need to braid the policies more effectively together demands additional system-level factors to ensure there is effective redress and implementation. Knowing this, bases, cultures, and key institutions, and stakeholders, need to act interdependently at local, national, and international levels. This is critical because, whilst there are well intentioned actors, there are still too many silos resulting in competition and compromise rather than collaborative consensus. Only in creating an implementation ecosystem will we be able to link the well-intentioned policy and bridge the gap it has with delivery.

It is for this reason that the aligning of the respective institutional and knowledge base of both the circular economy and of economic development into one system is particularly pressing and essential. Whilst sharing the same policy frameworks, we must work even harder to align, connect, and mutually reinforce our respective ways forward. Without this, the prevailing path will remain one of costs versus gains, growth v no growth and subsequently the deep transformation required for true circularity and effective social provisioning will remain elusive.

3. ECONOMIC DEVELOPMENT AND THE CIRCULAR ECONOMY

The integration of resource sufficiency/circular economy into economic development is often (and previously) seen as a challenge. Indeed, the circular economy can often be seen as a 'additional' policy 'ask' serving to complicate the economic picture. However, the weaving of more progressive agendas should be seen as an opportunity- an additional ingredient to a much richer recipe. However, to do so needs a greater degree of innovation and creativity – and this should not be seen as a challenge but an opportunity.

To achieve this, we cannot (and must not) shy away from the challenges of aligning economic growth with sustainable resource use and the importance of making

circular economy principles a foundational aspect of economic policy. We must reject siloes and entrenched positioning within the policy eco-system.

To work through this, we need to consider the foundational aspects of economic growth regarding wealth accumulation and its relationship to materials and resources. Economic growth is fuelled by investments that can only be afforded through debt. In order to repay the debts, the return of the investment must be higher than the amount originally spent. Therefore, we need growth and productivity to increase which, in turn, produces further material and resource use.

This has been dubbed the “dilemma of growth” in which more production leads to more pollution, extraction of scarce resources and climate change (Jackson 2019). In crude terms, economic production requires the extraction of virgin materials and resources from the planet. Indeed, much of Scotland’s large material footprint is embedded in the overconsumption of imported goods from abroad, combined with intensive extraction of materials, such as fossil fuels, at home (CGR Scotland, 2022).

In recent times, the notion of green growth has emerged as a dominant policy response to this dilemma. The idea of green growth asserts that continued economic expansion can be compatible with planetary limits, as technological change and substitution will allow us to decouple GDP growth from resource use and carbon emissions. However, work notably by Hickel and Kallis (2019) at the global aggregated level has found little evidence to suggest that decoupling from resource use can be achieved alongside economic growth, and that the pace is too slow to prevent global warming over 1.5°C, even under optimistic policy conditions.

The essential goal of decoupling economic prosperity from material resource consumption, therefore, remains elusive. This aggregated global picture, with the required shifts to the global financial order, should never be far from our sight. However, it cannot, and does not, preclude a redoubling of efforts in everyday economic development practice. In this, as a consideration of the Scottish local, regional, and national perspective is key in moving us forward.

Moving economic development in Scotland forward, as a discipline, requires us to be much more adept at surfacing and questioning growth and the dominant linearity of material and resource use. With Scotland’s Community Wealth Building agenda in mind, economic development must increasingly appreciate that circularity and extraction is not merely about materials and resources, but also central to wealth extraction, finance and investment. Indeed, one cannot consider one without the other. Wealth and material/resources are two sides of the same circular economy coin.

Leaning into this, it is often wrongly perceived case that Scottish and international economic development is synonymous with economic growth. However, rather than being about growth, the everyday practice of economic development is (and should increasingly be) much more concerned with social provisioning, with a renewed focus on quality and the need to develop ways that the economy supports wealth distribution, fairness, and progress within environmental limits.

Key here is the need to confidently recognise that a circular economic system offers significant investment opportunities as a key source of innovation within production. In this, material and resources use should pivot from being seen and used in linear terms as regards inputs and then outputs as products with some 'waste' but rather – have the full life cycle of material planned from the outset - with waste planned, factored for and used by associated production processes. For example asking the NHS to manage their use of plastics in the whole system of production through to disposal as an asset rather than simply seeing themselves as a purchaser of PPE.

The dramatic width of the circularity gap goes to the heart of the inflexion point highlighted earlier. With much of our material impact entrenched in imports, it is vital that we operate at economic systems level. And this innovation must be enveloped within individual businesses, clusters, local and regional strategies, and regional economic partnerships alongside growth and city deals. In Scotland, we need to start making the system change - not solely with policy, but also with our shared knowledge bases, and key institutions and stakeholders including EDAS and Zero Waste Scotland. With the holistic systems-thinking approach, and the reframing of economic development outlined above, we could see the advancement of new fruitful possibilities.

Indeed, the Circularity Gap Report Scotland (2022) provides a picture of the innovation in key sectors that should, in the first instance, be targeted for the circular economy transition.

Housing and construction - Housing and construction have been identified as critical points of redirection towards a circular model of resource use. Housing alone accounts for 17% of total material consumption in Scotland (CGR: Scotland, 2022), while also providing 10% of all jobs. Additionally, a pressing need for more affordable housing across the country has been outlined by the Scottish Government's 'Housing to 2040' strategy (2021), which set a goal to deliver 100,000 new affordable homes throughout Scotland by 2032. This creates an opportunity to apply circular principles and practices to construction, so that the increased housing stock can meet its stated aim of realising the right to an adequate home for everybody, without causing further environmental destruction. Integration of circular principles in the realms of procurement, investment, retrofitting and decarbonising are all necessary.

Net Zero Infrastructure - As indicated by the Green Industrial Strategy, development in the renewable energy sector is well-situated to give Scotland a competitive advantage in transitioning away from a fossil fuel dependent economy. A swift and just transition to a renewable energy-driven society is absolutely necessary and embedding circularity into the material infrastructure as well as increasing levels of community wealth through community and municipal ownership affords long-term sustainability and futureproofing of this sector. Material reuse and improvement of circular supply chains, such as with turbine blade recycling and implementing solar vehicle use, are key areas for the attention of changemakers in this field.

Food systems - The food system in Scotland currently accounts for over 70% of land use nationally and is an incredibly significant economic player and employer, especially in rural areas (CGR: Scotland, 2022). Globally, food accounts for a third of total greenhouse gas emissions and is a major driver of biodiversity loss. Under agroecological and regenerative practices, a circular food economy could flourish, supporting Scottish biodiversity and acting as a carbon sink rather than a primary emitter. The Scottish Government's Good Food Nation Plan (2024) draws the links between health, social equality, economy and environment, across the food system. This presents an ideal political backdrop for circular food policy to be advocated for. As food is particularly tied to land, and therefore local communities, there are many opportunities for shortening supply chains, supporting small enterprises and Inclusive and democratic business models and generally championing the inclusive economic development of the agrifood sector via circular principles.

4. CONCLUSION

This works stands at a necessary inflexion point, in which we must transition to a circular economy which 'socially provides' within planetary limits. This think piece recognises that the circular economy is the lynch pin to creating a dynamic, innovative, sustainable and successful Scottish Economy.

This think-piece exemplifies an approach which seeks to work between the poles of a sometimes contentious and fraught debate, of growth – v no growth, costs – v gains. This debate is understandable but stultifying. All economic institutions and strategies at national, regional and local level need to explicitly and intentionally grapple with these tensions. We believe a route forward is to recognise that a circular economic system is a key innovation for these times and should be placed at the heart of economic development strategy and activity.

As outlined, we have supportive policies and legislation that continue to evolve. The wellbeing economy, NSET, Circular Economy Act =, Just Transition, green industrial strategy and Community Wealth Building all acknowledge that the linear economy is damaging to our natural environment and that we must move to greater circularity and they all must be braided together more effectively. However, these polices alone are not enough, it is now time to harness additional factors, knowledge bases, and pro circular behaviour within our key institutions & stakeholders. To achieve this, there must be greater acknowledgement that that flows and the circularity of material and resource use is not of peripheral concern, but central to economic strategy and our future, and as such should be reflected more confidently within our local, regional, and national economic strategies and in our economic system planning.

In this there are positive and realisable opportunities in the short term, serving as a launchpad to show us the way toward even deeper change. The integration of circular principles in the housing and construction industry as regards procurement, investment, retrofitting and decarbonising is an opportunity. Likewise in the energy renewable sector and in food systems sector, circularity as regards land use and material infrastructure alongside the shortening of supply chains, supporting small

enterprises and Inclusive and democratic business models is a positive, and should be amplified.

Finally, this think piece is an offering, and we hope will prompt some further consideration and debate. In thinking through and exploring the issues through both of our perspectives, there is a mutual recognition that greater alignment between 'the worlds' of circular economy and economic development is essential. In this both EDAS and Zero Waste Scotland have begun an exploration predicated on an appreciation that: progressive policy is not enough; and that system level approaches are key; that wealth and prosperity alongside material and resource are two sides of the same coin and that a circular economy is a source of innovation which Scotland is well placed to harness.

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Material concern: realising the economic potential and opportunities of the Circular Economy

