





WASTE AND CIRCULAR ECONOMY COLLABORATION

RAPID EVIDENCE REVIEW: BUSINESS UPTAKE OF CIRCULAR ECONOMY APPROACHES

Focus: Barriers & Drivers, Interventions

Evidence Base: Academic Literature & Stakeholder Interviews

POLICY HIGHLIGHTS



This document represents a 9-page synthesis of a 44,000-word rapid evidence review, conducted as part of the Business Barriers to the Uptake of Circular Economy Approaches project – one of three themes being explored by BehaviourWorks Australia and its partners as part of a Waste and Circular Economy Collaboration¹. The aim was to synthesise available evidence on barriers, drivers and interventions for business adoption of Circular Economy (CE) practices, with the linked goals of informing the policy dialogue and to identify opportunities for trials in the later stages of the Collaboration program.

KEY HIGHLIGHTS

For waste and circular economy policymakers

Overcoming barriers to business adoption of more circular business models requires both:

- 1. overcoming internal barriers of organisational inertia and hesitancy
- 2. building/proving consumer interest and demand.

This needs to be supported by:

- addressing change in supply and value chain networks
- targeted removal of perverse incentives and barriers, and
- enhancing economic drivers and transferring (rather than developing) well advanced technologies.

At present, evidence of success in mainstreaming CE experimentation and innovation would indicate substantial progress, beyond the existing 'bubble' of early adopter entrepreneurs and innovators.

For organisational behaviour change / engagement programs

Clear evidence for specific interventions is currently lacking in the academic literature.

What is needed are carefully-designed trials to answer a range of key research questions, including:

- What interventions influence the adoption of CE practices for firms that are aware of, but cautious about, adopting CE practices and models?
- What constitutes a compelling business case (across different business types) to invest and/or experiment in CE products and services?
- What works to build consumer awareness, interest, relationships and trust in CE products and services?
- How can we best influence consumer behaviours across different dimensions of CE (e.g., from product purchases, to stewardship and returns)?

¹ The Collaboration is a partnership between BehaviourWorks and the Australian Government Department of Agriculture, Water and Environment (Department of the Environment and Energy at time of commissioning); Victorian Government Department of Environment, Land, Water and Planning; Sustainability Victoria; Environment Protection Authority Victoria; and the Environment Protection Authority NSW. Find out more at: www.behaviourworksaustralia.org/major-project/waste-collaboration-stream-3-business-barriers-to-circular-economy-approaches

KEY FINDINGS

Addressing barriers of organisational / supply chain inertia

Promising policy interventions on the organisational and supply chain side include **entrepreneurship and experimentation in CE initiatives** and **addressing known regulatory barriers and trust shortfalls** (e.g., CE procurement policies, product labelling schemes, taxes/subsidies), **removing various structural**, **economic and market barriers** to support innovation.

Importantly, it is doubtful that further investments in awareness-raising communications or technological R&D are needed in Australia; instead, efforts should focus on correcting a lack of CE knowledge translation and application, particularly benefiting from other jurisdictions that have already invested substantially in these areas.

Further, while there are early adopter 'start ups' and innovators in Australia, there is a need to "break the bubble" of CE enthusiasm occurring among small cohorts of sustainable business and corporate social responsibility communities and engage the wider business community.

Experimentation incubators and networks, sharing platforms, peer-to-peer learning and targeted incentives and support are all possible endeavours to support CE transitions (for both SMEs and larger businesses).

Building and proving interest and demand for CE products and services

For consumer demand and building a broader culture of circularity, the challenges are many and the solutions/ideas are few.

One key area revolves around **correcting the 'unlevel' playing field**. For example, **building confidence in CE products and services through standards and labels**, **while regulating to implement CE requirements and removing virgin material subsidies** that have supported traditional linear model production, could also be important in increasing the attractiveness of circular products and services relative to established linear offerings.

Another area involves motivating consumers to accept changes in practices that come with circular products and services. Circular business models will (at least initially) likely require more effort by consumers, whether to return, maintain, or develop new routines (e.g. cleaning), etc. **More research is needed** to understand how government and firms can best **increase chances of consumers taking up new circular products/services**.

On the government and business-to-business level, building **confidence in the quality assurance and consistency of products and materials** also appears to be key, as well as **increasing 'circular' procurement**. For the latter, **more research is needed** to understand how interventions influence procurement in B2B or government. For example, where there is an (apparently) attractive and credible CE service or product in existence, what messages or interventions are effective in expanding its uptake and adoption by business or government?

Broader policy intervention options

Policy interventions were only addressed in just over one-third of the included reviews, and largely reflect recommendations and proposals, with limited links to demonstrated outcomes. As best as possible, the following recommendations reflect what is known in the literature. Further in-depth research is still needed to fully understand what is needed to increase business adoption of circular economy approaches.

Contextualising our behavioural public policy focused findings, the review identified five main clusters of policy interventions that are suggested, but are not necessarily demonstrated, to support CE adoption by businesses. These are:

- Education and awareness raising amongst the public, businesses and supply/value chains
- Place-based and virtual business parks and networks aiming to reduce barriers to sharing materials and fostering collaboration
- Incentives and market settings: targeted funding, tax relief and market establishment for circular materials, and removing virgin material subsidies and perverse incentives.
- Policy leadership in terms of setting clear long-term policy signals, identifying and removing barriers, mandatory standards and participation, and procurement.
- Technology diffusion and participation, facilitating collaboration and materials sharing, and targeted investment in enabling infrastructure where needed.

SUMMARY OF RESULTS

BARRIERS to business adoption of circular approaches

Consumer demand and interest (lack of)	Consumer concerns related to the quality and durability of recycled, repaired, repurposed items (as well as any negative stigma associated with them); an unwillingness to pay the (perceived) higher prices for such goods and services; a distrust of the CE credentials of products (including a lack of accurate measures and indicators that convey such information to the consumer); a reluctance to breaking existing consumption habits. This lack of consumer demand and interest was reported from both the consumer and business perspective.
Market/ economic	Businesses lack of resources/capital for high upfront/investment costs (especially when compared to linear business models); the availability and low costs of virgin materials (creating unfair competition); longer return on investment timeframes (putting the business at risk); costs associated with greater administrative burdens resulting from engaging in horizontal and vertical CE business relationships simultaneously; costs associated with the separation, recycling and repair of materials (which are exacerbated by product designs and collection services that do not facilitate such processes). Such barriers are of particular concerns and/or relevance to SMEs based on the reviewed studies.
Organisational leadership / culture / routines	Lack of knowledge on CE business opportunities, input streams, partners and technological innovations; lack of data and evidence that demonstrate compelling business cases for CE business models; risk aversion to changing current business processes that have a track-record of "working" (combined with unknown returns of adopting CE business models within highly competitive business markets); poor environmental/social culture within businesses (e.g., where businesses do not see waste, environmental pollution, and resource scarcity as pressing concerns); an unwillingness to experiment or pilot new initiatives (or only willing to do so at an incremental rather than a radical level).
Regulation / policies	Legislation, regulation, taxes and incentives that continue to favour linear business models (creating an uneven playing field); outdated procurement policies that do not support CE approaches; greater administrative burden/red-tape linked to CE/green business activities (e.g., the reuse of waste); the absence or the slow development of industry standards by government (where the government is often behind the developments and innovations taking place in the business sector).
Supply chain (linear)	Lack of standards, traceability and quality assurances (e.g., contamination) of "circulated" materials in the supply chain; impacts on brand image if other businesses in the supply chain do not perform (leading to mistrust within the supply chain); availability (and credentials of) potential supply chain partners; the need to create additional coordination, contracting, licensing, communication and distribution processes and channels within the supply chain; competing goals of different businesses; intellectual property concerns with third-party access to products.
Technologies	Absence of information-sharing platforms describing potential CE input streams, partners, and technologies; lack of infrastructure and innovation to support the roll-out of CE business models at scale (e.g., equipment for collecting, sorting, processing, and recovering material); low levels of technical expertise within private and public institutions (e.g., resource recovery infrastructure, CE product design and business models); challenges of integrating innovations and technological solutions across multiple businesses in the supply chain.

See more detail on p.6

DRIVERS of business adoption of circular approaches

To avoid unnecessary repetition, the following table does not present drivers that essentially mirror the above barriers.

Profitability	Save money (over the longer term) through the reduction of inputs and waste; innovations and technology that offer a competitive advantage and product differentiation (while at the same time increasing profit margins); reduction in government-imposed pollution taxes and related licensing costs; access to new (international) markets that require specific CE standards; business resilience and risk reduction by diversifying product range and not being reliant on singular or virgin material streams; reduced transportation/distribution/production costs when working in networked regional areas/industrial parks based on CE principles; additional revenue streams (e.g., new maintenance, repair and refurbishment services; purchase of by-products from production processes by third parties); resource efficiency gains (due to rising resource and energy prices)
Regulation/ policy	Waste, pollution and environmental impacts are regulated and taxed; targeted policies that reduce the business risk of adopting CE business models; subsidies for CE approaches; streamlining cooperation between the public and private sector when it comes to CE endeavours; developing up-to-date standards and guidance related to the reuse and recycling of "circulated" materials; grants for research and development; mandatory product design standards and procurement policies that support CE approaches; supply restrictions on raw materials (or levies on commodity prices).
Reputation	Businesses seen as an innovative front runner; protection of a business's social licence to operate; expanded brand value across multiple stakeholders; stronger and longer relationships with new and existing customers (through reputation as well as product credentials, quality and durability).

KEY INTERVENTIONS to increase business adoption of circular approaches

(Listed in alphabetical order, not prioritised)

Awareness raising	Targeted and ongoing CE education and communication campaigns aimed at the general public, businesses and their suppliers. Viewed as <i>one</i> of the necessary but not sufficient foundations for changing patterns of consumption; also potentially helps businesses to identify leverage points in their control to initiate CE endeavours.
Business parks or "loops"	Eco-industrial parks or coordinated networks of businesses in close proximity that avoid products and materials having to travel long distances (while also creating efficiencies in terms of input streams and infrastructure requirements); can also reduce the "mental distance" for businesses to collaborate.
Incentives	Government establishing new funding streams for businesses that support CE innovation, investment, commercialisation and scaling; tax relief for goods produced with secondary/circulated materials; tax burdens for goods produced using virgin materials.
Leadership in regulation / policy	Clear and certain direction in government policy to reduce the risk of business innovation; drive CE innovation through procurement policies that demand circular products and services in government operations; replace government regulation that support linear business models with circular business models (e.g., preferential taxation frameworks); establish product design standards that support product recyclability/reuse (e.g., material toxicity standards); regulate mandatory participation in CE platforms/registers to assist in the formation of a CE norm within society.
Technologies	Foster coordination and cooperation along the value chain through (mandatory) online platforms or registers that allow manufacturers, distributors, service providers, recyclers, sorters, collectors etc. to document their outputs/by-products and input needs to facilitate an understanding of potential partnerships and technological solutions; investment and implementation of infrastructure and technology to improve material sorting and separation (including reverse logistics).

Key components of circular economy definitions

Table 2 in the Report provides a selection of CE definitions that were encountered during this review process. Current and future government CE policies will benefit from ultimately having a unifying definition that can be applied across jurisdictional boundaries. The diversity of definitions in play also suggest caution should be applied in extrapolating between different applications of CE, and research regarding barriers, drivers and interventions, as it is likely that they are not comparing identical scopes, strategies and principles.

Key elements of definitions include such components as the following.

Scope	 Applies across the whole product/material lifecycle, including production, distribution & consumption Covers technical, biological materials and/or energy Is a closed and self-sustaining system, with total throughput, eliminating leakage, waste and emissions at all stages of lifecycle
Strategies	 Minimises/reduces use of raw resources / virgin materials, and energy Increases resource & energy productivity / minimises material throughput Maintains products, components and materials at their highest utility/value for as long as possible Captures products, components and materials at end of life and reintroduces back into circulation, eliminating waste Based on renewable energy Eliminates toxic and harmful chemicals Achieved through intentional design / rethinking, and the slowing (long life design), narrowing (maintenance, repair, reuse, refurbish) and closing (recycling, remanufacturing, energy recovery) of material and energy loops
Principles	 Involves design and adoption of new business models and systems Represents a paradigm shift / mindset change / is transformational Resource use is decoupled from economic growth and value creation Is restorative and regenerative, and increases system resilience Protects environment / prevents environmental damage/degradation/pollution while maintaining/maximising economic value and providing social benefit.

Key research questions still to be answered

The full report identified a range of potential research questions for future research related to the two recommended policy trial focal topics.

Overcoming internal barriers to business adoption of CE practices:

- What exactly are different Australian firms hesitant about when it comes to the CE and where do the main barriers exist? (e.g., leadership, KPIs, availability of capital, capability etc.).
- What are the key differences between Australian firms actively adopting CE practices, and those that are not?
- What interventions influence the adoption of CE practices for firms that are aware of, but are cautious about, adopting CE practices and models?
- What constitutes a compelling business case (across different business types) to invest and/or experiment in CE products and services?

Building demand for CE products and services:

- What works to build consumer awareness, interest, relationships and trust in CE products and services?
- What consumer behaviours provide the greatest leverage and impact on achieving CE outcomes?
- How can we best influence consumer behaviours across different dimensions of CE (e.g., from product purchases, to stewardship and returns)?
- What is the contribution of eco-labels targeting different levels of reduce, reuse, recycling and recovery?

DETAILED RESULTS

More detail on drivers and barriers from literature and interviews

The following table presents the barriers and drivers identified in the largely international academic literature and the Australian policy maker interviews. Barriers/drivers highlighted in **green** are those that only arose in one of the two activities. All other barriers/drivers occurred in both sources..

THIS REVIEW INTERVIEWS

BARRIERS (as typically categorised in the literature)

Consumer demand/interest

- Consumer concerns related to the quality and durability of recycled, repaired, repurposed items (as well as any negative stigma associated with them).
- An unwillingness to pay the (perceived) higher prices for such goods and services.
- A distrust of the CE credentials of products (including a lack of accurate measures and indicators that convey such information to the consumer).
- Strong existing consumption habits / unwilling or unaware of need for change.

Primary barriers:

- Not enough (perceived) demand for end products from Business to Business and Government customers (e.g. remade furniture, etc) due to
 - inertia/innovation diffusion
 - quality concerns
 - higher costs.
- Overall less discussion/focus on mass consumer markets as opposed to business/government.

Alternative driver

 Growing consumer awareness / demand - need for early leadership by bus/gov, and the sleeping giant of mass markets.

Economic

- Businesses lack of resources/capital for high upfront/investment costs (especially when compared to more linear business models).
- The availability and low costs of virgin materials (creating unfair competition), longer return on investment timeframes (putting the business at risk).
- Costs associated with greater administrative burdens resulting from engaging in horizontal and vertical CE business relationships simultaneously.
- Costs associated with the separation, recycling and repair of materials (which are exacerbated by product designs and collection services that do not facilitate such processes).
- Such economic barriers are of particular concerns and/or relevance to SMEs based on the reviewed studies.

Primary barriers:

- SMEs are time-poor and very cost driven, don't have time to explore/assess, nor capital for investments, and finance is hard to access.
- Barriers to market entry, including general start-up barriers, lack of capital / customer base / scale for economic viability, plus:
- Initial higher costs of circular vs linear virgin material offerings (unlevel playing field).

Other barriers:

- Costs of industrial ecology: retrofitting existing development due to constrained footprint and distance to new developments (greenfield much easier to develop).
- A strong and growing driver: Resource scarcity / increasing commodity prices.

Organisational

- Lack of knowledge on CE business opportunities, input streams, partners and technological innovations.
- Lack of data and evidence that demonstrate compelling business cases for CE business models.
- Risk aversion to changing current business processes that have a track-record of "working" (combined with unknown returns of adopting CE business models within highly competitive business markets).
- Poor environmental/social culture within businesses (e.g., where business do not see waste, environmental pollution, and resource scarcity as pressing concerns).
- Unwillingness to experiment or pilot new initiatives (or only willing to do so at an incremental rather than a radical level).

Primary barriers:

- Inertia (including internal fear/resistance to change of either leaders OR workers), and where current model is working well (e.g. construction, resources).
- Lack of knowledge of opportunities, potential input streams, potential partners, technologies.

Other barriers:

- Concerns with just getting basic resource recovery right (e.g. high landfill, stockpiles, etc) plus SMEs still just trying to get a handle on recycling.
- Lack of technical skills, knowledge and information to design, develop and implement CE business activities.
- Lack of knowledge of how to conduct assessment of opportunities and construct business cases.

Alternative driver:

Innovative/disruptive/entrepreneurial spirit.

THIS REVIEW INTERVIEWS

BARRIERS (cont'd)

Supply chains

- Lack of standards, traceability and quality assurances (e.g., contamination) of "circulated" materials in the supply chain.
- Impacts on brand image if other business in the supply chain do not perform (leading to mistrust within the supply chain).
- Availability (and credentials of) potential supply chain partners.
- The need to create additional coordination, contracting, licensing, communication and distribution processes and channels within the supply chain.
- Competing goals of different businesses, and intellectual property concerns with third-party access to products.

Primary barriers:

- Lack of, or difficulty obtaining, standards / quality assurance of 'circulated' materials/products to mitigate concerns / risks / stigma
- Difficulty in reaching scale (e.g. smaller manufacturing industries, large distances between, etc).
- Businesses with large reliance on resources or other supply chain risks.

Alternative drivers:

- Existing activities are actually circular (i.e. resource efficiency, recovery, reuse) (e.g. motor vehicles, second-hand consumer goods, etc).
- Businesses who can incorporate waste products (often single, clean streams) back into own value stream (e.g. Viridian glass, mining/resources, agriculture).

Technological

- Absence of information-sharing platforms describing potential input streams, partners, and technologies.
- Lack of infrastructure and innovation to support the roll-out of CE business models at scale (e.g., equipment for collecting, sorting, processing, and recovering material).
- Low levels of technical expertise within private and public institutions (e.g. resource recovery infrastructure, CE product design and business models).
- Challenges of integrating innovations and technological solutions across multiple businesses in the supply chain.

Primary barriers:

 Lack of data / capacity to do business cases on transitions/evolutions.

Other barriers:

- Lack of technical skills, knowledge and information to design, develop and implement CE business activities.
- Lack of infrastructure to support roll out of CE models, e.g. resource recovery infrastructure at scale; technology and communications networks.
- Lack of research & development around specific uses for currently undervalued material streams (e.g. e-waste).

Government policy (as barrier)

- Legislation, regulation, taxes and incentives that continue to favour linear business models (creating an uneven playing field).
- Outdated procurement policies that do not support CE approaches.
- Greater administrative burden/red-tape linked to CE/green business activities (e.g., the reuse of waste).
- The absence or the slow development of industry standards by government (where the government is often behind the developments and innovations taking place in the business sector).

Primary barriers:

 Regulations that constrain development (e.g. planning constraints particularly near residential areas, heritage) or other activities (e.g. waste/hazard reg), including outdated restrictions in procurement policies (e.g. roads).

Other barriers:

- Subsidies for linear models (i.e. resources).
- Lack of policy harmonisation (different regulations in different jurisdictions).
- Lack of understanding of how regulations hinder, constrain, divert or otherwise influence innovative circular approaches (both understanding at individual business level, and across whole sectors/economy).

THIS REVIEW INTERVIEWS

DRIVERS (as typically categorised in the literature)

Reputation

- Businesses seen as an innovative front runner.
- Protection of a business's social licence to operate.
- Expanded brand value across multiple stakeholders.
- Stronger and longer relationships with new and existing customers (through reputation as well as product credentials, quality and durability).

Primary drivers:

- Businesses with particular sustainability/wellbeing values.
- Businesses whose environmental impacts are heavily regulated (e.g. mining/resources, resource recovery) or need to secure/strengthen social licence to operate.
- Momentum overseas 'trickling down' to Australian businesses through international head offices.

Profitability

- Save money (over the longer term) through the reduction of inputs and waste.
- Innovations and technology that offer a competitive advantage and product differentiation (while at the same time increasing profit margins).
- Reduction in government-imposed pollution taxes and related licensing costs.
- Access to new (international) markets that require specific CE standards.
- Business resilience and risk reduction by diversifying product range and not being reliant on singular or virgin material streams.
- Reduced transportation/distribution/production costs when working in networked regional areas/industrial parks based on CE principles.
- Additional revenue streams (e.g., new maintenance, repair and refurbishment services.
- Purchase of by-products from production process by third parties).
- Resource efficiency gains (due to rising resource and energy prices).

Primary drivers:

 A strong and growing driver: Competitive advantage (e.g. Lend lease, Assistive technology) or not getting left behind.

Other drivers:

- Large businesses who see financial value in minimising inputs and waste and have the money to invest in order to save money / increase profit margins – not necessarily doing 'CE' (e.g. agriculture, mining/resources, logistics major brands).
- Investor interest in full ESG of companies, and interest in supporting those looking ahead to future markets, models, risks.
- Many of those embracing circular approaches are doing so because they recognise the ability to increase business value while reducing environmental harm.
- Businesses in regional areas, where local loops make sense (e.g. agriculture, mining/resources).
- the importance of micro/local/regional loops that avoid products and materials having to travel large distances around the country (which was often considered to undermine national circular approaches/programs).

Government policy (as enabler)

- Waste, pollution and environmental impacts are regulated and taxed.
- Targeted policies that reduce the business risk of adopting CE business models.
- Subsidies for CE approaches.
- Streamlining cooperation between the public and private sector when it comes to CE endeavours.
- Developing up-to-date standards and guidance related to the reuse and recycling of "circulated" materials.
- Grants for research and development.
- Mandatory product design standards and procurement policies that support CE approaches, and supply restrictions on raw materials (or levies on commodity process).

Primary drivers:

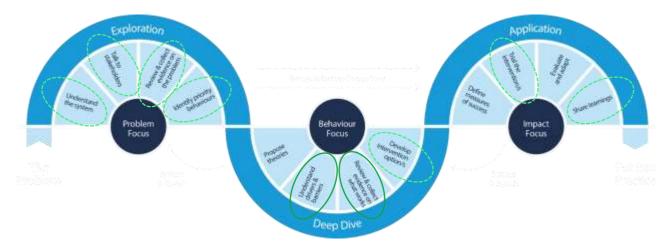
 A strong and growing driver: Increasing landfill levies around Australia.

Other drivers:

- Businesses with particular challenges (e.g. airport with quarantined food waste).
- Government strategies/road maps/ investment/ facilitation – clear Govt interest provides level of certainty / de-risks projects (e.g. Qld Roadmaps, CE Lab).
- Current drivers are mostly related to business characteristics/ circumstances, and are generally ahead of any government programs / support / interventions.

SUMMARY OF METHODS

Developed over several years, the BehaviourWorks Method is a tried and tested approach to behaviour change. Consisting of three primary phases - Exploration, Deep Dive and Application - the Method can be used in full, or in parts, to gather evidence on the behaviour change approach that is most likely to work. This work by BWA applied rapid review and practice review techniques to two of the Deep Dive activities: exploring available evidence on drivers/barriers and for effective interventions. It forms part of a larger scope of work in the Waste and Circular Economy Collaboration, indicated by the dashed circles below.



Rapid reviews synthesise evidence for policy where a broad overview is required quickly (i.e. 10, 30 or 90 days). A hierarchy of evidence is applied to preferentially identify, quality assess and summarise: existing systematic reviews, narrative reviews, reports or other consolidated information. The method compares with traditional systematic reviews for scholarship, which aim to identify all primary studies pertaining to the topic and can take from nine months to two years to complete.

Define key concepts and develop search strategy	The team applied the <u>STARR decision tool</u> to refine the following research questions and search strategy with the policy partners.: 1. What drivers and barriers influence the adoption of CE business practices? 2. What is the effectiveness of interventions to promote adoption of CE business practices?
Search literature and extract relevant insights	Broad search terms were iteratively narrowed across three databases. Four reviewers screened for: review papers, addressing businesses, in developed economies, published since 2000. Two reviewers extracted: CE definitions, practices, geographical/industry setting, review type & questions, drivers/barriers, interventions, impacts, policy learning, and author conclusions, plus bibliographic details Papers were quality appraised (SANRA & AMSTAR).
Review and synthesise findings	Two primary authors reviewed the included 33 papers and wrote the report. Thematic analysis of barriers, drivers and interventions formed the basis of the findings, combined with comparative analysis with policy stakeholder interview findings from an earlier phase.

Number of articles reviewed and included in the final Report



READ MORE ONLINE

Visit the BehaviourWorks website to read more about this research, and the other streams in our Waste and Circular Economy research collaboration:

www.behaviourworksaustralia.org/major-project/waste-collaboration-stream-3-business-barriers-to-circular-economy-approaches



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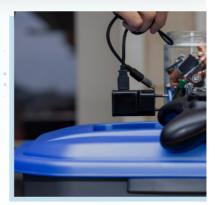
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Business barriers to circular economy approaches

What works?

Policymakers, businesses and researchers are increasingly recognising the opportunities – and need – to move towards a Circular Economy (CE), whereby disposable products are designed out of the market and brought back in as redesigned/reusable products. This kind of economic transformation needs business innovation and behaviour change.



Major project

Waste collaboration

Project overview

Background

Kerbside recycling

Ecolabelling Business barriers

Impact stories

Extra resources