



**Interreg - IPA CBC**   
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**BeCircular**



# **Change Management for Circular Economy via Circular (Business) Models**



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Authors of the handbook:

**Assoc. Prof. & PostDoc Dr. Renata Petrevska Nechkoska**

Gauss Institute, Bitola, North Macedonia

Faculty of Economics, Prilep, University St. Kliment Ohridski Bitola, North Macedonia

Faculty for Economics and Business Administration, Ghent University, Ghent Belgium

Tactical Management in Complexity Hub

[tactical-management-in-complexity.com](http://tactical-management-in-complexity.com)

**Prof. Dr. Mimoza Bogdanoska Jovanovska**

Gauss Institute, Bitola, North Macedonia

Faculty of Information and Communication Technologies, Bitola, University St. Kliment Ohridski Bitola, North Macedonia

Reviewers:

**Prof. Dr. Vesna Damjanovic**, Faculty of Organizational Sciences, University of Belgrade, Serbia

**Prof. Dr. Igor Nedelkovski**, Gauss Institute, Bitola, North Macedonia, Faculty of Information and Communication Technologies, University St. Kliment Ohridski Bitola, North Macedonia

**Dr. Antonia Caro Gonzalez**, Valencian International University (VIU), Spain, Faculty of Social Sciences; I2Cat Foundation, Digital Society Technology Unit; Eoh-for-Good: Leading Systemic Transformations for the Common Good.

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# List of abbreviations

EC - European Commission  
LSGU - Local Self Government Unit  
EU - European Union  
BM - Business Models  
SEA - Law on Environment  
LWM - Law on Waste Management  
PUC - Public utility company  
MoEPP - Ministry of Environment and Physical Planning  
NEAP - National Environmental Action Plan  
RNM - Republic of North Macedonia  
SEA - Strategic Environmental Assessment  
FAO – Food and Agriculture Organisation of the United Nations  
IUCN – the International Union for Conservation of Nature  
IWRM – Integrated Water Resource Management  
SPA – Special Protection Areas  
WFD – Water Framework Directive  
CE - circular economy  
CCSCP: Collaboration Centre for Sustainable consumption and production  
GPP - green public procurement  
GRO - means grow in Nordic  
KPI - key performance indicators  
SDG - sustainable development goals  
CEDP - circular economy design principles  
CEAP- circular economy action plan  
RENO - renovation wave (European government 2020)  
WEEE - Waste Electrical and Electronic Equipment  
IWMS - Integrated Waste Management Solution

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## Disclaimer

This publication was prepared by the GAUSS Institute in the context of the BECircular project - Boosting Employment through Entrepreneurship in Circular Economy (URL: <http://www.ipa-cbc-programme.eu/approved-project/91/> and <https://becircularproject.eu/> ) funded by the Interreg IPA - CBC Programme (co-funded by the European Union and national funds of the participating countries Greece and North Macedonia), according the Terms of Reference for the respective work package and lot. The views expressed in this publication represent only the views of the authors and the collaborators.

This book is not to be printed

# Executive Summary

This book is intended to assist students, researchers, trainers, coaches, mentors, practitioners, teachers, managers, entrepreneurs, business owners, citizens, government officials ... any stakeholder in an economy willing to learn and adhere to an old-new paradigm of circularity. It encompasses the main theoretical foundations - the Circular Economy concepts, definitions, mechanisms, principles, regulations, approaches, frameworks; it describes the Business Models in their essence and it portrays what is the difference - and how they can become (if new) or transition to (if existing) circular economy. That is one of the most important didactic aspects of the book. The second part enlists important practices towards Circular Economy, which are to be used as examples, trajectories, best practices to learn from, and copy-paste special in its own context. The challenges we face are similar, the system design of solutions and their contextual adaptation are a necessity, so this is one step in the proper direction of conceptualizing and action.

This book contemplates and presents a plethora of works and contributions as learnings from the BeCircular project funded by the European Commission (with the partners Diadyma, CluBe Greece and ZMAI North Macedonia), original research of the authors and collaborates (Renata Petrevska Nechkoska, Geert Poels, Gjorgji Manceski) presented on conferences, master theses references and excerpts by Laura de Roeck, Manou Baert, Olivier de Gussemme, Sophie Sanders, Wouter van Cauwenberghe, Judith De Koninck, Tibo Hendrickx, Dieter Labeeuw, from the joint supervision within Ghent University Belgium (Renata Petrevska Nechkoska and Geert Poels), the MultiCreation projects carried out by the authors within the University St. Kliment Ohridski Bitola and a broad system of stakeholder partners, North Macedonia, and the mentoring and coaching sessions of the authors Mimoza Bogdanoska Jovanovska and Renata Petrevska Nechkoska.

# Methodology

Regarding the manner in which the book was contemplated, it is visible there is a theoretical background contemplated from the established literature in CE and business models and conceptual frameworks, complemented with referenced original research in diverse domains of application of the circular economy, performed under mentorship of the involved authors and collaborating professors, by master students at the university of Ghent, Belgium. The methodology to bridge the business and problem-based models with the circular logic is creatively deployed to point out the differences and what needs to be incorporated to make them circular. On the other hand, the second part of the book draws learnings from practice - on a global scale, from the BeCircular cross-border project between Greece and North Macedonia, from the Western Balkans context, and on the national level of the Republic of North Macedonia. In this part, both existing and novel approaches are discussed, derived from the own experience and experimentation of the authors within their professional and voluntary realm of engagement, as well as within facilitated projects undertaken to initiate positive change, rather than adapting to negative changes.

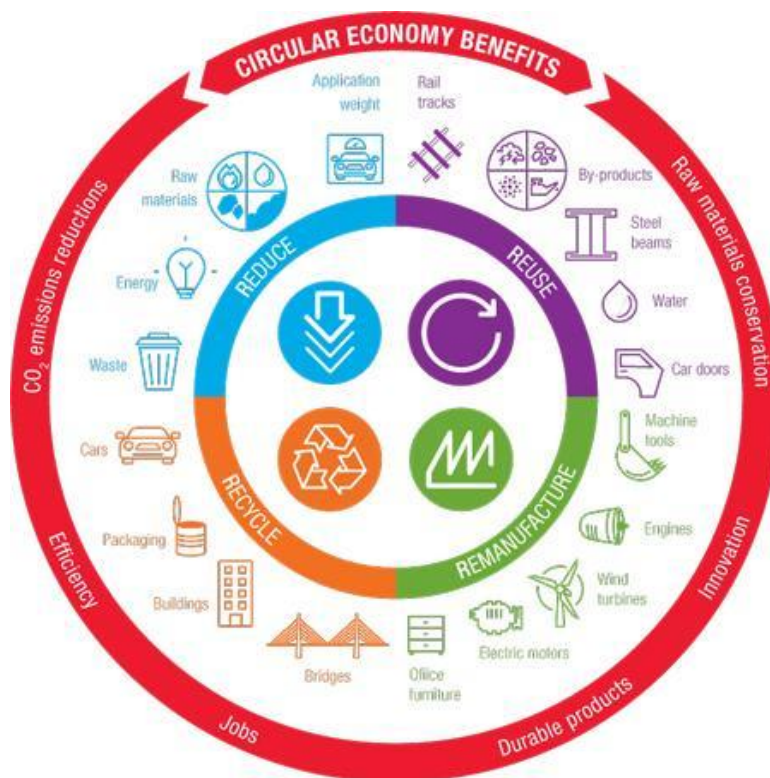
# Part A - Theoretical Foundations

## 01. Circular Economy - definitions

Circular economy can be perceived as a regenerative economic system, where all the resources, waste, emissions and energy use are substantially reduced by slowing down, optimizing of the production/consumption cycles and extension both on the energetic and material life cycles. It aims to change the paradigm of perception of waste, even its definition, and to portray it as a challenge attractive to be converted into money and goods.

According UNCTAD (Fig 1), “a circular economy entails markets that give incentives to reusing products, rather than scrapping them and then extracting new resources. In such an economy, all forms of waste, such as clothes, scrap metal and obsolete electronics, are returned to the economy or used more efficiently. This can provide a way to not only protect the environment, but use natural resources more wisely, develop new sectors, create jobs and develop new capabilities.” A notion pursued by UNCTAD is “the goods of today are the resources of tomorrow at yesterday's resource prices”





**Figure 1.** Circular Economy, UNCTAD<sup>1</sup>

According to the most established authority for Circular Economy, its definition is as follows:

“Circular Economy: A systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature. It is underpinned by a transition to renewable energy and materials. Transitioning to a circular economy entails decoupling economic activity from the consumption of finite resources. This represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits.” (Ellen MacArthur Foundation, 2013)

When decomposing this definition, first and foremost, we see that CE is perceived as ‘systems solution framework’ which means it promotes systemic design of any action or entity, and a comprehensive governance which doesn’t elude one-size-fits-all, but on the contrary, every action and actor needs to find

<sup>1</sup> <https://unctad.org/topic/trade-and-environment/circular-economy>

their own pathways aiming at these challenges, while following several main principles.

The entire direction of re-introducing CE is to address global challenges produced by the 'business as usual' or by the so called 'linear economy' (Fig 2) which follows the 'take-make-dispose' workflow. In any sense, that is problematic and cannot be sustained, neither on a small scale nor a mass scale across the globe and humanity. The 'take' consumes to some extent resources which cannot be renewed (at all or via the needed pace), all the take-make-dispose consume ridiculous amounts of energy (so far predominantly from non-renewable sources) and the 'dispose' stage produces way too much waste which aggregates and piles up endangering soil, water, air. Hence, CE is set in action to address the global challenges such as climate change, biodiversity loss, waste and pollution. Additionally, it underpins 'renewable' as the main trait of the resources, materials and energy, hence decoupling the economic activity, from finite materials and resources, moving beyond the wrongfully perceived abundance towards humans being respectful hosts and guests on this planet.



**Figure 2.** Linear economy

We have reached another aspect of defining the CE - its principles, and different authors suggest a plethora of useful technological, managerial, ecological, societal and other principles. The three described here are:

- eliminate waste and pollution,
- circulate products and materials (at their highest value), and
- regenerate nature

Which should be incorporated in the design of the business models, projects, endeavors which use resources of any kind. Only by interweaving them as design principles with a compulsory adherence will there be some chances of recuperating our Planet and improving the quality of life without further endangering.

As defined here, the CE ought to produce a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits. We have to agree that humanity cannot simply shift the complex socio-economical-technological-ecological systems with substantial complexity and self-preserving motivation without encompassing a way of working and living which has to consider the business aspects, the profits, the economies and the societies.

Figure 3 depicts a relevant question - why should we care, as individuals? A question which should be asked before every participant in any CE training. And the answers vary from - better quality of life NOW, preserved planet for the FUTURE generations, visible damage being done even now, collective action is needed.



**Figure 3.** Why care? Every individual is very short on this planet, why should we care?

## 02. Principles of Circularity and Sustainability

Literature and practice combine and enhance a set of principles, which can be recognised in one way or another, in every approach, regulation, framework. At the moment, there are 6Rs of sustainability (somewhere enhanced with a U-for upcycle) (Weetman, 2017) and currently, revolving around 10Rs. Hence we can distinguish the following 6Rs, as visualised on the poster on Fig 4:



**Figure 4.** The 6Rs of environmental sustainability, York university

However, here we are providing brief description of 10Rs, encompassing all currently in use:

**Refuse:** We consume more than we need: cars are often idle and offices are very often empty. We can change this by refusing to have such unnecessary and unsustainable products with solutions that maximize the use of fewer goods.

**Rethink:** Each product and system must be rethought to reduce its environmental impact.

**Reduce:** The central idea of a circular economy is dematerialization or "doing more with less." To achieve this, we must use and produce products in smarter ways.

**Reuse:** To achieve zero waste and reduce carbon emissions, we need to look beyond the extractive industry's current take-make-waste model.

**Repair:** Planned obsolescence and a throwaway culture are a stark reality in today's society. An example: in October 2019, the EU adopted an eco-design law requiring manufacturers of phones, tablets, and laptops to make their products more easily repairable.

**Reconstruct:** Refurbishing is the process of restoring and updating an old or discarded product so that it can once again perform its original function. Damaged parts are replaced, resulting in an overall update while the product looks brand new. Refurbishing products can reduce the need for new materials, resulting in a reduction in waste and carbon emissions.

**Remanufacture/Recondition:** Remanufacturing, or reconditioning, involves refurbishing parts of a discarded product and reusing them in a new product with the same function.

**Re-offer/Repurpose/Upcycle:** transforming a discarded product into a new product with a different function.

**Recycle:** *Upcycle:* the quality of the recycled product increases/decreases after recycling. *Downcycle:* the quality of the recycled product decreases/decreases after recycling.

**Recover:** What if waste was not? Through anaerobic digestion, microorganisms can break down biodegradable waste into materials that we can use to generate energy, as well as reduce pollution, water acidification, and carbon emissions. It is important to note that this R is the last resort after all other "10R" options of the circular economy have been exhausted.

### 03. Regulations and Strategic Direction

When discussing strategic focus for CE and in general, we need to look into some most present global principles for circularity. United Nations' Sustainable Development Goals are another popular concept (SDGs, 2015) and they have a broader scope and are based on the concept of long-term development. Incorporating some circular principles, on the other hand, can aid in the achievement of these SDGs (Fig 5). According to the 73rd United Nations General Assembly and the UN Economic and Social Council, a circular economy can help accomplish SDGs 6, 8, 11, 12, 13, 14, 15, and 17.

# SUSTAINABLE DEVELOPMENT GOALS



**Figure 5.** United Nations' Sustainable Development Goals<sup>2</sup>

However, even though the leaders across the globe have somewhat dedicated their focus and efforts towards the SDGs, on tactical level and even more on operational, it is each country or union, on their own, meaning aversion of the systemic approach, frameworks, design and hence, effects. On the dark side, there is a more realistic view on how the SDGs are achieved so far, transforming them into Sustainable Development Ghouls, which should make us question what has been done so far and how effective it is (Fig. 6)

<sup>2</sup> <https://www.un.org/en/sustainable-development-goals>

## SUSTAINABLE DEVELOPMENT GHOULS



**Figure 6.** Sustainable Development Ghouls, University of Galway, Ireland<sup>3</sup>

As far as the European Union goes, and for example, Belgium as a representative country examined with regards to legislation, we can conclude that there is a plethora of regulations which, at least theoretically and conceptually tackle the CE tactics and governing principles (Fig 7).

The main principles deployed across EU are in direction of **caution** - taking legal and regulatory action even if the risk cannot be fully pinpointed, **prevention** - of ecological damage to protected species, natural habitats, water and soil; **correction at source** - stopping solution at its source instead of repairing damages; **the polluter pays** - the financial damages from its actions.

If we decompose from top to bottom, from Europe to specific institutions deploying circularity principles, we would need to consider at least the following regulations and legal aspects:

- The European Green Deal<sup>4</sup>

<sup>3</sup>

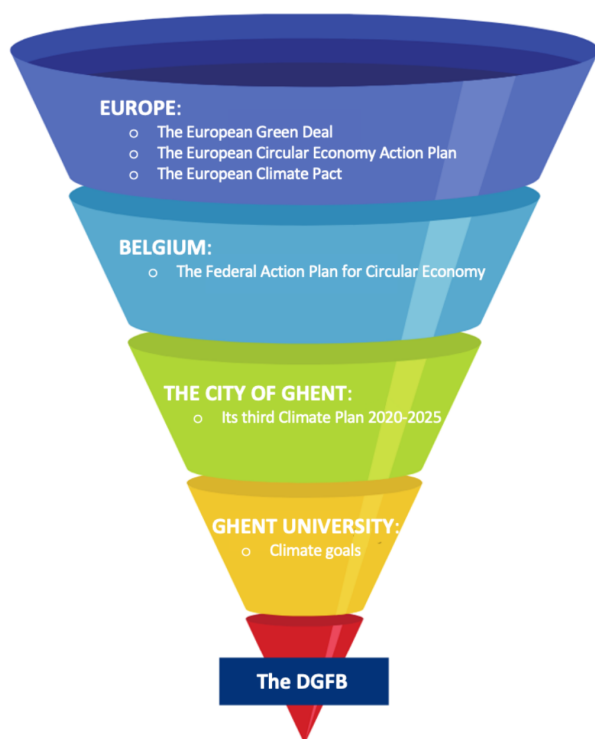
<https://www.universityofgalway.ie/media/buildingsoffice/files/services/Sustainable-Development-Ghouls.pdf>

<sup>4</sup> [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en)



- The European Circular Economy Action Plan (CEAP)<sup>5</sup>
- The European Climate Pact<sup>6</sup>
- The Federal Action Plan for a Circular Economy (e.g. Belgium) (2021-2024)<sup>7</sup>
- The third Climate Plan (e.g. The city of Ghent)(2020-2025)<sup>8</sup>
- The Climate Goals (e.g. Ghent University)<sup>9</sup>

|                      |   |
|----------------------|---|
| Quantitative targets | Reduce <b>landfilling</b> of municipal waste to a maximum of <b>10%</b> by 2030 |
|                      | Prepare <b>65%</b> of <b>municipal waste</b> for re-use and recycling by 2030   |
|                      | Prepare <b>75%</b> of <b>packaging waste</b> for re-use and recycling by 2030   |
| Qualitative targets  | Launch and continue <b>waste prevention programmes</b>                          |
|                      | Develop an EU methodology to <b>measure food waste</b> and define indicators    |
|                      | Promote efficient use of <b>bio-based resources</b>                             |
|                      | Encourage recovery of <b>critical raw materials</b>                             |



<sup>5</sup> [https://environment.ec.europa.eu/strategy/circular-economy-action-plan\\_en](https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en)

<sup>6</sup> [https://climate-pact.europa.eu/index\\_en](https://climate-pact.europa.eu/index_en)

<sup>7</sup> <https://khattabi.belgium.be/en/belgium-adopts-ambitious-federal-plan-sustainable-development>

<sup>8</sup> <https://stad.gent/en/city-governance-organisation/city-policy/ghents-climate-actions>

<sup>9</sup> <https://www.ugent.be/en/ghentuniv/mission/sustainability/climateplan>

**Figure 7.** Regulation perspective of the Circular Economy, De Roeck and Baert, 2022 and Labeeuw, 2020

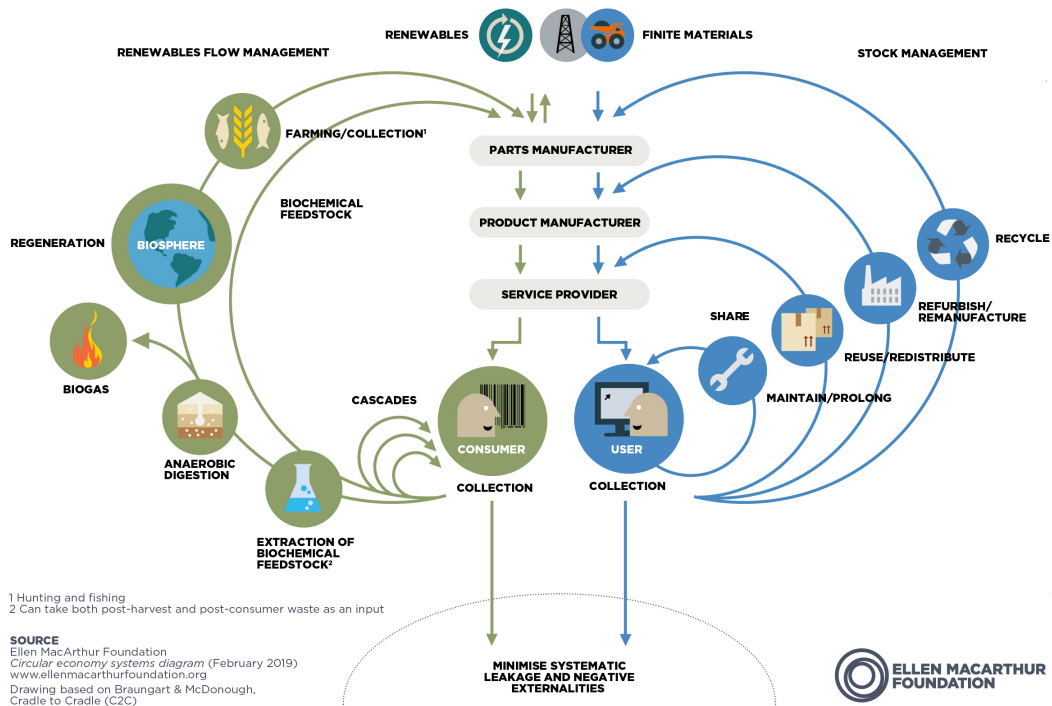
## 04. Approaches for Circular Economy

### The Butterfly Diagram

The Ellen McArthur Foundation developed a diagram called the “butterfly diagram” with the intent to graphically show the acceleration of the transition towards a circular economy. This diagram helped to spread awareness of a CE on the business and political levels (EU, 2015; UN Global Compact & Accenture, 2014) using the cradle-to-cradle approach. The **cradle-to-cradle** concept concerns eco-effectiveness instead of other eco-efficiency as approaches (Toxopeus, De Koeijer & Meij, 2015). The difference between eco-effectiveness and eco-efficiency is the fact that the first approach is focused on a positive footprint and thus is about doing more good. The second approach, eco-efficiency, is based on the negative footprint or “doing less bad” (Toxopeus et al., 2015). The Cradle-to-cradle <sup>10</sup>adopts 5 key principles: **material health** in terms of safety for people and the environment, **material reutilisation and product circularity**, **clean air, renewable energy and climate protection**, **water and soil stewardship**, and **social fairness**.

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<sup>10</sup> <https://www.c2ccertified.org/get-certified/product-certification>



**Figure 8.** Butterfly diagram, Ellen McArthur Foundation <sup>11</sup>

Within the butterfly diagram (Fig 8), as the concept of circular economy, a distinction can be made between a technical and biological cycle. Both cycles are visualized in the butterfly diagram, which depicts the ongoing flow of all materials present in an economy (Ellen MacArthur Foundation, 2013). This visual allows possibilities to adopt the best-suitable approach and technology to a circular flow mode. The tighter the circles are, the more complete the implementation of a circular strategy is (Bastein, Roelofs, Rietveld & Hoogendoorn, 2013).

The technical cycle intends to sustain the value of the utilised material while also using it continually using strategies such as: recycling, refurbishing, reusing and redistributing, and lastly maintaining or prolonging the product life. In other words, within the technical cycle, inorganic materials (e.g., chemicals) are constantly circling in a closed-loop manner within society.

<sup>11</sup> <https://ellenmacarthurfoundation.org/circular-economy-diagram>

On the contrary, materials from biological sources are sustainably operated and renewed in a biological cycle which can be achieved through the extraction of biochemical feedstock, anaerobic digestion, regeneration and farming or collection. This allows continuous circulation of organic materials (e.g., wood) in open loops in nature.

Out of the remarks and issues with the butterfly diagram, we can enlist the creation of imaginative natural environment, where no such thing as waste is mentioned in the biological cycle; separate perception of humankind, while people are actually part of the entire ecosystem; the notion of continuous cycles where no quality or energy is lost is not realistic; exclusion of the extractive industries and the primary processing of materials (Velenturf et al., 2016, 2017, 2019).

## **The ReSOLVE Framework**

The ReSOLVE Framework has been introduced by McKinsey Center for Business and Environment, and consists of the following notions.

“ Building a circular economy requires complex efforts at the local, national, regional, and global levels. To transition from the current trajectory to a circular one, European economies and companies must undertake six actions: regenerate, share, optimize, loop, virtualize, and exchange—the ReSOLVE framework.” (McKinsey, 2016)

**Regenerate.** Shift to renewable energy and materials; reclaim, retain, and regenerate the health of ecosystems; and return recovered biological resources to the biosphere. For example, the Savory Institute’s promotion of comprehensive land management has influenced the regeneration of more than 2.5 million hectares of commercial land around the world.

**Share.** Maximize utilization of products through peer-to-peer sharing of privately owned products or public sharing of pools of products; reuse them throughout their technical life spans; and prolong those life spans through maintenance, repair, and design for durability. Examples include car- and home-sharing business models.

**Optimize.** Improve the performance and efficiency of products; remove waste from their supply chains; and leverage big data, automation, and remote sensing. None of these actions requires changing products or technologies.

**Loop.** Keep components and materials in closed loops and prioritize the inner ones. For finite materials, this means remanufacturing products or components and (as a last resort) recycling materials, as Michelin, Rolls-Royce, and Renault are doing. For renewable materials, it involves anaerobic digestion and the extraction of biochemicals from organic waste. In the United Kingdom, 146 anaerobic-digestion plants treat 66 percent of sewage sludge, and an additional 175 plants produce bioenergy from solid waste—a number that is growing rapidly.

**Virtualise.** Deliver utility virtually—books or music, online shopping, fleets of autonomous vehicles, and virtual offices.

**Exchange.** Replace old materials with advanced renewable ones; apply new technologies, such as 3-D printing and electric engines. In different ways, these actions all increase the utilization of physical assets, prolong their life spans, and shift the use of resources from finite to renewable ones. Moreover, each action reinforces and accelerates the performance of the others. Separately and together, they could have a profound impact, increasing cost competitiveness substantially. Most industries already have profitable opportunities in each area. Not all of the technological advances will reduce costs; many might improve performance instead, and in some cases, the technology will need time to make a difference. But the analysis is persuasive: the circular economy carries a transformational potential that business—and society—would do well to take seriously. Main reasoning presented in Fig 9.