

# Scaling Up Cross-sector Collaboration for a Circular Economy: Insights from Current Practice

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## Key messages

- The circular economy, which aims to decouple resource use from economic activity, can play a major role in meeting the target to limit global warming.
- European Union policies and businesses have pushed the circular economy forward, but more work is required to disseminate and increase the scale of circular innovations.
- Reconfiguring the economy is complex and demands cross-sector collaboration at every stage; from business model design to supply chains, infrastructure, policy and finance.
- The circular economy represents an opportunity for comparative advantage for organisations establishing cross-sector collaborations at multiple levels of the economy.
- This *Insight* series presents nine examples of circular innovations across different scales, sectors and geographic contexts, each characterised by strategies for collaborative working.

## Introduction

The landmark Paris Agreement, signed by 193 parties to the United Nations Framework Convention on Climate Change in December 2015, came into effect in November 2016. It set the target to limit global warming to 1.5°C above pre-industrial levels. To achieve this goal, we need to reduce annual global emissions from 65 to 39 billion tonnes carbon dioxide equivalent (CO<sub>2</sub>e) by 2030, a pathway that is both a collective challenge and a significant potential market opportunity.<sup>1</sup>

Yet, existing climate policies, newly committed to in the Paris Agreement and those previously in place related to renewable energy, energy efficiency and reducing deforestation, can only contribute half the necessary reduction (around 11–13 billion tonnes CO<sub>2</sub>e).<sup>1</sup> Resource management aligned with the circular economy concept (see box overleaf) therefore has a significant role to play in reducing emissions further.<sup>2</sup>

The circular economy is now a key pillar of European Union (EU) policy. In December 2015, while the Paris Agreement was being negotiated, the European Commission adopted its

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ambitious *Circular Economy Package* as a means to boost competitiveness, create jobs and generate sustainable growth, as well as mitigate climate change.<sup>3</sup>

The Commission estimates that, in addition to creating 170,000 direct jobs, implementing the legislative proposals and initiatives in the *Circular Economy Package* could prevent an average of 30 million tonnes of CO<sub>2</sub>e emissions per year being emitted (equating to 600 million tonnes by 2035) and reduce the EU's CO<sub>2</sub>e by 450 million tonnes per year by 2035.<sup>4</sup> Furthermore, the circular economy represents a means to stabilise volatile and rising commodity prices, with the potential to create regional material markets and enable new business models.<sup>5</sup>

Less than 6 per cent of the global economy can be considered circular,<sup>6</sup> underlining the fact that substantial work is required to reconfigure consumption and production systems to maximise value and realise co-benefits.

The transition to a circular economy will require increased investment flows in new infrastructure, collaboration between and within sectors, and scaling up of emerging circular economy business models. The European Commission, in conjunction with the European Investment Bank, has launched a finance platform to bring together financial market participants and businesses to increase flows of finance to circular initiatives.<sup>7</sup>

## Scaling up collaboration for the circular economy

Reconfiguring the economy so it is aligned with circular economy principles at every level requires the redesign and repurposing of products, business practices, supply-chain relationships, infrastructure, conceptual and

measurement tools, and increased flows of relevant finance and data.

As standalone tasks, these are complex endeavours. Achieving them simultaneously will entail change of an entirely unprecedented nature. It will demand novel modes of business with key actors working cooperatively rather than competitively – within multi-sector and multi-stakeholder collaborations – rather than as siloed entities, disrupting current norms to promote technological and social innovations.<sup>12</sup>

But, while partnerships offer the greatest synergies by pooling resources to achieve scale and impact, collaboration has its own challenges and questions. For example:

- **Working together has costs as well as benefits:** How can organisations share both risk and value distribution to harness the collaborative advantage potential associated with the circular economy?
- **The complexity of global supply chains:** How can organisations work in completely new ways, entering into partnerships with those they may never have worked with directly or only through limited 'arm's length' transactions?
- **The need to shift from protectionism to open innovation:** How can historically competitive organisations shift from the urge to protect their intellectual property, when the 'new normal' requires open platforms and the sharing of knowledge and value?
- **Creating a favourable institutional and regulatory context:** How might fiscal incentives and other policies encourage innovation and cross-sector collaboration?

### Defining the circular economy

The circular economy concept has risen to prominence over the past decade and is increasingly recognised as a new paradigm for sustainability.<sup>8</sup> The concept and related principles have been defined in a variety of ways across academia, business and policy. These are outlined as follows:

- as a "closed spaceman economy", which contrasts with the linear "cowboy economy": "...in which the earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy"<sup>9</sup>
- as one that is "restorative by design, and which aims to keep products, components and materials at their highest utility and value at all times"<sup>10</sup>
- as an "economic model based *inter alia* on sharing, leasing, re-use, repair, refurbishment and recycling, in an (almost) closed loop, which aims to retain the highest utility and value of products, components and materials at all times"<sup>4</sup>
- as an umbrella concept, which "articulates the capacity of a group of strategies to extend resource life as a means to facilitate additional value extraction and reduce value loss and destruction".<sup>11</sup>



## Accelerating collaboration through knowledge sharing

As these questions suggest, understanding the best ways to nurture and sustain partnerships and cross-sector collaborations is an essential but often overlooked aspect of scaling up the circular economy. Sharing the experiences, insights, lessons and best practices of those taking the first steps is crucial to accelerating the transition from an extractive, linear paradigm to a new age of resource sharing, where competition is balanced by cooperation or 'coopetition'.

Climate-KIC, Europe's largest public-private partnership dedicated to climate innovation, has commissioned *Climate Innovation Insights: Accelerating the transition to sustainable production systems* to share recent experiences of exploring different ways to nurture and sustain partnerships and cross-sector collaborations for a circular economy. This series reveals the strategies, approaches and challenges developed and deployed, as well as the lessons learned. Capturing this knowledge is vital to creating the conditions that enable innovation in a context where there are few precedents or existing protocols.

This series considers nine case studies of circular innovation occurring at different scales across various sectors and European geographies. Sitting at the nexus of research, business and education, Climate-KIC is uniquely positioned to draw out key insights from this diverse range of cases, each of which represents an effective strategy for implementing circular economy principles.

## Exploring collaboration from different angles

This *Insight* series is an attempt to address some of the often difficult issues arising from collaboration. Spanning industrial symbiosis, resource productivity, resource efficiency, energy efficiency and product-life extension, the cases demonstrate how different types of collaboration

are necessary to scale up particular types of circular innovation and related business models.

### **New organisational and business models that share risks and benefits are required to harness the collaborative advantage offered by the circular economy.**

Strenchock's case study of Cargonomia (*Insight 2.2*) illustrates how proximity is an important factor in enabling micro-enterprise to scale up circular food production and deliver climate impact and social co-benefits in Budapest. Sainthérant et al's case study of Qarnot Computing (*Insight 2.3*) demonstrates how cross-sector synergies – in this case between information technology and the built environment – can yield circular innovation, delivering unique business models that provide value to multiple parties. Gaiani et al's comparative case studies of circular business models in Emilia-Romagna, Italy (*Insight 2.4*) illustrate that circular innovations take many different forms and are not limited to technologically oriented businesses.

### **Multi-stakeholder collaborations that operate in novel ways are necessary to create and scale up innovative circular strategies.**

Bonoli et al's case study (*Insight 2.5*) shows how Italian universities are catalysing the mining of critical materials from disused electrical and electronic equipment (EEE) and how wider sectoral collaborations have been enabled by a process of 'learning by doing'. Mitschka et al. (*Insight 2.6*) demonstrates how GrowUp, a social enterprise, has been able to harness design, engineering and agricultural expertise to build the UK's first commercial urban farm combining aquaponics with vertical farming.

### **Opening up intellectual property and increasing data sharing between organisations can accelerate the transition to a circular economy.**

Tronchoni and Brennan, in their case study of Industry 4.0 platforms (*Insight 2.7*), discuss the potential for the Internet of Things to facilitate the creation of real-time digital marketplaces for production waste, enabling diverse by-product exchanges and resource-sharing across industries. Antonucci and



Hanhoun (*Insight 2.8*) focus on the evolution of INSPIRA, a French eco-industrial park, to show how digital platforms can make hidden supply and demand material flows more tangible, catalysing further optimisation of infrastructure.

**Fiscal incentives and wider policy measures can create level playing fields and encourage wider adoption of circular strategies.** Bellini and Bonoli (*Insight 2.9*) illustrate how joining the dots between public acceptance, industry support and public policy development in Emilia-Romagna, Italy has enabled the implementation of progressive waste management strategies. Gavarra et al. (*Insight 2.10*) explores the potential to recover plastic from waste EEE at an industrial scale and use it as an input in additive manufacturing. This case study demonstrates that fundamentally changing the way materials are labelled is necessary to support the industrial recycling of plastic. In addition, regulatory intervention with cross-industry support is needed to ensure that contaminants do not bio-accumulate.

## Conclusion

Scaling up circular innovations through collaboration and appropriate institutional change will contribute significantly to the transition to a more sustainable and prosperous world. This set of diverse, but pioneering cases illustrates that reconfiguring the economy and implementing circular strategies is complex and poses many challenges. It demands multi-sector, multi-stakeholder collaboration at every stage, from business model design to supply chains, physical and digital infrastructures, policy and finance.

Moreover, these cases demonstrate the importance of innovative models of collaboration in stimulating, nurturing and driving purpose-led entrepreneurs to disrupt existing systems. The potential for impact is such that businesses, entrepreneurs, customers and other key actors – willing to collaborate across sectors and work within open platforms – can create new value chains and increase societal benefits. Those succeeding in establishing such collaborations, whether at the micro-enterprise, larger organisation or industrial cluster level, will have the advantage in this new paradigm.

## Endnotes

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*Climate Innovation Insights* is a platform for reflection and discussion on the lessons, challenges and opportunities of addressing climate change through innovation. It brings together key insights, informed opinion, best practice and methodological approaches to understand how research, education, business and government can, together, accelerate the transition to a zero-carbon economy. The series is developed and published by Climate-KIC, Europe's largest public-private partnership focused on climate innovation. We would like to thank the Series Editor, Dr Geraldine Brennan and the two external reviewers, Dr Carmen Ruiz Puente and Dr Inês dos Santos Costa.

### About Climate-KIC

Climate-KIC is Europe's largest public-private partnership addressing climate change through innovation. With a focus on sustainable production systems, Climate-KIC is building a new foundation for industry in Europe – developing climate-friendly and economically viable circular models of manufacturing for a zero-carbon economy. Climate-KIC is supported by the European Institute of Innovation and Technology (EIT), a body of the European Union.

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### About CEEDR

The Centre for Enterprise and Economic Development Research (CEEDR), Middlesex University Business School, has been a leading research centre on small business and regional development policy for over 25 years and is currently leading research on sustainable enterprise for the Economic and Social Research Council Centre for the Understanding of Sustainable Prosperity.

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