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AUSSEN WIRTSCHAFT BRANCHENREPORT UNITED KINGDOM

RECYCLING AND RESOURCE MANAGEMENT IN THE UK

OVERVIEW OF REGULATORY DRIVERS, FINANCIAL INCENTIVES AND UK MARKET STRUCTURE AND KEY DRIVERS

AUSSENWIRTSCHAFTSCENTER LONDON
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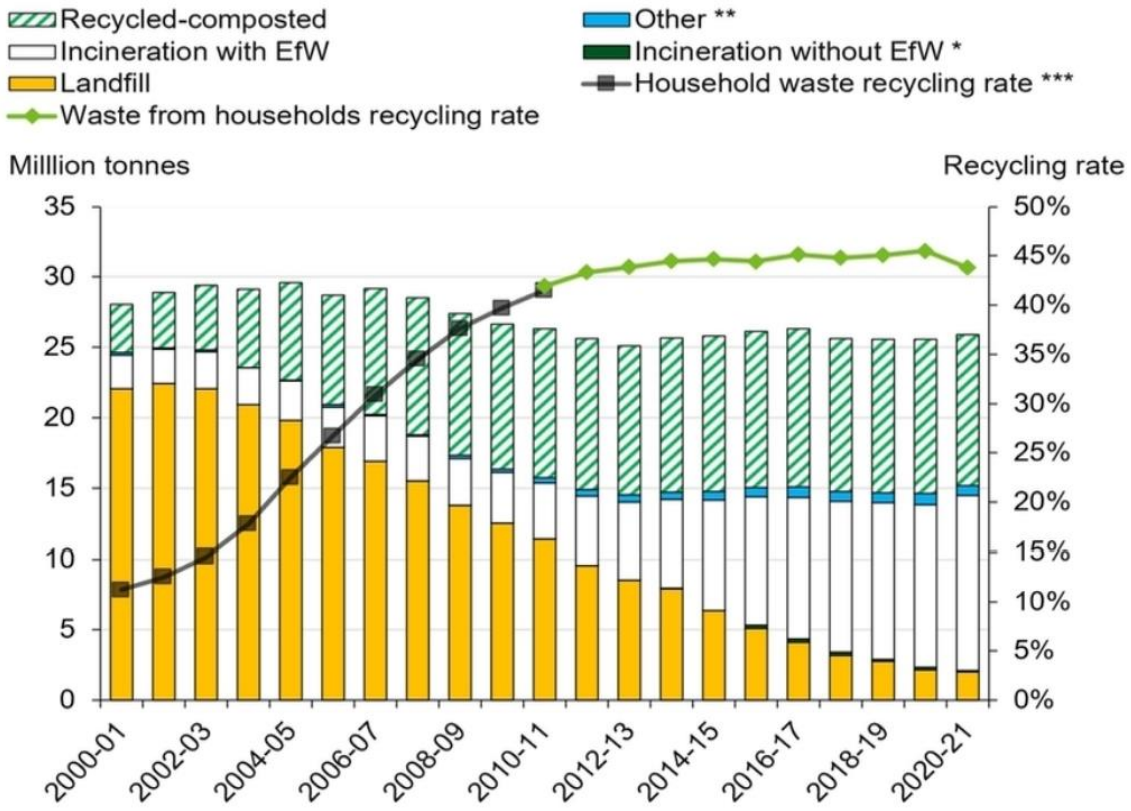
TABLE OF CONTENTS

UK Circular & Resource Efficiency – Status Quo

The UK has made considerable progress since the early 2000's in implementing recycling infrastructure to meet European targets and to comply with the waste hierarchy or reduce, re-use, recycle, recover and dispose. Figure 1 shows that England has been reducing landfill disposal and increasing waste recovery over the past twenty years. While recycling originally grew with the introduction of source segregation for households and commercially business, recycling rates have been stagnating if not slightly reducing in the past years. In the last ten years the shift was mainly from landfill disposal to energy from waste (EfW).

Today, the key drivers for waste management and circularity are the carbon reduction and resource efficiency targets. This is true across the UK, where environmental issues are devolved matters, which means England, Wales, Scotland and Northern Ireland have their own individual policies, tax regimes and environmental bodies. However, it needs to be noted that England represents 80 – 85% of the waste arisings.

Figure 1 : Waste management and recycling in England



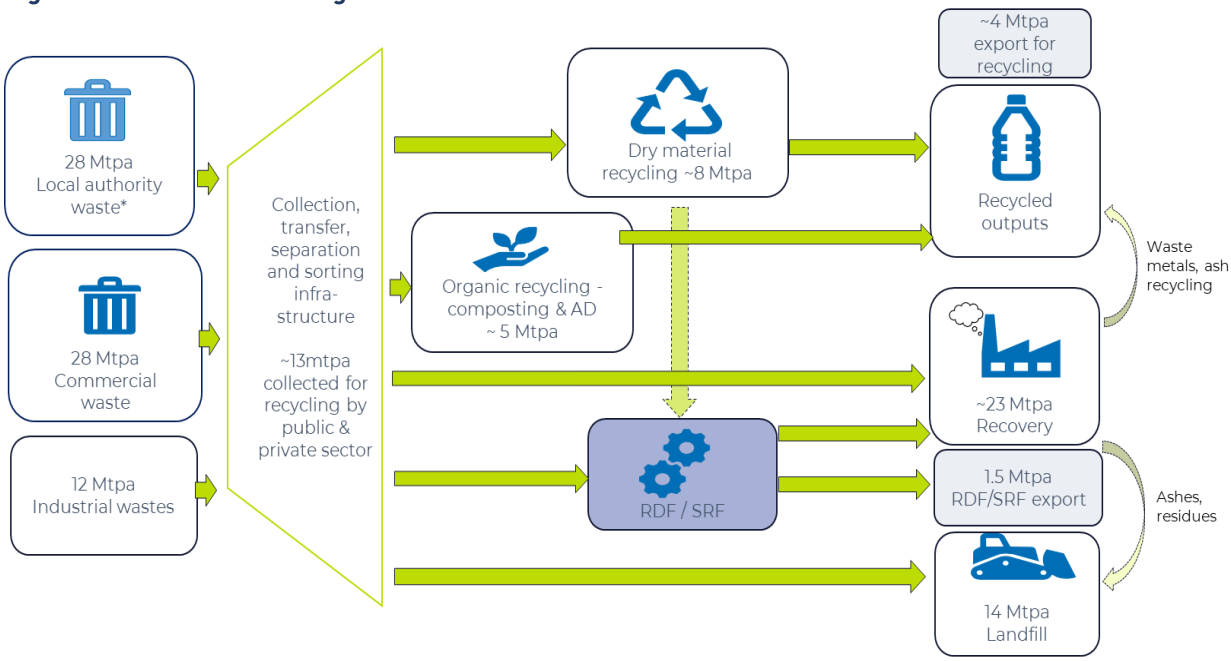
Source: Defra waste statistics

Therefore, there is considerable opportunity in the UK to increase the collection, separation and sorting of recyclables to improve circularity and re-use materials in manufacturing to lower carbon emissions.

Figure 2 shows an estimated 68 Mtpa of solid non-hazardous wastes from households and commercial sources are managed in England today and the general flow of these wastes through the waste management system is very similar to Austria and other European countries.

The reverse supply chain consists of waste collection, separation and sorting stages as well as recycling and processing of the individual waste streams to create fertiliser, recycled glass, metal, plastics, paper & cardboard, as well as energy production. Some wastes are exported for recycling and energy recovery or disposed of in landfills in the UK.

Figure 2: Waste flows in England



Some UK specific characteristics are that:

- The UK does not yet have a 'dual' collection system for packaging and a national producer responsibility organisation (PRO) administering the collection of household and commercial packaging as most continental European countries (Please see www.pro-e.org for details). All household packaging is collected via Local Authority contracts and commercial packaging is collected via private waste contracts and then channelled to the sorting and recycling sector. The latter issues Packaging recycling/recovery notices or PRN's to verify the recycled packaging, which are traded on the market. Therefore, PRN pricing reflects supply and demand – not necessarily the costs or value of the recycled material – this is under review with the implementation of the new EPR system, which will be administered by the UK Extended Producer Responsibility (pEPR) for Packaging Scheme Administrator.
- Waste management contracts for local authority waste collection and disposal are part of a two-tier authority system in England, where district and county authorities have different waste contracting functions e.g., waste collection and waste treatment/disposal respectively. Wales & Scotland are combined authorities and major English cities also have Borough and Metropolitan Authorities, which are combined authorities delivering both functions. Therefore, local authority waste contracting can be complex as contracts can be let by individual authorities, joint district and county authorities or even procurement partnerships across authorities to combine purchasing power and provide regional solutions.
- The waste collection and sorting/separation market is fairly dominated by the large waste firms, however the recycling, composting and AD markets are more fragmented and independently owned. Therefore, waste might be contracted several times between collection and final treatment.

Drivers for Investment into circular material flows

With the need for increased recycling to meet targets and the ambition to create circular material flows and decarbonise industry the UK is supported by a mixture of regulatory, financial and voluntary drivers as outlined in Figure 3.

Figure 3: Key drivers for circular material flows

Figure 4 shows key policies across the devolved UK nation and their different stages of circular economy implementation. Wales has the highest recycling rates in the UK and is also one of the leading European recycling nations.

Across the UK a number of key measures originally outlined in the UK Resource & Waste Strategy from 2018 are being implemented – pending the July 2024 election outcomes. One of the first policies implemented, the tax on plastic packaging materials was introduced in 2022, which taxes plastic packaging with less than 30% recycled content.

Other measures are the new packaging EPR, other EPR systems and DRS etc. These key components of a circular economy are being supported by the amendment of the Environment Act 2021, which includes new collection requirements to simplify recycling (Simpler recycling in England: additional policies - GOV.UK (www.gov.uk) and provide more uniform and simplified collection system in the UK. This will be a key driver for infrastructure investments along the supply chain and is expected to increase the separate collection of dry recyclables and organic waste for both local authorities and commercial waste. The additional amounts of waste collected will require more plants to sort, clean and prepare materials for recycling to create secondary materials for manufacturing as well as organic fertiliser and energy from food and green wastes. The UK currently heavily relies on export for recycling and therefore this is another opportunity for investment and knowledge sharing.

In addition, the UK is one of the leading nations supporting sustainable transport and aviation fuels, therefore this is also a key growth sector driven by the updated RTFO subsidy scheme and the SAF mandate, which was finally published in May 2024.

All of this will need to be supported by respective data tracking and management systems to enable and inform the implementation of a circular economy, which is a separate growth sector and will require equipment, knowledge and services.

Figure 4 : Key regulatory requirements & financial incentive schemes

Regulations & targets	England	Wales	Scotland	Northern Ireland
Circular Economy & resource efficiency	Circular Economy Package Resource & Waste Strategy 2018 Simpler Green Collection Regulations 2026	Beyond Recycling, 2021 The Waste Separation Requirements Regulations 2023	Consultation on Circular Economy Bill 2023, Making Things Last – a CE strategy for Scotland, 2016	Circular Economy Strategy for Northern Ireland, Draft 2023
Recycling performance '22 & targets	~44 %	~57% (66% '23)	~42%	~48 %
	65% municipal recycling rate and a 10% threshold for municipal waste going to landfill by 2035.			
Long term residual waste reduction target	50% reduction in residual waste per capita (sent to landfill, recovery, or exported for disposal recovery) by 2042 (based on 2019 levels)			
Key implementation measures driving key growth areas:				
Plastic Packaging Tax (PPT)	'The UK PPT applies to UK manufacturers, importers, business and end customers and importers (>10 tonnes of plastic packaging per year). 'The PPT's aim at £217.85 per tonne from 1 April 2024 is to provide a clear economic incentive for businesses to use recycled plastic in the manufacture of plastic packaging, which will create greater demand for this material'... to 'stimulate increased levels of recycling and collection of plastic waste.'			
Packaging EPR (pEPR)* & fees	Full implementation of the UK EPR scheme in 2025, payments for Local Authority collected packaging determined form 1st April 2024.. Dr. Margaret Bates is the head of the UK pEPR Scheme Administrator – working with Defra & devolved administrations to implement the scheme and develop modular EPR fee system.			
Deposit return schemes (DRS)	Introduction of DRS for PET, steel and aluminium beverage containers (> 150 ml & < 3 litres) in October 2027 (inclusion of glass under discussion). Phase 1 – Spring'25 appointment of administration organisations. Phase 2- by Spring '26 – full set p of the DRS management organisation incl. funding, logistics, delivery partners, IT etc.) Phase 3 by spring'27 roll-out of DRS. Discussion if digital DRS can be included so that incorporation of materials recycled at home within existing collection systems can be included as a deposit route.			
Sustainable aviation fuel (SAF) mandate (April'24 pending approval)	The UK SAF mandate aims for 2% SAF of aviation fuel in 2025, rising to 22% in 2040 to support the UK waste to SAF infrastructure developments and help decarbonise transport fuels. A specific industry funded revenue certainty mechanism for UK SAF plants is set to be delivered by end of 2060. This builds on the Renewable transport fuel obligation and subsidy scheme support non-recyclable fossil wastes and non-fossil waste to fuel developments.			
UK ETS expansion to waste sector	As in Europe the process to expand emissions trading scheme to include the waste sector is underway with MRV (Monitoring reporting and verification) anticipated from 2026 and trading (purchase and surrendering of allowances) from 2028. Set to include EFW and other recovery activities (including waste to fuels) with chemical recycling to products (not fuels) excluded			

Note: Packaging EPR, other EPR schemes relate to WEEE, ELV, tyres, batteries etc.

UK waste market structure & circular economy facilitators

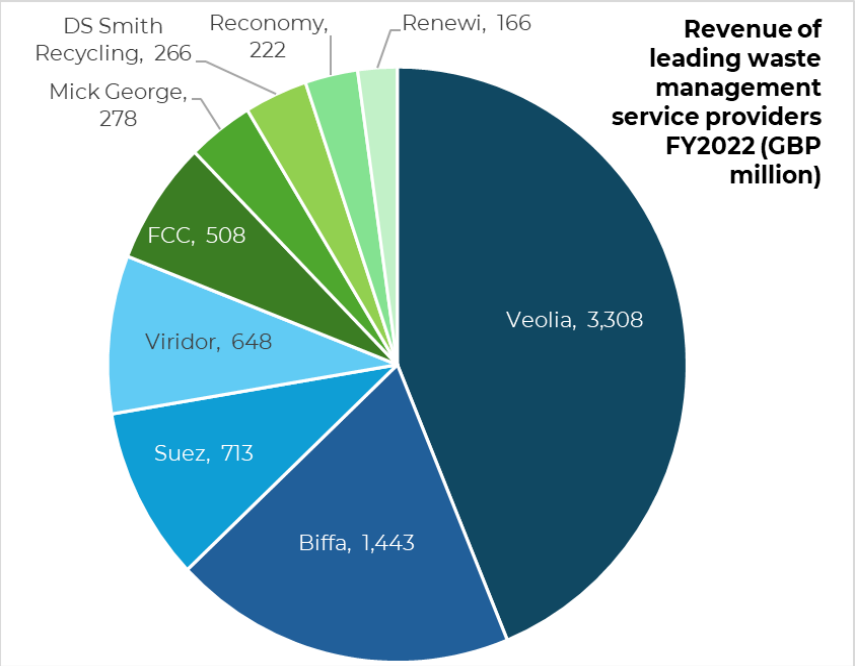
In 2023, it was reported that UK Circular Economy investments rose to over £ 1.3 billion and that considerable growth is expected to continue in this sector. Figure 5 shows some key areas for investment to create circular material flows and decarbonise industry.

Figure 5: Key UK investment areas

Waste collection	Implementation of Simpler Green Collection will require new collection containers, vehicles and data systems
Dry material recycling (glass, plastics, metals, paper, cardboard)	Upgrading and expansion of separation & sorting facilities (e.g. AI/robotics). Growth of domestic recycling infrastructure
Organic waste recycling	Expansion of AD and IVC for additional food waste collections, biomethane upgrading and CO_2 capture.
Energy recovery of residual waste	Refurbishment of older EfW, front-end plastic extraction to reduce carbon input. Carbon capture, storage and utilisation.
Renewable transport fuel production	Biomethane for vehicle use (LNG/CNG). Residual, tyre and plastic waste to SAF, drop in fuels, maritime, hydrogen etc
EPR, DRS and waste data tracking	Implementation of EPR and DRS management systems, data tracking, storage and evaluation.

In order to realise these opportunities, it is important to understand the UK waste market and its key players. Figure 6 shows that the waste market is dominated by four large national waste companies (so-called 'Tier 1' waste firms), who are key providers of circular material flows in the UK. The smaller 'Tier 2' companies are often more focussed on certain wastes, geographies or parts of the supply chain.

Figure 6 : Revenue of leading waste management service providers



Source: Various incl. Statistica 2023.

Note: Beauparc Utilities is est. to turn over £ 345 million processing 3.5 Mtpa in over 40 waste facilities in the UK and Ireland

The major national UK waste companies are fully integrated waste services providers with a wide range

of waste collection, treatment and disposal activities for municipal, commercial and industrial waste streams.

Figure 7: National Tier 1 waste companies in the UK

All are investing in circular material flows in the form of resources, knowledge and infrastructure to provide domestic capacity for waste management and increase resource efficiency in the UK. This needs to be funded and while the UK Governments provide the regulatory framework and some fiscal support, it is mainly being funding by the private sector. Larger infrastructure can often not be funded on balance sheets and with the help of banks alone and many innovative solutions including novel technologies and approaches need venture capital or private equity investors.

Therefore, private equity has become a key player in the UK waste infrastructure as shown in Figure 8, which provides an insight into investors and owners of key waste management infrastructure in the UK today. Supported by debt financing where appropriate Private Equity and Venture Capital investments account for 79% of 2023 UK Circular Economy investment. This is the result of the following historic developments in the waste sector:

- Limited public investment after the Government closed the Private Finance Initiative (PFI) in 2018, which had funded key waste infrastructure for household waste;
- Tier 1 and some Tier 2 waste companies entered into public private partnership (PPP) arrangements supported by banks to finance new equipment and waste management plants;
- In the past five years the UK market has seen some consolidation in the waste management sector and portfolio sales of existing plants, upgrading & expansion of assets as well as investment in new waste infrastructure. This included key EfW and biogas portfolio sales in 2022/23 as well as key investments into the large waste management companies, reshaping of service offerings as well as acquisitions of smaller waste firms with key services, logistics and transfer locations.

Figure 8: Examples of Key UK Infrastructure Investors

Investors	Collection & Sorting	Dry / organic waste recycling	Waste to energy & sustainable fuels	Biomass/ wood to energy
Aviva Investors				✓
EQT			✓ Encyclis	
CIP			✓ Lostock, Slough, Kent	
EMK Capital	✓ Reconomy			
ECO	✓ Biffa	✓	✓	
Black Rock/KKR (BGF)		✓ Viridor	✓	
Macquarie	✓ Beauparc	✓	✓	
Ancala	✓ Augean	✓ Biogen		
Iona Capital		✓ Advantage		✓
Equitix		✓ BioCapital	✓ Baddesley, Bridgwater EfW	✓ Wellland, TGP
First Sentier			✓ Enfinium	
I Squared Capital	✓ Enva	✓ Enva		
Carbon Direct Capital			✓ Velocys SAF	

While the regulatory forces and financial incentive systems are key to shaping the industry – the profitability of key waste operations and the CE supply chain are very much driving private investment and setting the pace for the implementation of circular material flows.

Commercial organisations and their motivation to create returns for their investors in the CE sector will be key to provide opportunities for investment, sales and knowledge sharing with Austrian companies. While the Government will intervene in the market to achieve NetZero and push environmental solutions – collaboration and the value distribution along the recycling and circular material flows supply chain will be a key factor to determine commercial success and to achieve Net-Zero ambitions.

Figure 9 shows that 70% of organisations that are involved in circular economy (CE) related activities across the UK are commercial organisations driven by market forces and sustainability commitments.

The key commercial and public sector actors in the UK circular material supply chains are:

- Waste management companies and waste infrastructure operators – Tier 1, Regional Tier 2 and individual collectors and plant operators

- Private investors, pension funds and banks – financing the refurbishment, upgrading, expansion of existing infrastructure and growth of new facilities.

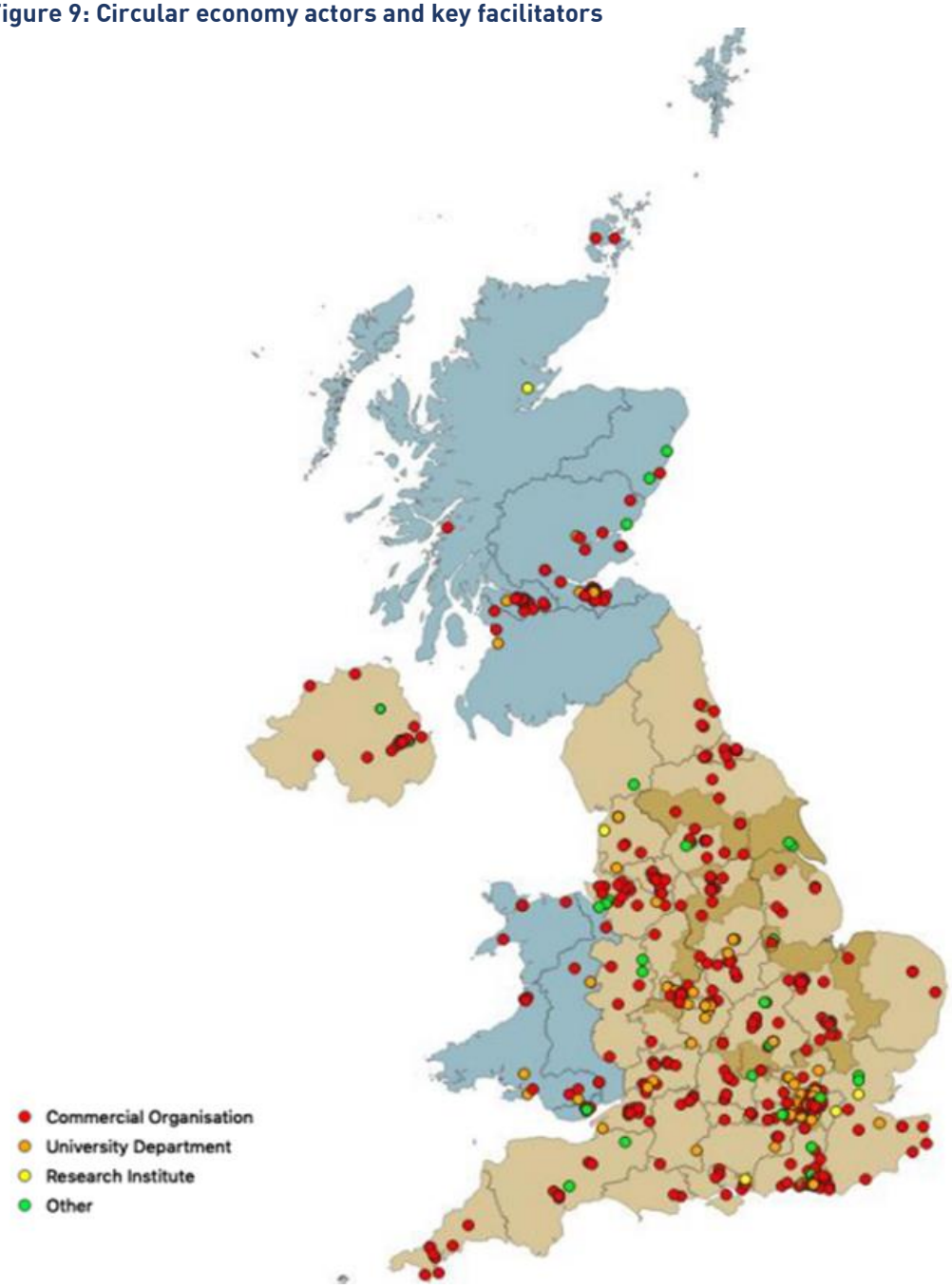
- Brands, manufacturers, retailers and other waste producers paying EPR fees, PPT and contribute under the 'polluter pay' and EPR.

- Central and devolved governments and administration bodies for subsidies and penalties e.g. plastic tax, EPR fees, PRNs, landfill tax.

- Regulators across the four nations: Environment Agency (EA), Scottish Environmental Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency (NIEA).

- Public and privately funded facilitators and trade bodies e.g. WRAP, CIWM, ESA, UROC, REA, ADBA, INCPEN, Green Alliance, Innovate UK.

Figure 9: Circular economy actors and key facilitators

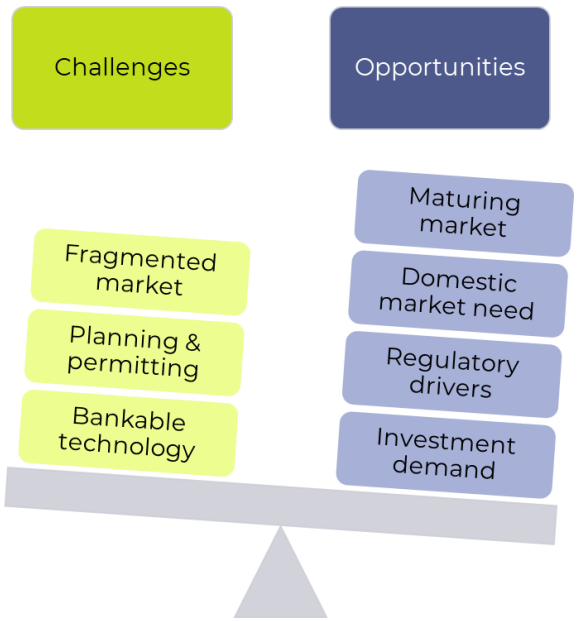


Source: CIRCULAR-ECONOMY.pdf (smartspecialisationhub.org)

Opportunities & challenges

In summary, there are considerable opportunities in the waste and circular material markets in the UK. The individual products, equipment and service offering will determine where these opportunities are and how these can be realised. However, there are also some specific challenges to accessing the UK market as shown in Figure 10.

Figure 10: Summary of key challenges and opportunities



The UK is an exciting market with considerable growth potential, which is trying to address the key issues, which impact all players along the supply chain and the Governments to transition from a linear to a circular economy. These include:

- Move from tonnage targets to carbon accounting and impact assessment to contribute to 'Net Zero';
- Commercialise new technology options at scale – AI sorting, 'hard to recycle' materials, renewable fuel production;
- Fund and finance the 'dual' role of the waste industry as waste processor and secondary product manufacturers;
- Incentivise the manufacture and consumptions of recycled materials and products to increase demand;
- Enable pre-competitive collaboration in a competitive market – 'as a circular economy cannot be created in isolation' –
- Raise public awareness and share knowledge across the value chain.to create a joint understanding and objectives.

The AUSSENWIRTSCHAFTSCENTER LONDON is the first point of support for Austrian companies doing business in the UK market, assisting with market and regulatory knowledge, finding business partners and the organisation of events.

Appendix

A. Policy and Legislation:

UK wide

- Plastic packaging taxation Increase to Plastic Packaging Tax rates from 1 April 2024 - GOV.UK (www.gov.uk) and impact summary Introduction of Plastic Packaging Tax from April 2022 - GOV.UK (www.gov.uk)
- EPR guidance - Extended producer responsibility for packaging: how to assess household and non-household packaging - GOV.UK (www.gov.uk)
- Consultation response EPR Consultation Government response template (publishing.service.gov.uk)

England

- Environmental Improvement Plan 2023 (First revision of the 25 year Environmental Plan published 2018) Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)
- Resources and waste strategy for England - Resources and waste strategy for England - GOV.UK (www.gov.uk)
- Recycling Tracker survey: Spring 2023 | WRAP
- PEPR checker tool Check if you need to report packaging data - GOV.UK (www.gov.uk)
- Simpler recycling collections and tougher regulation to reform waste system - GOV.UK (www.gov.uk)

Wales

- Beyond Recycling, 2021 - Beyond recycling | GOV.WALES
- The Waste Separation Requirements (Wales) Regulations 2023
- The Prohibition on the Incineration, or the Deposit in Landfill, of Specified Waste (Wales) Regulations 2023

Scotland

- Circular Economy (Scotland) Bill, 2023, Overview | Scottish Parliament Website
- Making Things Last – a circular economy strategy for Scotland, 2016, Making Things Last: a circular economy strategy for Scotland - gov.scot (www.gov.scot)

Northern Ireland

- Circular Economy Strategy for Northern Ireland | Department for the Economy (economy-ni.gov.uk), Draft 2023

B. Information Sources:

Circular Economy & Investment

- BDO-Circular-Economy-Series-2024.pdf
- Recycling and Waste Management News - letsrecycle.com
- Materials Recycling World | Waste Management Industry News (mrw.co.uk)

Organics & Biogas & Energy from Waste

- UK Energy from Waste Statistics - 2023 - Tolvik
- Biogas Map | Anaerobic Digestion (biogas-info.co.uk)
- Anaerobic Digestion deployment in the UK (nnfcc.co.uk)
- AD Market in the UK – A Food Fight? – Tolvik

Material Recovery - Market Reports & Data

- Material Recovery Facilities – Market Overview (Monksleigh)
- Map of UK Composting Sites – (REA - Renewable Energy Association)
- WRAP Industry Survey Report: anaerobic digestion and composting

Important trade events

- Recycling Expo |15-16th October 2024 | London
- ERWM Resource & Waste Management | 11-12th September 2024 | Birmingham
- Packaging Innovations | 12-13th February 2025 | Birmingham

C. Market Partners:

Market Consultants (Circular Economy and Waste Engineering)

- Eunomia Research and Consulting
- Oakdene Hollins
- Tolvik
- Ceresemc
- Anthesis Group
- NNFCC

Engineering Consultancies (Circular Economy and Waste Engineering)

- Mott MacDonald
- Arup
- Wood
- Ricardo
- WSP
- Sweco
- SLR Consulting
- Arcadis
- Turner & Townsend

Trade associations and enablers:

- WRAP – Waste Resources Action Programme
- Green Alliance- environmental think tank
- Innovate UK – UKRI - UK's innovation agency
- CIWM - Chartered Institution of Wastes Management
- REA – Renewable Energy Association
- ESA – Environmental Services Association
- UROC - association for independent waste operators
- ADBA - Anaerobic Digestion & Bioresources Association
- incpen: Industry Council for Packaging & the Environment
- British Metals Recycling Association
- Association of Plastic Recyclers
- The Recycling Association - association for recycling and waste management companies
- Alupro - The Aluminium Packaging Recycling Organisation
- British Glass - trade association for the UK glass industry
- CPI – Conferation of Paper Industries
- BBIA - Bio-based and Biodegradable Industries Association
- RTFA - Renewable Transport Fuel Association
- MIBAAA – Manufacturers of IBA Aggregates Association

Glossary

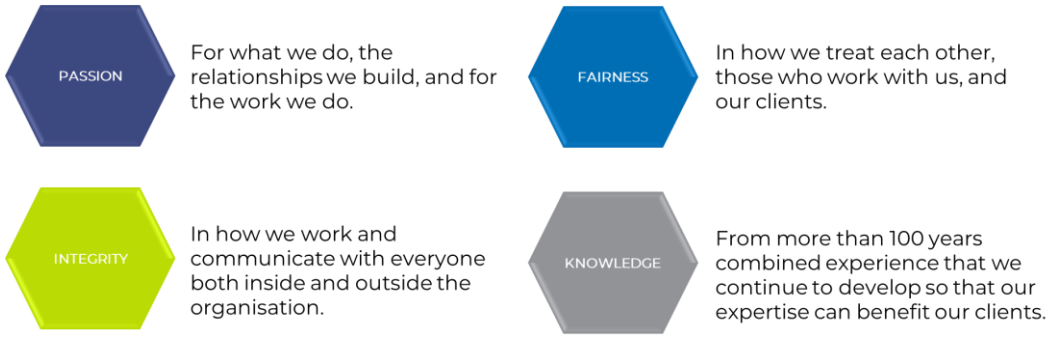
Abbreviation	Definition
AD	Anaerobic digestion
ADBA	The Anaerobic Digestion & Bioresources Association
CIWM	Chartered Institute of Waste Management
CNG	Compressed natural gas
DMR	Dry matter recycling/recyclates
DSR	Deposit return scheme
EA	Environment Agency (English environmental regulator)
EfW	Energy from Waste
ELV	End of Life Vehicles
EPR	Extended producer responsibility
ESA	Environment Service Association
ETS	Emission Trading Scheme
INCPEN	Industry Council for Packaging & the Environment
IVC	In-vessel composting
ktpa	000 tonnes per annum
LNG	Liquified natural gas
MRF	Material recovery facility
MSW	Municipal Solid Waste
NRW	Natural Resources Waste (Welsh environmental regulator)
OPRL	On-Pack Recycling Label organisation
PAS	Publicly Available Specification
PFI	Private Finance Initiative
POM	Placed on the market
PPP	Public private partnership
PPT	Plastic packaging tax

PRN	Packaging Recovery Note
RDF	Refuse derived fuel
REA	The Association for Renewable Energy and Clean Technology
RTFO	Renewable transport fuel obligation
SAF	Sustainable aviation fuel
SEPA	Scottish Environmental Protection Agency
SRF	Solid Recovered Fuel
UROC	United Resource Operators Consortium
WEEE	Waste Electric & Electronic Equipment
WRAP	Waste & Resources Action Programme
ZWS	Zero Waste Scotland

Context & Author

The report was authored by Ceres Environmental Management Consultancy (Ceres EMC) which was founded in 2018 and re-launched as Ceres Waste Renewables and Environment (Ceres) with three additional new Directors in March 2024.

Our core values are at the heart of everything we do.



They are who we are as individuals and as an organisation. Our values guide the positive relationships that we build with our clients across the supply chain and the services we offer as outlined below:

Claudia Amos
For and on behalf of Ceres Waste, Renewables & Environment
June 2024
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