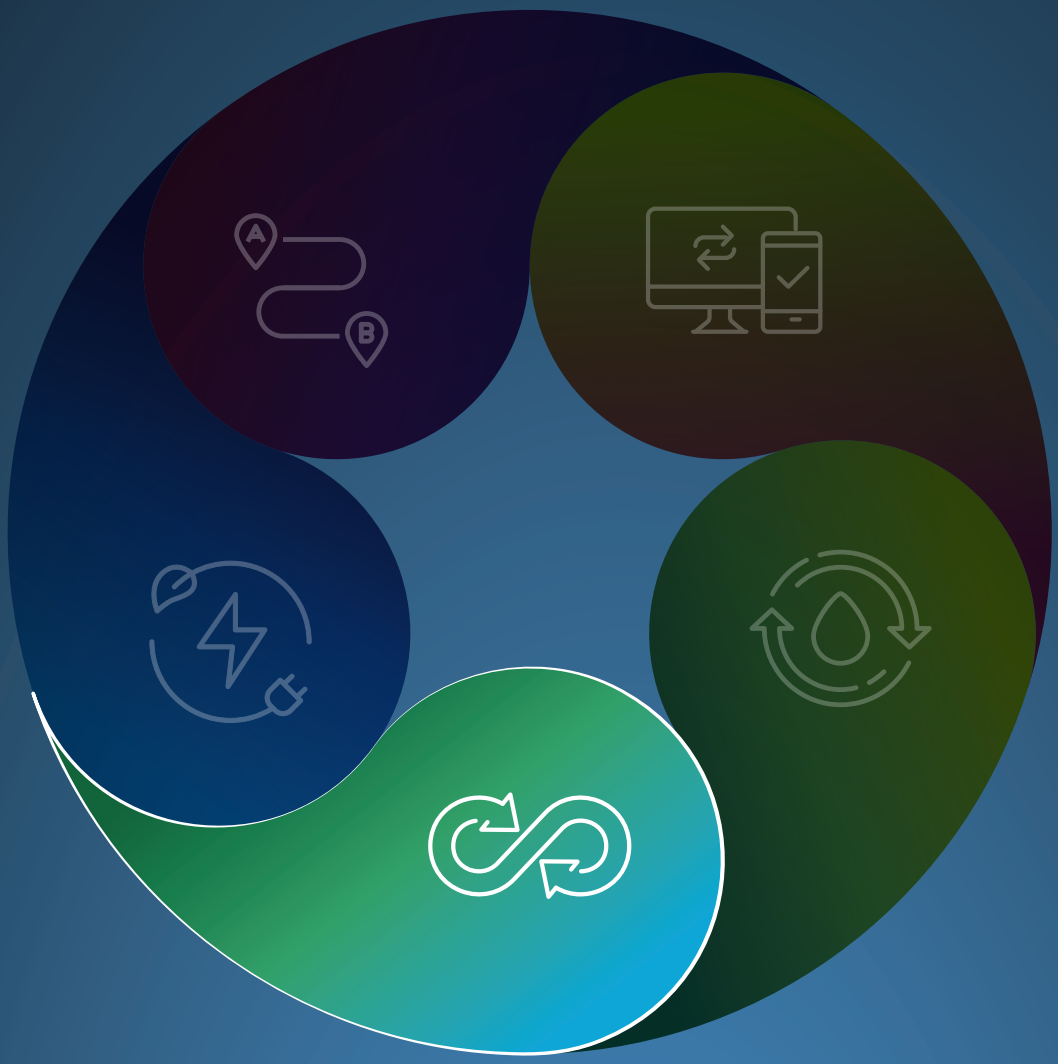
Comisiwn Seilwaith Cenedlaethol Cymru
National Infrastructure Commission Wales

in partnership with ARCADIS



CIRCULAR ECONOMY SECTOR INFRASTRUCTURE INSIGHTS

State of Play and Future Challenges

Ref: 30277500-AUK-XX-XX-RP-TC-0005-01

Contents

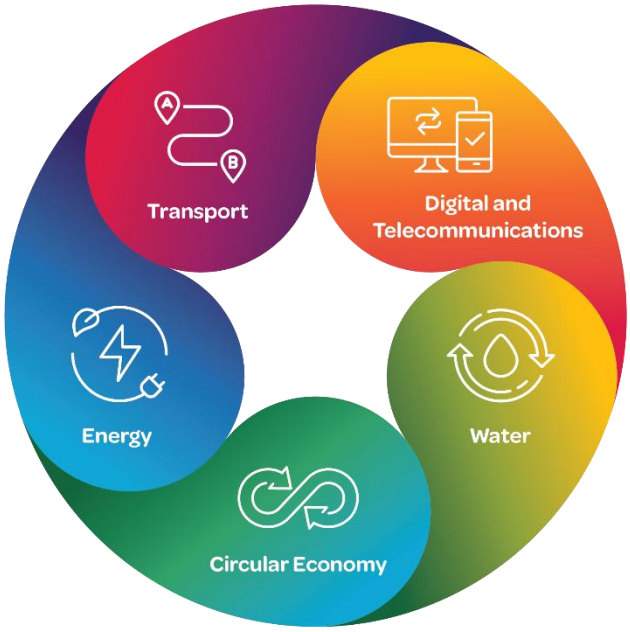
Abbreviations

Abbreviation	Meaning
CE	Circular Economy
NICW	National Infrastructure Commission for Wales
NRW	Natural Resources Wales
WRAP Cymru	Waste & Resources Action Programme Cymru
WEEE	Waste Electrical and Electronic Equipment
WPPN	Welsh Procurement Policy Notice
ONS	Office for National Statistics
FE/HE	Further Education / Higher Education
StatsWales	Statistical service for Welsh Government
WPPN 12/21	Welsh Procurement Policy Notice 12/21
WPPN 06/22	Welsh Procurement Policy Notice 06/22
LA	Local Authority
SME	Small and Medium-sized Enterprise
NPS Wales	National Procurement Service Wales

1 Introduction

1.1 Context

1.1.1 This report is one of five Infrastructure Insights reports commissioned by the National Infrastructure Commission for Wales (NICW) to consider key infrastructure needs for Wales over the next 80 years across the following sectors:



1.1.2 This Insight Report explores the role of the Circular Economy (CE) within Wales' future infrastructure system, building on the stakeholder workshops and targeted engagement sessions with industry, recyclers, and community reuse networks held between September and November 2025. It forms part of NICW's Infrastructure Assessment Programme and supports the Wellbeing of Future Generations (Wales) Act 2015, the Net Zero Wales 2035 and Future Wales 2040 Plans.

1.1.3 The report identifies the current state of play, sector challenges, and practical steps to accelerate circularity across all resource flows. It draws on insights from the September stakeholder workshop and the follow-up session with community repair and reuse organisations, highlighting the importance of collaboration across government, industry, academia, and local communities.

1.2 Circular Economy Sector Overview

1.2.1 In line with the Welsh Government's Beyond Recycling Strategy (2021), a Circular Economy is one in which "resources and materials are kept in use for as long as possible and all waste is avoided."

1.2.2 This approach aims to design out waste, maximise the value of materials through reuse, repair and recycling, and build a more resilient, low-carbon economy that supports both environmental and social wellbeing.

1.2.3 The CE is not a single sector but an interconnected system that cuts across every part of Wales' economy and infrastructure. This Insight explores how circularity applies across key material and industry flows - including domestic waste and recycling, automotive and battery recovery, digital and electronic waste, steel and manufacturing, construction and aggregates. It also examines **cross-cutting enablers** such as procurement, digital data tracking, and community-led repair and reuse. Together, these areas represent the infrastructure, policies, and behaviours needed to keep materials in productive use and drive a resilient, low-carbon Welsh economy.

1.2.4 The transition to a CE is strongly reinforced by the Well-being of Future Generations (Wales) Act 2015, which provides a statutory framework for long-term thinking, prevention, and resource stewardship. Aligning circular-economy interventions with the WFGA's seven well-being goals ensures that CE is not treated as a standalone agenda, but as a core mechanism for delivering social, environmental, and economic wellbeing across public services and infrastructure.

1.3 Focus of this Report

1.3.1 Focusing on the CE in Wales and specifically on the flow of materials, products and resources across key sectors, the purpose of this report is to:

- **Assess and explain** the current key issues impacting Wales' transition to a CE - including waste generation, material reuse, recycling capacity, market development and infrastructure readiness.
- **Present and interpret existing data** to evidence the current state of CE performance across Wales - including material flows, recycling rates, reuse infrastructure and employment potential - to enable future monitoring and benchmarking of progress.
- **Identify future needs, challenges and risks** that could affect Wales' ability to move towards a fully circular system, considering these through the lens of the Well-being of Future Generations (Wales) Act 2015 - particularly the goals of a prosperous, resilient and globally responsible Wales.
- **Highlight priority issues of critical significance** for Welsh Government and stakeholders - such as policy coherence, procurement reform, data integration, and skills and community capacity to deliver circularity.
- **Guide future Commissioners** on the key issues and challenges they might consider as a priority for action and development within the next Senedd term.

1.3.2 It is important to note that this report is intended to provide a high-level overview of the issues across the sector and to highlight those which will be important for Welsh Government to consider further. The scope of the study was to provide a narrative and overview of the issues based on sector experience, readily available headline information and with targeted input from key stakeholders. The scope did not allow for primary research or detailed analysis of existing data. Research was completed during 2025, and the document presents the state of play as of then.

1.3.3 In line with NICW's overarching ambitions and remit, this report takes a long-term view of the CE in Wales. It recognises that achieving a fully circular system requires sustained action, infrastructure investment, and cultural change over multiple decades. Broadly, it considers the following timescales:

- **Short term** – 5 – 15 years ahead, therefore looking beyond the next Senedd term but within the timeline of most existing plans and policies, including Future Wales: The National Plan 2040.
- **Medium term** - 15 – 50 years ahead, to enable forward planning and help shape understanding beyond current policy horizons to consider the next likely significant issues and challenges.

- **Long term** - 50 – 80 years ahead but in recognition of the difficulties and uncertainties around very long-term thinking, this is subject to a lighter focus. However, the importance of a long-term perspective in helping to ensure the actions we take across the sector in the short term are suitably informed, resilient and future proofed is recognised.

1.4 Stakeholder Input

1.4.1 To ensure that this overview of the current state of play and future challenges is informed by the real-world experience of stakeholders, NICW and Arcadis convened a programme of engagement with representatives from across the Welsh CE community.

1.4.2 An online stakeholder workshop was held on 30 September 2025, bringing together participants from government, industry, recyclers, trade bodies, academia, and community organisations to explore key barriers and opportunities. A follow-up session focused on community repair, reuse and 'Library of Things' models was held on 30th October 2025, with Repair Café Wales, Benthyg - Library of Things, and other local initiatives contributing practical insights into how circularity is delivered at community level.

1.4.3 Information gained from these sessions has informed the narrative throughout this report.

1.5 Assumptions

1.5.1 This review has been based on a series of broad assumptions about what a future Wales might look like, to assist with understanding of the longer-term timeframe, and to ensure that the five Infrastructure Insight reports are consistent. The assumptions are based on established, published sources and are intended to provide a high-level guide and to help frame thinking around scale of change across Wales:

- Climate change will have cross cutting impacts in Wales. For example, current worst-case projections anticipate increases in temperature of 3.8 to 6.8°c in the summer by 2070; significant changes in the seasonality of weather extremes, with significant increases in heavy hourly rain anticipated[1]; and sea level rises of between 22cm and 28cm in Cardiff[2].
- Wales has made progress towards emissions reductions, including an estimated c.60% reduction in emissions from the waste sector over recent decades. However, these changes are considered to have come about due to 'easy wins' in the energy and industry sector. Significant further reductions will have been achieved through the closure of the Port Talbot Steelworks in 2024. However, significant change is needed to further accelerate emissions reductions in line with Wales' Carbon Budgets, with concern identified that these changes are not taking place at a fast enough rate.[3][4]. This demonstrates the impact of policy, behavioural change and infrastructure investment in resource efficiency, while also highlighting the need to replicate similar systemic progress across other sectors.
- Energy use - Welsh electricity demand is projected to at least double and potentially triple by 2050[5].

[1] ukcp18_headline_findings_v4_aug22.pdf
[2] Adapting to climate change - Progress in Wales
[3] Wales's Fourth Carbon Budget
[4] Progress Report: Reducing emissions in Wales
[5] Energy use in Wales, third edition 2022

- Population is anticipated to increase in Wales over the short – medium term, with a 5.9% increase projected by mid-2032 and a 10.3% increase projected by 2047[6]. This increase will be driven by migration, with natural change being negative over the same time period.
- Age profile - The number of people in Wales aged over 65 is set to increase by 19.6% by 2032 in the short term and will be over 1 million by 2060 [7].
- In terms of economic development, longer-term forecasts identify challenges associated with relatively weak productivity compared to other parts of the UK, compounded by an ageing population. However, Wales retains a strong manufacturing base - proportionally one of the largest in the UK - which presents significant opportunity for Circular Economy innovation in materials, remanufacturing, and industrial symbiosis. Changing working patterns and emerging industries resulting from technological innovation are considered to provide both opportunities and challenges[8].
- Nature and biodiversity in Wales are under threat. Changes in how we manage land in Wales combined with the effects of climate change will continue to impact nature in the future and will require transformative action to address[9].
- Emerging development pressures and industries: Wales is expected to experience growth in data-centre infrastructure, renewable energy generation, electrification of transport, and hydrogen production, all of which will increase demand for raw materials, grid capacity, and low-carbon construction. These trends will shape CE priorities around resource efficiency, material recovery, and sustainable supply chains. Their development will need to embed circular design principles from the outset, minimising material intensity and ensuring assets are designed for reuse, refurbishment and recovery at end of life.

1.6 Structure of this Report

1.6.1 Following this introduction, this Infrastructure Insight document takes the following structure:

- **Chapter 1 - Introduction:** Outlines the purpose of the CE Insight Report, its alignment with NICW's wider Infrastructure Assessment, and the approach taken to engage stakeholders across Wales.
- **Chapter 2 - Background and Context:** Explains why the CE matters to Wales and how it supports national policy objectives, including Beyond Recycling, Net Zero Wales, and the Well-being of Future Generations (Wales) Act 2015.
- **Chapter 3 - Current State of Play:** Establishes a baseline of current performance, highlighting key statistics, sectoral progress, and ongoing challenges across materials, infrastructure, and community initiatives.
- **Chapter 4 - Future Ambition:** Describes what a fully circular Wales could look like by mid-century, identifying the benefits for government, industry, communities, and the environment.
- **Chapter 5 - Future Challenges - short term:** Sets out the immediate challenges Wales will face over the next 0–5 years, including infrastructure gaps, circular procurement adoption, market confidence, data integration, and early behaviour change needed to accelerate delivery.
- **Chapter 6- Future Challenges - medium & long term:** Explores the deeper systemic challenges emerging over the 5–30 year horizon, such as scaling domestic reprocessing, workforce development, digital tracking, resilient supply chains, and aligning CE with climate resilience and wider economic pressures.

[6] National population projections: 2022-based [HTML] | GOV.WALES
[7] Ibid.
[8] Welsh Budget 2023: Chief Economist's report
[9] State of Natural Resources Report 2025

- **Chapter 7 - Roadmap to a Circular Wales:** Provides a phased pathway outlining priority actions and milestones needed to transition from early interventions to a mature Circular Economy by 2050, spanning policy, infrastructure, procurement, skills, and community initiatives.
- **Chapter 8 - Monitoring and Next Steps:** Identifies how progress should be measured over time and proposes indicators, data systems, and governance arrangements to support long-term CE delivery, including a Circularity Dashboard and biennial reporting.

2 Background and Context

2.1 Why does this Sector Matter to Wales?

2.1.1 Wales leads the UK in recycling performance, achieving 68.4% (2024/25) recycling (Local authority municipal waste management: April 2024 to March 2025 [HTML] | GOV.WALES). However, to reach full circularity, focus must shift from recycling to designing out waste and keeping materials in productive use for as long as possible.

2.1.2 In this report, it is recognised that the term “recycling” is often used generically to describe the collection and segregation of waste materials. In Wales, however, recycling performance is measured on the basis of materials sent to reprocessors and manufacturers for transformation into new products, materials or substances, with statutory netting off of contamination and rejects.

2.1.3 For the purposes of this Insight report, and in line with the approach in Wales, circularity is understood to extend beyond collection and sorting to include the transformation of recovered materials into secondary raw materials and products that are actively used within the Welsh economy. This distinction is critical in understanding where value is retained, where it is lost, and where future infrastructure investment should be targeted.

2.1.4 The *Beyond Recycling Strategy (Welsh Government, 2021)* and Net Zero Wales Carbon Budgets 2 and 3 set the direction for a CE that cuts embodied carbon, supports domestic reprocessing, and builds resilience against global supply chain risks. Circularity is also central to achieving the goals of the Well-being of Future Generations (Wales) Act 2015, particularly prosperous, resilient, and cohesive communities.

2.1.5 In line with internationally recognised definitions, a CE is understood not only to eliminate waste and keep materials in use, but also to contribute to the regeneration of natural systems. In the Welsh context, this includes reducing pressure on land and ecosystems, supporting biodiversity recovery, and strengthening long-term food and resource security.

2.1.6 NICW’s role is to assess how infrastructure, governance, and market mechanisms can enable this shift - ensuring the system is equipped to retain value, create skilled employment, and drive innovation. The CE has the potential to strengthen Wales’ industrial competitiveness, create local jobs in repair, reuse, and materials recovery, and reduce exposure to imported resources and price volatility.

2.1.7 Tables 2.2 and 2.3 show how actions around Circular Economy align with the Well-being goals and ways of working.

Table 2.-1 – Contribution to Wellbeing Goals

Well-being goal	Contribution of the CE sector
A prosperous Wales	The CE supports a more productive and resource-efficient Welsh economy by reducing waste, retaining material value, and creating new markets in repair, reuse, remanufacture, and recycling. It drives innovation, supports SMEs, and enables high-value green jobs in local supply chains.
A resilient Wales	Building circular systems increases resilience by reducing reliance on imported materials and volatile global supply chains. Local reprocessing and reuse hubs strengthen community and regional self-sufficiency while reducing vulnerability to resource scarcity and climate shocks.
A healthier Wales	Reduced waste, pollution, and emissions from circular practices improve air quality and reduce environmental health risks. Community repair and reuse initiatives foster wellbeing by promoting volunteering, intergenerational learning, and connection to place.
A more equal Wales	The sector creates inclusive economic opportunities by supporting community enterprises, social businesses, and local training in repair and materials recovery. Affordable access to reused goods helps reduce inequality in household consumption and resource use.
A Wales of cohesive communities	CE initiatives such as repair cafés, libraries of things, and sharing networks help strengthen local pride, trust, and participation. These initiatives promote shared ownership, community collaboration, and local regeneration.
A Wales of vibrant culture and thriving Welsh language	Repair and reuse networks celebrate Welsh identity and creativity through making, mending, and local craftsmanship. Many community initiatives operate bilingually, helping normalise the use of Welsh in enterprise, education, and volunteering.
A globally responsible Wales	Wales' leadership in CE policy demonstrates global responsibility by reducing resource consumption, minimising exports of waste, and sharing best practice internationally. Circular supply chains help lower Wales' global carbon and material footprint.

Table 2.-2 – Contribution of Circular Economy to the Five Ways of Working

Way of Working	Contribution of this sector
Long-term	The Circular Economy sector is committed to using resources efficiently and eliminating waste, helping to build a more resilient and sustainable Wales for future generations.
Prevention	By encouraging repair, reuse, and recycling, the sector tackles waste and pollution at source, reducing pressure on the environment and conserving valuable materials.
Integration	Circular economy initiatives are designed to deliver wide-ranging benefits. They support new jobs, strengthening local communities, improving well-being, and advance policy targets in relation to climate goals.
Collaboration	Close partnership between government, business, and communities is vital to the sector, enabling new ideas and making it possible to scale up circular practices.
Involvement	Efforts across Wales involve the community, small businesses, and social enterprises, ensuring circular solutions reflect local needs and generate real value for communities.

2.2 Relationship with Nature

2.2.1 Wales' commitment to embedding circular principles is reinforced by progressive policies, such as the Well-being of Future Generations (Wales) Act 2015 and the Welsh Government's Beyond Recycling strategy. These frameworks explicitly link CE practices with the enhancement of biodiversity and ecosystem health.

2.2.2 The CE in Wales represents a fundamental shift from the traditional linear "take-make-dispose" model to one focused on keeping resources in use for as long as possible. This approach is closely interconnected with the protection and enhancement of the natural environment. By prioritising waste minimisation and resource efficiency, the CE reduces the volume of waste sent to landfills and curbs pollution, which in turn helps protect fragile ecosystems and biodiversity. Sustainable resource use also means less dependence on extracting virgin materials - such as those from mining, forestry, or agriculture - thereby reducing habitat loss and environmental degradation.

2.2.3 A key element of Wales' CE is its support for biodiversity and the regeneration of natural systems. Many Welsh projects integrate nature-based solutions, including green infrastructure and habitat restoration, within product and service design, helping to restore and maintain natural habitats.

2.2.4 The CE also plays a significant role in mitigating climate change. Practices such as reuse, remanufacturing, and recycling typically reduce lifecycle energy demand and embodied carbon compared to primary material production, particularly for energy-intensive materials such as steel, aluminium and plastics. These benefits arise from avoided virgin extraction and processing and, where supply chains are shortened, reduced transport emissions.

2.2.5 Continued biodiversity decline and reliance on imported food and materials expose Wales to growing food-security and price risks; CE interventions that reduce land pressure, regenerate ecosystems, and localise value chains therefore play a critical role in long-term national resilience.

2.2.6 Across Wales, practical examples abound - from food waste reduction and composting projects that improve soil and support local food systems, to companies adopting circular product design to reduce pollution and resource extraction. Community-led initiatives, such as FareShare[10] Cymru's surplus food redistribution programme - supported over many years in Wales - alongside repair cafés and sharing schemes, further reduce consumption and waste, easing the strain on natural resources. Together, these efforts illustrate how the CE in Wales not only benefits the economy, but also fosters a healthier, more resilient natural environment.

2.3 What Shapes the Sector Today?

2.3.1 The CE in Wales is shaped by a strong national policy framework but remains constrained by fragmented delivery and inconsistent recognition of material value across sectors. While Wales is regarded internationally as a leader in recycling and waste reduction, many current frameworks still emphasise end-of-pipe waste management rather than systemic circularity - i.e., designing products, infrastructure and services to minimise waste at source and retain value within the Welsh economy.

2.3.2 The public register shows that Wales has over 130 approved reprocessors handling materials such as plastics, glass, wood, steel and aluminium, with permitted capacities indicating substantial recycling and material recovery activity across multiple waste streams. However, while Welsh recycling performance is measured on the basis of materials sent to reprocessors, register capacity data alone does not indicate the scale, value level, or proportion of materials ultimately retained and converted into manufacturing-grade inputs within the Welsh economy.

2.3.3 The CE should be understood as a connected system rather than a collection of discrete initiatives. Circular outcomes depend on how decisions made at one stage of the system - such as design standards, procurement requirements, or data availability - shape behaviour and value retention at later stages, including use, reuse, and end-of-life recovery. In Wales, progress in individual areas such as recycling, community reuse, and industrial recovery has been strong. While significant efforts have been made to strengthen integration across collection, reprocessing and manufacturing supply chains, Stakeholders report that coordination across policy, infrastructure, markets, skills and data remains inconsistent in practice, limiting the scale and pace of circularity. This Insight therefore focuses on how infrastructure, governance and market enablers can work together to support circular outcomes across the full lifecycle of materials and products, rather than assessing initiatives in isolation.

2.3.4 There is growing recognition - reflected in successive Welsh strategies since *Wise About Waste* (2002) - that achieving a truly circular Welsh economy requires integration across policy domains, linking planning, industry, skills, and procurement with waste and resource management. However, in practice, many regulatory and operational levers remain structured around waste streams rather than whole value chains or circular design principles. This can limit incentives for manufacturers, developers, and service providers to prioritise reuse, repair, or remanufacture at scale.

[10] https://fareshare.cymru/

2.3.5 Product-as-a-service and access-over-ownership models are increasingly recognised as important enablers of CE outcomes, particularly where durability, maintenance, and end-of-life responsibility remain with the provider. These models can reduce material throughput, improve product longevity, and support affordability and wellbeing. In this Insight, such approaches are considered as part of the wider demand-side transition alongside repair, reuse, and borrow models, rather than as a standalone sector, reflecting NICW's infrastructure-focused remit.

2.3.6 A fundamental constraint on CE outcomes is that traditional product-sales business models reward volume and turnover, incentivising shorter product lifecycles and repeated replacement. Even where recycling rates are high, each circulation of a product through the system results in some material and value leakage, meaning that faster product turnover leads to greater cumulative loss of resources over time.

2.3.7 Servitisation and product-as-a-service models offer a structurally different incentive framework. Where assets remain on the balance sheet of the provider, commercial value is aligned with maximising product lifespan, performance, upgradeability, and recoverability. This creates strong incentives for design for durability, modularity, refurbishment, and controlled end-of-life recovery, reducing virgin material demand and limiting cumulative leakage across successive use cycles. From a system perspective, these models demonstrate how circular outcomes can be driven by aligned economic incentives rather than reliance on regulation alone.

2.3.8 Wales' CE ambitions, as reflected in this report, align with established CE frameworks which prioritise higher-order actions - such as refusing, rethinking, reducing, reusing, repairing, refurbishing and remanufacturing - ahead of recycling and recovery, recognising that material efficiency alone is insufficient to address the climate and biodiversity crises.

2.3.9 The Welsh Government has an ambitious vision through its Beyond Recycling Strategy (2021), but greater cross-departmental alignment - particularly between economic development, planning, and procurement - will be critical to unlock system-scale change.

2.3.10 Table 2.3 summarises the key international, UK, and Welsh policy and legislative frameworks that currently shape the development and delivery of the CE in Wales.

Table 2.3 – Context – Legislation, Policy and Plans

Category	Policy/legislation	Relevance to this sector review
International	EU Circular Economy Action Plan (2020)	Sets global precedent for circular design, eco-labelling, and right-to-repair legislation, influencing Welsh policy through UK and devolved frameworks.
	UN Sustainable Development Goals (SDG 12: Responsible Consumption and Production)	Provides overarching rationale for reducing resource consumption and waste generation in line with Wales' Well-being of Future Generations (Wales) Act 2015.
UK	Environment Act (2021)	Introduces Extended Producer Responsibility (EPR), Deposit Return Schemes (DRS), and reforms to waste and resource management. Certain provisions apply in Wales via regulations made by Welsh Ministers, while others apply only in England, with Wales operating complementary policies - including the Collections Blueprint 2025 and the Workplace Recycling Regulations 2024 - to drive high-quality recycling and resource efficiency. **Only certain provisions apply in Wales**, implemented through regulations made by Welsh Ministers - for example, *The Environment Act 2021 (Commencement No. 1 and Saving Provision) (Wales) Regulations 2022*. These reforms will reshape packaging and recycling markets once enacted at the devolved level.
	Resources and Waste Strategy for England (2018)	Provides comparative context; highlights divergence of Welsh policy which goes further in ambition and community engagement.
	UK Net Zero Strategy (2021)	Emphasises industrial decarbonisation, resource efficiency, and CE innovation as key enablers of net zero.
Wales	Well-being of Future Generations (Wales) Act (2015)	Establishes long-term well-being goals and principles for sustainable development, underpinning all CE objectives.
	Beyond Recycling Strategy (2021)	Sets Wales' national pathway to a zero-waste, CE by 2050. Provides policy foundations for repair, reuse, remanufacture, and public procurement reform.
	Net Zero Wales Carbon Budgets 2 and 3	Embeds resource efficiency and circularity within decarbonisation targets, with clear links to industrial and construction sectors.

Category	Policy/legislation	Relevance to this sector review
	Public Sector Procurement Policy (WPPN 12/21 and 06/22)	Requires embedding of carbon and CE principles in public contracts; a major lever for change.
	Planning Policy Wales (Edition 12, 2024)	Strengthens policy alignment between development management, sustainable materials, and waste prevention infrastructure.
	Economic Mission for a Stronger, Fairer, Greener Wales (2022)	Positions circularity and low-carbon innovation as central to economic resilience and fair work.
	Waste (Wales) Measure 2010	Introduced statutory municipal recycling targets and waste planning requirements, forming the foundation of Wales' high recycling performance.
	Environment (Wales) Act 2016 – Part 4 (Waste)	Places duties on Welsh Ministers regarding waste prevention, reuse, recycling and disposal, and establishes a framework for sustainable resource management in Wales.
	The Waste Separation Requirements (Wales) Regulations 2023	Mandates separate collection of specified recyclable materials from workplaces and strengthens source separation to improve quality and value retention.
	The Prohibition on the Incineration or Disposal in Landfill of Specified Waste (Wales) Regulations 2023	Introduces restrictions on the disposal of certain recyclable materials, reinforcing the waste hierarchy and supporting circular economy objectives.

2.4 Who is Responsible?

2.4.1 Responsibilities for the management and delivery of CE activities in Wales are shared across government departments, regulators, delivery agencies, local authorities, and community and private sector partners. This distributed landscape reflects the cross-cutting nature of circularity - encompassing waste management, economic development, skills, and community resilience.

2.4.2 Table 2.4 provides an overview of the key organisations and their respective roles.

Table 2.-4 – Key Stakeholders

Organisation	Remit	Role
Welsh Government (Climate Change, Environment and Rural Affairs Group)	Leads on CE waste strategy, and resource efficiency policy.	Sets national strategy (*Beyond Recycling*, *Net Zero Wales*), funds local initiatives, and coordinates policy across departments (planning, procurement, skills).
Natural Resources Wales (NRW)	Environmental regulation and resource management.	Regulates waste operations, environmental permitting, and compliance; supports innovation through permitting reform and evidence gathering.
WRAP Cymru	Programme delivery and technical support for resource efficiency.	Provides evidence, market development, and business support for recycling, reuse, and circular procurement. Delivers Welsh Government programmes on plastics, construction, and food waste.
Local Authorities	Waste collection, recycling, reuse centres, and community partnerships.	Deliver front-line services, manage contracts, and support local repair/reuse facilities; key to consistent implementation of national CE targets.
Recycling and Waste Operators (Public and Private)	Waste processing, materials recovery, and reprocessing.	Provide the technical and logistical capacity for recycling and secondary materials; invest in infrastructure and innovation.
Community and Social Enterprises (e.g. Repair Café Wales, Circular Communities Cymru)	Community-led reuse, repair, and social value delivery.	Deliver local reuse networks, volunteering, training, and social benefits; act as key partners in expanding circular participation.
Industry and Manufacturing Sector	Product design, materials use, and industrial processes.	Integrate circular design, remanufacturing, and closed-loop production within supply chains; collaborate through CE clusters.
Public Sector Procurement Bodies (e.g. NPS Wales, local authorities, health boards)	Public purchasing and contract frameworks.	Embed circular principles into procurement, drive demand for reused and low-carbon materials, and demonstrate public sector leadership.
Academic and Research Institutions (e.g. Cardiff University, Swansea University)	Research and innovation in materials, digital systems and circular design, including collaboration through the pan-	Develop new circular technologies, data frameworks, and skills training to support industrial transition.

Organisation	Remit	Role
	Wales Circular Economy Research & Innovation Group (CERIG).	
Circular Economy Innovation Communities (CEIC)	Delivery of circular-economy capability building and knowledge exchange	Leads Communities of Practice programmes across public and private sectors, enabling applied learning, peer-to-peer exchange and practical implementation of circular-economy principles. CEIC has achieved high levels of engagement and demonstrable practice change across Welsh organisations.

Note: Stakeholders highlighted the CEIC programme as a particularly effective mechanism for translating circular-economy policy into applied practice across Wales, complementing the strategic and regulatory roles of Welsh Government and delivery bodies.

3 Current State of Play

3.1.1 Understanding Wales' progress toward a CE requires a clear picture of how materials currently move through the system - from production and consumption to reuse, recycling, and disposal. This section provides a baseline overview of CE performance across three key sub-sectors:

- Municipal and household materials
- Industrial and construction materials
- Community and consumer circularity.

3.1.2 Together, these areas illustrate where Wales is performing strongly, where value is being lost, and where the greatest opportunities lie to keep materials in productive use for longer.

3.2 Municipal and Household Materials

Current State of Play

3.2.1 **Recycling:** Wales achieved 68.4%[11] municipal recycling (2024/25) - this is the highest in the UK (myrecyclingwales.org.uk). Across Wales, consistency in kerbside collection, strong policy levers, and community engagement underpin success.

3.2.2 Beyond recycling, Wales has a well-established repair and reuse network. Through the Circular Economy Fund, Welsh Government has supported Repair Café Wales to establish cafés within 135 communities. The network is on target to repair over 9,000 items this year, saving households an estimated £0.75m. Over the past seven years, Welsh repair cafés have saved more than 1 million kilograms of carbon emissions - equivalent to driving a petrol car approximately 4.47 million miles. In addition, 35 Libraries of Things (Benthyg) are now operating across Wales, diverting an estimated 22,500kg from landfill and avoiding c.290,000kg CO_2e emissions.

[11] All Local Authorities in Wales (Where does your recycling go? | My Recycling Wales)

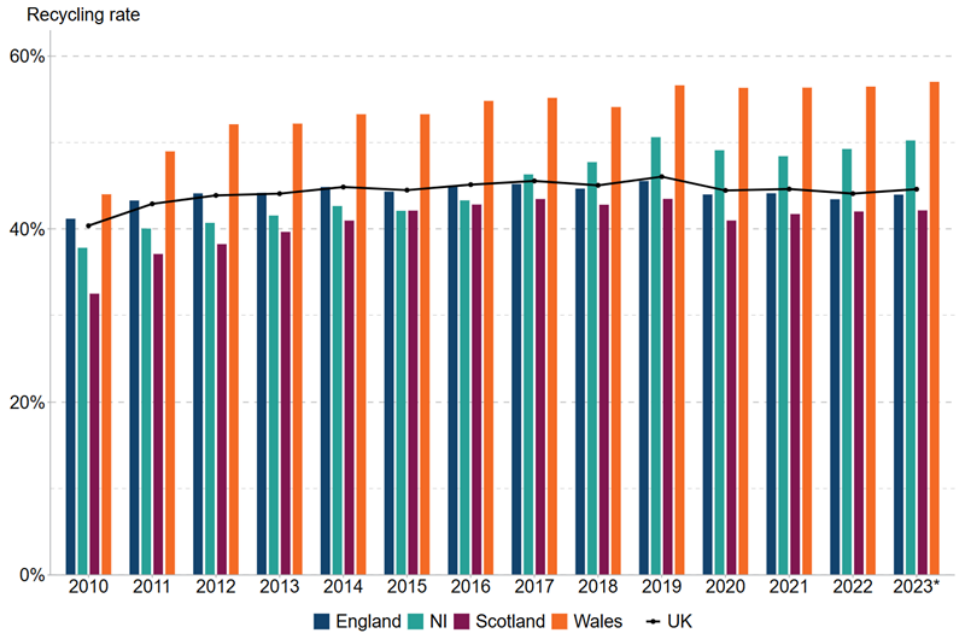


Figure 3.-1 – Recycling Rate from Waste from Households, UK and Country split, 2010 to 2023[12]

3.2.3 While published recycling rates demonstrate strong performance in waste management, they do not in themselves indicate the quality, grade, or proportion of recovered material that is suitable for, or incorporated into, high-value manufacturing and construction supply chains within Wales. Recycling reporting captures material sent to reprocessing but does not fully evidence the level of domestic value retention or industrial utilisation across the Welsh economy. Understanding this distinction is essential to shaping a future industrial strategy that fully embraces circular-economy principles.

3.2.4 Wales consistently outperforms the rest of the UK in household recycling, maintaining a clear lead since 2010. Wales achieved recycling rates of 57% in 2023, compared with around 44% for England (provisional), 50% for Northern Ireland, and 42% for Scotland. [13]

3.2.5 This sustained performance reflects strong national policy direction, early statutory recycling targets, and the deliberate implementation of separate collection systems to generate high-quality recyclate for domestic reprocessing and manufacturing - as set out in the Collections Blueprint (2011) and reinforced in its 2025 update under the Beyond Recycling framework.

3.2.6 The graph also illustrates that while progress across the UK has plateaued since 2012, Wales continues to show steady improvement - positioning it among the top-performing nations in Europe for municipal recycling.

3.2.7 **Reuse:** Only 7.5% of materials in the UK are currently reused showing a large, untapped opportunity.[14]

[12] WasteDataFlow, Defra Statistics (UK statistics on waste - GOV.UK)
[13] WasteDataFlow, Defra Statistics (UK statistics on waste - GOV.UK)
[14] Circularity Gap Report the United Kingdom

3.2.8 **Waste generation:** Approximately 938,000 tonnes (2023/24) of local-authority-collected waste is generated annually (myrecyclingwales.org.uk), of which only 0.7%[15] is landfilled.

3.2.9 However, a significant proportion of recyclables are traded beyond Wales for reprocessing or end-use manufacture. While material flows are bidirectional and Wales hosts important reprocessing capacity, limited published data on net value retention makes it difficult to assess the extent to which secondary material value and associated economic benefits are captured within the Welsh economy.

3.2.10 **Behavioural change:** While public recycling participation is strong, reuse and repair activity remains less embedded at system scale. Survey evidence indicates strong public openness to repair and second-hand purchasing; however, stakeholder engagement feedback highlights uneven infrastructure provision, limited permanent hubs in some areas, and challenges in scaling participation consistently across Wales.

Key issues and challenges

3.2.11 **Infrastructure gaps:** Uneven availability of local reuse and higher-value reprocessing hubs, particularly for plastics, textiles, and complex WEEE streams. While private repair services are widely available, stakeholder engagement feedback highlights limited permanent community-scale reuse infrastructure and constrained domestic capacity for higher-value WEEE remanufacture and material recovery. As of 2025, Wales hosts over 90 Repair Cafés and around 35 dedicated reuse shops or hubs[16], though coverage is uneven - with higher concentrations in South Wales (Cardiff, Swansea, Newport) and fewer permanent facilities in mid and rural areas of Wales. The Future Generations Report 2025 calls for a repair and reuse hub in every town. Many community repair activities still rely on pop-up events held monthly or quarterly, which deliver valuable awareness but lack permanence or scale. Dedicated repair hubs offer higher footfall and visibility but face prohibitive rental and operating costs, limiting their viability.

3.2.12 **Funding and procurement:** While Welsh Government provides significant strategic and capital support to local authorities, stakeholders report that delivery organisations often experience short operational funding cycles that can constrain long-term planning and workforce stability. In parallel, public procurement practices do not yet consistently prioritise refurbished or repaired alternatives, limiting demand signals for circular products in some sectors.

3.2.13 **Funding and investment:** Stakeholder engagement feedback indicates that the formal, community-based reuse and repair infrastructure - including social enterprises, repair cafés, and networked reuse hubs - is heavily reliant on Welsh Government funding (estimated at around 90% of core support), with comparatively limited structured private-sector or corporate investment. It is important to distinguish between the publicly funded community network and the wider commercial repair and second-hand market, which operates extensively across Wales through high-street services, vehicle repair, online resale platforms and charity retail. The funding concentration relates primarily to the structured, community-based circular infrastructure. This does not reflect the wider informal or commercial reuse economy, which is active across Wales, but highlights funding concentration within publicly supported delivery networks. Current grant schemes are often short-term and regionally focused, creating uncertainty for delivery partners. There remains potential to strengthen structured partnerships between community reuse networks and private-sector actors. While a vibrant commercial repair and second-hand market exists in Wales, stakeholder engagement feedback suggests fewer formal mechanisms that connect larger businesses with local reuse infrastructure at

[15] Where does your recycling go? | My Recycling Wales (2024/2025)
[16] Repair Café Wales (2025) - Network Overview and Locations Map, WRAP Cymru (2023) - State of Reuse in Wales.

scale. Examples such as FareShare Cymru and corporate-supported initiatives like Cwtch Mawr Multibank demonstrate that effective cross-sector partnerships are possible, though stakeholders suggest these models are not yet embedded consistently at system scale. For example, companies with major Welsh operations such as *Admiral Group* (a Cardiff-based financial services firm) and *Veolia* (a resource management and waste services provider) have developed visible circular partnerships in other UK regions. Stakeholders suggested that similar place-based collaborations could be explored further within Wales. This highlights the need for stronger place-based partnerships, clearer incentives, and a national corporate engagement framework to mobilise private-sector funding for local circular initiatives.

3.2.14 **Market development:** Secondary-material markets are active in Wales; however, stakeholders report variability in quality standards, end-use integration, and the extent to which secondary materials are retained and utilised within Welsh manufacturing and construction supply chains. Costs for refurbishment and repair can also exceed resale value in some segments, constraining economic incentives. In lower-value consumer segments - such as small household electrical appliances and fast-consumer goods - stakeholders report that refurbishment or repair costs can exceed resale value, reducing economic incentives and limiting commercial viability without subsidy.

3.2.15 **Accessibility and inclusion:** Repair and reuse initiatives are valued primarily for their *cost-saving and community benefits*, with environmental motives often secondary. However, access remains uneven - lower-income households, rural residents, and those without transport can be excluded where hubs are centralised or operate infrequently. Research undertaken by the Welsh Government; 'Evaluation of Repair and Reuse Activities' published in November 2025 provides an overview of how the location of a facility can affect both impact and cost-effectiveness[17]. Mobile repair and reuse vans provide a promising solution to reach dispersed communities, support local events, and engage new users who may not otherwise participate.

3.2.16 **Skills and liability:** Volunteers and community repairers often face constraints around training, insurance, and liability for home-based repairs, which discourages wider participation and limits the range of products that can be safely handled.

3.2.17 **Skills and workforce:** Within the voluntary and community-based repair and reuse sector, stakeholder engagement feedback indicates a reliance on older volunteers, many of whom possess technical and craft skills that are not consistently being transferred to younger generations. Youth engagement remains variable across community-led initiatives, despite outreach through schools, universities, and programmes such as the *Duke of Edinburgh's Award* and *Prince's Trust* (King's Trust). Adult learning courses in repair and practical trades have also declined due to low demand and limited funding. Without renewed investment in skills, accreditation, and career development, Wales risks losing vital practical expertise needed to scale circular activity.

3.2.18 **Awareness and perception:** Repair and borrowing still carry a degree of social stigma, often perceived as second-best or a sign of financial constraint. There is also limited awareness of the wide range of items that can be borrowed or repaired - from tools and household appliances to clothing, leisure equipment, and digital devices. Campaigns should emphasise the joy and convenience these options can add to daily life - for example, *borrowing garden furniture or equipment for a weekend event, or trying out a new hobby without the cost of purchase.* Wales needs to reframe repair and sharing as aspirational, community-led, and resource-smart behaviours. Public engagement, local

[17] www.gov.wales/repair-and-reuse-activities-evalution

champions, and positive storytelling will be critical to normalising these practices and broadening participation.

3.2.19 **Public-sector asset visibility:** Reuse platforms such as Warp-It have been encouraged and adopted across parts of the Welsh public sector. However, stakeholder engagement feedback suggests variability in asset visibility and cross-departmental redistribution practices across government departments, health boards, and local authorities. A more integrated, system-wide approach to public-sector asset mapping - potentially building on existing platforms - could further strengthen circular procurement, shared resource use, and cost savings. The health sector, as one of Wales' largest material consumers, presents an opportunity to build on existing initiatives through more coordinated asset mapping, refurbishment of equipment and furniture, and shared storage or redistribution platforms.

3.2.20 **Product design and durability:** Many consumer products are not designed for repair or longevity, leading to premature disposal and unnecessary resource loss. Short lifespans, limited access to spare parts, and restrictive warranty periods make repair uneconomic or impractical for most users. This deliberate *"planned obsolescence"* locks consumers into replacement cycles and undermines circularity. European countries are moving faster, introducing *Right to Repair* legislation, longer warranties, and design standards mandating disassembly and spare-part availability. Wales and the wider UK could benefit from learning from these approaches, commissioning research and pilot programmes to explore how similar requirements could be adapted for the Welsh market. There is an urgent need for stronger eco-design standards, extended producer responsibility, and longer mandatory warranty periods to incentivise durability, repairability, and product reuse across all sectors.

3.2.21 **Data consistency:** Wales has one of the most comprehensive municipal waste reporting systems in the UK. WasteDataFlow has been in place for around two decades, and Wales uniquely publishes detailed end-destination data through *My Recycling Wales*, including material-specific carbon savings. This provides a high level of transparency on recycling performance and the movement of local-authority-collected materials. However, from a circular-economy systems perspective, some data gaps remain. Current reporting frameworks are primarily structured around waste arisings, recycling tonnages, and end destinations. They do not consistently capture:

- The quality grade of secondary materials,
- The proportion retained and utilised within Welsh manufacturing supply chains,
- The economic value retained in Wales,
- The scale and impact of informal, commercial, or peer-to-peer reuse activity,
- The carbon and cost, benefits of repair and lifetime extension at product level.

3.2.22 Significant reuse and repair activity takes place across commercial, voluntary and informal markets in Wales, much of which is not systematically quantified. As a result, while recycling performance is well evidenced, the wider picture of material value retention, circular business development, and domestic secondary-material utilisation is less visible. Strengthening integration between waste data, industrial data, procurement data, and reuse metrics would enable a more complete understanding of circular performance - moving from "where waste goes" to "how material value is retained and recirculated within the Welsh economy." This would support more robust business cases, targeted infrastructure planning, and monitoring aligned with long-term circular-economy objectives.

3.2.23 **EU-wide Right to Repair regulation**: An important external driver of change is the forthcoming EU-wide Right to Repair regulation which will introduce stronger requirements for repairability, spare parts

availability and consumer rights. Although Wales does not have devolved legislative competence in this area, alignment with such standards offers a significant opportunity. Welsh consumers, suppliers and repair services will benefit from broader market shifts, and Wales can position itself to respond through aligned infrastructure, skills and service development. This also provides a strategic lens through which to view public procurement, innovation funding and SME support.

Implications for NICW Monitoring

3.2.24 NICW could play a key role in advising how circular-economy performance is monitored and reported across Wales. Wales already benefits from comprehensive municipal waste reporting (via WasteDataFlow and My Recycling Wales), and the forthcoming UK Digital Waste Tracking service will further strengthen traceability of waste movements across the supply chain. However, current frameworks are primarily structured around waste tonnages and end destinations. They do not yet provide a fully integrated picture of material quality, value retention within Welsh supply chains, reuse activity, or wider economic and social benefits. In particular, reuse is a waste-prevention activity and therefore sits largely outside conventional waste reporting systems. As a result, significant formal, commercial and informal reuse activity (e.g. charity retail, repair services, peer-to-peer resale platforms) is not systematically captured in national datasets. Strengthening national monitoring will therefore require not only digital tracking infrastructure, but also improved integration between waste data, industrial data, procurement data and carbon metrics, alongside consistent circular-economy indicators at the Wales level.

3.2.25 NICW could recommend that Welsh Government and delivery partners track progress through a broader suite of circular-economy metrics, complementing existing waste reporting systems. Potential indicators include:

- % of material reused vs recycled - evidencing movement up the waste hierarchy.
- Domestic vs exported material flows - highlighting resilience and value retention within Wales.
- Carbon intensity per tonne processed or reused - capturing climate benefits of reuse and local reprocessing.
- Secondary material utilisation within Welsh manufacturing - tracking domestic circular supply-chain integration.
- Estimated economic value retained (£/tonne) - evidencing the economic benefit of circular activity.

3.2.26 This would move monitoring beyond waste management performance toward system-wide circular-economy outcomes aligned with Wales' long-term zero-waste and decarbonisation ambitions.

3.3 Industrial and Construction Materials

Current State of Play

3.3.1 **Construction waste:** The construction and demolition (C&D) sector is one of the largest material flows in Wales, generating an estimated 3.4 million tonnes in 2019 (NRW survey). Reported recycling rates are high (around 90%, NRW, 2019), reflecting strong performance in diversion from landfill and established recovery infrastructure. However, a significant proportion of this activity involves processing materials into lower-grade aggregates rather than retaining structural components or materials at their highest value. Direct reuse of beams, steel sections, bricks, or modular components is a form of waste prevention and therefore does not appear within waste statistics. As a result, strong recycling performance does not necessarily indicate the scale of higher-value reuse or circular design practices within the built environment. Across the UK, reuse of construction materials is estimated to

remain below 2%, despite high recycling rates. This suggests that while Wales performs strongly in waste management terms, there remains substantial opportunity to increase component reuse, design for disassembly, material passports, and local secondary-material markets - all of which are critical to achieving deeper circularity and retaining economic value within Wales.

3.3.2 **Manufacturing and Industry:** Steel represents one of the most advanced examples of CE delivery in Wales. For over two decades, electric-arc-furnace (EAF) steelmaking has enabled the transformation of UK-sourced scrap into high-quality construction steel within Wales.

- 7 Steel (formerly Celsa Steel UK) has operated an EAF in Wales since 2003, processing approximately 1.2 million tonnes of scrap annually and producing over 1 million tonnes of steel for the UK market. This scrap is sourced entirely from the UK, with a significant proportion originating in Wales, demonstrating a mature domestic circular supply chain.
- In recent years, 7 Steel has expanded this capability through closed-loop circular steel services for the construction sector, whereby demolition arisings are recovered from site, reprocessed directly through the EAF, and supplied back into new developments via fabrication services. This model aligns closely with emerging CE planning requirements, including the Greater London Authority's CE Statements, and positions Wales as a net exporter of practical CE solutions.
- Welsh-produced low-carbon, high-recycled-content steel has already been supplied to major UK infrastructure projects, including over 300,000 tonnes delivered to Hinkley Point C, as well as transport and utilities schemes such as HS2.
- Industry stakeholders highlighted that the UK steel sector is undergoing a managed transition toward EAF technology as the primary decarbonisation pathway. EAF steelmaking enables high levels of scrap utilisation, faster operational flexibility, and significantly lower direct emissions compared with blast furnace production. During this transition period, steel users may continue to rely on international supply chains for certain products, including imports from the Netherlands and India, while domestic EAF capacity is expanded. Access to reduced-carbon steel during this interim phase will require early technical and commercial engagement between clients, fabricators and producers.

3.3.3 **Aggregates:** Recycled and secondary aggregates supply approximately 30% of aggregate demand in Great Britain (Mineral Products Association, 2022), and Wales is likely to reflect a broadly similar proportion, supported by Regional Aggregate Working Party data[18]. This represents one of the highest rates of secondary aggregate use in Europe. However, the majority of recycled aggregate in Wales is currently used in lower-grade applications such as bulk fill, capping layers and sub-base. While established standards exist - including BS EN 12620, BS 8500 and the WRAP Quality Protocol - stakeholder engagement feedback indicates that, in practice, concerns around quality consistency, liability, and performance risk can discourage uptake in higher-value structural applications. Even where materials meet technical specifications, perceived risk often leads designers, contractors and clients to favour virgin materials, particularly in safety-critical or insured assets. This highlights that the challenge is less about the absence of standards, and more about market confidence, assurance mechanisms, and risk allocation across supply chains. There is therefore clear potential to increase higher-value use of secondary aggregates through improved certification visibility, early-stage design integration, clearer procurement signals, and stronger alignment between material testing, warranties and insurance frameworks.

3.3.4 **Digital & critical materials:** Although Wales (and the wider UK) generates significant volumes of electronic waste, recovery of rare earths and high-value components remains extremely limited, with

[18] Wales-specific data is limited

less than 1% of rare earth elements in electricals currently recycled. This under-exploited "urban mine" represents a major circular opportunity. Wales is well positioned to expand leadership in this area through its growing advanced manufacturing and research base - including facilities at Swansea University's SPECIFIC Innovation & Knowledge Centre and Cardiff University's Institute for Compound Semiconductors. Improved collection, advanced processing infrastructure, and better tracking of secondary material flows could create both regional employment and supply-chain resilience for critical industries such as renewables and digital technology. While academic leadership in Wales is clear, practical implementation remains limited. An industrial pipeline for closed-loop recovery of digital or critical materials is not yet mature, and progress will depend on enabling policy, infrastructure investment, and commercial uptake. These applications therefore remain strategically important but contingent on further system development.

3.3.5 **Lost value and economic opportunity:** According to WRAP/Welsh Government analysis, a more CE could deliver up to £3.8 billion in GVA for Wales, alongside up to £1.9 billion per year in materials cost savings and significant job creation.[19]

Key issues and challenges

3.3.6 **Design for circularity:** Few formal requirements in planning or procurement currently mandate design-for-deconstruction, modularity, or use of reclaimed materials. Pilot schemes exist (e.g. HS2 and Welsh public-sector buildings) but are not yet standard practice.

3.3.7 **Infrastructure investment:** While Wales has established, or soon to be installed, large-scale reprocessing capacity for certain materials[20] - most notably scrap-based steel, WEEE, concrete, insulation, plastics, glass, and cardboard - there remain gaps in end-market reprocessing and remanufacturing for other construction products and emerging material streams such as PIR/PUR foams, EPS/XPS, lithium-ion/EV batteries, vapes. These gaps continue to drive reliance on facilities in England or overseas, increasing transport emissions and limiting value retention within the Welsh economy.

3.3.8 **Market confidence:** There is no consistent certification, testing, or warranty framework for reused structural components. Insurers and designers remain cautious, constraining uptake even where materials are technically suitable.

3.3.9 **Skills and capacity:** Limited training and accreditation in deconstruction, materials auditing, and circular design across the construction workforce. Professional awareness is growing but capacity remains low, particularly among SMEs and supply-chain contractors.

3.3.10 **Illegal waste practices:** Stakeholders also highlighted the continued prevalence of illegal waste practices, including rogue operators, off-book disposal, and unlicensed aggregation of materials. These undermine legitimate reuse and recycling businesses, distort market pricing, and contribute to environmental harm. Strengthening enforcement capacity, inspection regimes, and data-led tracking will be essential to protect compliant operators and maintain public trust in circular systems.

[19] Wales: leading the way to a circular economy | WRAP - The Waste and Resources Action Programme

[20] Rockwool UK's recycling plant in Bridgend, Royal Mint's e-waste recovery facility in Llantrisant, Envirowales Limited's lead-acid battery recycling facility at Ebbw Vale, Knauf Insulation's planned manufacturing plant in Shotton, Jayplas' planned plastic reprocessing plant in Swansea, Eren's planned cardboard recycling mill in Deeside.

Implications for NICW Monitoring

3.3.11 NICW could track progress in decarbonising and circularising Wales' construction and industrial material systems through a consistent set of indicators such as:

- % of recycled and reused content in public projects - measured through procurement returns and project certification (e.g. BREEAM, CEEQUAL).
- Domestic secondary-material processing capacity (Mt/year) - tracking reprocessing, remanufacturing, and recycling facilities operating within Wales.
- Annual investment in circular-economy infrastructure (£/year) - capturing both public and private capital directed to reprocessing, materials-hub, and remanufacturing projects.
- Industrial symbiosis and materials-exchange projects established - indicating regional collaboration between industries to close material loops.
- Circularity Index (materials recirculated / materials consumed) - providing an overarching measure of material efficiency across the construction and manufacturing sectors.
- Training and accreditation uptake in circular construction - monitoring workforce capacity growth in deconstruction, reuse, and materials auditing.

3.4 Community and Consumer Circularity

Current State of Play

3.4.1 Wales has a broad repair, reuse and borrowing landscape spanning industrial-scale maintenance and remanufacturing (e.g. aviation and automotive sectors), commercial repair services, online and peer-to-peer resale markets, and community-led initiatives. Survey evidence indicates high levels of self-reported consumer reuse, repair and borrowing behaviour. However, much of this activity is informal or commercially dispersed and therefore less visible in strategic infrastructure and policy planning. This review focuses primarily on areas where coordinated public policy can strengthen value retention, market maturity and long-term system resilience. Stakeholder perspectives differ on the relative scale and maturity of repair, reuse and borrowing in Wales; this report reflects that diversity of views.

3.4.2 Reuse, repair and borrowing activity in Wales spans a broad ecosystem, including private repair businesses, charity retail networks, online resale platforms, and informal peer-to-peer exchange. Alongside this vibrant commercial and informal reuse economy, community-led initiatives - such as Repair Café Wales, Circular Communities Cymru and emerging Library of Things networks - play an important role in embedding circular behaviours locally.

3.4.3 These initiatives contribute not only to waste prevention, but also to skills development, social inclusion and community resilience, complementing the wider market-based reuse sector.

3.4.4 **Scale:** Repair Café Wales supports over 90 venues across Wales, offering regular sessions for repairing small electricals, textiles, bikes and household items. (Repair Cafe Wales)

3.4.5 **Participation:** In recent campaigns, repair cafés in Wales collectively fixed more than 21,000 items, saving over £1 million in free repairs. (Wales Recycles)

3.4.6 **Reuse infrastructure:** All 22 Welsh local authorities now host at least one reuse shop, typically linked to household waste recycling centres, representing important national coverage. Examples include established facilities such as The Cabin at Lamby Way HWRC in Cardiff and similar local authority-

linked reuse outlets across Wales. In parallel, community-led networks such as Repair Café Wales (supporting over 90 venues), Circular Communities Cymru members, and emerging Library of Things initiatives are expanding preventative reuse and borrowing activity. There is also a vibrant commercial and charitable reuse and borrowing market operating across Wales, including charity shops, online resale platforms and private repair businesses.

3.4.7 However, **scale, capacity and integration** vary considerably between areas. In some locations reuse is well embedded within site operations and supported by dedicated staff and onward sales channels; in others it remains smaller in scale, more dependent on local partnerships, and less integrated with wider procurement or redistribution systems. This uneven maturity affects throughput, visibility and the extent to which higher-value reuse can be systematically maximised and retained within Welsh supply chains.

3.4.8 **Economic contribution:** While there is evidence of community activity and volunteer engagement, published data on full-time equivalent (FTE) jobs supported by reuse/refurbishment in Wales is currently limited, suggesting a need for improved measurement.

Key issues and challenges

3.4.9 **Funding and stability:** Many community-based reuse, repair and borrowing initiatives remain reliant on short-term or project-based grants, particularly for core staffing and premises costs. Local authority budget pressures have increased uncertainty in some areas. However, there is growing recognition that long-term resilience will depend on diversified income models rather than continued grant dependence alone.

3.4.10 Potential pathways toward greater financial sustainability include:

- Blended income models combining sales revenue, repair fees, training provision, and commissioned services.
- Service-level agreements with local authorities for waste prevention, bulky waste diversion, or digital inclusion support.
- Corporate partnerships and sponsorship linked to ESG and social value commitments.
- Social-enterprise models retaining value through resale of refurbished goods and borrowing.
- Integration into public procurement frameworks, enabling reuse providers to supply refurbished furniture, IT, and equipment to the public sector.
- Development of accredited training programmes funded through skills budgets or apprenticeship routes.

3.4.11 Examples from within Wales and elsewhere in the UK demonstrate that reuse and borrowing hubs operating as social enterprises - particularly those with strong retail operations or contractual relationships with local authorities - can achieve higher levels of financial stability while retaining social and environmental outcomes.

3.4.12 The opportunity therefore lies not only in continued public support, but in creating clearer commercial pathways and procurement routes that embed reuse within mainstream service delivery and supply chains. While community hubs play an important role, a strategic approach must also recognise and support the broader commercial repair and refurbishment sector to avoid over-reliance on volunteer-led delivery models.

3.4.13 **Infrastructure and access:** A lack of affordable, flexible workshop and storage space continues to restrict expansion. Co-location with libraries, community centres, or reuse shops has proven effective in several areas but is not yet widespread or strategically coordinated.

3.4.14 **Skills and accreditation:** Practical repair skills are declining, particularly in electronics, furniture, and textiles. There are limited opportunities for accredited training or formal FE/HE pathways in repair and refurbishment, and few clear career routes for younger participants.

3.4.15 **Procurement barriers:** Public-sector procurement plays a pivotal role in shaping circular markets. While refurbished goods, repair and borrowing-based services, and remanufactured products are not yet consistently embedded across all public-sector frameworks, there are emerging examples of good practice in Wales. For example, the case study: Procurement of second life furniture through national collaboration between WLGA and WCVA demonstrates how coordinated frameworks can stimulate demand for refurbished products and support reuse markets at scale. National guidance, including Welsh Procurement Policy Note (WPPN) 12/21 - *Decarbonisation through Procurement*, sets clear expectations for embedding circular principles. However, stakeholder engagement feedback suggests that implementation remains uneven at operational level, with risk aversion, specification norms, and budget structures sometimes favouring new goods over refurbished alternatives. Procurement is therefore a critical enabler of Wales' circular transition: when systematically applied, it can stimulate local reuse markets, drive innovation in product design and materials efficiency, and ensure public investment retains value within the Welsh economy. Wider adoption of circular procurement across public frameworks and construction contracts - supported by training, shared tools, lifecycle costing approaches, and clearer performance metrics - would provide a stronger and more consistent demand signal.

3.4.16 **Cost-of-living:** Strongly shapes repair and borrowing behaviours. While sustainability is a motivator for some, many households engage in repair or borrowing primarily to save money. However, repair can still be perceived as inconvenient, time-consuming, or unreliable compared with buying new, especially where low-cost imported goods distort price expectations. Addressing affordability, convenience, and service reliability will be key to broadening participation beyond environmentally motivated users.

3.4.17 **Data and recognition:** Activity remains under-recorded. Few consistent metrics exist to capture tonnes diverted, carbon saved, or social value created. Investment in digital data capture and reporting systems would help demonstrate outcomes and strengthen funding bids. As noted in Welsh Government's 2025 evaluation of Repair and Reuse Activities, data collection methodologies vary across programmes, highlighting the need for more consistent measurement frameworks.

3.4.18 **Spatial distribution of facilities:** The spatial distribution of reuse, repair, borrowing and reprocessing infrastructure across Wales is uneven. While some urban areas benefit from Repair Cafés, libraries of things, and municipal reuse centres, rural communities face barriers including transport distance, lower volumes, and reduced access to markets in England. Spatial mapping of existing sites could support strategic siting and collaboration.

3.4.19 **Equity - Rural vs Urban:** A key consideration is ensuring equitable access to CE services across urban and rural areas. Differences in infrastructure provision, internet connectivity (for digital matching platforms), and community capacity may exacerbate inequalities unless proactively addressed.

3.4.20 **Digital:** Circular Economy ambitions are also reflected in Welsh Government's Digital Action Plan, highlighting the importance of digital infrastructure in enabling material tracking and sector integration.

3.4.21 Opportunities and emerging models

- **Library of Things and shared-use models:** Library of Things initiatives in Cardiff, Swansea, and other communities are piloting shared-ownership and access-over-ownership models that can reduce household consumption by an estimated 20-30 % among participants. These models also foster community interaction and support low-income households by reducing up-front purchase costs.
- **Integration with local-authority waste and resource strategies:** Several councils are beginning to embed reuse and repair objectives within waste-management and CE plans, creating opportunities to formalise funding, governance, and data collection through service-level agreements or extended-producer-responsibility frameworks.
- **Partnerships for skills and inclusion:** Collaboration with FE colleges, housing associations, and social-enterprise networks offers potential to anchor repair and borrowing hubs as part of skills, employability, and community-benefit programmes. These partnerships can also link repair activities with training in product design, materials science, and sustainable manufacturing, building a future skills pipeline.
- **Corporate and private-sector engagement:** There is growing interest from Welsh-based employers and utilities to support local reuse, repair and borrowing as part of ESG and community-investment commitments - representing an opportunity to diversify funding and create place-based partnerships.

Implications for NICW Monitoring

3.4.22 NICW could monitor the expansion and social impact of Wales' community circular-economy ecosystem through a consistent set of indicators such as:

- Number and spatial coverage of repair, reuse, borrowing and Library of Things hubs per 100,000 residents - showing equitable geographic access and inclusion.
- Tonnes of materials repaired, reused, borrowed or redistributed annually - tracked through digital reporting systems to evidence carbon and cost savings.
- Jobs and volunteering hours created through community circular activity - including training placements and apprenticeships linked to reuse and repair.
- % of public-sector procurement spend directed to reused, borrowed or refurbished goods - reflecting uptake of circular procurement guidance (e.g. WPPN 12/21).
- Social-value and wellbeing indicators - skills gained, community participation, reduction in waste-related inequality, and wellbeing improvements.

3.5 Cross-Cutting Challenges

3.5.1 The evidence across all three sub-sectors highlights that Wales has achieved global recognition for its recycling success but now faces a more complex challenge: **building a fully circular system** that links design, consumption, reuse, and material recovery through coherent policy, infrastructure, and data.

3.5.2 Table 3.1 below summarises the main cross-cutting challenges identified across all sub-sectors, highlighting where gaps in policy, investment, and data integration may constrain Wales' transition to a fully CE.

Table 3.-1 – Cross Cutting Challenges

Theme	Current challenge	Implications
Policy coherence	CE ambitions are set out clearly in the *Beyond Recycling* Strategy, but delivery remains fragmented across planning, economic, skills, and procurement policies.	Risk of inconsistent implementation, duplication of funding, and missed opportunities for cross-sector investment.
Procurement and investment	Circular principles are not yet fully embedded in public-sector spending, despite WPPNs requiring their consideration.	Public procurement represents 50–60% of infrastructure investment and could be a major demand driver for reuse and secondary materials if CE standards are mandated.
Infrastructure and capacity	Wales has an extensive network of permitted recycling and reprocessing facilities. However, stakeholder feedback highlights uneven regional distribution and limited high-value remanufacturing capacity for certain materials (e.g. plastics, WEEE, higher-grade construction products).	Continued reliance on inter-UK or export markets for some secondary materials, limiting domestic value retention.
Market development	Secondary materials face low market confidence and inconsistent quality standards.	Price volatility discourages private investment in CE infrastructure and innovation.
Skills and workforce	Shortage of technical and repair skills across industrial and community levels.	Need for stronger integration of CE competencies in FE/HE curricula and training pathways.
Legislation alignment	Wales lacks legislative competence over product standards and consumer rights, limiting its ability to directly mandate repairability or design-for-disassembly.	There is a risk of policy divergence and missed strategic alignment with influential legislation such as the EU's Right to Repair Directive. However, aligning infrastructure, services and procurement strategies with these external standards offers an opportunity to accelerate market readiness and position Wales to benefit from wider regulatory shifts.
Data and evidence	Fragmented datasets exist (e.g. waste tonnage, end destinations, market prices), but there is no unified framework linking material flows, reuse activity, domestic value retention, and secondary-material utilisation within Welsh supply chains.	Limited ability to assess circularity performance, economic value retention, and investment impact at a system level.

Theme	Current challenge	Implications
Behavioural and cultural change	Citizens strongly support recycling but are less familiar with repair, remanufacture, and shared ownership models.	Need for consistent public engagement and education on the broader CE vision.
Innovation capability and commercialisation	Low rates of innovation-active SMEs in Wales limit the development and scaling of circular products, services and business models, with constrained access to design, testing and commercialisation support.	Weak innovation capability restricts supply-side growth of circular solutions, reduces market confidence and value retention in Wales, and limits progress against the Well-being of Future Generations Indicator 11 (innovation active).

3.6 Data Priorities for NICW and Welsh Government

3.6.1 The purpose of improved monitoring is not data collection for its own sake, but to inform policy, investment and market design. Consistent material flow and reuse data would help identify infrastructure gaps, assess the effectiveness of public investment, support procurement reform, and track progress against climate and resource-security objectives. Monitoring should therefore be proportionate and decision-led, avoiding unnecessary reporting burdens while strengthening strategic oversight.

3.6.2 To effectively track CE performance over time, NICW and Welsh Government should focus on establishing consistent, long-term datasets that go beyond traditional waste statistics. Recommended priority indicators include:

1. **Material flow accounts and CE monitoring integration** - building on existing materials footprint work (e.g. Joint Nature Conservation Committee), to enable consistent tracking of domestic material flows, reuse activity, value retention and circular performance over time.
2. **Reuse and repair indicators** - developing proxy and sample-based metrics for formal reuse networks, repair enterprises, public-sector redistribution platforms, and sector-level economic data, alongside modelling of associated carbon and value retention impacts.
3. **Circular procurement data** - proportion of public contracts embedding CE criteria or reused/recycled content.
4. **Secondary material capacity** - annual processing capacity by material type and region.
5. **Circular jobs and skills** - employment in reuse, recycling, repair, remanufacture, and CE innovation.
6. **Social value indicators** - number of community CE initiatives, volunteering hours, and wellbeing outcomes.
7. **Circularity Index** - a composite indicator of materials recirculated vs extracted, benchmarked against European best practice.

3.6.3 These datasets would enable NICW to monitor both system performance (materials, markets, emissions) and societal outcomes (jobs, equity, resilience) - supporting evidence-based decision-making across future Senedd terms.

4 Future Ambition

4.1.1 Based on the findings of this review it is suggested that the future ambition should be for Wales to be recognised as a global leader in CE infrastructure by 2050- transforming waste into value, creating green jobs, and safeguarding resources for future generations.

Ambition: Materials are kept in productive use for as long as possible, supporting a resilient, low-carbon economy.

Figure 4-1 – Proposed Targets and Ambitions

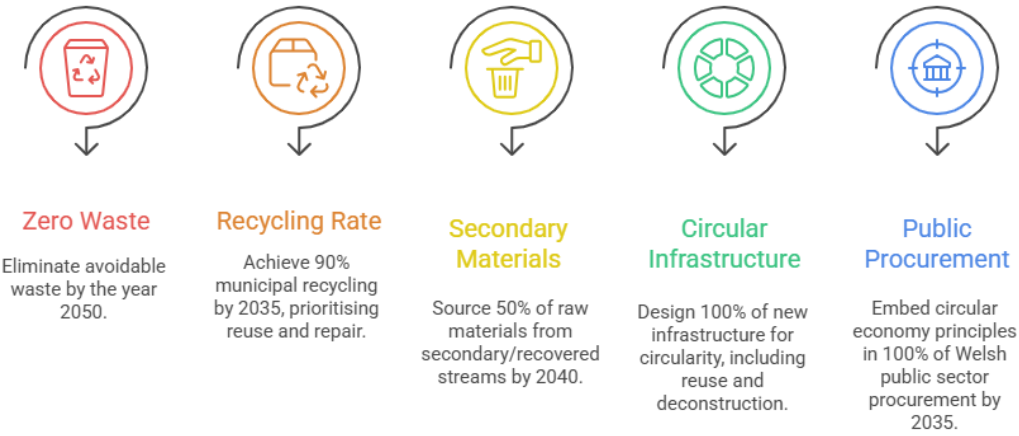
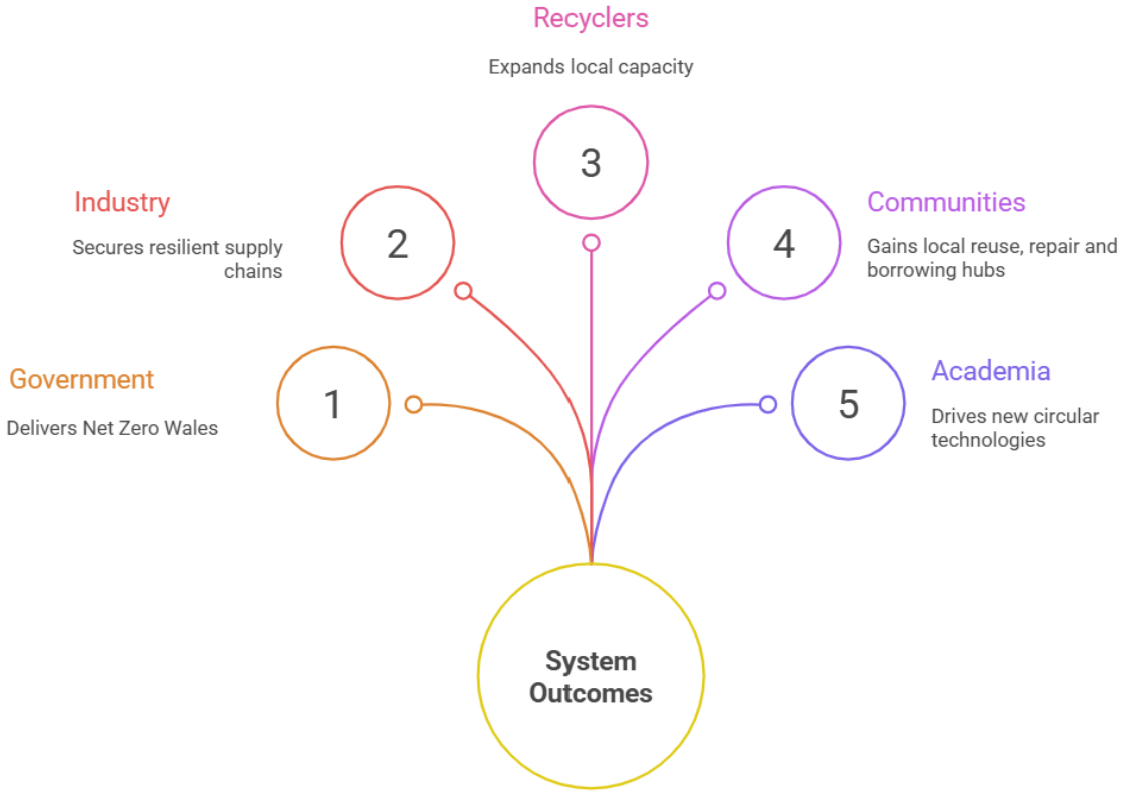


Figure 4-2 - System Outcomes – This Future Benefits Everyone



4.1.2 Transition risks should also be considered, including potential impacts on affordability, supplier competitiveness, storage logistics, and digital integration costs. Sequencing and proportionality will be key to maintaining economic resilience during transition.

5 Future Challenges – Short Term

5.1.1 Building on the current evidence base and stakeholder insights, this chapter outlines the **short-term challenges** Wales will face as it begins to accelerate delivery towards a fully CE. Over the next five years, progress will rely on strengthening local reprocessing capacity, embedding circular procurement, improving policy coherence, and enabling the early development of secondary-material markets and skills. These actions lay the foundations for the deeper system change that will follow in the medium to long term.

5.1.2 The immediate focus across Wales will need to be on:

- Expanding local repair, reuse, borrowing and reprocessing infrastructure
- Creating the demand conditions for circular products and services
- Improving policy alignment across government departments
- Embedding circular procurement requirements in public-sector contracts
- Beginning to address skills shortages, particularly in repair, materials auditing, digital systems, and CE implementation
- Early-stage R&D and pilot projects will be essential to ensure viable technologies are available for future large-scale deployment.
- Strengthening digital waste/data tracking to support transparency.

5.1.3 Table 5.1. below summarises the short-term challenges.

Table 5.-1 – Short-term Key Issues and Timelines

Timeframe	Challenge	Description
Short term (0–5 yrs)	Infrastructure gaps	Uneven distribution of formal reuse, repair borrowing and reprocessing capacity; limited large-scale value retention for some material streams.
	Policy coherence	Circularity unevenly embedded across planning, waste, procurement, and industry policy.
	Procurement reform	Need for CE criteria in all public frameworks and construction/service contracts.
	Early market development	Weak demand and limited certification for secondary materials, refurbished goods, and reused components.
	Digital systems	Need to expand digital waste tracking, improve data sharing, and prepare for UK-wide mandatory tracking systems.
	Behaviour change	Despite positive attitudes toward reuse, repair and borrowing (WRAP Cymru survey), stakeholders report inconsistent uptake and limited mainstream adoption of repair, reuse, borrowing and shared ownership models.
	Illegal practices and enforcement	Waste crime, unregulated operators, and inappropriate disposal undermine legitimate circular businesses.
	Skills shortages	Repair, deconstruction, electronics, and materials-auditing skills are in short supply; volunteer-led models lack stability.

6 Future Challenges – Medium and Long term

6.1.1 This chapter outlines the **medium- to long-term** challenges Wales will face in maturing its Circular Economy over the next 5 to 30 years. As existing and planned reprocessing and manufacturing capacity comes online, the emphasis will shift from foundational infrastructure delivery to optimising performance, strengthening domestic value retention, and building fully functioning circular markets.

6.1.2 The priority will be to integrate Wales' established and emerging facilities into resilient domestic supply chains, increase higher-value material utilisation, and embed circularity across procurement, design, and consumer behaviour. Alongside this, Wales will need to respond to climate, geopolitical, and economic pressures that affect material security, competitiveness, and industrial transition.

6.1.3 The planned transition of Tata Steel's Port Talbot site to electric arc furnace (EAF) steelmaking later this decade represents a significant potential expansion of Wales' circular steel capacity. This transition is expected to significantly increase the use of UK-sourced scrap, reduce reliance on imported raw materials, and materially lower operational emissions. However, this shift should be understood as building on - rather than initiating - Wales' existing leadership in circular steel production, which has been demonstrated for over two decades through established electric arc furnace operations and closed-loop supply chains serving the construction sector. The Port Talbot transition therefore represents a scale-up and consolidation of proven circular practices, rather than a starting point for circular steel in Wales.

6.1.4 Tata's Port Talbot site is expected to be operational by the end of 2027. Primarily melting down abundant UK scrap steel (around 2-2.5 million tonnes annually) using electricity, instead of relying on imported iron ore and coking coal. By using up to 80% UK-sourced raw [scrap] material (compared to c.17% currently), we are building a truly enabling CE and increasing supply chain resilience for customers. The switch to Tata's Port Talbot EAF technology is projected to reduce direct CO_2 emissions by about five million tonnes per year, which equates to approximately 1.5% of the UK's total annual CO_2 emissions.[21]

6.1.5 Alongside developments in steel, Wales is also seeing significant investment in plastics and fibre reprocessing capacity, including major expansion by Jayplas in plastic recycling and Eren in cardboard recycling. These developments further strengthen Wales' domestic reprocessing base and support greater material value retention across multiple high-volume waste streams.

6.1.6 Over the next three decades, Wales will need to focus on:

- Establishing large-scale reprocessing capacity for 'hard to recycle' materials (lithium-ion/EV batteries, textiles, emerging materials)
- Expanding and better integrating domestic supply chains for scrap steel, secondary aggregates, critical materials and reuse markets to strengthen value retention within Wales.
- Developing standards, certification and insurance pathways to support reuse in construction and manufacturing
- Embedding circular design - modularity, repairability, durability, longevity
- Transitioning to real-time digital material flow data and product passports
- Addressing future climate resilience impacts on CE infrastructure and supply chains, building on the findings of the forthcoming national assessment of climate risks to waste infrastructure.

[21] Briton Fabricators

- Ensuring CE markets are resilient to external economic and political factors (global imports, instability, material scarcity).

6.1.7 Table 6.1. below summarises the long-term challenges.

Table 6.-1 – Long-term Key Issues and Timelines

Timeframe	Challenge	Description
Medium term (5–15 yrs)	Market maturity	Strengthening and deepening domestic secondary-material markets to ensure stable demand, higher-value utilisation, and greater value retention within Wales.
	Certification and standards	Need for robust quality, safety, and insurance standards for reused and remanufactured products.
	Industrial symbiosis	Scaling shared material flows, heat recovery, and cross-sector resource exchange.
Long term (15–30 yrs)	Behaviour change	Normalising reuse, repair, borrowing and shared ownership models across society and business culture.
	Data and tracking	Full transition to real-time digital material passports, circularity reporting, and unified national indicators.
	Climate resilience	Ensuring CE infrastructure is resilient to temperature, rainfall, supply-chain disruption, and extreme weather impacts.
	Global economic factors	Sensitivity to commodity prices, regulatory divergence, and international market volatility affecting material flows.
	Skills and workforce	Maintaining a pipeline of CE-aligned skills for repair, remanufacturing, materials science, and digital systems.

6.1.8 These challenges are interconnected: without stronger short-term investment in infrastructure and policy alignment, medium- and long-term ambitions for circular design, behaviour change, and data integration will be difficult to achieve. Addressing them in a coordinated way will be essential if Wales is to move from a high-performing recycling nation to a truly **circular and regenerative economy**.

7 Roadmap to a Circular Wales

7.1 Overview

7.1.1 Responding to these challenges will require a coordinated roadmap for action, bringing together Welsh Government, regulators, local authorities, industry, academia, and communities. The roadmap outlines the practical steps and shared responsibilities needed to embed circular principles across Wales' infrastructure, economy, and society.

7.1.2 The transition to a fully circular Wales will not happen through isolated initiatives. It will depend on system-wide collaboration - linking design, procurement, manufacturing, consumption, and reuse - underpinned by consistent data, investment, and governance.

7.2 Lifecycle Roadmap

7.2.1 Figure 7.1 shows the CE stages from initial design to policy implementation and Table 7.1 describes the stages in the lifecycle of the CE. This roadmap provides a suggested framework for NICW, Welsh Government, and delivery partners to track progress and identify where further intervention or investment may be needed.

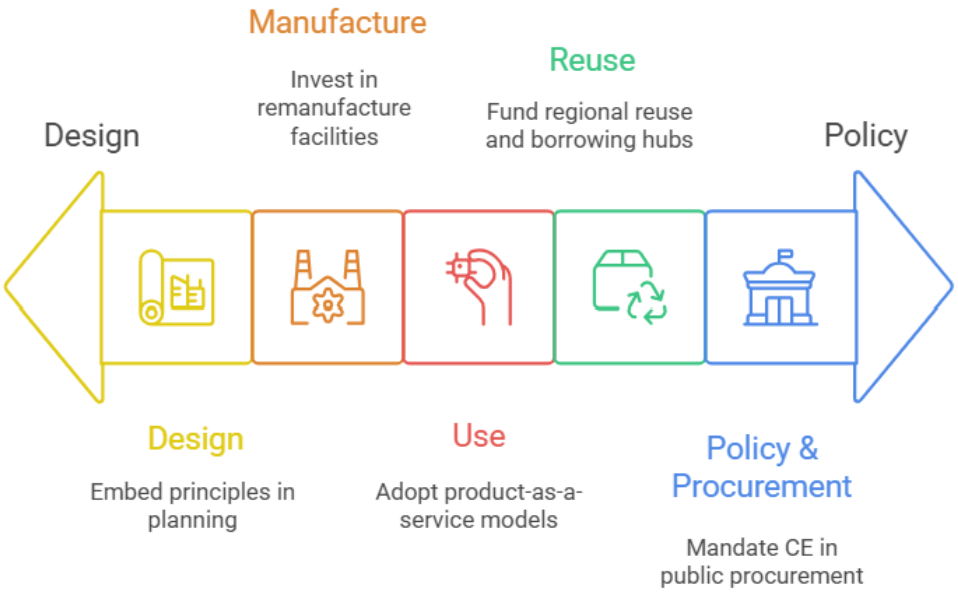


Figure 7.-1 – CE Roadmap

Table 7.-1 – Circular Economy lifecycle

Lifecycle Stage	Government & Policy	Industry & Business	Communities & Third Sector	Academia & Innovation
Design	Embed CE principles in planning, design standards and TANs; integrate with *Future Wales 2040* and Strategic/ Local Development Plans.	Apply design for deconstruction and material passports.	Co-design community spaces using reused materials.	Research low-impact materials and digital design tools.
Manufacture	Incentivise low-carbon, high-recycled content production through fiscal measures.	Invest in remanufacture and refurbishment facilities; strengthen local supply chains.	Partner with SMEs and social enterprises for repair and assembly.	Demonstrate industrial symbiosis and process efficiency.
Use	Lead by example through circular procurement in public buildings and infrastructure.	Adopt product-as-a-service and extended warranty models.	Run local repair, reuse, borrowing and sharing initiatives.	Study consumer behaviour and product life extension.
Reuse/Recovery	Fund regional reuse, borrowing and reprocessing hubs; ensure grid and transport access.	Scale secondary materials markets and logistics.	Expand repair and borrowing networks and Library of Things initiatives.	Pilot AI-enabled sorting and materials tracking.
Policy & Procurement	Mandate CE in all public procurement by 2035; integrate with skills and industrial strategies.	Collaborate through CE clusters (construction, water, digital).	Engage communities in co-design and local procurement pilots.	Develop CE data frameworks and skills programmes.

7.3 Implementation Focus (2025 – 2040)

7.3.1 Between now and 2040, the priority is suggested to be to:

- Expand **regional circular hubs** for reuse, repair, borrowing and construction materials recovery.
- Embed **circular procurement** across public infrastructure frameworks.
- Develop **national CE data and reporting standards**.
- Support **circular innovation and commercialisation** - including SME access to design, testing, pilot funding and scale-up support - to strengthen domestic market capability.
- Integrate **skills development** into FE/HE curricula.
- Strengthen **community enterprise funding** to maintain local delivery capacity.

7.3.2 This roadmap provides a suggested framework for NICW, Welsh Government, and delivery partners to track progress and identify where further intervention or investment may be needed.

8 Key Challenges and Next Steps

8.1.1 Delivering a CE for Wales will require sustained collaboration, clear metrics, and long-term accountability. Wales has already demonstrated international leadership in recycling, but the next phase of transition will depend on how effectively it can **measure, coordinate, and scale** circular activity across all sectors. NICW has a critical role to play in tracking progress and guiding the long-term vision. The Commission can help ensure that the CE remains integrated across infrastructure planning, investment decisions, and policy delivery.

8.1.2 The success of CE delivery is also interdependent with infrastructure systems such as transport, energy and digital. Efficient logistics, access to renewable energy for reprocessing, and digital tracking systems all require coordination beyond the waste sector.

8.1.3 To maintain momentum and convert ambition into measurable progress, we recommend that:

1. Cross-sector collaboration is strengthened through a CE Infrastructure Forum linking government, industry, academia, and communities to coordinate delivery and share innovation.
2. Procurement reform is accelerated to create consistent demand for reused, remanufactured, and low-carbon materials, embedding circular requirements across all public infrastructure programmes.
3. Circular hubs for reuse, repair, borrowing and construction recovery are expanded and coordinated into a national network by 2030, building on successful local and regional initiatives.
4. Digital data integration - via a Circularity Dashboard, product passports, and standardised reporting - is established by 2036 to improve transparency, accountability, and investment confidence.
5. Biennial progress reporting is embedded within the NICW Infrastructure Assessment process to maintain visibility across future Senedd terms and support continuous policy improvement.

8.1.4 These next steps provide the overarching direction of travel. The priority issues, pathways, and indicative timescales for action are summarised in Table 8.1, which identifies where the most significant opportunities exist to accelerate progress towards a circular Wales. It highlights where coordinated action by Welsh Government, industry, communities and academia will have the greatest impact in accelerating Wales' transition to a CE.

8.1.5 Growing domestic demand for circular goods and services is essential if Wales is to retain more value locally. Many Welsh SMEs working in reuse, remanufacturing, repair, or materials reprocessing struggle to compete with cheap linear imports and inconsistent public-sector demand. Strengthening markets for Welsh circular products - through procurement reform, consumer incentives, long-term contracts, and alignment with wider UK measures such as the Carbon Border Adjustment Mechanism - would help build a resilient local supply chain, reduce reliance on imported materials, and stimulate green jobs.

8.1.6 Alongside infrastructure investment, regulatory and fiscal levers - including right-to-repair frameworks, extended warranties, repair vouchers, and tax incentives - may play an important role in improving the economic viability of repair over replacement.

8.1.7 CE approaches also contribute directly to climate resilience. Designing infrastructure for adaptability, modularity, and reuse reduces exposure to volatile material markets while ensuring that assets can be

repurposed or repaired during future climate shocks. Reuse of materials, local supply chains, and reduced dependence on virgin imports all help to strengthen resilience to extreme weather, supply disruption, and global price instability.

8.1.8 While many Circular Economy levers sit within devolved competence - including planning, procurement, waste policy, and economic development - certain instruments relevant to circular transition, such as VAT reform, extended producer responsibility design, and Carbon Border Adjustment mechanisms, remain reserved to the UK Government. Clarity on devolved versus reserved powers is therefore essential when designing policy interventions and assigning delivery responsibilities.

Table 8.-1 - Priority Issues and Potential Actions for Advancing the CE in Wales

Priority Issue	Pathway	Timeline
1. Limited reprocessing and reuse infrastructure	Develop a National Circular Infrastructure Plan to coordinate existing and planned facilities (e.g. plastics, construction materials, WEEE), identify remaining material gaps, and align public capital with private investment through a CE Infrastructure Fund. Capital investment in circular infrastructure should be considered alongside fiscal constraints and competing public spending priorities. Blended finance models - combining Welsh Government capital, UK-level funds and private co-investment -may be necessary to ensure deliverability.	Short term (0-5 yrs)
2. Fragmented policy and governance	Establish a *Cross-Government CE Delivery Board* to align planning, procurement, waste, and skills policies under one delivery framework. Embed circularity in *Future Wales* and local development plans.	Short-medium term (0-10 yrs)
3. Lack of circular procurement standards and uptake	Mandate CE criteria in all public construction and infrastructure contracts. Expand use of Welsh Procurement Policy Notes (WPPN 12/21 and 06/22) and develop CE performance KPIs across the public sector.	Medium term (5-15 yrs)
4. Weak secondary material markets	Create market confidence through quality assurance standards, recycled-content targets, and green public procurement. Support industrial symbiosis networks linking waste producers with end-users.	Medium term (5-15 yrs)
5. Inconsistent data and tracking	Develop a unified *Circular Data Framework* for Wales. Implement material passports, product labelling, and annual CE progress reporting via StatsWales and NICW dashboards.	Medium-long term (5-20 yrs)
6. Skills and workforce capacity gaps	Introduce CE training pathways through FE/HE institutions and apprenticeships. Embed repair, remanufacture, and materials management within Net Zero Skills Wales programmes.	Medium term (5-15 yrs)
7. Behavioural and cultural change	Deliver a national *"Make, Mend, Borrow"* campaign and scale Repair Café Wales, Library of Things, and community reuse and borrowing networks to normalise circular lifestyles.	Long term (15-30 yrs)
8. Funding certainty for community enterprises	Provide multi-year core funding for community-based repair/reuse enterprises through a Welsh CE Social Value Fund linked to circular procurement.	Short–medium term (0-10 yrs)

8.2 Conclusion

8.2.1 Wales has already demonstrated that bold policy, clear targets, and strong community engagement can deliver world-leading recycling performance. It also possesses significant sectoral strengths in areas such as steel, aggregates, plastics reprocessing, and community reuse. The next phase is to build on these foundations - strengthening coordination, domestic value retention, and long-term market confidence - so that materials and economic value circulate more consistently within Wales, supporting green jobs, industrial resilience, and the well-being of future generations. Wales already hosts significant circular activity across industrial reprocessing, commercial repair services and community initiatives. The challenge is not starting from zero, but aligning and scaling these existing strengths within a coherent long-term framework.

8.2.2 A central insight from this review is that long-term circular outcomes depend not only on improved recycling or regulation, but on aligning economic incentives with durability, repair, reuse, and domestic value retention. Even in high-performing recycling systems, business models that reward rapid product turnover can drive cumulative material loss. By contrast, service-based models, circular procurement, and stronger domestic secondary-material markets demonstrate how profitability can be aligned with longevity, maintenance, refurbishment, and controlled recovery. Enabling this incentive shift is critical to moving from strong recycling performance to a fully functioning Circular Economy.

8.2.3 Through coordinated action across design, procurement, manufacturing, infrastructure planning, and community reuse, Wales has the opportunity to consolidate and scale its existing circular strengths - positioning itself among Europe’s leading circular economies and demonstrating how infrastructure, policy, and people can work together to create a resilient and regenerative system.

8.2.4 NICW has an important role in enabling this transition - providing independent advice, strengthening cross-government coordination, improving monitoring and data integration, and championing the long-term collaboration needed to embed circular principles across Wales’ infrastructure, economy, and society.

8.2.5 Wales does not lack circular activity; rather, it faces the challenge of aligning, scaling and evidencing existing strengths within a coherent long-term system.

9 Monitoring Progress

9.1.1 Future monitoring should move beyond traditional waste and recycling statistics to include metrics that capture value retention, carbon impact, and community benefit.

9.1.2 The following indicators are recommended for NICW and Welsh Government to review biennially through a *CE Dashboard*:

- **Material flow balance**: proportion of materials reused, recycled, or recovered domestically versus exported.
- **Secondary material capacity**: tonnes processed within Wales by sector and region.
- **Circular procurement**: percentage of public contracts embedding CE principles.
- **Community impact**: number of reuse and borrowing hubs, repair cafés, and Library of Things networks established.
- **Skills and employment**: number of jobs and training programmes linked to circular practices.
- **Circularity Index**: overall measure of materials recirculated per tonne extracted.

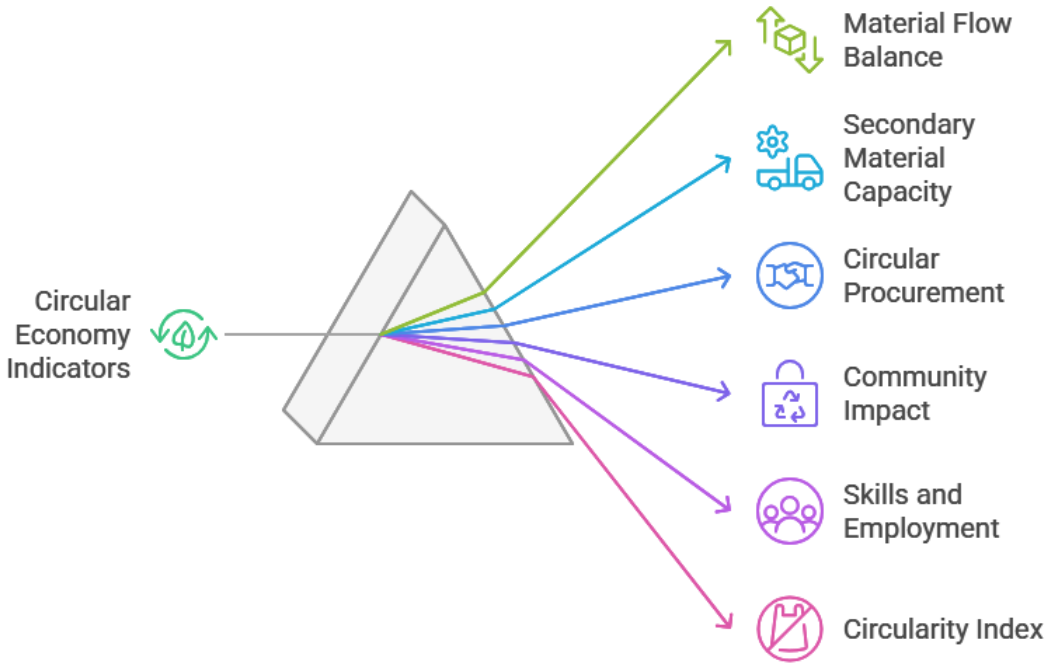


Figure 9.-1 – Circular Economy indicators

9.1.3 These indicators build on several existing data sources whilst also identifying new evidence gaps that will need to be addressed through collaboration between Welsh Government, NICW, StatsWales, WRAP Cymru, and local authorities.

9.1.4 Progress in Wales is also influenced by external economic and political factors. Global commodity prices, UK-wide regulatory decisions, trade policy, and overseas manufacturing standards all affect the competitiveness of Welsh circular businesses and the viability of domestic reprocessing. Wales' CE will therefore rely on close alignment with UK, European, and international frameworks, while strengthening domestic capacity to reduce exposure to external shocks.

9.1.5 Stakeholders emphasised the need for more robust digital waste tracking, including mandatory use of the UK Digital Waste Data Service once implemented. Consistent digital reporting across local authorities and businesses would improve data accuracy, transparency and traceability of material flows. While improved digital tracking can support regulatory oversight, effective reduction of waste crime will also require adequate enforcement capacity and regulatory resourcing. Investment in interoperable digital infrastructure - alongside strengthened enforcement capability - will be critical to achieving this.

9.1.6 Tables 9.1 and 9.2 summarise the existing datasets and key data gaps that should be addressed to enable consistent long-term monitoring of Wales' CE performance.

Table 9-.1 – Existing Data available to Track Circular-economy Performance

Indicator / Dataset	Why important	Who collects / manages	Frequency	Publicly available
Municipal recycling rate	Tracks household recycling performance and policy outcomes.	StatsWales	Annual	✓
Waste generation by stream (tonnes)	Baseline for material-flow accounting.	NRW / WRAP Cymru	Annual	✓
Employment in recycling and waste sectors	Early indicator of CE jobs and skills development.	ONS / StatsWales	Annual	✓ (partial)
Procurement carbon reporting (WPPN 12/21 returns)	Measures integration of CE principles in public procurement.	Welsh Government	Biennial	✕ (partial)

Table 9.-2 – Data Gaps and Future Monitoring Priorities

Indicator	Why it matters	Who could collect / coordinate	Proposed frequency
Material flow balance (imports, exports, reuse)	Tracks domestic value retention and supply-chain resilience.	StatsWales + Welsh Government / NICW	Biennial
Circular procurement spend (% of contracts)	Captures demand-side progress and market pull.	Welsh Government / NPS Wales	Annual
Value retained in Welsh economy (£ / tonne)	Quantifies economic benefit of circular activity.	WRAP Cymru / NICW	Biennial
Social-value outcomes (skills, wellbeing, participation)	Reflects community benefit of circular initiatives.	Circular Communities Cymru / Local Authorities	Annual
Circularity Index	Composite measure of materials recirculated vs extracted.	Welsh Government / NICW	Biennial

9.1.7 Together, these datasets and indicators will allow NICW to monitor both system-level performance - materials, markets, carbon - and societal outcomes such as jobs, equity, and resilience. They will form the evidence base for future NICW Infrastructure Assessments and enable consistent tracking of Wales' progress toward a fully CE.

Appendix A - Alignment of Identified Issues against the NICW Framework

The issues and challenges identified in this report and highlighted for further consideration in Table 7.1 have been assessed, in qualitative high-level terms, against the NICW framework and remit, which includes:

- The Well-being of Future Generations Goals
- The Nature Emergency
- The Climate Emergency
- The Socio-Economic Duty
- Long-term considerations.

NICW Framework element	Assessment
Goal – Prosperous Wales	The issues and challenges identified for further consideration include the need for an interconnected system that cuts across every part of Wales' economy and infrastructure.
Goal – Resilient Wales	This report highlights opportunity to build resilience through developing local capacity, reducing reliance on global supply chains, promoting adaptive infrastructure, fostering community self-sufficiency, and investing in innovation and skills. Each of these areas require long term investment and planning in addition to measure supporting culture change in favour of CE activity.
Goal – More equal Wales	The report references opportunities for creating inclusive job opportunities, improving access to affordable goods and services through local initiatives. Efforts should be made to extend recycling and Circular Economy initiatives beyond town centres and into rural communities.
Goal – Healthier Wales	Whilst CE activities identified in the report suggest a positive contribution to improvements in environmental health and community well-being an absence of data and monitoring makes it difficult to quantify.
Goal – Wales of Cohesive Communities	The report identifies funding, infrastructure, skills, inclusion, and strategic coordination as key issues that must be addressed to enable CE initiatives to fully support cohesive communities in Wales.
Goal – Wales of vibrant culture and thriving Welsh language	As above.
Goal – Globally responsible Wales	The report identifies fragmented policy, high resource use, waste export, infrastructure gaps, and limited data as key challenges to Wales fully achieving the goal of being globally responsible in its CE transition.
Nature Emergency	The report identifies excessive resource extraction, weak recycling infrastructure, illegal waste practices, immature circular markets, skills shortages, behaviour change barriers, and poor data integration as key challenges to effectively combatting the nature emergency in Wales.

NICW Framework element	Assessment
Climate Emergency	In addition to the above issues, the report also highlights economic pressures as an issue.
Socio-Economic Duty	An absence of key indicators and data makes it difficult to evidence and address inequalities.
Long-term considerations	A key issue highlighted in the report is the need for long-term consistent policy and to move away from short term funding horizons.

Arcadis Consulting (UK) Limited

Suite 4D, Fourth Floor
Hodge House
114-116 St Mary Street
Cardiff CF10 1DY

T: +44 (0)29 2092 6700

arcadis.com