



Making the business case for resource recovery

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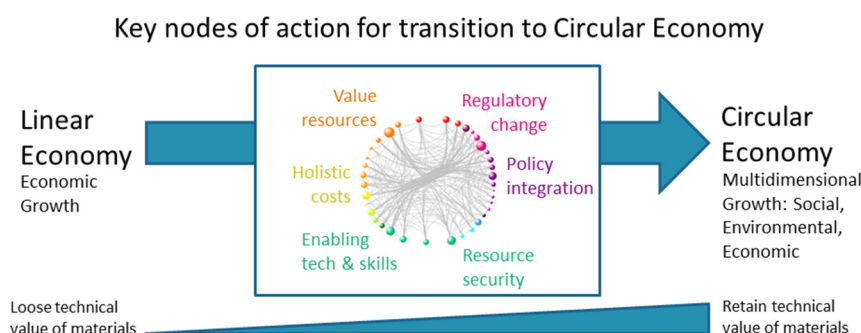
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HIGHLIGHTS

- This article outlines how to write business cases for resource recovery.
- Resource recovery experts articulated drivers, barriers and actions.
- Key themes for industry and government business cases were identified.
- Researchers should explain how resource recovery delivers economic and social and environmental growth.

GRAPHICAL ABSTRACT



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ABSTRACT

People altered the biophysical environment upon which they depend through the overexploitation of resources and growing waste generation. Action is urgently needed to return the resource economy within planetary boundaries and safeguard human well-being, by realising an increasingly closed-loop system that maintains values of materials and products within a sustainable circular economy. Innovative technologies and business models must be developed and implemented, requiring convincing “business cases” for industry and government; why should they be interested in adopting circular, resource recovery practices? Despite multi-dimensional challenges facing people and their environment, and the ability of resource recovery to contribute to restoring environment, society and economy, arguments for circular practices are often overly focused on economic aspects. Economic growth is not a panacea and this article supports the preparation of better arguments by presenting expert insights on 37 themes to consider for a resource recovery business case. The most important themes cover 1) Economic, social, environmental and technical value of resources and 2) Regulatory change; focusing business cases on these is likely to deliver positive impacts regarding all identified themes. The article synthesises the old “growth will solve it-” with a new “multi-dimensional challenges and solutions” paradigm, suggesting that resource recovery should support multi-dimensional growth to partly redistribute economic benefits to social and environmental values through the preservation of technical, functional value of materials and products. Writing successful business cases for resource recovery requires inter-disciplinary collaboration, and sustained effort to complete and translate business cases into measurable impacts through changed practices outside academia.

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1. Introduction: the changing values that shape business cases

Resource overexploitation and dissipation of wastes into the environment adversely impact on the Earth's capacity to sustain ecosystem services (Rockström et al., 2009). The planetary boundaries framework

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put forward environmental limits to guide societies towards a safe operating space where human activities can continue to thrive without destabilising critical Earth system processes. The planetary boundaries of climate change, biosphere integrity, biogeochemical flows, and land systems change have been crossed, and assessment of atmospheric aerosol loading and the impact of novel entities (such as new products) has yet to be definitively assessed (Steffen et al., 2015). A circular economy focusing on waste prevention is a prerequisite for staying within planetary boundaries (Wijkman and Skånberg, 2015).

Ecosystem services are essential to realise and/or maintain a foundation for society (MEA, 2005). While people need to stay below the ecological ceiling of maximum impacts on the environment, the social foundation of well-recognised priorities should also be strengthened – building a “safe and just space for humanity” (Raworth, 2017). Prioritised factors for human well-being include food security, income, water and sanitation, health care, education, energy, gender equality, social equity, voice (e.g. political participation, freedom of expression), jobs, and resilience (e.g. the scope and scale of poverty) (Dearing et al., 2014); now covered by the UN Sustainable Development Goals (UN, 2015b).

Current economic models focus on growth i.e. human progress is measured in terms of GDP and/or company profits. This growth, coupling rising industrial activity with increased resource consumption, does not take account of its negative cumulative impact on planetary resources and, consequently, quality of life for people. Recognising multi-dimensional challenges, from climate change to food security and economic crises, and the inadequacy of existing economic theories to help diverting human society to a more sustainable pathway, Raworth proposed the alternative view of “doughnut economics” (Raworth, 2017).

Doughnut economics emphasise the importance of embedding economic activity within environmental and social boundaries. It reveals the shortcomings of progress with a mono-dimensional focus on economic growth; as if the same economic thinking that caused the widespread sustainability issues will be able to solve them i.e. the “growth will solve it” discourse (Raworth, 2017). Instead, it is necessary to re-define progress and open the scope to a broader set of values including environmental, social and economic factors. This alternative view on multi-dimensional progress needs to be linked to the circular economy to evolve away from measuring success in resource throughput expressed in monetary terms with little regard for future availability of finite resources and the impacts of their extraction, transformation, consumption and disposal. A transition is needed from this open system with unlimited resources to be temporarily exploited towards a new, closed system with a limited set of resources to be permanently conserved; measuring round-put and the nature and quality of resources (Boulding, 1966; Lieder and Rashid, 2016; Iacovidou et al., 2018). As such, it important to add technical, functional value of materials to the value types that make up the well-known triple bottom line (Iacovidou et al., 2017a; Millward-Hopkins et al., 2018).

Material and energy flows need to become part of an increasingly sustainable and circular economy, introduced by the European Union as follows: “In a circular economy, the value of products and materials is maintained for as long as possible. Waste and resource use are minimised, and when a product reaches the end of its life, it is used again to create further value.” (EU, 2018). Enabling a circular economy depends on concerted efforts from actors throughout society such as producers, consumers, governments, and knowledge- and technology providers (Velenturf and Purnell, 2017). However, there still is a major gap between the obvious issues and practical solutions for global sustainable development and the rationales for individual local actors to create shared environmental, social, technical and economic values (explained in Section 2) (Dyllick and Muff, 2015). This hampers progress towards a sustainable, circular economy. “Business cases” are needed that clearly demonstrate how local actors can benefit from participating in a circular economy: How can resource recovery business cases be articulated for

companies and governments? What are the costs and benefits of bringing business practices and government interventions in tune with the circular economy?

This articles aims to outline how the business case for resource recovery can be prepared for industry and government. The objectives are threefold: 1) Identify motivations to adopt a circular economy; 2) Identify challenges encountered when formulating business cases for circular practices and government interventions; and 3) Define actions for academia, industry and government in support of circular economy. Section 2 sets out the background, methods are explained in Section 3, Section 4 presents the results and Sections 5 and 6 complete the article with a discussion and conclusions.

2. Background: from “growth will solve it” to solving multidimensional challenges?

Global sustainability issues are evident and urgent action has been advocated for decades. What has been recommended to government and industry so far, what are the arguments for adopting a circular economy? Here a summary of key points from the extensive academic literature is provided.

2.1. Industry uptake of circular economy practices

The overall picture emanating from the literature is that companies are willing yet lack the knowledge and skills to transform their activities to meet sustainability challenges in a meaningful way. Empirical research into circular economy implementation is relatively scarce, but there is a growing body of evidence suggesting a number of drivers and barriers (summarised in Table 1). Some of these fit into the old “growth will solve it” discourse, such as a focus on short-term financial benefits, and others are more about a new multidimensional approach, such as skills to integrate sustainability with business development.

Dealing with all prime sustainability issues (outlined in Section 1) presents a major challenge for companies (Vermeulen, 2015). Companies need to take a systems-approach that prevents displacement from one issue to another. For example, the move away from fossil-fuel can cause new issues due to depleting natural reserves of metals needed for low-carbon infrastructures (Vidal et al., 2013). Rather than taking a systems perspective, industry strategies have so far been biased towards specific product types and tend to focus on environmental and social issues that are best known, overlooking resource depletion (Vermeulen, 2015). The circular economy offers a framework for companies to engage with global sustainability challenges through the creation of shared value (Genovese et al., 2017). Shared value creation refers to the process in which micro-level values for businesses are combined with creating macro-level values addressing major sustainability issues (Dyllick and Muff, 2015). Despite a growing number of CEOs actively pursuing sustainability and circular practices, the issues are still mounting up (Compact and Accenture, 2014; Dyllick and Muff, 2015). The addressing of global sustainability issues needs to be better integrated with business management.

More practical support is needed to help companies realise the transition towards sustainable, circular practices. Arguably, the first step is recognising challenges outside direct trade relations of a company, and for the company to start addressing the risks and opportunities that sustainability issues may present to them (Dyllick and Muff, 2015). This can reduce risks and costs and simultaneously provide benefits such as increased revenues, brand reputation and competitiveness. However, as Vermeulen (2015) noted, such approaches tend to be patchy and are unlikely to address sustainability issues in a sufficiently coherent and significant manner. Companies are still part of the old “growth will solve it” reasoning.

A step up would be to integrate the delivery of environmental and social values into the core business operations through more purposeful

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