

# Making the shift to the circular economy with innovative business models

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## Introduction

The basic idea of sustainable circular economy business models is to produce not only economic value, but also environmental and social value. In the circular economy, the key objective is to keep the value of materials and products high for as long as possible.

A shift from product-focused activities towards production of services supports the transition.

In the CloseLoop project of the Strategic Research Council of the Academy of Finland, challenges associated with the development of new business models are systematically assessed, and new circular economy business models and concepts are brainstormed for Finnish companies.

## Towards the circular economy with digital solutions

Digitalization and the Internet of Things (IoT) offer new opportunities for the development and implementation of circular economy business models. They enable the gathering of information on products in a new way. This provides the manufacturer with increased knowledge on how the product is being used, when the product needs maintenance, and when the product is nearing the end of its service life. This makes it possible to develop new services and optimize the value of the product and its materials.

New technologies can be seen as enablers for circular economy change. Additive manufacturing enables advanced solutions for both functional optimization and local manufacturing. Increased intelligence of the products and the data availability during the whole lifetime enable reliability and predictability of product performance.

## Understanding value from different perspectives

An individual company cannot solve the challenges related to circular business operations. What is needed is comprehensive understanding of the viewpoints and needs of various parties.

The question of value can be examined at many different levels, taking into account such aspects as economic, social and environmental value. When considering the value received by the end customer, it is also essential to understand the value as a ratio between sacrifices and benefits.

## New tools needed for the development of business activities

In the circular economy, business activities are more networked and systemic than before. Therefore, new tools are needed for both innovation and the development of existing business operations.

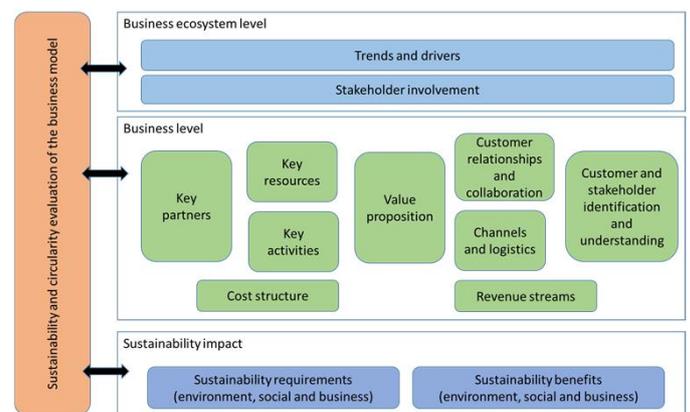


Figure 1. A systematic examination framework suited for the development of business models

Changes in the business environment can be taken into account by assessing the ongoing development trends and drivers of change.

Stakeholder participation in the examination work promotes generation of a shared view on the matter.

At the level of business operations, the examination focuses on the key elements of the business model.

The impact of operations is assessed from the viewpoints of requirements and the benefits achieved.

Changes need to be assessed, and the business model adjusted to the changed circumstances.

## References

- Antikainen, M., Valkokari, K., 2016. A Framework for Sustainable Circular Business Model Innovation. *Technology Innovation Management Review* 6.
- Kivikytö-Reponen, P., Tiusanen, R., Halme, J., Raunio, K., Saarela, O. 2017. Machine Performance and Availability Prediction through the Lifetime. *Proceedings of the 2<sup>nd</sup> Annual SMACC Research Seminar*.
- Hanski, J., Valkokari, P., Uusitalo, T. 2017. Kiertotalous korostaa kunnossapidon merkitystä. *Kunnossapitoyhdistys Promaint Ry, Promaint*, No. 2, pp. 14-16. [https://issuu.com/promaintlehti/docs/promaint\\_2\\_2017](https://issuu.com/promaintlehti/docs/promaint_2_2017)

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