



# Leren over de Circulaire Economie

## *Leeslijst*

*Onderdeel van het project Competenties voor de Circulaire Economie (C-4CE)*



Europees Fonds voor Regionale Ontwikkeling

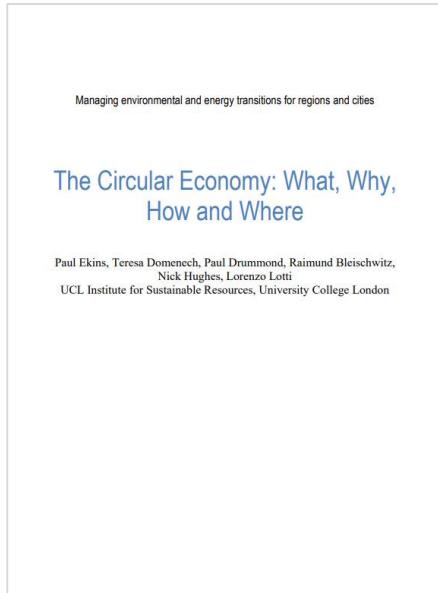


*Dit overzicht is ontwikkeld door Breda University of Applied Sciences en Centexbel in het kader van het Interreg Vlaanderen-Nederland project ‘Competenties voor de Circulaire Economie (C-4CE)’.*

*Meer informatie over dit project is te vinden via <https://www.c-4ce.com>.*

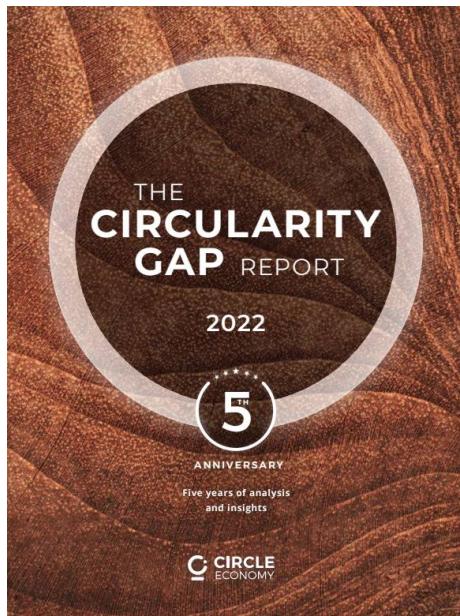
## The circular economy: Why, what, how and where

<https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf>



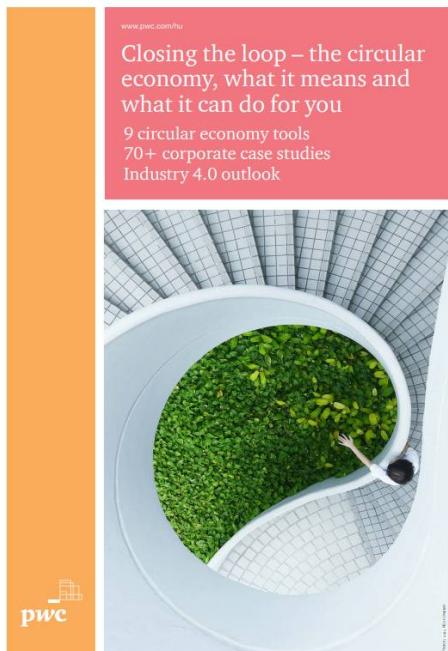
## The circularity gap report 2022

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## Closing the loop: The circular economy, what it means and what it can do for you

<https://www.pwc.com/hu/en/kiadvanyok/assets/pdf/Closing-the-loop-the-circular-economy.pdf>



## Closing the skills gap: Vocational training and education for the circular economy

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## Circular economy competencies for design

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**Sustainability** Article  
**Circular Economy Competencies for Design**

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**Abstract:** This study addresses what competencies (knowledge, skills, and attitudes) designers need in order to successfully design products and services for a circular economy. Existing literature, though sparse, has identified a number of circular economy competencies for design. Yet, a coherent overview is lacking. To complement the competencies found in the literature with insights from practice, we conducted 18 semi-structured interviews with experts in the field. This resulted in five new competencies for circular economy for design: (1) Circular Impact Assessment, (2) Design for Recovery, (3) Design for Multiple Use Cycles, (4) Circular Business Models, (5) Circular User Engagement, (6) Circular Production Methods, and (7) Circular System Components. We also propose a general sustainability competency framework to incorporate our findings. Interestingly, we did not find evidence of the Systems Thinking competency in practice, although in the literature it is mentioned as a relevant competency for design for a circular economy. In addition, we found that methods and tools for design for a circular economy are not yet well developed. The development of design for a circular economy can be seen as an upcoming, independent field within the sustainability domain, which requires a specific set of competencies, methods, and tools. Our overview of circular economy-based design competencies can guide the development of relevant methods and tools, circular economy-based design curricula, and training programs in the future.

**Keywords:** design education; competencies; circular economy; product design; sustainability; circular consumption

**1. Introduction**  
It has been recognized that the linear “take-up of materials and energy, which is focused on raw extraction, production, use, and dismantling of products (i.e., the so-called take-make-waste model), challenges sustainable development [1]. The circular economy, which is described by the Ellen MacArthur Foundation as restorative and regenerative by design [2], offers an alternative. The aim of design for a circular economy is to maintain product integrity over multiple use cycles (for instance through repair, reuse, and recycling), and to minimize environmental impacts (through recycling), while at the same time building economically viable product-service systems [3].

The European Commission emphasizes the role of design in the EU action plan for the circular economy, stating that “the role of design is to ‘make it circular’—to ‘design out waste or remanufacture’” [4] (p.27). The overarching aim of design for a circular economy is to contribute to sustainability [5]. It can be seen as one of the approaches in the design for sustainability field. Other approaches include the design for sustainability field procedures [6], design inspired design [7], sustainable product-service systems [8], design for low resource waste (also known as design for the base of the pyramid) [9], design for social innovation [11,12], and transition design [13].

Similar to the other design for sustainability approaches, design for a circular economy has its own specific procedures and concepts. The concept of the circular economy has gained traction

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## Circular business model challenges and lessons learned: An industrial perspective

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**Sustainability** Article  
**Circular Business Model Challenges and Lessons Learned—An Industrial Perspective**

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**Abstract:** Both practitioners and researchers are concerned about resource deficiencies on the planet earth and agree that circular business models (CBMs) represent solutions to move towards zero waste, improving environmental impacts and increasing economic profit. Despite all of the benefits CBMs offer, the implementation of these models is failing in many industries. This paper aims to reveal the primary obstacles that stand in the way of CBM transition. This paper aims to identify the primary challenges of CBMs. Multiple case studies are employed, incorporating six companies and data gleaned from 17 in-depth interviews. Theoretical and managerial implications are described at the end of the study.

**Keywords:** circular business models; circular economy; barriers; challenges; empirical study

**1. Introduction**  
Current linear business models, which are often described as “take-make-waste” approaches, have led the world into an enormous cycle of waste production and extreme shortages of resources [1]. These trends are in contrast to nature, where there is no waste and everything is an input for other processes. The term “circular economy” was first used in 1970s to describe the fact that there are currently shortages in critical supplies such as water [3], and some materials will be exhausted within five to 10 years, including indium, which is used to produce Smartphone touch screens. Moreover, it is important to note that radical changes are necessary to move towards the current economy. Circular business models (CBMs) have been proposed as a way to assist toward decreases in waste, as well as the reuse, recycling, and retention of materials [4].

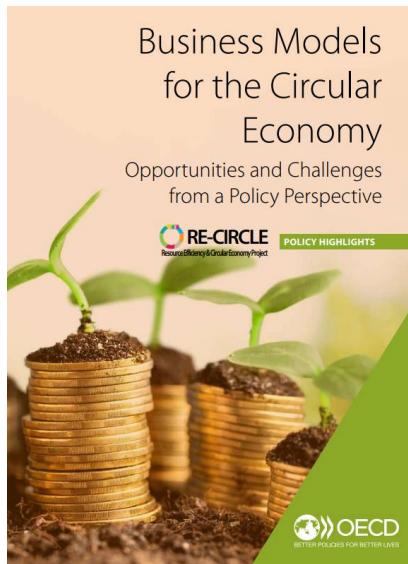
Although the concept of circular business models has existed for many years, the precise term has only been used since the early 2000s. The term “circular economy” (Oghazi et al. 2017) demonstrates an increase in the number of mentions of the term in academic publications from 1 article in 2013 to 19 in 2016. Both practitioners and scholars have come to understand the benefits of adopting CBMs.

Various studies related to this field have different lists of barriers for CBM adoption. The literature review by Mostaghel et al. (2017) reveals a more comprehensive categorization of antecedents and barriers of CBM adoption from the perspective of local firms, their customers and suppliers, government, and society. The barriers are categorized into internal and external factors, as well as the entire supply chain in the adoption of CBMs [1,6,7]. The goals of reusing, recycling, and recovering products did not achieve the expected results in the implementation of CBMs [1]. The study of Gosselin et al. (2016) empirically illustrates the important role of cooperative collaboration in transition to business model innovation. There are limited empirical studies that incorporate a holistic overview, from suppliers to end consumers. Bocken et al. (2016) call for studies that focus on the supply chain and infrastructure to develop case studies.

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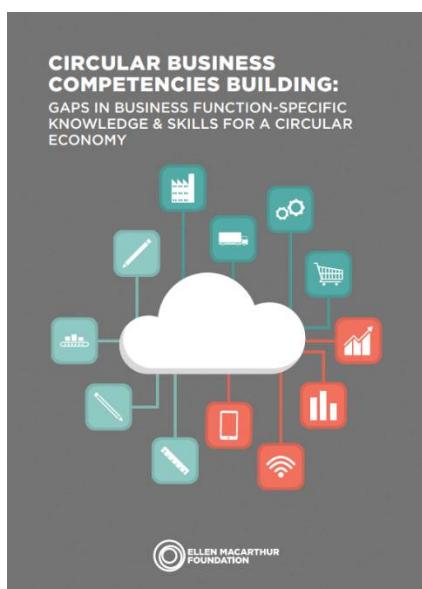
## Business models for the circular economy

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## Circular business competencies building

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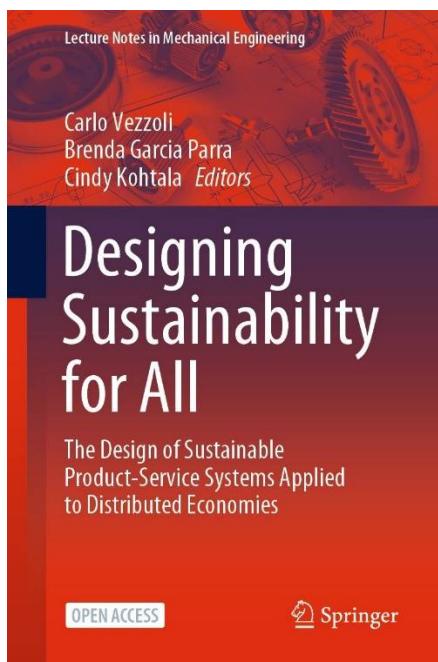
## Sustainability competencies: A systematic literature review

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## Designing sustainability for all

<https://link.springer.com/content/pdf/10.1007/978-3-030-66300-1.pdf?pdf=button>



## Achtergrondinformatie over het Interreg-project C-4CE

Het project ‘Competenties voor de Circulaire Economie’, afgekort met C-4CE, wordt uitgevoerd binnen het thema ‘Arbeidsmobiliteit’ van het Interreg V-programma Vlaanderen-Nederland. De verwachting is dat Circulaire Economie (CE) de komende jaren veel nieuwe werkgelegenheid opleveren. Een van de constateringen voorafgaand aan dit project was dat het huidige CE-opleidingsaanbod in de grensregio Vlaanderen-Nederland onvoldoende bekend (er is geen adequaat opleidingsoverzicht) en onvoldoende van kwaliteit is (opleidingen bestrijken lang niet alle relevante aspecten van CE), waardoor het organisaties aan mogelijkheden ontbreekt om barrières in kennis te doorbreken of effectieve oplossingen voor problemen te vinden teneinde de transitie naar CE in gang te zetten.

Hiertoe is vanuit C-4CE een overzicht van CE-gerelateerde opleidingen gemaakt dat is verwerkt tot een doorzoekbare database die beschikbaar is via Ellie.Connect. Organisaties kunnen deze CE-opleidingsdatabase op diverse criteria doorzoeken (onder meer thema, prijs, duur), inclusief de link van de opleiding met de Sustainable Development Goals  
(<https://platform.ellieconnect.com/products-simplified>).

Daarnaast is naar aanleiding van kwalitatief en kwantitatief onderzoek onder organisaties in de grensregio Vlaanderen-Nederland in kaart gebracht wat kenmerken van effectieve leerprocessen op het gebied van CE zijn. Op basis van de resultaten van deze onderzoeken is gekozen om de methode van Challenge-Based Learning (CBL) onderdeel van de deliverables van het project te maken. Dat heeft zijn beslag gekregen in de Praktijkgids Challenge-Based Learning en begeleidend materiaal alsook in twee toepassingen van CBL op het online communityplatform Ellie.Connect  
(<https://ellieconnect.com>).

Meer informatie over het project C-4CE is te vinden op de projectwebsite: <https://www.c-4ce.com>.