
Building a more productive and resilient UK through circularity

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About the authors

Simon Oates is a Strategy& Partner providing strategic economic advice to clients facing complex business challenges with a focus on mitigating regulatory risk, driving performance, and achieving the best commercial outcome. He combines a depth of experience and understanding of how investors, regulators and policy makers think and make decisions with a sharp awareness of commercial reality. Simon is the UK Economics Leader for PwC UK.

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Greg Boyd, David Drew, Marelle Goodlander, Isabel Watts and Eddie King.

Executive Summary

The UK has a productivity problem. Even though more people are working, and for more hours, productivity hasn't really moved. This stagnation has held back wage growth and living standards, with the so-called "productivity puzzle" proving resistant to conventional solutions. This isn't just about one sector or one issue. It's a widespread challenge across the UK economy.

In many business and policy discussions the term "circularity" is often proposed or interpreted largely as an environmental play. We wanted to dig deeper. Could circularity – done right - offer real economic and business value in the UK? Could it deserve a more central place in discussions about growth? This paper explores the economic value of the UK context.¹

We've looked at some realistic, near-term scenarios. These are deliberately conservative, aimed at answering a simple question: would more of the right kind of circularity support growth?

Our findings say yes.

Focusing on increasing circularity in key sectors (construction, textiles, packaging and electronics sectors) the scenarios show growth in the UK economy of 0.85 to 1 percent. Plus creating or sustaining c.150,000 to 170,000 full-time equivalent jobs.

That adds up to a 0.2 to 0.4 percent boost in labour productivity, measured by GVA per job. To put that into context, it's more than what's projected from many emerging technologies.²

The UK might be especially well-placed to take advantage of this.

We already have relative strength in services. We don't have a big footprint in extractive industries and primary conversion/manufacturing. Our population is also relatively dense, which helps with logistics and reuse. And looking ahead, the UK aims to grow its share of more advanced forms of manufacturing and re-processing, and increase resilience to trade shocks and resource availability.

A note of caution: not all forms of circularity are created equal. There are many possible configurations of value chains and business models that could be (and often are) described as circular. Many of them are not feasible, not scalable, do not drive economic value or do not deliver environmental benefit. To make circularity work at the scale and quality required, needs well-considered chains of physical activities, propositions and information flows. That's what we mean by 'viable' circularity.

But if this criteria is met, our analysis suggests that viable circularity could help the UK tackle two big economic challenges: productivity and resilience.

¹ The paper focusing on business value will be published separately later this year

² UK Government (2025). The wider economic impacts of emerging technologies in the UK, Link.

UK suitability for a circular economy

The UK has a persistent productivity problem. Despite increasing numbers of people working, we are not getting much more value out of each hour worked. That's held back economic growth, wage growth and living standards, and so far conventional solutions haven't delivered.

That's why circularity deserves a closer look.

Done right, circularity could offer a practical, system-wide way to boost productivity and resilience. It could also help create new, high-value jobs and more resilient supply chains. And crucially, the UK is well placed to take advantage of it.

We're already a service-based economy

Successful circularity in many senses turns high-quality goods into services. Nearly 80% of the UK's GDP comes from services. That's a strength when it comes to circular business models – such as resale, sharing, leasing, and product-as-a-service (PaaS). The UK already has a large base of service providers in areas like logistics, technology, and finance that are essential to enabling the operation of circular business models. Think third-party resellers, repair services and digital platforms.

We are an importer of materials and goods

Given its relative reliance on imported goods and raw materials, the UK faces reduced downside risks from shifting away from linear, resource-extractive models for goods, where economic activity is disproportionately happening overseas. Instead, circularity gives us an opportunity to grow our local economic value, while reducing exposure to material scarcity and price volatility. It's a smarter, more resilient way to grow.

We are an open economy, but building strategic local capabilities

We trade globally, but we have started to bring key parts of our supply chains closer to home. Brexit and COVID-19 forced the issue – and now 58% of UK manufacturers are taking steps to bring parts of their operations closer to home.³ The UK stands to benefit from building on this by further localising strategic parts of its supply chains to enable circularity at scale and further mitigating the impacts of global trade volatility. Advances in AI, robotics and automation will help facilitate this circular on-shoring.

There's transition potential for existing industries and people

Circularity doesn't mean starting from scratch. Many UK industries already have the right foundations. For example, manufacturers can adopt secondary production processes, while extractive businesses can recover critical minerals from recycled products. There's also an opportunity to create higher-quality, better-paid jobs⁴. Many circular activities use similar skills, processes and technologies as existing UK industry creating economic and technical synergies that improve efficiency and boost productivity. Moreover, the ability to co-locate and consolidate activities along the value chain plays to the UK's strengths in regional industrial hubs.

³ The Engineer, 2024. UK embraces reshoring as global supply chains falter, [Link](#).

⁴ ReLondon, 2022. The circular economy at work: Jobs and skills for London's low carbon future, [Link](#).

Estimated impact

To assess how shifting to a circular economy could impact the UK, we undertook a macroeconomic analysis.

Overview of approach

We employed environmentally extended input-output modelling to understand how incremental shifts towards greater adoption of circular models in some sectors would impact UK GDP, employment and productivity, as well as territorial GHG emissions, waste and material use.

The modelling focused on four sectors: construction, packaging, textiles, and electrical and electronic equipment.

We modelled changes in production inputs across sectors within the UK's national accounts based on proportionate levels achieved in other European markets that are more advanced in their own circular economy transition in these sectors: The Netherlands, Germany, Finland and Norway. Analytically, the results presented are a snapshot of the potential impacts if this transition took place relative to the UK economy today⁵.

We modelled two scenarios, which both assume relatively conservative assumptions about the depth and breadth of the UK's circular transition.

- **Scenario 1:** Assumes change in production inputs proportionate to activity observed in the next best comparator market, relative to current UK activity.
- **Scenario 2:** Assumes change in production inputs proportionate to activity observed in the current top comparator market, relative to current UK activity.

The boundaries of the analysis and scenarios have been deliberately defined as relatively conservative, particularly over a 5-10 year period, to support the evidence base about whether more viable circularity would or would not increase improve UK growth.

For more information, please refer to the methodology annex of this report.

Macroeconomic impact

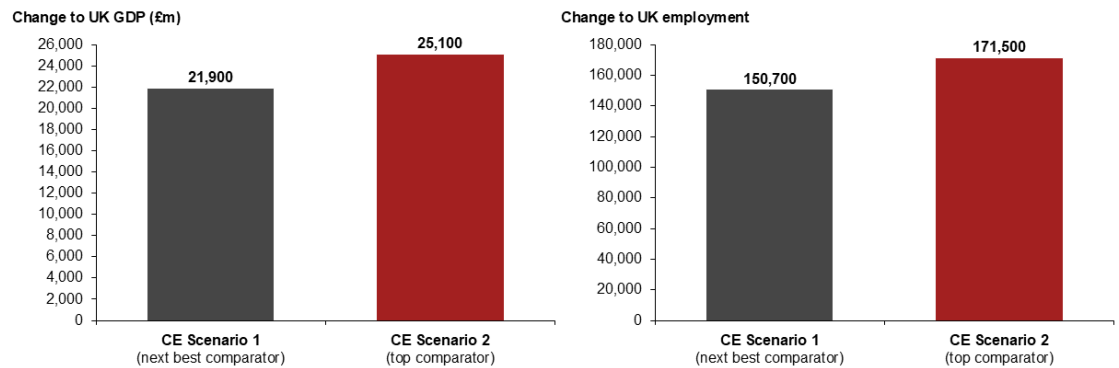
At the macroeconomic level, these relatively conservative analyses suggest that circularity supports economic growth and additional employment.

Under the relatively conservative scenarios for four sectors of the UK economy, our modelling indicates that greater circularity could lead to a 0.85-1 percent growth in UK GDP and 150,500-171,500 jobs created or sustained.

That adds up to a 0.2 to 0.4 percent boost in labour productivity, measured by GVA per job.

⁵ Based on 2022 national accounts data, the latest available at time of analysis.

Figure 2. Macroeconomic impact of greater circularity in the UK



We find this comes with associated environmental benefits. Our modelling indicates that under these scenarios, greater circularity could lead to c.4 million tonnes of waste avoided and a 0.4% decrease in the UK's material footprint.

We have not conducted detailed carbon analysis. Logically, we observe that in effective circular value chains, there is likely to be an increase in UK activities, such as logistics and re-manufacturing, and a decrease in non-UK activities, such as extraction and primary processing. All else equal, the replacement of the typically higher emitting activities in extraction and primary manufacturing with lower emitting activities would likely reduce emissions at a global level. Similarly, we would expect a reduction of UK's consumption-based emissions. The improvement would likely be less visible as measured by UK territorial emissions, due to the increased activity happening in the UK.

The driving forces behind these impacts are:

- A shift of imports & primary manufacturing to remanufacturing;
- A shift of waste activity to recycling, wholesale/retail, and maintenance & repair activity, which tend to have higher economic multipliers; and
- Localisation of supply chains, creating an increase in demand for transport, storage & logistics activity.

Annex: broader benefits – case studies

Profitability

In a separate study, we compared the profitability of scale circular business models across sectors with their linear peers (pending publication). They can be as profitable, and grow at least as fast. As with linear business models though, there is no inevitability of success - getting the business model and proposition right is critical for viable circularity.

Household benefits

Circular models can also generate direct benefits for households, both financial and non-financial.

Financially, cost savings may be passed on to consumers, as seen in the second-hand clothing market, where buyers often pay significantly less than they would for new items.

Beyond savings, there are also meaningful well-being benefits: reduced wait times, more flexible access to assets, higher-quality goods at lower prices, or even improved mental health from owning fewer possessions and embracing minimalist lifestyles.

Community benefits

At a community level, the non-financial benefits from circularity are compelling. For example, research has found that there is significant latent social value potential from unused but functional laptops and tablets currently stored in UK households: if these items were redistributed to people in need, up to £44.7 billion in social value could be created through increased digital inclusion of those communities.⁶

⁶ Tech-Takeback & CIWM (2025). The Social Value of Reuse, Link.

Annex: Methodology

This annex sets out the methodology used to estimate the economic and environmental impacts of transitioning to circular models in selected UK sectors.

Modelling method

A single-region environmentally extended input-output (EEIO) model was built to represent economic and environmental flows across UK sectors. Input-output modelling captures the economic interdependencies between sectors – what each sector buys from and sells to others. Its ability to trace production, consumption, and resource flows makes it well-suited for circular economy analysis.

Circular strategies were modelled by adjusting input coefficients to reflect:

- Remanufacturing and reuse
- Recycling and substitution of virgin materials
- Extended product lifespans

Data sources

The model draws on:

- UK National Accounts for economic transactions (2022 supply-use tables sourced from the Office for National Statistics)
- UK Environmental Accounts for emissions and resource use (2024 tables sourced from the Office for National Statistics)
- Exiobase 3 for environmental intensities (e.g., kg CO₂e/£ of economic output)
- National Accounts from comparator markets
- Supplementary datasets on circular economy jobs and profitability from public third-party reports

Data was cleaned, harmonised, and integrated to reflect a common base year and appropriate sectoral detail.

Scenario development

Two scenarios were developed to apply circular interventions across four high-potential sectors – construction, textiles, packaging and electronics – in line with comparator markets more advanced than the UK in circularity.

1. **Circular Economy Scenario 1:** Assumes change in production inputs proportionate to activity observed in the next best comparator market, relative to current UK activity.
2. **Circular Economy Scenario 2:** Assumes change in production inputs proportionate to activity observed in the current top comparator market, relative to current UK activity.

Both scenarios take a conservative approach, by focusing on just four sectors with significant potential to scale circular practices, modelling performance against peer markets, and holding total economic output constant to isolate the effects of circular interventions.

Comparator markets were identified as European countries that are further along in their transition in these sectors.

- **Finland** – First country to publish an operational roadmap for circular economy (2016-25),⁷ with leadership in packaging⁸ and battery value chains.⁹

⁷ Sitra (2025). Finnish road map to a circular economy 2016-25, Link.

⁸ Creative Finland (2024). Finnish packaging innovations guide the transformation towards a fully circular economy, Link.

⁹ Good News Finland (2021), Finland sparks change for batteries, Link.

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- **The Netherlands** – Services-based economy with circularity entrepreneurship in construction and textiles.¹⁰
 - **Norway** – Pioneer in recycling WEEE with advanced recycling techniques and one of the highest recycling rates in Europe.¹¹
 - **Germany** – Heavy industrial economy taking leadership on circularity in mining and minerals since 2010.¹²

Scenario implementation

Key steps to model these scenarios included:

- Modifying sector inputs and final demand to reflect circular economy interventions
- Balancing the EEIO model to maintain total output across scenarios, so that the total value of goods and services produced in the economy is not changed. Differences in GDP and employment between scenarios therefore arise from changes to inter-industry flows.
- Modelling changes in material use, emissions, and employment
- Running sensitivity analyses to test assumptions (e.g., job impacts, scale of change)

Outputs & interpretation

The model generates a range of outputs, including economic indicators (e.g., value added, employment, value added per FTE employee) and environmental indicators (e.g., resource use, waste generation, GHG emissions). Results highlight the potential economic and environmental benefits of the UK's transition to a circular economy.

Limitations

- The model is static and does not capture technological or behavioural changes over time.
- Input-output tables provide an industry level average output. However, changes might impact companies which have a higher or lower impact than the average. Therefore, the analysis provides insights which are directionally correct and tend to be true at a macro level, but actual impacts may differ at a company level.
- Significant data gaps exist for emerging circular activities. For example, the modelling does not reflect potential lower environmental intensities of production as the UK's electricity grid decarbonises further. The model has used the best available empirical and modelled data but relies on expert judgement where gaps are persistent.
- The modelling is limited to UK domestic trade and does not consider the impacts created in international supply chains. For example, the model does not consider the potential social and economic impacts created for supplier communities abroad from localising supply chains in the UK.

¹⁰ The Progress Playbook (2023). How the Netherlands built a thriving circular economy, [Link](#).

¹¹ UNITAR (2025). The National E-waste Monitor 2025 – Norway, [Link](#).

¹² Ellen MacArthur (2021). Which country is leading the circular economy shift?, [Link](#).

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