



REFRAME

**Circular Economy strategy FRAMEwork
for sustainable SMEs**

IO3: Circular Economy Implementation Framework (CE Framework)

Disclaimer:

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SIGMA



3.7 Technical and knowledge factors

Drivers and obstacles to the transition to CE rarely come isolated, in only one driver in one sector or value chain. Typically, several factors are in play and often the factors influence each other. Technical and knowledge drivers/barriers come often together and are also internally related to policy, regulation and legal framework, social, cultural, economic, technological or infrastructural contexts.

Building institutional capacity for CE practices involves the development of policy, technological and network facilitation knowledge, as well as establishing effective communication channels and helping to create conducive conditions for various participating stakeholders, where Information and Communication Technologies (ICT) play a key role in promoting and establishing collaborative networks.

Intermediaries also termed “knowledge brokers” or “circularity brokers” play the role of being knowledge catalysts, through merging network research and circular supply chain research: connecting, informing, protecting, mobilizing, integrating and measuring. These intermediaries bridge “circularity holes” and “structural holes”. A circularity hole exists because the value of a good is not recognized by its owner and/or by the potential receiver. The structural holes are the absence of connections where the information or knowledge cannot be transferred to other actors yet, is kept by its possessor and maintains its original value. The core function of the broker is to fill the gap between actors who have no ties with each other and allow them to get access to each other’s information or (technical) knowledge. So, they can transform knowledge barriers into knowledge drivers.

Henry Chesbrough, who formulated the “Open Innovation” paradigm, defines it as “the use of purposive inflows and outflows of knowledge to accelerate innovation”. And what is the CE shift if not a ground-breaking innovation? Shifting the paradigm, from a linear to a circular business model, will imply changing ways of work, thinking, and dealing with uncertainties, to achieve common goals effectively and successfully. This means that organisations can and should use external ideas as well as internal ideas, and internal and external paths to market and stakeholders. The reason is that the resources and technical knowledge required for shifting from a linear model to a circular model are not always available within the company's boundaries. The innovative capacity of an organisation, no matter the size, sector or type, depends largely on the ability to access existing resources in technology providers, service providers, customers, investors, competitors, and even technical expertise that may not exist inside the company, especially in the case of micro- and SMEs. So, innovation cannot exist without collaboration.

The European guiding specification CEN/TS for Innovation Management System, part 5 – Collaboration Management – explains that collaboration “*helps to improve opportunities for successful creativity and innovation*”, by sharing multidisciplinary

teams/researchers working toward a common goal - access knowledge. Helps to *“access to new geographic markets or new segments through products/services that bring together the distinctive competencies of the partners”*, or even *“coping with increasing technological complexity”* by sharing the know-how or technical expertise. Access to Technology for Rs, access to information and communication technologies, such as digital intelligence, networks, collaboration platforms for industrial symbiosis, etc., are CE success factors. But, enabling these drivers may not be easy without proper collaboration, access to knowledge and technical expertise. In this way, technical and knowledge factors can easily become barriers to a truly CE ecosystem. Universities, research organisations and specialist consultancies themselves must collaborate with companies in enabling synergies to be established through the provision of highly specialised knowledge. On the other hand, managers can also play informal relationships that enable initial synergies to be coordinated and thence larger CE (namely, Industrial Symbiosis) networks to flourish.

Companies, especially from the construction, manufacturing and crafts sectors, may ask:

- How may collaborative technologies support the development of a CE strategy adapted to my company?
- How may data integrity be granted in my circular ecosystem?
- Which role may Distributed Ledger Technologies play in my circular ecosystem?
- How may Enterprise Systems embed CE management processes?
- Which may be the most effective and innovative ICT to leverage in my CE ecosystems?
- To which extent may technology-enabled process innovations contribute to the success of a CE strategy in my company?

The answer to these questions may lie in continuous search for knowledge, and a collaborative culture inside companies, where innovation needs can only be fulfilled with the help of external resources: infrastructures, specific technology, human resources – with proper skills & technical expertise - costs sharing, intellectual property sharing, or even access to other markets.

To assess the importance of the Technical and knowledge factors for your organisation, you can ask yourself the following (additional) questions:

- Does my company belong to any “collaborative network(s)”? If not, what benefits could it bring?
- Can I identify “circularity holes” within my company?

- Can I identify “structural holes” within my company?
- How can my company benefit from an “Open Innovation” approach?
- Can I identify stakeholders that can support my company in their CE transition (for example, Universities, research organisations, specialist consultancies and even competitors)?
- With whom can I establish informal relationships that enable my company's synergies for CE transition?