SUSTAINABLE GROWTH WITH CIRCULAR ECONOMY BUSINESS MODELS

Playbook for businesses

EXECUTIVE SUMMARY

Curbing the climate crisis and halting global biodiversity loss can't wait. This means that economic growth and prosperity can no longer be based on the wasteful use of natural resources and on buying and owning more and more new goods.

A global transition towards a carbon-neutral circular economy is an opportunity for all companies to develop new business, expand into new markets and create sustainable growth.

This playbook has been compiled by Finnish Innovation Fund Sitra and Deloitte to help companies in this task.

The circular economy is an economic model that addresses the root causes of biodiversity loss, the climate crisis and the depletion of natural resources.

A circular economy is not about producing more goods but about maximising the value from what we have, and keeping that value in the economy for as long as possible through smarter design, digital solutions and a shift from owning products to using services.

The benefits of the circular economy are clear, but there are always challenges when shifting to new business models.

This is a practical guide that provides insight, examples and hands-on tools to help business transition to the circular economy. It is aimed at companies that want to differentiate themselves from their competitors, respond better to the needs of customers and other stakeholders as well as create more value with fewer resources. This is made possible by five circular business models presented in this guide.

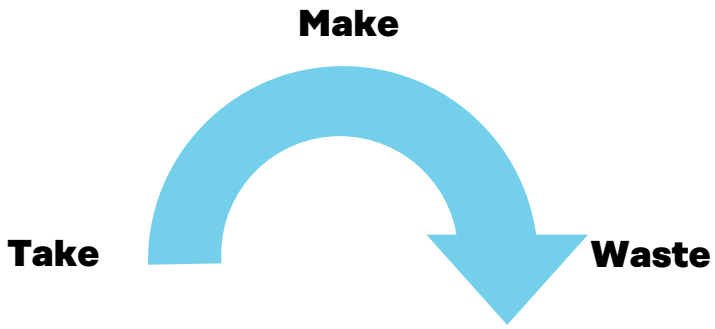
There’s a need for a global systemic change from linear thinking to a new circular economy that fits within the carrying capacity of the planet. This playbook enables businesses to be a part of this transformation.

TABLE OF CONTENTS

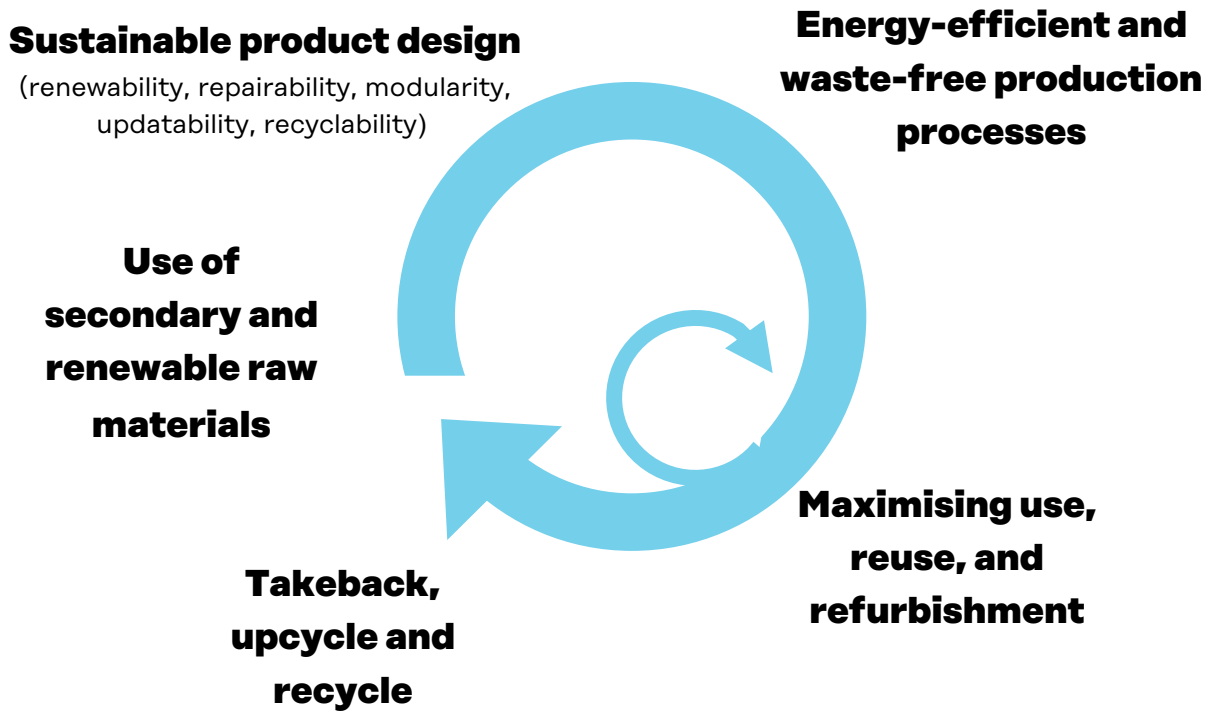
SITRA

INTRODUCTION: WHAT IS THE CIRCULAR ECONOMY?

LINEAR ECONOMY



THE CIRCULAR ECONOMY



Sources:: Kemianteollisuus ry, Sitra & Business Finland (2020): Circular business models for chemical companies

SITRA

INTRODUCTION: MORE VALUE WITH FEWER RESOURCES

The circular economy is an economic model that tackles the root causes of biodiversity loss, the climate crisis and the depletion of natural resources.

The circular economy is not about constantly producing more goods but getting more value from what we have, and we keep that value in the economy for as long as possible through smarter design, digital solutions and consumption based on the use of services rather than ownership.

A transition to the circular economy involves new ways of thinking about and using materials and products. For businesses, the circular economy offers tools to create more value with fewer resources. It is also an opportunity to meet the changing needs of customers, cut expenses, minimise risks and make business more sustainable for the planet.

As this playbook shows, the circular economy is an inevitable trend that all businesses need to integrate with. Change affects every business and the benefits of being at the forefront are being shared now.

DID YOU KNOW?

- By 2030 the value added by the circular economy could be EUR 3,700 billion.
- By 2030 the circular economy could create 700,000 new jobs in the EU.
- Circular economy thinking can increase the life-cycle value of products by 75%.
- Circular economy business models can increase business revenues seven-fold in comparison to traditional business models.
- Circular economy thinking can deliver at least 60-85% smaller product environmental footprint.

Sources: Accenture – Lacy & Rutqvist (2015): Waste to Wealth: The Circular Economy Advantage; Sitra, Technology Industries of Finland & Accenture (2018): Circular economy business models for the manufacturing industry; European Commission (2020): A new Circular Economy Action Plan For a cleaner and more competitive Europe

BUSINESS MODEL CANVAS

This business model canvas is a tool for developing circular business models. This playbook shows how to create a business model canvas for your circular business concept, step by step after each chapter.

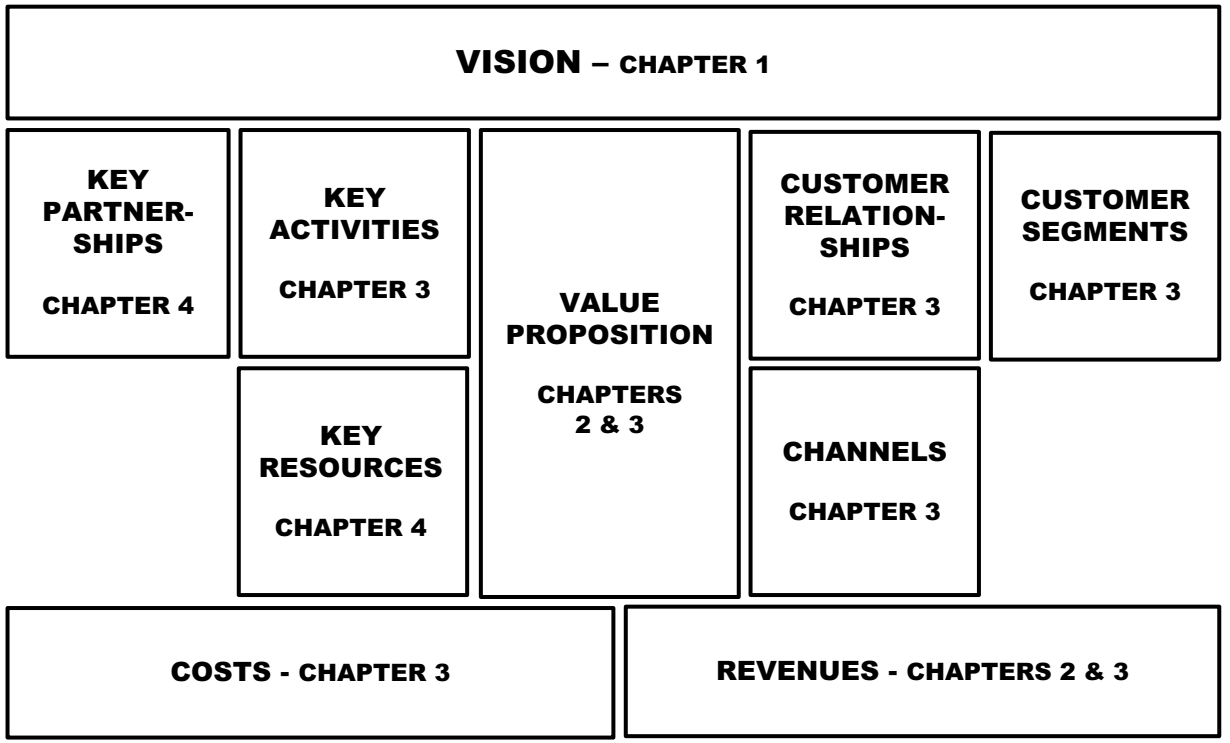
After **CHAPTER 1** you will understand why the circular economy is important - you will be prompted to start drafting your company's circular economy vision.

After **CHAPTERS 2 and 3** you will start drafting the value proposition, key activities, customer segments, customer relationships, channels, and costs and revenues of your circular business idea.

After **CHAPTER 4** you will assess the capabilities needed for circular economy transformation – you should be able to understand what resources and partnerships you will need to realise your vision.

In **CHAPTER 5** make your circular business a reality. Revise and utilise the completed business model canvas to prepare you to test your circular business idea with customers, and communicate your circular business idea internally.

You can find a blank chart on the next page.



Notes: Canvas adopted from Ellen MacArthur Foundations Circular Design Guide

SITRA

BUSINESS MODEL CANVAS

VISION:

KEY PARTNERS:

KEY ACTIVITIES:

KEY RESOURCES:

VALUE PROPOSITION:

CUSTOMER RELATIONSHIPS:

CHANNELS:

CUSTOMER SEGMENTS:

COSTS:

REVENUES:

SITRA

QUICK START GUIDE

This quick start guide outlines the contents of the playbook and the steps you can take to transform your business from linear into circular. Each section includes quick tasks to help you to get started on your circular economy journey.

QUICK START GUIDE CONSISTS OF:

- Summary of the contents of the manual and steps in developing circular economy business.
- Questions to help you start considering what circular economy means for your business.

On your mark.

SITRA

1. UNDERSTAND THE IMPORTANCE OF THE CIRCULAR ECONOMY

What are the main changes in the business environment?
What are my risks and opportunities?
What does my circular economy vision look like?

Any business that wants to succeed, find new growth opportunities and improve risk management should seize the opportunities of the circular economy.

The circular economy helps us to adapt to five key changes in the business environment:

1. **Climate change and biodiversity loss:** the circular economy is a powerful tool to reduce climate emissions and tackle biodiversity loss.

2. **Regulation and policy:** the circular economy will play an increasing role in regulation and policy.

3. **Customer-orientation and changing consumption:** customer behaviour is changing with the pursuit of more sustainable lifestyles.

4. **Technology and data:** new technologies will enable circular economy business models.

5. **Economic rationale:** public and private circular economy investment and funding are growing rapidly.

What does the changing business environment mean to companies?

1. **License to operate:** Sustainability is a matter of license to operate: stakeholders, the public and the law demand it.

2. **Efficiency and resilience:** Transitioning to the circular economy will bring cost savings through operational efficiency and a more resilient supply chain.

3. **Growth and differentiation:** Companies at the forefront of the transformation to sustainable business will differentiate themselves from competitors, increase market share and scale up to new markets.

TASK:

Start outlining your company's circular economy vision

- What risks and opportunities can you identify in the changing business environment?

- What could your circular economy business look like in the future?

2. UNLOCK THE CIRCULAR OPPORTUNITIES

What are the inefficiencies in your value chain?

How can the circular economy turn inefficiencies into opportunities?

How can the circular economy add value?

The global economy is highly inefficient. Only 8,6% of it operates according to circular economy principles. The typical inefficiencies in the value chain include:

1. **Unsustainable use of materials:** materials are not recovered.
2. **Underused capacity:** products and resources are not being used efficiently.
3. **Short product lifetime:** products are not used to their full lifetime potential.
4. **Wasted end-of-life value:** products and materials are wasted, for example, in landfills or incineration.
5. **Not getting the most out of customer relationships:** focusing on the quantity of products means missing opportunities for services and additional sales, for instance.

The circular economy provides new business opportunities by addressing these inefficiencies and turning them into new value.

Added value can be created through:

1. **Growing revenues** – increase supply through services, resale, recycling.
2. **Enhancing the brand** – stand out from competitors and increase customer satisfaction.
3. **By reducing costs** – increase resource productivity, reduce waste.
4. **By reducing risks** – the dependency of the production chain and the changing regulatory environment.

TASK:

Consider the potential of the circular economy

- What are the main inefficiencies in my company's value chain?
- How can I turn them into new value?

3. DEFINE YOUR CIRCULAR ECONOMY BUSINESS MODEL

What are circular economy business models?
Which one is right for your company?
What are the challenges in applying them?

If a company wants to transform its business towards a circular economy, it should identify the most important capabilities for circular economy and strengthen those in which the company still has shortcomings.

The core capabilities for the circular economy can be divided into three categories.

1. Organisation and culture: Circular principles need to be embedded into the fabric of an organization: from procedures and guidelines to culture, leadership and KPIs.

1. Core activities and culture
2. Management and metrics
3. Rethinking sales
4. Financing

2. Functions and innovations: The production processes need to be based on the principles of the circular economy and the design of products and services should focus on value creation throughout a product's life cycle.

1. Product and service design
2. Operational funtions
3. Technology and data
4. Acquisitions and internal start-ups

3. Circular economy ecosystem: Partnering with public and private sector actors won't only be key for your business model, but will also enable a collective transformation to a circular economy and mainstreams new value creation with less resources across industries.

1. Ecosystem and partnerships
2. Production chain
3. Return systems

TASK:

Identify circular economy capabilities that are most relevant to your business and find our where you need to improve.

- What are the most important capabilities for your business to make a change?
- Which of these require the most development?

4. ASSESS THE CAPABILITIES NEEDED FOR CIRCULARITY

What does the transformation to circularity require from a company?

What are the key capabilities in making the change?

How can these capabilities be strengthened?

Circular economy business models are:

1. **Circular inputs:** Use recycled, bio-based materials and renewable energy in production. Create sustainable, repairable and recyclable products.
2. **Sharing platforms:** Digital platforms make it possible to increase the utilisation rates of goods and resources through, for example, renting, sharing and sharing.
3. **Product as a service:** Offering clients access to products instead of owning products, through services such as leasing and renting.
4. **Product life extension:** Making products last longer such as through repair, maintenance, upgrade, and resale services.
5. **Resource recovery:** Recovering materials and resources from products that are no longer functional in their current application.

The most common challenges with implementing circular economy business models are:

1. **Internal:** implementing new business models requires new capabilities, change in mindsets and internal resourcing.
2. **Customers:** certain business models require a change in how customers use them, for example buying a service instead of a product
3. **Ecosystem:** holistically transforming the value chain to the circular economy and closing material loops can't be done alone.

TASK:

Start the design of your circular economy business model

- Which business model is most interesting for your business?

- How could you benefit from it?

- Where could you start?

5. TAKE ACTION

How to get ahead?
What kind of transformation path suits your company?

Companies that want to move forward quickly to pilot a new business idea and tolerate failure well should begin with Path A (test and validate).

Companies that pursue a longer-term, comprehensive and a strategic business transformation should try Path B (vision and roadmap).

A: Test and validate

What: An agile startup-style method to quickly test, learn and validate whether your idea creates value, whether customers are willing to pay for it and whether you have the capacity to implement the solution in scale.

Who: For companies that want to move fast, focus on adding value and tolerate failure, uncertainty and risk.

Outcome: A successful pilot or lessons learned from what didn't work

B: Vision and roadmap

What: A forward-looking strategic approach to integrating the circular economy in your strategy. A roadmap to realise your vision.

Who: Companies that want to integrate the circular economy holistically into their strategy.

Outcome: The definition of your preferable circular future (where you want to be) and actions driven by strategy that get you there.

A suitable approach can also be found combining the two. Many companies transforming towards the circular economy are both updating their strategy and conducting experiments.

EXERCISE:

Think about how your business can start to implement a circular economy transformation.

- Which approach is more appropriate for your business – or can you combine both?
- How could you use them in the future?

1. UNDERSTAND THE IMPORTANCE OF THE CIRCULAR ECONOMY

The first chapter explains in more detail why the circular economy is relevant to your business, and you're encouraged to begin to work out your circular economy business vision.

AFTER THIS CHAPTER, YOU WILL:

- Understand how the global business environment is changing, and how the circular economy can help to adapt to these changes and keep your company relevant in the changing business environment.
- Have identified the risks and opportunities for your business and have started to outline your circular economy vision.

Circularity, here we come!

SUMMARY OF CHAPTER 1

WHY IS THE CIRCULAR ECONOMY IMPORTANT? The circular economy is a new economic model that positively contributes to solving the global environmental and societal issues and is key to building a sustainable economy. The circular economy helps tackle the climate crisis, biodiversity loss and the overconsumption of natural resources. The circular economy should be on the radar of all companies that want to succeed, mitigate risks and find new business opportunities.

The first chapter addresses five changes in the business environment. These are:

1. CLIMATE CHANGE AND BIODIVERSITY LOSS: The circular economy is crucial for reducing emissions and reaching the global emission reduction targets set by the Paris Agreement. The circular economy can reduce the use of natural resources and the stress on nature and biodiversity. It can also boost resilience to the physical impacts of environmental crises.

2. REGULATION AND POLICY: The circular economy is increasingly incorporated in regulatory and policy agendas, especially in the European Union, where the Circular Economy Action Plan and Green Deal have achieved numerous new regulations and policies. Initiatives such as the sustainable product policy initiative and the new EU taxonomy are affecting all businesses and creating new incentives.

3. CUSTOMER-ORIENTATION AND CHANGING CONSUMPTION: Business has become increasingly customer-centric, with products and services developed in close interaction with customers. The behaviour of customers is dramatically changing with the pursuit of more sustainable lifestyles on the rise. Companies that find the best ways to enable sustainability for their customers – both consumers and organisations – are winners.

4. TECHNOLOGY AND DATA: New technologies and increasing amounts of data enable circular economy by making it cheaper and easier to spot and fix inefficiencies — increasing transparency and creating new business opportunities.

5. ECONOMIC RATIONALE: Public and private funding that supports the transition towards a circular economy is increasing rapidly. The Covid-19 pandemic has shown that companies that invest in the circular economy are more resilient to market shocks and outperform the rest of the market. Investing in sustainable business pays off.

OVERVIEW OF THE CHANGING BUSINESS ENVIRONMENT 1/2

Sustainability is a major driver of change, influencing the expectations of customers and stakeholders towards businesses. The circular economy is a new economic model and way of thinking that can help to answer these new expectations, while adapting to tighter legislation, improving operational efficiency, driving innovation and growth, and creating impact.

The changing business environment poses risks and opportunities for businesses. In the short term, it can be about securing your license to operate* or experimenting with new resource-efficient business models. In the longer term there is no alternative: future businesses will operate sustainably, and the frontrunners will reap the biggest benefits. This chapter reviews the developments in legislation, the environment, society, technology and the economy.

OVERVIEW OF THE CHANGING BUSINESS ENVIRONMENT 2/2

How changing operating environment impacts business

The changing business environment poses risks and opportunities.

Climate change and biodiversity loss | **Regulation and policy** | **Consumer orientation and changing consumption** | **Technology and data** | **Economic rationale**

SHORT TERM

Examples of what the changes mean to your business.

LONG TERM

1. A License-to-operate

- Sustainability is a matter of a license to operate: your stakeholders, the general public and law demand it*.
- Traditionally focused on your footprint but in the future you will focus also on your handprint (positive impacts). There will be no room for companies that have net negative impacts on the planet.

2. Resilience and operations

- Going circular will bring cost savings through operational efficiency and a more resilient supply chain.
- In the future, legislation will favour resource efficiency and sustainable solutions, and find to minimise climate emissions and waste generation.

3. Growth and differentiation

- Companies at the forefront of the transformation to sustainable business will differentiate, scale up to new markets and expand to new markets.
- Leading companies are net positive: they replenish natural resources and reduce net CO2.

SITRA

CLIMATE CRISIS AND BIODIVERSITY LOSS 1/3

Resource extraction and production of goods are responsible for 45% of global emissions and 90% of global biodiversity loss and water stress[2]. The circular economy can substantially contribute towards meeting global climate and nature targets, while increasing resilience to the physical effects of environmental crisis. It helps both to mitigate the climate crisis and adapt to its impacts.

A CRUCIAL TOOL FOR REDUCING EMISSIONS

Combining circular economy with climate crisis mitigation can close the emissions gap and reach the goals of the Paris agreement (below 2-degree-world). In fact, current climate pledges only bring us 15% of the way towards this goal, whereas circular economy has the potential to deliver the remaining 85%.[1]

The emission reduction targets can be met by doubling the current global circularity rate of 8,6%, and applying smart strategies and reducing material consumption. These actions together can shrink the global GHG emissions by 39% and cut virgin resource use by 28%.[1]

Sources: [1] Circle Economy (2021): Circularity Gap Report

SITRA

CLIMATE CHANGE AND BIODIVERSITY LOSS 2/3

IMPROVING RESILIENCE TO THE PHYSICAL IMPACTS OF THE CLIMATE CRISIS

Climate is changing due to human activity. Even if we succeed in mitigating the climate crisis, the climate will nevertheless change to an extent and disrupt our societies and the business environment due to such things as changes in rainfall, drought, wildfires, high temperatures, and extreme weather events. The hotter the climate gets, the more intense and widespread many extreme weather events become.

For businesses, the circular economy has the potential to improve resilience to climate risks.

Global, complex, interconnected and interdependent supply chains are especially vulnerable to climate risks.[1]

The circular economy can help substantially to cut your company's emissions and improve your supply chain's resilience towards climate risks. The circular economy decouples supplies of materials from the consumption of raw materials. The shorter supply chains and more local production can make supply chains more flexible. [1]

In the future, incorporating circular economy thinking into business operations will also likely become a clear requirement for any carbon neutral-related business claims.

countries in reaching their targets.

Sources: [1] Ellen MacArthur Foundation (2019): Completing the picture: How the Circular Economy Tackles Climate Change

CLIMATE CRISIS AND BIODIVERSITY LOSS 3/3

Biodiversity is disappearing faster than ever before, with tremendous impacts all over the world. Many ecosystems have already reached the tipping point where they are beyond repair and will change to a new state with unknown consequences. This threatens ecosystem services locally and globally and the long-term value creation of our economy as well[1], as more than half of global GDP depends on nature[2]. The circular economy is a powerful tool to halt biodiversity loss.

Halting biodiversity loss and achieving the United Nations 2050 Vision for Biodiversity requires the widespread adoption of five actions[3]:

1. **Scale up** efforts to conserve and restore biodiversity.
2. **Keep climate change** well below 2 °C.
3. **Reduce other pressures** driving biodiversity loss – including pollution, unsustainable use of aquatic ecosystems and invasive species.
4. **Transform** the way we produce goods and services, especially food.
5. **Reduce consumption** of materials and services that affect biodiversity.

The circular economy provides the tools for each of these actions.

It reduces pressure on nature by using secondary raw-materials as input, and regenerates natural systems (action 1). It can close the emissions gap and with nature-based solutions improve the adaptation to the climate crisis (action 2). It reduces the exploitation of ecosystems by improving land use and decreases the pollution of air, soil and water (action 3). It transforms our production and consumption system by keeping materials in use and reducing their consumption through circular economy business models (actions 4 and 5).

Loss of biodiversity impacts business. According to the World Economic Forum, biodiversity and ecosystem loss creates threefold risks for business.

1. **If your business depends directly on nature and its resources**, biodiversity loss will directly impact operations, disrupt supply chains, affect real estate asset values, physical security and business continuity.
2. **If your business negatively influences nature,** this will likely sooner or later trigger negative consequences, such as losing customers or entire markets.
3. **There will be physical and market risks** posed by the disrupted natural ecosystems.

Companies that move now to control their biodiversity impact will be rewarded, as the expectations, costs and regulations around influencing nature will develop in the coming years.

Sources: [1] The Dasgupta Review (2021): The Economics of Biodiversity; [2] World Economic Forum (2020): Nature Risk Rising; Why the Crisis Engulfing Nature Matters for Business and Economy; [3] Secretariat of the Convention on Biological Diversity (2020): Global Biodiversity Outlook 5, Summary for policy makers

REGULATION: A NEW POLICY ENVIRONMENT

The circular economy has a substantial role to play in meeting climate targets and therefore and is increasingly shaping local and global policies. National and regional circular economy-related commitments and ambitions influence international agreements and trade policy, and vice versa, opening up great opportunities for businesses that support these ambitions.

EUROPE LEADS THE WAY WITH THE GREEN DEAL

The European Union is the global forerunner in incorporating the circular economy into policy making, aiming for a systemic transformation of the region's resource use. The circular economy is central to the European Green Deal – aiming for a carbon neutral EU by 2050 – and to the Coronavirus Recovery Plan.

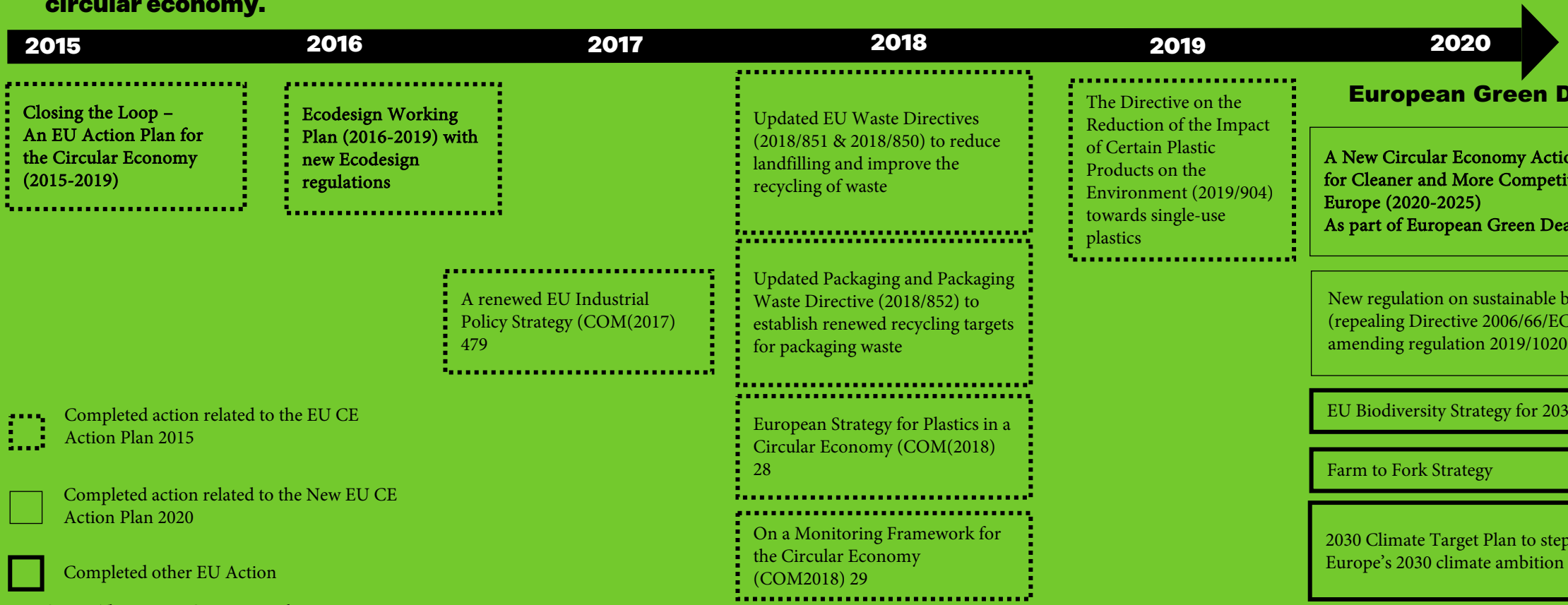
The new Circular Economy Action Plan outlined in the Green Deal includes making circularity a key principle in product design, promotes the "right to repair", fosters sustainable consumption and creates a criteria for mandatory Green Public Procurement. The focus areas of the EU's circular economy policy work are electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings; and food, water and nutrients.[1]

There are vast differences inside the EU in how advanced Member States are in the circular economy. The common circular economy target offers major opportunities for the export industries to support other countries in reaching their targets.

Sources: [1] European Commission (2020): Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions – A new Circular Economy Action Plan for a cleaner and more competitive Europe

EU REGULATION ON CIRCULAR ECONOMY 2015 - 2020

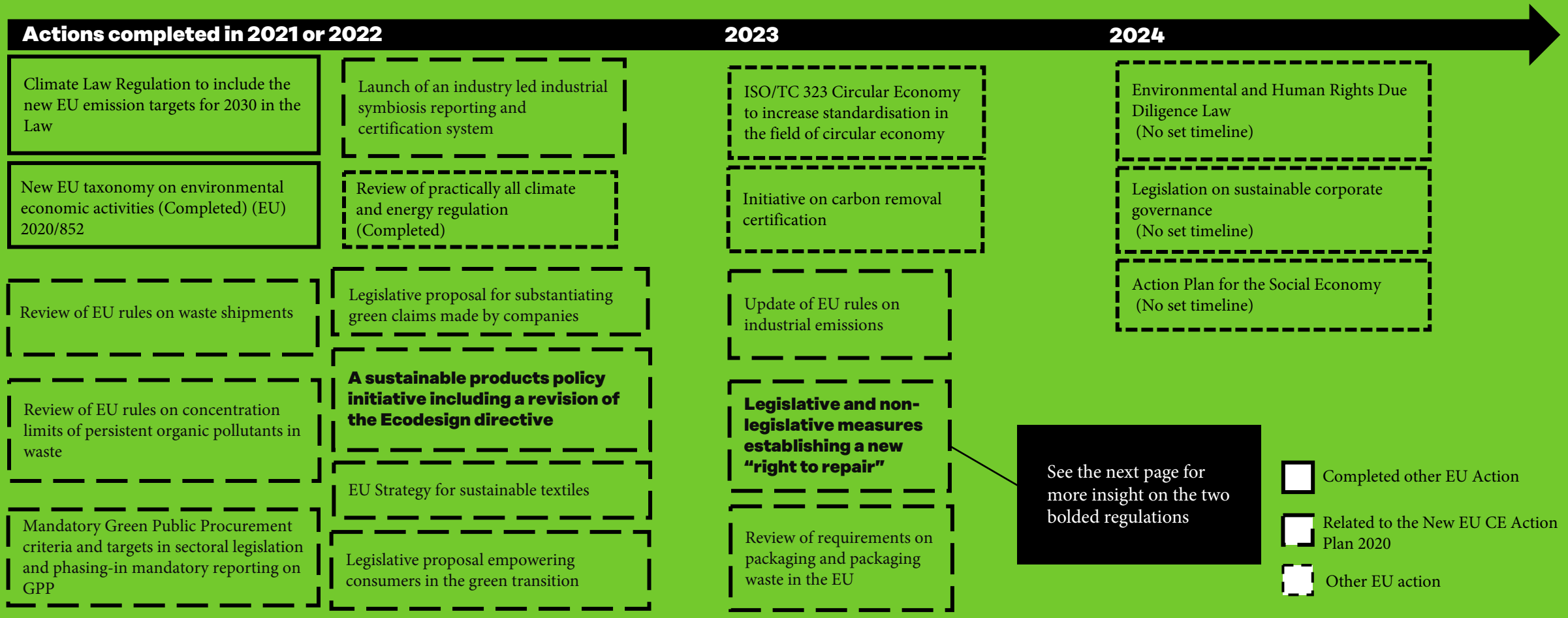
The EU adopted its first Circular Economy Action Plan in 2015. The EU's recent work and plans, most notably the New Circular Economy Action Plan, anticipate more regulation that supports the transition to a circular economy in the coming years. The timeline on this and the next page illustrates the regulatory developments from 2015 to 2025 that relate to circular economy.



Sources: The European Commission webpages

SITRA

EU REGULATION ON CIRCULAR ECONOMY 2020 - 2025



Sources: The European Commission webpages

SITRA

THE NEW CIRCULAR ECONOMY ACTION PLAN – 2 CORE ACTIONS

THE PROPOSAL FOR A REGULATION ON ECODESIGN FOR SUSTAINABLE PRODUCTS

What? Regulation to extend the Ecodesign Directive and propose additional legislation for new minimum requirements for product sustainability and related communication. The Ecodesign Directive will also be extended to new product groups - textiles, ICT, electronics, furniture, steel, concrete and chemicals.

Why? The aim is to make the products sold in the EU market more sustainable and ensure that the performance of frontrunners in sustainability progressively becomes the norm.

Status Commission's adopted in March 2022. Although the sector specific sustainability requirements for different product groups are still uncertain (for example, what additional legislation will be implemented), companies should already start assessing and improving the sustainability performance of their products.

The Product Environmental Footprint (PEF) method is a key tool for this initiative. The PEF Guide was adopted in 2013, but amendments to it are expected soon. Companies should invest in understanding and applying this method and using it in their product development phase to ensure the competitiveness and good environmental performance of their products.

LEGISLATIVE AND NON-LEGISLATIVE MEASURES ESTABLISHING A NEW "RIGHT TO REPAIR":

What? In November 2020, the European Parliament adopted a resolution on a more sustainable single market for business and consumers. The resolution called on the Commission to ensure that consumers are provided with sufficient information and services that enhance repairability of products and establish a consumer's 'right to repair'.

Why? Make product repair systematic, cost efficient and attractive across the EU.

Status Commission's adopted proposal for a new Ecodesign for Sustainable Products Regulation in March 2022.

In practice the initiative would mean, for example, that companies must be prepared to provide information on the availability of spare parts, repair services and product durability to the consumer at the time of purchase. As stated by the EU Parliament, this could mean introducing clear and easily understandable labelling of product durability and reparability (an index on the estimated lifetime and usage of a product), and the development of a uniform repair score.

Overall, the right to repair legislation will promote smarter consumption habits, make repairing and longer lifecycles of products common and enhance the competitiveness of circular economy solutions. Coupled with other upcoming EU-level initiatives and incentives, we are starting to see a quick shift to sustainable consumption habits and an increased demand for circular business models.

Sources: [1] LE Europe, VVA Europe, Opsos, ConPolicy and Trinomics for the European Union (2018): Behavioural Study on Consumer's Engagement in the Circular Economy – Final Report; [2] Ellen MacArthur Foundation (2020): Financing the Circular Economy; [3] Sitra (2020): Rethinking Ownership

SITRA

THE NEW EU TAXONOMY INCENTIVISES SUSTAINABILITY 1/2

EU taxonomy aims to contribute to the EU´s environmental objectives. In the future, companies classified as sustainable will be able to gain a competitive advantage in capital markets.

In April 2021, the EU Commission adopted a common classification, or taxonomy, for economic activities that significantly promotes the Union's environmental targets. The taxonomy aims to support the EU economy in meeting its European Green Deal objectives. It provides clarity about which economic activities are sustainable and seeks to support investment flows into those activities. The capital markets can provide benefits (for example, cheaper finance) to sustainable companies. In short, the new taxonomy determines how sustainable companies are defined.

The EU is also developing corporate responsibility requirements (CSRD) and (SFDR). When all companies share information with the financial markets about what proportion of their business is sustainable, it will improve the finance possibilities for sustainable companies.

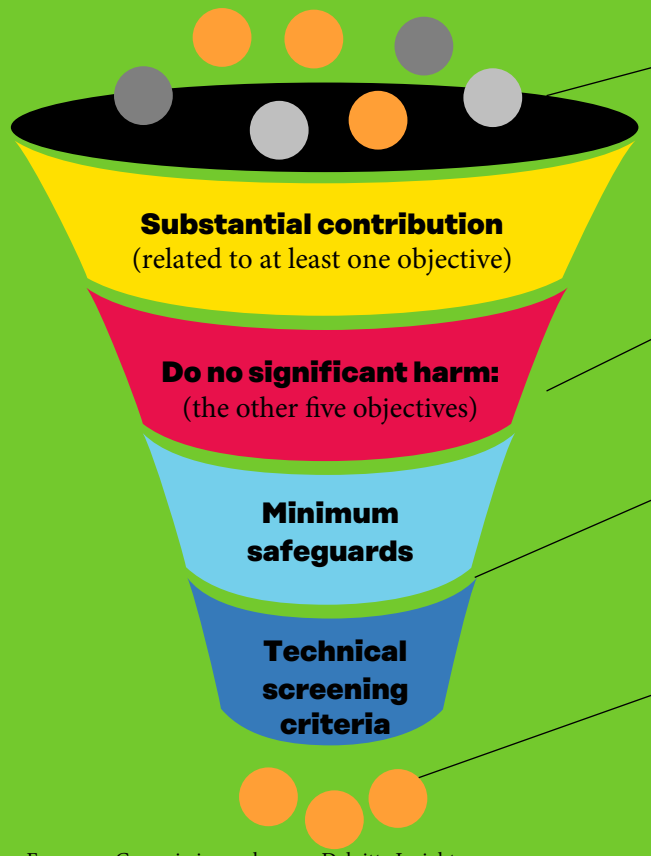
Figure on the next page shows the process by which companies must assess the environmental sustainability of their performance indicators (turnover, OPEX and CAPEX).

If companies want to develop their businesses with sustainable investments going forward, they need to ensure that their product portfolio will perform well in the new framework.

Sources: European Commission webpages, Deloitte Insight

THE NEW EU TAXONOMY INCENTIVISES SUSTAINABILITY 2/2

HOW COMPANIES NEED TO DETERMINE THE PERCENTAGE OF THEIR ACTIVITIES ALIGNED WITH THE NEW EU TAXONOMY?



The whole product portfolio and related activities go into an assessment "funnel", where each activity is assessed individually to determine whether they substantially contribute to at least one environmental objective.

The activity must pass each environmental objective's criteria (significantly contribute and do no significant harm). Additionally, the product must not do significant harm to the remaining 5 objectives.

The activity must pass minimum safeguards and technical screening criteria.

The activities that meet the criteria may be disclosed as part of the share of environmentally sustainable economic activities of the company. The KPIs used are turnover, CAPEX and OPEX.

THE ENVIRONMENTAL OBJECTIVES DETERMINED IN THE TAXONOMY:

1. Climate change mitigation
2. Climate change adaptation
3. The sustainable use and protection of water and marine resources
4. The transition to a circular economy
5. Pollution prevention and control
6. The protection and restoration of biodiversity and ecosystems

Sources: European Commission webpages, Deloitte Insight

CUSTOMER-ORIENTATION AND CHANGING CONSUMPTION 1/2

Business is becoming more customer-oriented. Products and services are developed in close interaction with customers. Sustainable lifestyles are on the rise and both consumers and business customers are looking for responsible alternatives.

THE CIRCULAR ECONOMY IS CUSTOMER ORIENTED

Today, the customer has a bigger role in the development of a product or service. In a customer-centric business, a product or service is made in close interaction to best meet their needs. Design focuses on solving customer problems.

In a circular economy, business is increasingly based on providing services rather than selling products. Profit is made by producing solutions that suit the customer's needs, are efficient and don’t waste resources. Customer-oriented thinking is built into the circular economy.

CUSTOMERS WANT MORE RESPONSIBLE OPTIONS

Consumption priorities are changing. Sustainable and responsible consumption are rising trends and will become increasingly important for both consumer and business customers.

The climate crisis and over-consumption of natural resources are driving legislation and investment towards a circular economy and sustainable business. In the B2B business, companies seek solutions that can reduce their footprint. This can already be seen in the subcontracting of large companies.

CUSTOMER-ORIENTATION AND CHANGING CONSUMPTION 2/2

RETHINKING OWNERSHIP

In a circular economy, consumption is based on services rather than ownership: sharing, renting, loaning and repair.

People are used to owning goods. But studies show that millennials increasingly prefer to have access over ownership for items such as cars, music and luxury goods.

The sharing economy offers major business opportunities, as the market is expected to grow twentyfold between 2015-2025, from 12 billion to 276 billion euros.[2]

New circular business models supported by digital technologies can make renting and leasing easy, secure and cost effective. In these business models, companies take or keep the ownership of products throughout their life cycle for rent, maintenance and take-back. This creates close relationships with customers and enables a continuous cash flow.[3]

The business environment doesn't yet sufficiently support the transition to producer ownership[3].

The producer ownership principle means that manufacturers are, or fully act like, owners of the materials in their products. But the sharing economy is incorporated in the EU Circular Economy Action Plan by objectives to incentivise new service models and by extending producer responsibility - the change is underway.

Chapter 3 has more on this topic and explains different producer ownership models and the ways you could concretely use this opportunity.

Sources: [1] LE Europe, VVA Europe, Opsos, ConPolicy and Trinomics for the European Union (2018): Behavioural Study on Consumer's Engagement in the Circular Economy – Final Report; [2] Ellen MacArthur Foundation (2020): Financing the Circular Economy; [3] Sitra (2020): Rethinking Ownership

NEW TECHNOLOGIES AND DATA AS ENABLERS 1/2

Global technological innovation is faster than ever before, and the ongoing digital transition is reshaping business globally. Using new digital technologies can also support the global sustainability endeavours and the circular economy transition. Technologies and data are a key enabler for circular business models: from digital platforms, ways of interaction and ecosystem cooperation to sensors and the internet of things. Locating and tracking inefficiencies has never been as cost effective as it's today.

DATA SUPPORTS (CIRCULAR) BUSINESS

The advancements and increasing use of new technologies such as artificial intelligence, machine learning, big data, the internet of things, blockchain, robotics and autonomous systems are rapidly changing our world. These technologies can, for example: help to track inefficiencies and measure performance, optimise supply and demand through foresight, support smart manufacturing and recycling processes, and enable better traceability[1].

What is common for all of these technologies is that they are centred around data. By gathering, organising, exchanging and using data, new ICT-technologies foster a circular data economy.

Data is a requirement for informed decision-making. It influences how to design, produce, use and dispose things. It is central to circular economy because it allows an exchange of information throughout the value chain, from the manufacturer to the end user, which supports such things as reuse, remanufacturing, and recycling.

Businesses should actively get involved in data sharing – either by making use of it internally to optimise operations and to innovate new circular economy offerings, or by supporting other organisations with their data needs.

Sources: [1] Liikenne- ja viestintävirasto Traficom (2020): Selvitys ICT-alan nousevien teknologioiden vaikutuksista ympäristön- ja ilmastonmuutokseen

SITRA

NEW TECHNOLOGIES AND DATA AS ENABLERS 2/2

Types of material and traceability data[1]

- Material content
- Interfaces of different materials
- Origin of the materials
- Proportion of recycled materials in a product
- Product design specifics
- Resources used in manufacturing

Such data is crucial for determining whether the product can be reused, repaired or remanufactured and for knowing how to recycle the product.

Types of product performance data[1]

- Sales prices
- Take-back prices
- Rental frequency
- Customer preferences
- Product usage (how often is the product used)
- Produce damages

Access to product usage data is especially important for the sharing economy and different producer ownership models.

Sources: [1] Danish Business authority (2021): Looping on data – webinar material; [2] Kasvuryhmä (2019): Kasvua kiertotaloudesta –työkirja; [3] International Federation of Robotics (IFR) (2020): IFR Press Conference

SITRA

THE NEW ECONOMIC RATIONALE

Investments are increasingly directed to increase circular businesses and projects. The financial sector is starting to embrace the circular economy opportunities, with new instruments being introduced and tenfold growth taking place in private market funds growth –with promising results. This, combined with the new EU taxonomy and changing customer behaviour shows that sustainable companies are desired and often outperform their competitors.

Spinnova, a circular economy company that makes textile fibre from paper pulp and leather waste, was successfully listed on the stock exchange in 2021 with a total value of around EUR 100 million.

Public equity funds with the circular economy as a sole partial investment focus on average performed

5

percentage points better

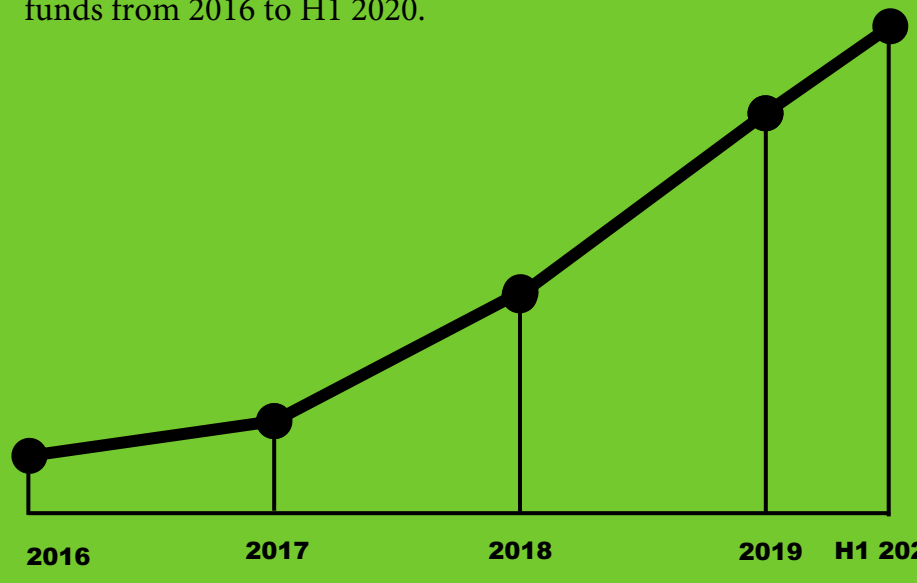
better than their benchmarks in H1 2020*.

In 2020, these funds included: BlackRock, BNP Paribas, Candriam, Cornerstone Capital Group, Credit Suisse (two funds), Decalia, Goldman Sachs, NN Investment Partners and RobecoSAM.

NUMBER OF PRIVATE MARKET FUNDS WITH A CIRCULAR ECONOMY FOCUS

Conservative estimate. Includes venture capital, private equity, and private debt funds.

10x increase in the number of private market funds from 2016 to H1 2020.



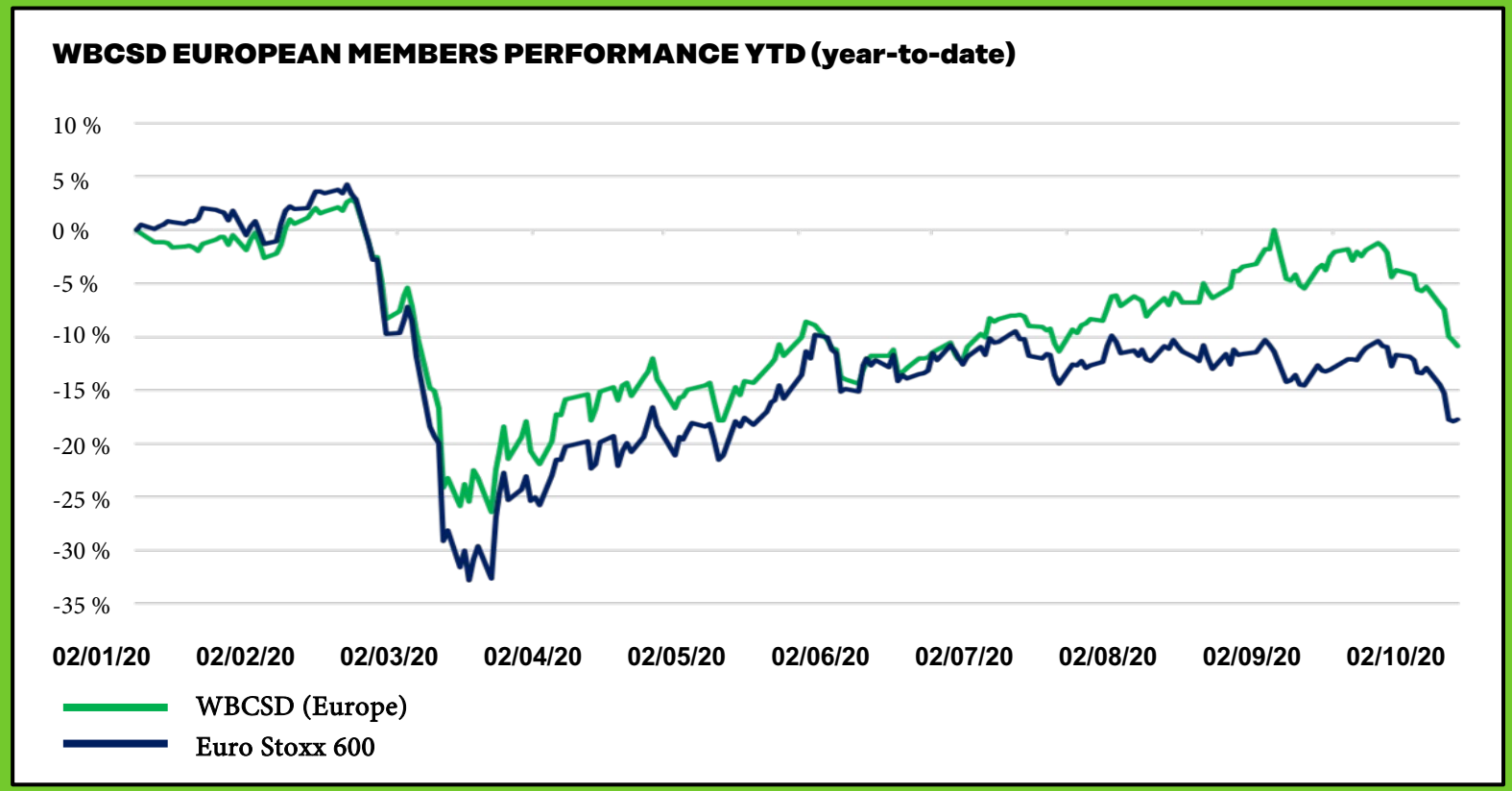
Sources: [1] Atomico (2019), State of European Tech; Ellen MacArthur Foundation (2020): Financing the Circular Economy; organisation webpages; The Chemical Industry Federation of Finland, Sitra & Business Finland (2020): Sustainable and circular business models for the chemical industry

SITRA

INVESTING IN SUSTAINABILITY PAYS OFF

Companies that invested earlier in Environment, Social, Governance (ESG) factors have proven to be more resilient in times of crisis, including the Covid-19 pandemic. According to the World Business Council for Sustainable Development (WBCSD), listed companies that take sustainability issues seriously have outperformed the markets across various geographies during the pandemic. These companies have been less vulnerable to systemic risks and more resilient to shocks. In Europe, the WBCSD's listed member companies beat the Stoxx Europe 600 benchmark by 7%.

WBCSD members include about 200 forward-thinking companies that are committed to advancing the global sustainability agenda. Almost half of these members are in Europe (46%) and a fourth in North America (23%).



Sources: World Business Council for Sustainable Development (2020): Increasing risk management & resilience through ESG investing; and WBCSD webpage

SITRA

WHAT DOES THIS MEAN FOR MY BUSINESS?

Based on what you have learned in this chapter, think about why the circular economy is relevant to your business. What are the risks and opportunities that it brings to your business. Recheck the overview of the changes in the business environment on page 15.

Category	**What risks relating to the changing business environment can you identify today?** An example of risk: we have no data of the sustainability of our products. But having it will be a legal requirement in the near future. This is an operational risk that might lose us our license-to-operate and eventually stop our operations.	**What opportunities relating to the changing business environment can you identify today?** An example of an opportunity: We collect data on the sustainability of our products and company. This enables us to demonstrate their sustainability compared to our competitors.
License to operate (things must be in order)		
Resilience and Operations (cost savings)		
Growth and Differentiation (revenues, increased customer value)		

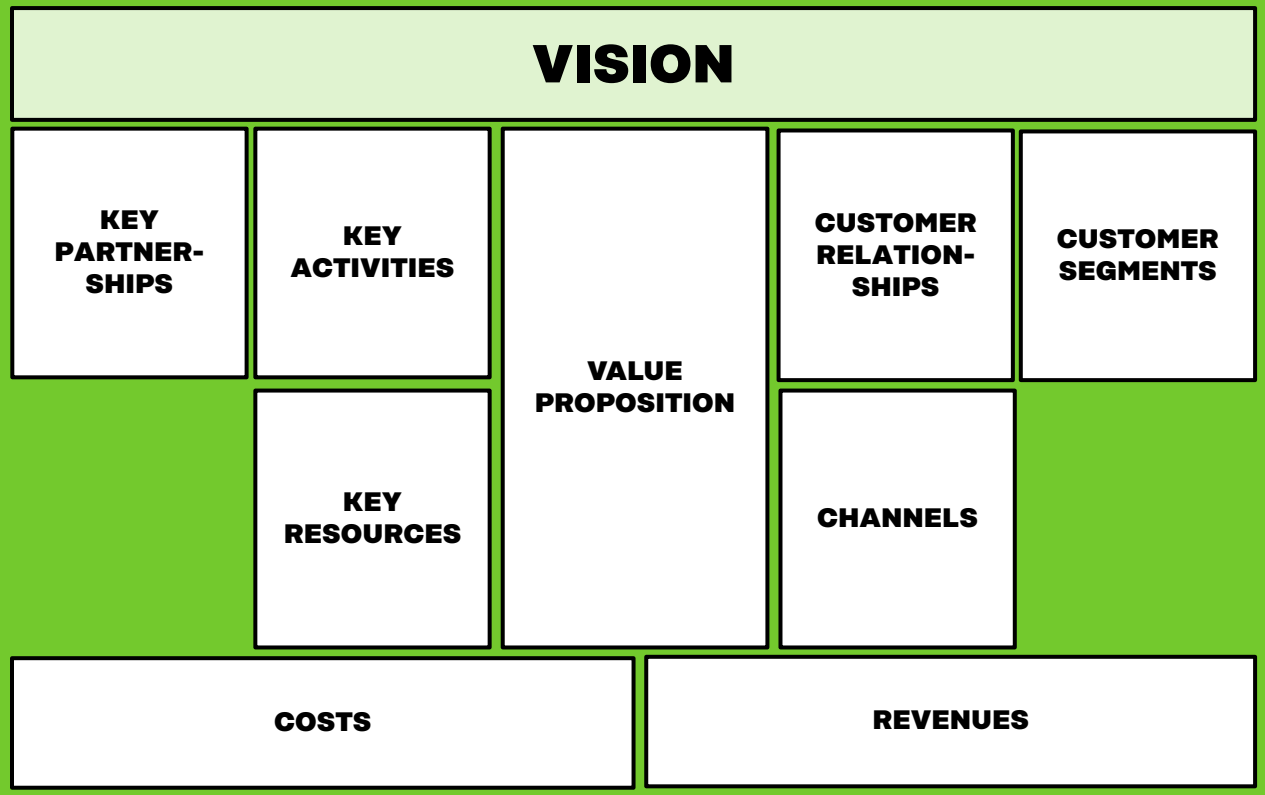
Sources: Deloitte Insight

THE BUSINESS MODEL CANVAS

Start by drafting your company's circularity vision on the business model canvas. The questions below will help you get started.

KEY QUESTIONS TO DEFINE YOUR VISION:

- What is the most important thing to your business in the circular economy?
- Where do you want to be in the circular economy in the next 10 years?
- How ambitious will your vision be? Could you become an industry leader in circularity?
- How will your vision position you in the market? How will it differentiate you from your competitors?
- Is your vision tangible and measurable?
- Will you know for certain when/if you achieve your vision?



Sources: Deloitte Insight

SITRA

2. UNLOCK THE CIRCULAR OPPORTUNITIES

Here you can check out the opportunities that exist for the circular economy and the practical new value it can create for your business.

AFTER READING THIS CHAPTER, YOU WILL:

- Understand how the circular economy turns inefficiencies into new business value.
- Be able to identify inefficiencies in your value chain and start exploring your circular economy opportunities.

Circular is the brand new brand new!

SUMMARY OF CHAPTER 2

WHAT BUSINESS OPPORTUNITIES DOES THE CIRCULAR ECONOMY OFFER? Circular economy business models offer growth potential in every sector. The global transition towards the circular economy is an opportunity for individual companies to develop their existing business, expand into new markets and create sustainable growth.

The global economy is highly inefficient, with only 8,6% based on circular economy. Typical inefficiencies in value chains include: use of unsustainable materials, underutilised capacity, premature end of product life cycle, loss of end of life value, and unexploited customer relationships.

The circular economy provides companies varied new business opportunities by addressing these inefficiencies and turning them into new value. New value can be created through growing revenues, brand enhancement, and by reducing costs and/or risks. The circular economy also substantially reduces emissions and resource use, creating positive environmental and social impacts that can also translate to business benefits. Companies can tap this new value by changing their business logic towards offering outcomes instead of products, and increasing customer centricity throughout their business.

Circular economy models offer growth potential in all sectors. Sectors with the highest potential for growth in the short-to-medium term are plastics and packaged goods, fashion and textiles, food and agriculture, electronics, and automotive, transport and logistics.

Check out your company's value chain to detect inefficiencies that you can turn into new value and transform your business!

ONLY 8,6% OF THE GLOBAL ECONOMY IS CIRCULAR

The global economy uses materials inefficiently: 92% of the materials extracted don't return to the economy after their first life[1]. The reasons lie in our linear, short-term thinking: the use of unsustainable materials, underutilised capacity, prematurely ending product lives, wasted value at the end-of-life, and buying input instead of output.

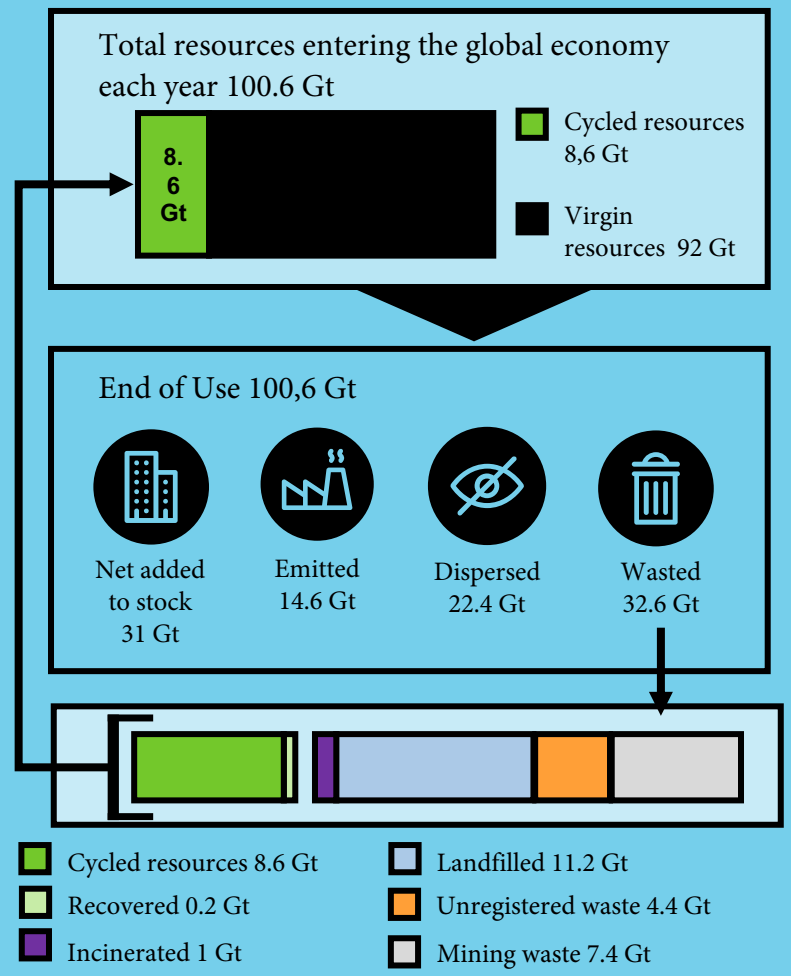
The circular economy is a new way of thinking about materials, and it has the potential to reshape the global economy and fix inefficiencies.

Each year, 100.6 Gt of materials enter the global economy. They are further processed to produce everything around us – infrastructure, consumables, food, housing, medicine, mobility and technology. Only 8,6% of materials is recycled from the global economy, meaning they are not from virgin natural resources.[1]

Of the materials entering the global economy, 31 Gt remains in use, for example materials embedded in buildings and infrastructure. The rest is either emitted (14.6 Gt), dispersed in the environment as unrecoverable waste (22.4 Gt), or collected as waste (32.6 Gt).

The majority of the collected waste is lost in landfills or incineration and not recycled back to the economy.

GLOBAL MATERIAL FLOWS



Sources: [1] Circle Economy (2022): Circularity Gap Report

SITRA

A WORLD OF INEFFICIENCIES

Inefficiencies exist in all areas of our economies and societies. Vast amounts of valuable materials are wasted or underused.

A consumer power drill is unused on average **97%** of the time.[1]

The average occupancy rate of cars is only **5%**[1]

An office's occupancy rate is about **40%**[1]

The average American household **300 000 items**[1]

In Finland, an ordinary household is estimated to have between **10 000 – 50 000 items.**[1]

10-15% of construction materials ends up in waste during the construction process[1]

50 %
of all plastics are single-use.[3]

60 %
of clothing is landfilled or burnt within years of being made.[3]

30 %
of edible food is thrown away3[3]

Sources: [1] Lacy, Long & Spindler (2020): The Circular Economy Handbook: Realizing the Circular Advantage; [2] Helsingin Sanomat (2018): Ihminen pärjäisi 250 esineellä, mutta peruskodissa niitä on 50 000 – tutkija huomasi, etteivät tavarat enää palvele nykyihmistä vaan päinvastoin ; [3] Ellen MacArthur Foundation (2020): Financing the Circular Economy

SITRA

TYPES OF INEFFICIENCIES IN A VALUE CHAIN

There are inefficiencies at all value chain stages, from sourcing materials and product design to product use and end of life of product materials. These inefficiencies can be categorised into five types of inefficiencies, which are presented below. Circular companies create business value by addressing these inefficiencies and unlocking unused opportunities. See the next page for practical examples on addressing these inefficiencies.

THE TYPES OF INEFFICIENCIES IN THE VALUE CHAIN

1. UNSUSTAINABLE MATERIALS
Material and energy that cannot be continually regenerated

2. UNDERUTILISED CAPACITIES
Underutilised or unusual products and assets

3. PREMATURE PRODUCT LIVES
Products are not used to fullest possible working life

4. WASTED END-OF-LIFE VALUE
Valuable components, materials and energy are not recovered at disposal

5. UNEXPLOITED CUSTOMER ENGAGEMENTS
Sales organisation focus on selling functionality of products rather than addressing the customer problem

Sources: [1] Adopted from: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the figure: Accenture: Lacy & Rutqvist (2015). Waste to Wealth: The Circular Economy Advantage

SITRA

BUSINESS VALUE FROM INEFFICIENCIES

This table shows how some of the leading circular economy companies have turned inefficiencies into business value.

INEFFICIENCIES	COMPANY
1. Unsustainable materials	About third of materials used in a new **Volvo** truck are recycled, and up to 90% of the truck can be recycled at the end of its life, thanks to labelling components for easy identification and dismantling. In the longer-term, Volvo aims to comprehensively replace unsustainable materials with recyclable materials, driving its whole value chain towards circularity and use of sustainable materials.
2. Underutilised capacities	Cars are in use only 5% of the time, with an average of 1,5 people using the car. **BlaBlaCar** has turned this inefficiency in to an opportunity by creating a platform that connects drivers and passengers willing to travel together and share the cost of the journey. The French startup has grown into 90 million members in 22 countries. Its market valuation is in billions and has reported a total of 1,4 billion euros in cost savings to users (since its creation), and 1,6 million tonnes of CO2 savings in 2018, thanks to the relative efficiency of full cars versus alternative forms of transport. BlablaCar creates 120 million hook-ups every year.
3. Premature product lives	The abundance of abandoned, used, high-quality clothing led the Finnish startup **Emmy** to create a turnkey model to sell and buy used clothes. Emmy collects used clothes and sorts, photographs and prices them to sell online. It pays the seller the selling price minus a commission and delivery charge. Emmy has a big impact by keeping clothes in use instead of being binned.
4. Wasted end-of-life value	**Neste** uses oil and fat waste and residues – examples of relatively high value waste generated from various small sources – to produce renewable traffic fuels, and is planning to expand the NEXBTL technology to other chemical products, such as plastic raw materials. Technological developments and innovative logistical solutions make it increasingly viable to recover waste streams, even though they are dispersed and, say, come from households.
5. Unexploited customer engagements	**Michelin** started offering tires as a service (the pay-per-mile model) to its truck customers. This led to a stronger customer relationship and an opportunity to offer new services to fulfil unmet customer needs. The tire manufacturer eventually launched Michelin solutions, with a revenue potential of 3 billion euros in 10 years. The service includes fuel efficiency enhancement, driver coaching / driver assistance, services associated with tire maintenance, services for fleet management and tire recycling services. The manufacturing company has started a transformation to a resource-efficient, data-driven service company.

– Sources: Company webpages; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries

SITRA

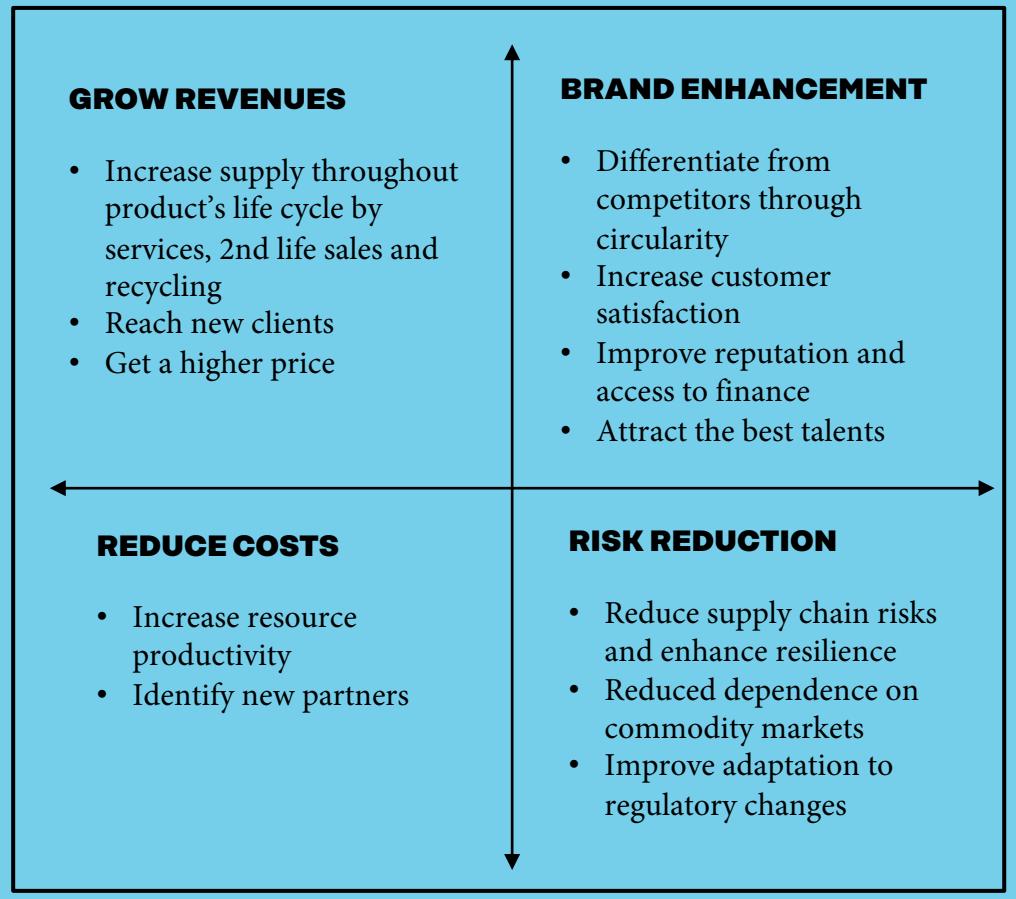
THE CIRCULAR ECONOMY CREATES BUSINESS VALUE

Addressing the inefficiencies discussed in the previous pages creates different types of business value for companies: the potential to increase revenues and enhance the brand position, as well as reducing costs and risks of business. Moreover, tackling the inefficiencies brings remarkable benefits to the environment and society.

To turn the inefficiencies into actual business value, companies need to start using circular business models. In the next chapter, we take a closer look at the circular business models and see how to adopt them.

Businesses should actively get involved in data sharing – either by making use of it internally to optimise operations and to innovate new circular economy offerings, or by supporting other organisations with their data needs.

Different ways to generate new value from the circular economy



Circular economy business models can reduce carbon footprint up to

65%

depending on the sector[2]. Individual solutions have even higher reduction potential.

Circular solutions can have positive societal impacts.

Sources: 1 Adopted from - Nordic Innovation & Sitra (2021): The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the figure: Accenture: Lacy, Long & Spindler (2020) The Circular Economy Handbook: Realizing the Circular Advantage; 2 Deloitte: Circular economy potential for Climate Change Mitigation (2016); Ellen MacArthur Foundation (2019): Completing the picture: How the Circular Economy Tackles Climate Change

SITRA

VALUE THROUGH CUSTOMER-CENTRICITY

In order to unleash the full value potential of circularity, companies should aim to become more outcome-oriented and customer-centric. This requires changes in skills and competences, ways of interaction, processes and tools, and metrics used. Identify and list ways you can start to move to outcome orientation and increased customer centricity. What opportunities does this present in each stage of the value chain?

	REQUIRED CHANGES TO ENABLE OUTCOME ORIENTATION	REQUIRED CHANGES TO FACILITATE CUSTOMER CENTRICITY
INFORMATION ON COSTS	From features → To big picture Information on the cost impact of total solutions (e.g. product as a service) and modifiable products is needed in order to provide these.	From production → To value-chain Highest customer value is achieved when the use of capabilities throughout the value chain is optimised for the sales team to have a close exchange with partners
INTERACTION	From silos → To one-company The sales team needs to, e.g., forward customer needs to the design department and request input on the feasibility of customer wishes.	From inside-out → To outside-in The sales team needs to embrace external information to advance solutions instead of pushing product information and products out to the market
PROCESSES & TOOLS	From stand-alone → To integrated Integrated databases are required to get easy access to information from the whole product lifecycle	From internal → To collaborative Processes for continuous engagement throughout the product lifecycle are required, and the exchance of data needs to be enabled through, e.g., platforms
METRICS	From snapshot → To longitudinal Performance indicators and connected incentives need to be forward-looking and consider development over time	From product → To customer Sales volumes need to be measured per customer instead of per product or product family to optimise the value delivered to a customer

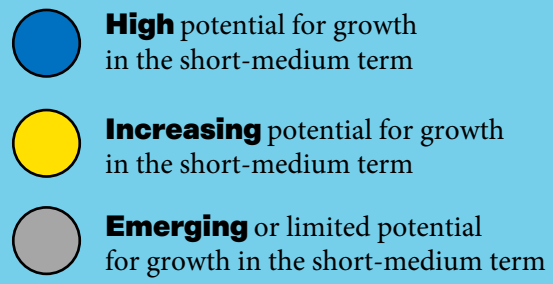
Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries

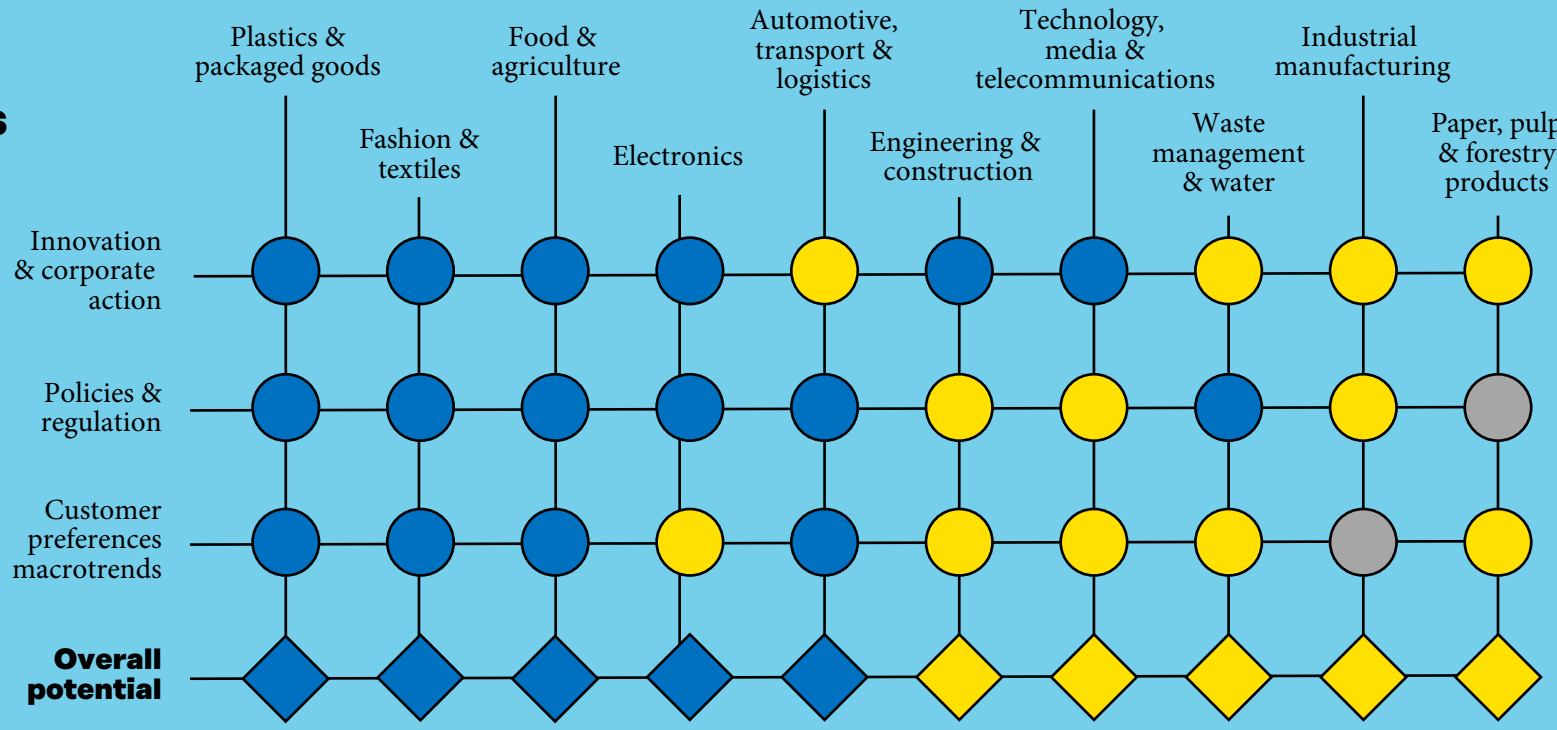
SITRA

GROWTH POTENTIAL EXISTS ACROSS SECTORS

A recent study by the Ellen MacArthur Foundation assesses the potential of the circular economy in 10 key sectors[1]. There are also remarkable opportunities in other industries, including retail, consumer products, accommodation services and the tourism industry. In principle, the circular business models are applicable to all sectors. All sectors are affected to some extent by the changing business environment – for example in terms of regulations and customer preferences).

HEATMAP WITH QUALITATIVE ASSESSMENTS OF CIRCULAR ECONOMY GROWTH POTENTIAL IN 10 KEY SECTORS





Sources: [1] Ellen MacArthur Foundation (2020): Financing the Circular Economy

SITRA

TOOL: ASSESS INEFFICIENCIES AND OPPORTUNITIES

You can start with the parts of the value chain over which you have the most control. But ideally you will be able to assess the dynamics of the whole value chain. You can continue to identify your circular opportunities further in the next chapter.

What are the key sources of waste or unused opportunities in your company's value chain?	What opportunities do these inefficiencies present in your current business. Think of your current customers: how can you turn these inefficiencies into customer value? Are there any completely new opportunities arising from the inefficiencies you identified in the value chain?	These questions can help in identifying inefficiencies.
◯ Unsustainable materials		Do you know the material composition of your products? What percentage of your material inputs are circular (completely renewable materials, renewable bio-based materials, other recyclable materials)?
◯ Underutilised capacities		What are the utilisation rates of your key assets (owned by you, shared ownership or owned externally)? Think beyond machinery of any key resources or even competencies.
◯ Premature product lives		How well do you know the life cycle of your products? Where are the areas of greatest resource intensity and waste leakage in your product and service portfolio?
◯ Wasted end-of-life value		Do you know what happens to your products after use phase?
◯ Unexploited customer engagements		Do you truly understand your customer needs, and how they develop throughout the use phase of your product or service? Check page 40 and how you can become more customer-centric and offer tangible outcomes

Sources: Deloitte insight

3. DEFINE YOUR CIRCULAR BUSINESS MODEL

In this chapter, you will learn how to develop your business towards the circular economy.

AFTER READING THIS CHAPTER, YOU WILL:

- Understand the five circular economy business models and how to apply them in practice.
- Be able to identify the best circular business model for your business.
- Start building your concrete circular economy business idea around circular economy business models.
- Understand the most common challenges of transforming to a circular economy business model.

Time to add value!

SUMMARY OF CHAPTER 3

WHAT ARE CIRCULAR BUSINESS MODELS? WHICH OF THEM IS RIGHT FOR ME? HOW DO I APPLY THEM? How to achieve the business benefits offered by the circular economy and address identified inefficiencies? Short answer: sticking to one or more circular economy business models

There are five circular business models by which companies can turn the inefficiencies in their value chains into new value. Each of these business models are unique in their business benefits and financial impacts, as well as their effects on operations and the ease of implementing them.

This chapter will give an overview of the five business models, considerations on how to start applying them, case examples of companies already doing it, and tools to define the most suitable circular business model for your business. At the end of the chapter, some common challenges with applying circular business models are also presented.

Circular business models:

1. **Circular inputs**
2. **Sharing platforms.**
3. **Product as a service:**
4. **Product use extension**
5. **Resource recovery**

The skills required to deploy models are discussed in Chapter 4 and practical piloting in Chapter 5.

CIRCULAR BUSINESS MODELS

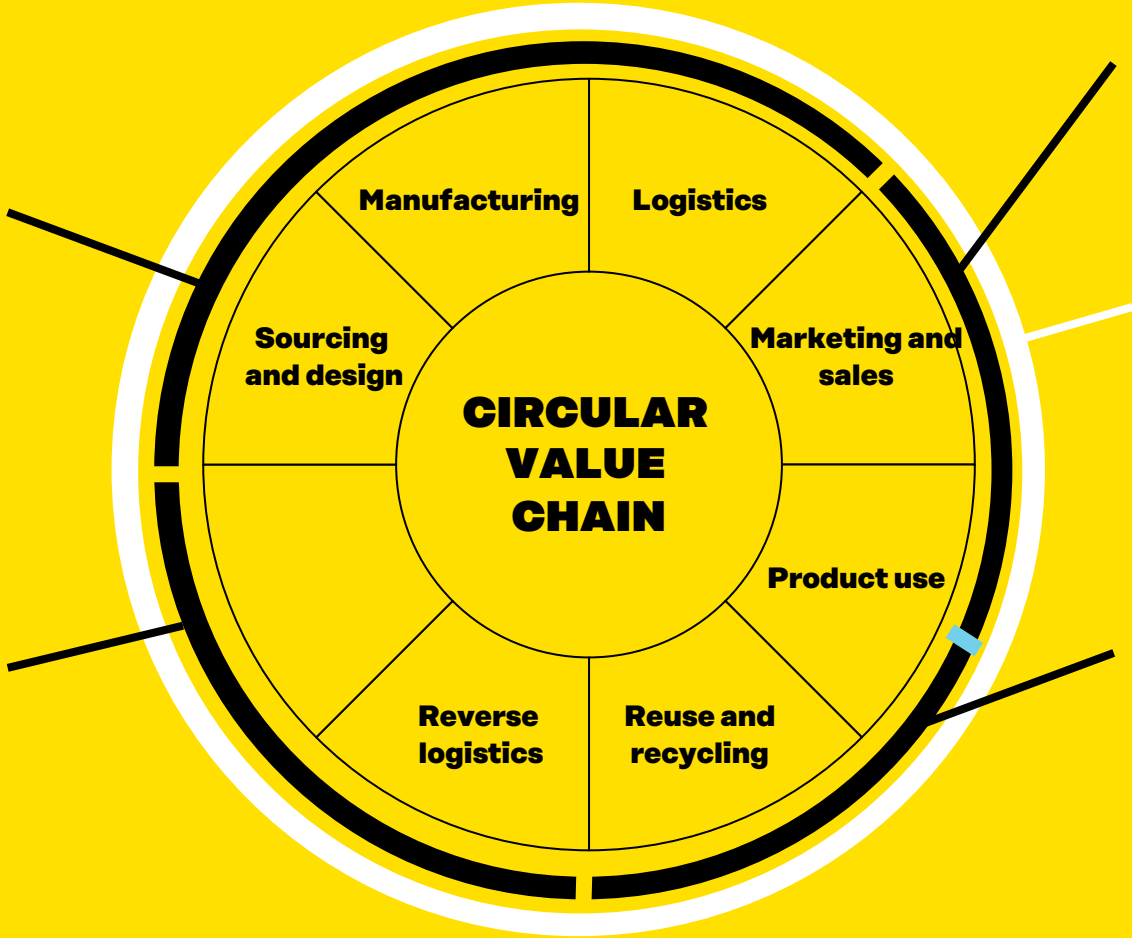
Circular economy business models address inefficiencies and create value for your company.

CIRCULAR INPUTS

Use recycled and bio-based materials and renewable energy. Design sustainable, repairable and recyclable products.

RESOURCE RECOVERY

Recovery of usable resources or energy from waste or by-products



SHARING PLATFORMS

Digital platforms enable increased utilisation of goods and resources through such things as leasing, co-use and sharing.

PRODUCT AS A SERVICE

The customer pays for a particular function or performance rather than owning a product. Revenue accrues from service or lease agreements.

PRODUCT LIFECYCLE EXTENSION

Achieved through repair, maintenance, upgrading, resale and remanufacturing

Sources: Adopted from Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the figure: Accenture: Lacy, Long & Spindler (2020): The Circular Economy Handbook: Realizing the Circular Advantage & Accenture: Lacy & Rutqvist (2015). Waste to Wealth: The Circular Economy Advantage

SITRA

BENEFITS OF CIRCULAR ECONOMY BUSINESS MODELS

Circular business models help generate more revenues and profits with fewer resources. The table below roughly illustrates the financial implications of each circular business model.

BUSINESS MODEL	BUSINESS BENEFITS	REVENUE IMPACT	MARGIN IMPACT
CIRCULAR INPUTS	Increased resource productivity (use waste streams) Reduce complexity through modular design Reduced emissions and energy usage	N/A	++
SHARING PLATFORM	Increase sales margins Charge transaction fees Sell add-on services	+	++
PRODUCT AS A SERVICE	New revenue: growth in share of wallet, entry into new segments Increased sales margins	+++	++
PRODUCT LIFECYCLE EXTENSION	Increase service sales (maintenance & repair) Increase sales of spare parts Sell second hand products/materials	+++	++
RESOURCE RECOVERY	Reduce material costs (volumes), sell by-products as feedstock Reduce disposal costs	+	+

Sources: Adopted from Sitra & Technology Industries Finland (2020): Circular economy business models for the manufacturing industry – Circular Economy Playbook for Finnish SMEs; Original source of the figure: Accenture: Lacy, Long & Spindler (2020): The Circular Economy Handbook: Realizing the Circular Advantage

THE SUB-MODELS

Each of the circular business models includes one or more sub-models. The table below presents these sub-models and describes what they mean in practice. They give a more in-depth idea of what types of circular businesses there are, and what your company could do.

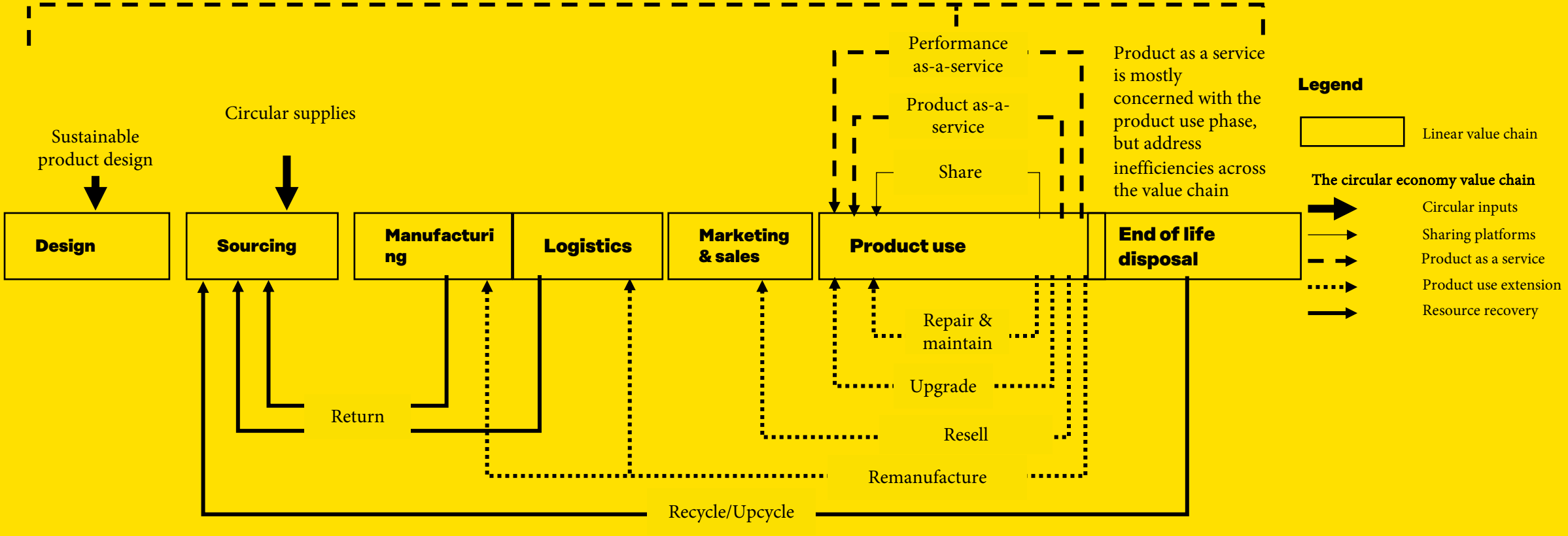
BUSINESS MODEL	SUB-MODEL	DESCRIPTION
CIRCULAR INPUTS	Sustainable product design	Design products that are durable and easy to repair (e.g. modular)
	Circular supplies	Use recyclable materials in production, e.g. renewable and bio-based materials, chemicals & energy to increase recovery rates
SHARING PLATFORM	Share	Develop solutions that enable increased use of capacity
PRODUCT AS A SERVICE	Product as a service	Offer customers to use a product against a subscription fee or usage based charges instead of owning it
	Performance as a service	Offer customers to buy a pre-defined service and quality level and commit to guaranteeing a specific result
PRODUCT USE EXTENSION	Repair & maintain	Deliver repair and maintenance services to extend the life of existing products in the market
	Upgrade	Improve product performance by upgrading existing components with newer ones
	Resell	Resell products that have reached their useful life to second and third hand markets
	Remanufacture	Take back and perform industry-like restoration or improvement of original functionality of products and remarket them with lower price
RESOURCE RECOVERY	**Recycle / upcycle**	Collect and recover materials of end-of-life products and reuse them in own production or sell as feedstock
	Return	Return wasted parts and materials to the source (e.g. waste and by-products from own production)

Sources: Adopted from Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the figure: Accenture: Lacy, Long & Spindler (2020) The Circular Economy Handbook: Realizing the Circular Advantage

SITRA

SUB-MODELS TURN VALUE CHAINS CIRCULAR

Here you see a linear value chain and how the sub-models of the circular business models create new loops in the value chain and turn it circular. Many circular economy opportunities are in the product use phase, bringing companies closer to their customers.



Sources: Adopted from Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the figure: Accenture.

SITRA

TOOL: POSSIBILITIES AT DIFFERENT STAGES OF THE VALUE CHAIN

Draw your linear value chain on paper and consider which sub-models could help develop your business in line with the circular economy. Where would you start? What opportunities do you spot at different stages of the value chain?

Design	Sourcing	Manufacturing	Logistics	Marketing and sales	Product use	End of life disposal

Sources: Deloitte insight

SITRA

HOW CAN I GET STARTED WITH A CIRCULAR BUSINESS MODEL?

The answer is by nature company specific but there area some general tips that will help you discover what circularity could mean to you.

THREE STEPS TO START THINKING ALONG THE PRINCIPLES OF THE CIRCULAR ECONOMY	How to do it in practice?
1. Source products and materials from the economy and markets, not from ecological reserves. Develop side streams into high value products.	Look for suppliers providing recycled materials, or reused parts or products, rather than virgin feedstock.
2. Create value for customers by 1) adding new value to existing products and materials 2) by add-on sales and new services that meet unrealised customer needs.	Sell outcomes rather than products or materials; use restorative technologies (like upcycling) and design processes to add value to existing materials.
3. Create valuable inputs for businesses beyond your customer – start developing an ecosystem lens and create new partnerships.	Different companies´ products and services complement each other in the circular economy value chain. The ecosystem drives innovation and can provide access to such things as new know-how or material flows. Start dialogue with companies in your supply chain or in the same industry to promote circular economy throughout the value chain.

Sources:: Board of Innovation (2021): Business models that work in circular economy; Deloitte Insight

CIRCULAR INPUTS 1/2

The circular inputs business model involves replacing linear, non-recyclable resources in the supply chain with circular ones, through circular materials use and design.

This business model is the base for others, as it focuses on the ingredients and concepts that go into your product at the design, sourcing and manufacturing stages and on energy use. Typical company examples that use this model include, for example, renewable energy providers and companies that base their products in bio-based materials.

Companies are increasingly looking for sustainable, circular inputs to improve their product's environmental performance and meet their sustainability targets. In some sectors, circular inputs businesses are highly driven by regulation, for example mandatory biofuel blending.

THE IMPACTS

1. Emissions reduction through a more efficient use of more sustainable materials. Generating circular inputs for businesses from waste products is essential in closing the materials loop. Elimination of wasted resources or the uptake of renewable resources positively contributes towards environmental and social wellbeing.

Consider the example of moving from extracting oil as the feedstock for your product, to collecting waste organic fats and grease as feedstock for the same product.

2. Enabling a fully circular value chain. The model allows you to reduce the use of virgin materials as well as the amount of waste. It also allows cooperation between companies. For example a company's core business can be the production of sustainable raw materials for another company.

Advanced companies can go beyond zero-waste and aim to be resource-additive – for example upcycling waste streams to become new material streams.

Sources: 1Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte insight

CIRCULAR INPUTS 2/2

CIRCULAR SUPPLIES CAN BE DIVIDED INTO THREE CATEGORIES:

1) Using recycled material as raw material

Man-made materials that can be recycled infinitely. For example, any recovered or recycled material such as glass, steel or aluminium

2) Renewable bio-based materials

That are sustainable produced and recyclable. For example, innovations in chemistry, such as bioplastics or algae-based edible packaging

3) Renewable resources and energy:

Such as water from rainwater harvesting, wind energy or solar energy

Where is the business model relevant?

Circular inputs is one of the most used circular business models, as companies across industries are realising the value circular design brings and the growing demand for circular materials. The application of the circular inputs business model is visible in almost all industries, including, but not limited to: automotive, manufacturing, textiles, construction, packaging, food, chemicals and mining and metals industries.

MY OPPORTUNITY

- Is this business model relevant to my business?
- How could I use circular design to create new customer value in a certain product category?
- Can I make (some) of my materials circular or offer my by-products to new partners?
- What types of collaborations and concepts are needed in order to access circular feedstock at scale?

Sources: 1Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte insight

CASE STUDY: PROTIX UPCYCLING FOOD WASTE TO PROTEIN 1/2

Protix is the global leader in insects farming. The company harnesses the latest technology, artificial intelligence, genetic improvement programmes, and robotics, for efficient and sustainable protein production. Black soldier flies are fed with upcycled food waste and they can be used as sustainable animal feed or food

PROBLEM/ INEFFICIENCY

The global food system is unsustainable and imbalanced, and efforts to upcycle food appear difficult to scale. Moreover, the expansion of agricultural land is driving biodiversity loss globally. Producing animal protein for feedstock is inefficient due to the feed-to-food conversion – it takes feed to create desired food output. For example, one-third of the world's ocean fish catch used for animal feed, a potential problem for marine ecosystems and a waste of a resource that could directly nourish humans.

BUSINESS SOLUTION

Protix has developed industrial scale insect production that can deliver sustainable protein for animal feed or food. Insects require minimum space, grow quickly, and can be fed with food and agricultural waste. The natural ability of the flies to upcycle food waste can help to create a circular food system, one of the most problematic industries that exist. Protix offers several products including those suitable for feeding, for example, chicken, shrimp, fish, and pets. Protix recently opened a 35 million euro commercial scale production facility in Netherlands. The by-products of the insect production are also not wasted, as the food fibres, insect skins and droppings make an excellent all-natural sustainable soil improver that Protix also sells under its own brand.

Sources: Protix's webpage; Deloitte insight

CASE STUDY: PROTIX UPCYCLING FOOD WASTE TO PROTEIN 2/2

KEY IMPACTS

Protix is a circular economy native company, as their whole business has been based on circular economy principles from the start. The business has been designed to use circular inputs (food waste), upcycle them via natural processes (insects) and sell the final product (insect protein) as a substitute for unsustainable materials (such as overfishing and the land-use problems of soy farming) to clients in various industries. The process has no major waste sources and it enables more sustainable animal-protein production and pet-keeping, among other applications.

Protix is in a high-growth business. Black soldier fly farming is increasing around the world with various companies and big investments in production facilities. While quantitative impact assessments are still on the way, the impact is big. A facility in Nestle France is estimated to avoid 25,000 tons of CO2 per year.

Sources: Protix's webpage; Deloitte insight

WHAT CAN WE LEARN FROM THE CASE?

- Waste can be a source of profitable business and an important circular economy resource – material innovations, biomimicry and technologies allow the upcycling of materials and regenerative business models.
- While detailed studies have not yet been published, the circular business model of Protix arguably indirectly halts biodiversity loss by alleviating two main drivers of biodiversity loss: overfishing and agricultural land use. Put simply, collected waste replaces the need for the need for pond cultivation for fishing feed (conversion rate about 25%).
- Protix reduces waste and emissions and helps industries switch to sustainable materials – the company is also involved in enabling the circular economy for surrounding industries.

MORE EXAMPLES OF COMPANIES WITH CIRCULAR INPUTS

Company
SOILFOOD: RECYCLED NUTRIENTS AND SOIL IMPROVERS FOR AGRICULTURE. Soilfood makes recycled nutrients and soil improvers from industrial and agricultural by-products. The solution improves soil quality and agricultural productivity. Read more about the case on Sitra´s website.
BETULIUM: POLYMERS FROM AGRICULTURAL WASTE. Betulium's technology makes it possible to produce the desired polymer structures from agricultural side streams, for example from the manufacture of potato starch or sugar. Read more about the case on Sitra´s website.
BC MATERIALS: RE-USING LOCALLY EXCAVATED SOIL FOR BUILDING MATERIALS. BC Materials recovers surplus soil from construction sites and turns it into construction materials. Read more about the case on Sitra´s website.
KOTKAMILLS: BIODEGRADABLE PAPER CUPS AND PACKAGING. The coating developed by Kotkamills offers a way to produce recyclable, biodegradable cardboard packaging – after use, the fibres are easy to extract and recycle as raw materials. Read more about the case on Sitra´s website.
THE INFINITED FIBER COMPANY: TEXTILE FIBRES FROM RECYCLED MASS. Infinited Fiber's technology turns textile, paper, and cardboard waste to a cotton-like, soft textile fibre based 100% on cellulose. The company sells technology licences for producing the fiber. Read more about the case on Sitra´s website.
SAFI ORGANICS: AGRICULTURAL WASTE INTO FERTILISERS. Safi Organics' solution turns the agricultural waste streams of Kenyan farmers into customised, carbon-negative fertilisers. The technology can be decentralised so that the fertiliser production can be done locally. Read more about the case on Sitra´s website.

Sources: Sitra´s online publications

SHARING PLATFORMS 1/2

Sharing platforms are digital market places that increase the accessibility and use of assets by incentivising a sharing economy.

A sharing platform business focuses on facilitating an exchange of resources between the users of the platform. This can mean the resale, rental, donation or borrowing of resources from each other. The sharing platforms' business domain is relatively new, and highly dependent on digital technologies, which can connect the supply and demand of resources. Sharing platforms are key businesses enabling the sharing economy.

A simple example of a sharing platform is a peer-to-peer rental service. If an asset such as a car or a boat is only seldom used, the owner can put the vehicle on a platform, which gives other users access to it. The other users pay according to their usage and the company typically charges a percentage fee of the payment. In the business-to-consumer (B2C) space, platforms often take care of insurance, lowering the threshold of listing an asset on a shared platform.

KEY IMPACTS OF THE BUSINESS MODEL

Integrating the use of sharing platforms to your company's operations, or starting up a sharing platform business, has several effects to consider.

1. Maximises asset utilisation. Sharing platforms can decrease the down-time of assets by giving more people or businesses access to the same resources. The users that share their resources can gain more value from what they own, and for example cover the costs of upkeeping the asset.

2. Makes assets more accessible for users. People or businesses can gain access to assets they may not be able to afford to access otherwise. This can substantially contribute towards social cohesion and community wellbeing.

3. Drives resource efficiency and has significant CO2 reduction potential. Sharing platforms cut the need for new production, either when idle capacities are redistributed, or the need of purchasing new assets is replaced with shared assets. This can have a significant impact on lowering the CO^2 emissions associated with the production of the asset. However, non-circular platform economy companies, such as Uber, may increase the total supply and consumption, resulting in increased CO2 .

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

SHARING PLATFORMS 2/2

Companies have four different basic ways to be part of this business model:

1. Offer your unused resources to an external sharing platform
2. Offer your unused resources on your own platform
3. Build a sharing platform and broker the supply of unused resources and demand from users
4. Become a user of a sharing platform – switch to using an asset only when you need it instead of buying the asset

WHERE IS THE BUSINESS MODEL RELEVANT?

The sharing platform business model can be used for almost any resource that has a low usage rate.

Most typical examples include accommodation and vehicles (for example Airbnb, BlaBla Car) and the use of this model is especially common with startups in the B2C space. However, the model has lately become increasingly popular in the business to business (B2B) space and the industrial context. Sharing platforms and their predecessors have been popular for decades in resource scarce emerging markets, as in Africa and Asia. These growing markets have a high demand for easily accessible, affordable assets and services such as vehicles, machinery and tools as a popular example.

MY OPPORTUNITY

- Is this business model relevant for my business?
- Do I have underused resources to share on a platform?
- Could I attract new customer segments or serve the current ones more efficiently through a sharing platform?
- Could I enable and profit from the growth of other sharing platforms with complementary services (such as logistics, repair and maintenance, insurance…)?

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

SITRA

CASE STUDY: EXCESS MATERIALS EXCHANGE 1/2

Excess Materials Exchange was originally a Resources Passport – a standardised data format that gives resources an identity and stores information on their composition to promote the circular economy. The company has since expanded into a digital matchmaking platform through which companies can find new high-value reuse opportunities for their materials or waste.

PROBLEM/ INEFFICIENCY

Companies often find it difficult and time-consuming to find high-value reuse options for their excess materials or waste products, due to lack of active and trusted market places. The growth and scale of circular initiatives is also hindered by lack of available circular resources and transparency.

SOLUTION

The Excess Materials Exchange digital platform enables effective collaboration between companies to redistribute their excess resources and utilise other organisations' waste streams. The platform automatically matches the supply and demand of excess materials with their highest reuse options.

The technologies used include artificial intelligence, Hyperledger blockchain, and smart contracts. The matchmaking platform is supported by the Resources Passport that provides information on exchanged materials properties, where applicable. The platform also allows companies to track and trace the exchanged materials flows and evaluate the financial, environmental and social impacts of their matchmaking activities.

Sources: Excess Material Exchange's webpage; Sitra's webpage

CASE STUDY: EXCESS MATERIALS EXCHANGE 2/2

KEY IMPACTS

Companies that use the platform to redistribute their surplus materials benefit through eliminating materials disposal costs and generating extra revenue from sold materials. Using the platform also helps these companies to reach their recycling targets. More broadly, Excess Materials Exchange helps to transform current coincidental and relatively small scale circular economy practices into highly scalable and structural exchanges of materials across industries.

WHAT CAN WE LEARN FROM THIS?

- Most companies are eager to find new, high value re-use options for their surplus materials or (and especially) waste, if they are offered an easy and attractive way to do so.
- Having data on your products' material properties can help you to generate extra revenue through redistribution.

Sources: Excess Material Exchange's webpage; Sitra's webpage

More examples of companies with sharing platforms

Company
AIR FAAS: "AIRBNB" FOR FACTORIES. Combi Works has created the global AirFaas service, which enables the sharing of underused factory resources with other companies. The cloud-based system reduces the need to build new production facilities. Read more about the case on Sitra´s website.
SKIPPERI: PEER-TO-PEER BOAT RENTAL SERVICE. Skipperi enables boat owners y to rent out their boats to others when they are not using them themselves. The service allows boaters and those interested in boating to start more cost efficiently without having to own a boat. Read more about the case on Sitra´s website.
FLOOW2 ASSET-SHARING PLATFORM FOR ORGANISATIONS. A platform for creating online B2B marketplaces for asset sharing. It enables companies in different sectors to make more efficient use of their assets, materials, services, personnel and facilities. Read more about the case on Sitra´s website.
RESQ CLUB: A PLATFROM TO SELL SURPLUS FOOD. A convenient way for restaurants to sell their surplus food and reduce waste. The app enables consumers can buy and collect portions from the restaurant. A simple way to cut food waste, make new profits for restaurants and offer cheap meals. Read more about the case on Sitra´s website.
ZADAA: CLOTHING SHARING PLATFORM. The Zadaa app encourages people to sell those unused clothes that gather dust at the back of wardrobes. Reusing the clothes extends their life cycle, and in a mobile marketplace distance is no obstacle to finding the right size and style of clothing. Read more about the case on Sitra´s website.
OLIO: NEIGHBOUR-TO-NEIGHBOUR FOOD SHARING APPLICATION. OLIO is a digital platform that lets users notify neighbours about extra food or ingredients, empowering communities to come together and prevent needless food waste. Read more about the case on Sitra´s website.

Sources: Sitra´s online publications

PRODUCT AS A SERVICE 1/2

This business model allows you to make money through offering outcomes instead of products to your clients. The product as a service model encourages an increase in resource productivity along the whole product life cycle.

In the product as a service business model, companies offer customers the right to use products instead of selling them. The customer pays for the end result of a service provided and the ownership of the product remains within the company. Payment can be a subscription fee or a pay-per-use billing. The model enables customers to access to the part of the product they really need – at their convenience – without having to worry about things like maintenance and storage.

THE KEY IMPACTS OF THE BUSINESS MODEL

Fully applying this model entails a profound change in your business logic, perhaps more holistically than in any of the other business models.

1. Change in production and sales incentives. The product as a service business model turns the incentive for production and sales upside down: instead of aiming to produce a product as cheaply as possible (cost driver) and sell as much as you can (volume driver), you now start to focus on quality, durability and performance. As you keep the ownership of the product, you have more of an incentive to redesign the product and optimise its reusability and material components. This can lead to reducing product lifetime CO2 emissions by up to 85% in some cases.

2.Closer customer relations. By offering a product as a service, you have a closer customer relationship throughout the product life cycle – for example, offering repair services when the product breaks. You might also add sensors and tracking technologies to your product to enable predictive maintenance and data collection. This closer customer relationship will often lead to add-on sales, new data driven business models and an opportunity to increase your share of the wallet of the customer in question, as well as offer new services to other customer segments.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

PRODUCT AS A SERVICE 2/2

3. New business opportunities at the end-of-life of your product. As you will continue to own the product and the materials throughout the product life cycle, you will enter new aftermarkets with the materials you're not able to further utilise yourself. You can start new partnerships in your ecosystem, as you start to create valuable inputs for businesses beyond your customers.

WHERE IS THE BUSINESS MODEL RELEVANT?

The adoption of as a service models has developed from media and entertainment to almost all areas, including fashion, food, electronics, mobility, and most industries – today you can get almost anything as a service. The business model is used extensively in premium goods and high-value assets with unused capacity.

When companies look into the shift to product-as-a service model, they should aim to add new value on their service model – it's often not enough to bluntly offer your current product with a new financial model, such as pay-per-use. Consider coupling the service model with new enhancements on the customer experience and preferences, i.e., improvements in convenience, availability, reliability, cost, performance (including environmental impact) and maintenance.

MY OPPORTUNITY

- Is this business model relevant to my business?
- Which products could I offer as a service? What is the best sub-model for doing it? How should I construct the payment process and pricing model?
- Who would be the target customers?
- What additional benefit can it bring to the customer?
- Or could I benefit from helping to enable another company's product as a service model?

– Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; 1McCarthy & Fader (2017): "Subscription Businesses Are Booming. Here's How to Value Them," Harvard Business Review; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

CASE STUDY: PIIROINEN – MEETING ROOM AS A SERVICE 1/2

Piiroinen is a family-owned company that designs and manufactures furniture for public spaces. The company has developed a meeting room service concept to reach new customer segments and ease upgrading and reusing furniture.

PROBLEM/ INEFFICIENCY

High costs make investing in high-quality conference room furniture challenging, especially for small companies. And due to high costs, conference furniture is typically upgraded infrequently, which doesn't allow for changes in the needs of the end-user. Piiroinen wanted to expand its circular economy activities from sustainable production to its business offering and product use phase.

BUSINESS SOLUTION

Piiroinen started exploring the opportunity to offer complete conference rooms as a service to their clients. The client can lease high-end design furniture and other equipment tailored to their specific needs, and easily change furniture – for example across the locations of a hotel chain customer. Piiroinen's products are already designed to be easily repairable, modular and durable, which supports a creation of a new product as a service business model.

To deliver the solution, Piiroinen partnered with three other companies and a financial institution.

Sources: Sitra & Technology Industries Finland (2020): Circular economy business models for the manufacturing industry – Circular Economy Playbook for Finnish SMEs; Deloitte Insight

CASE STUDY: PIIROINEN – MEETING ROOM AS A SERVICE 2/2

KEY IMPACTS

The conference room service solution arguably allows Piiroinen's customers to avoid large investments without compromising the quality of their meeting environment. But Piiroinen found that many clients still prefer to buy the traditional set of products, due to various reasons, including internal processes driven by easier "linear business" and "business-as-usual" ways of operating.

However, despite the initial challenges, the service solution has brought Piiroinen closer to its customers and enables the company to continue its circularity-related business development.

Today Piiroinen continues to offer furniture as a service and the company is exploring other circular initiatives, for example, offering outdoor auditoriums as a service.

WHAT CAN WE LEARN FROM THIS?

- Piiroinen learned that its clients are not always ready to buy outcomes – a big client chose the traditional product package, due to reasons like their internal procurement criteria.
- Piiroinen is one of the early movers in a relatively traditional business environment and has to put effort into raising awareness among its clientele.
- Experimenting with product as a service led Piiroinen to other circular economy opportunities and the process started to turn a very product-centric company into a innovative customer-centric company.
- One rapid experiment can often bring better results than big plans that never see daylight – Piiroinen is now developing circular economy business models together with its customers and learning about their unmet needs.

Sources: Sitra & Technology Industries Finland (2020): Circular economy business models for the manufacturing industry – Circular Economy Playbook for Finnish SMEs; Deloitte Insight

SITRA

MORE EXAMPLES OF COMPANIES WITH PRODUCTS AS A SERVICE

Company
NAPS SOLAR: SOLAR ENERGY AS-A-SERVICE. Customers only pay for the power generated by the photovoltaic system placed on the roof of their property. This gives them an opportunity to buy electricity at a lower cost and to reduce emissions without a separate investment. Read more about the case on Sitra´s website.
TAMTURBO: COMPRESSED AIR AS A SERVICE. Reliable availability of compressed air is important for industry. Tamturbo has developed a new compressor technology that allows it to produce compressed air without the use of oil. The technology is sold as a service. It is a long-established combination of a service model and other differentiating functionalities, making the choice easier for traditional customers. Read more about the case on Sitra´s website.
BSH HAUSGERÄTE – BLUEMOVEMENT: HOME APPLIANCES AS-A-SERVICE. In its service model, BSH delivers, installs, repairs, moves, adjusts and picks up the home appliances. These appliances are repaired and reused and working components of broken appliances are reinstalled in a new loop, if the appliance is not repairable. Read more about the case on Sitra´s website.
NAAVA: GREEN-WALLS AS-A-SERVICE. Naava offers as a service smart green walls that the company monitors and guides remotely on the basis of sensor data. Upgradable and modular walls can be moved to new premises once a contract expires. Read more about the case on Sitra´s website.
VALTAVALO: LED LIGHTING AS-A-SERVICE. Valtavalo sells light instead of light bulbs. The service model conserves energy and helps customers save on lighting costs. The customer pays for the service based on the savings. Read more about the case on Sitra´s website.

Sources: Sitra´s online publications

SITRA

PRODUCT USE EXTENSION 1/2

Product use extension businesses make products last longer and prevent premature disposal of used goods, thus improving sustainable resource use and resource productivity.

The product use extension business model is about prolonging product life cycle by developing solutions that support the use of a product in its original form for as long as possible. This can mean offering maintenance, repair, and refurbishment services to customers, or refurbishing and redistributing used goods. Central enabling elements of the product use extension business include circular design and modularity.

The business model can focus on offering product use extension services to a company's own products or to other companies' products. Nowadays customers are likely willing to pay more for products that come with a warranty promising a longer lifespan, and which they know to be easy to upgrade and maintain. This also increases customer satisfaction.

Perhaps the most typical example of product use extension is simply repairing. Some products are often disposed of and replaced with new ones without any attempt to repair them, which leads to lost value. In the EU, the business model is highly driven by the right-to-repair legislation, which would force certain repairability criteria for electronic products. The legislation is also expected to extend to new areas in the upcoming years.

An advantage of the product use extension model is that it doesn't require resetting a company's current business model and operations – it can be quite easy to start piloting for example the resale model and bring in new revenue streams. However, a more comprehensive transformation may be more complex and touch various areas of current operations – including using circular product design to increased modularity to allow for feature upgrades, or the need to make changes to your financial models to offset concerns over reduced one-time product sales.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

PRODUCT USE EXTENSION 2/2

THE KEY IMPACTS OF THE BUSINESS MODEL

1. Capturing the full value of products and materials. By providing product use extension services, companies can gain revenue from the whole product life cycle and not just at the initial sale. For customers, a longer product lifetime can have substantial value in terms of saved time, money, and effort.

2. Better resource efficiency and reduced emissions. Product use extension businesses help to avoid premature disposal of products and decrease the need to produce new products. For example, remanufacturing broken machines to "as-good-as-new" will often save easily over 50% of energy and resources, compared to manufacturing a new machine.

3. Potential for deeper customer engagement and brand loyalty. Offering product use extension services increases engagement with customers, who increasingly value quality, durability and repairability.

WHERE IS THE BUSINESS MODEL RELEVANT?

Product use extension innovations are emerging across various industries, including but not limited to: automotive, machinery and manufacturing industries (for example remanufacturing).

MY OPPORTUNITY

- Is this business model relevant to my business?
- Could I prolong the life cycle of some of my products?
- Do I have data about the life cycle of my key products / materials?
- How easy would it be organise a take-back scheme for a certain (broken) product?
- Could I combine a prolonged life cycle with product-as-a service or sharing platform model?
- Can I profit from being an enabler of product use extension for other companies (for example logistics or customer engagement concepts)?

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte insight

SITRA

CASE STUDY: SWAPPIE – REFURBISHED SMART PHONES 1/2

Swappie is a Finnish second-hand electronics startup. The company buys old Apple mobile phones and refurbishes and resells them with a guarantee. In 2022, Swappie had more than 1000 employees and a turnover of 1 million euros.

PROBLEM/ INEFFICIENCY

People purchase new mobile phones on average every 18 months in the West. Old mobile phones often end up lying around in drawers or are otherwise not recycled. This contributes to the global e-waste problem. Buying second-hand electronics is often perceived as unsafe, with no guarantee of the products working. The result is overconsumption of prestigious resources and the accumulation of e-waste in nature.

SOLUTION

Swappie buys used Apple mobile phones from companies and individuals to get the products back in use. Before resale, Swappie performs a technical analysis and any needed maintenance.

The new-like second-hand products are sold through Swappie's online stores or market places, together with a guarantee. If the phones can't be directly reused or repaired, they are used for spare parts. Swappie takes advantage of tax benefits in their revenue model: they can acquire used phones at a lower tax rate than what they get for the refurbished phones.

Sources: Sitra's webpage; Sitra (2020): How does the circular economy change jobs in Europe? Upskilling and reskilling for a just transition

CASE STUDY: SWAPPIE – REFURBISHED SMART PHONES 2/2

KEY IMPACTS

By developing a reliable marketplace for secondhand electronics, the company is able to capture value that has previously been almost completely lost. Extending the lifetime of a mobile phone from less than two years to over four years can halve the carbon footprint of a phone's life cycle. Buying second-hand electronics through Swappie is easy and safe for consumers, which makes it an attractive option next to a new mobile phone as well. It also enables the purchase of second-hand electronics for companies.

WHAT CAN WE LEARN FROM THIS CASE?

- Fixing big inefficiencies can equal big business: Swappie moved from zero net sales to EUR 8 million in two years and the startup has now attracted EUR 42,5 million in funding and is one of the fastest growing B2C startups in Finland.
- Swappie has a strong focus on data gathering and digital business and believes that data will further help the company to expand its circular business models.
- Regulation (for example the EU's sustainable product policy and right to repair) will increasingly continue to give an edge to companies and early adopters who prolong the life cycle of products.

Sources: Sitra's webpage; Sitra (2020): How does the circular economy change jobs in Europe? Upskilling and reskilling for a just transition

SITRA

MORE EXAMPLES OF COMPANIES WITH PRODUCT USE EXTENSION

Company
FISKARS GROUP: RESALE SERVICE FOR SECOND-HAND CROCKERY. With Vintage service, consumers can sell their used crockery to Iittala shops, where it is resold to new customers. The solution extends its service life and increases crockery recycling. Read more about the case on Sitra´s website.
BAMOMAS: SERVICE TO EXTEND THE LIFE CYCLE OF INDUSTRIAL BATTERIES. Battery Intelligence produces information to enhance the use and lifespan of batteries. Data accumulated in a cloud service helps customers select the right batteries for each purpose and recognise when to replace batteries. Read more about the case on Sitra´s website.
SUNCRAFTER: UPCYCLED SOLAR PANELS. SR-Harvesting buys unusable Valtra and Valmet tractors, disassembles them and saves the usable parts, which are cleaned, inspected and sold with their original spare part numbers. The parts are sold with a warranty. Read more about the case on Sitra´s website.
SR-HARVESTING: UNREPAIRABLE TRACTORS INTO SPARE PARTS. SR-Harvesting buys unusable Valtra and Valmet tractors, disassembles them and saves the usable parts, which are cleaned, inspected and sold with their original spare part numbers. The parts are sold with a warranty. Read more about the case on Sitra´s website.
KONECRANES: REAL-TIME MAINTENANCE TO EXTEND THE SERVICE LIFE OF INDUSTRIAL EQUIPMENT. The service extends the lifecycle of industrial equipment by means of remote monitoring that enables real-time maintenance. The service allows predictive equipment maintenance. Read more about the case on Sitra´s website.
RYPE OFFICE: REFURBISHING OLD OFFICE FURNITURE. Rype Office's design service integrates remanufactured items along with furniture they have designed from waste materials into beautiful, sustainable and affordable workspaces. Read more about the case on Sitra´s website.

Sources: Sitra´s online publications

RESOURCE RECOVERY 1/2

Resource recovery is the recovery of materials and resources from products that are no longer functional in their current application. It allows businesses to recover value from disposed materials.

The resource recovery business model generates value from waste streams. At its simplest, it extends traditional waste management, such as collecting plastic waste and reusing its valuable properties as feedstock for new applications.

Companies should always aim to recover used resources from their operations not only for their potential economic value, but also to decrease the environmental impacts of operations. Recovered resources can either be re-used as a secondary raw material by the company itself to decrease procurement costs of virgin products, or sold as circular inputs for other companies. Resource recovery often entails the development or use of new technologies and/or the establishment of reverse logistic networks to recover used resources.

THE KEY IMPACTS OF THE BUSINESS MODEL

1. Operational efficiency through the utilisation of waste and by-products. Fixing "your own backyard" brings cost savings by eliminating disposal costs and decreasing the need for virgin materials procurement. It is also a good stepping stone into expanding resource efficiency thinking into other areas of your business.

INSIGHT

Waste hierarchy means the logic of using any given recovered resource in a way that maintains its highest possible value for the longest period of time. The hierarchy goes as follows:

1. Avoid and prevent the generation of waste in the first place

2. Reuse, upcycle and/or recycle the waste (choose the best option based on available technologies, material properties, costs, etc.)

3. Energy recovery convert non-recyclable waste into heat, combine with for example carbon capture concepts.

4. Dispose, in landfill (avoid in all cases and expect it to be prohibited eventually)

Number one is the best option. Number four is the worst option. The aim is to go as high as possible in the waste hierarchy when handling any waste materials.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

RESOURCE RECOVERY 2/2

2. Increased scope for new partnerships and innovation on circular feedstocks. Your company's side streams may be valuable to other industries and companies. Virtually any waste can be recovered when you have the right people and technology. Resource recovery can trigger great innovations, when looking for the most high-value reuse option for the recovered resources.

3. Environmental and social benefits of closing the loop. Resource recovery has clear environmental benefits and emission reduction potential. Closed-loop recycling cuts the need for virgin materials. The businesses may also directly halt the disposal of materials in nature and positively contribute to local wellbeing.

WHERE IS THE BUSINESS MODEL RELEVANT?

Resource recovery may be the most common circular business model, closely linked to national infrastructure and regulation. It is applied to some extent in all industries at a basic level, but there are remarkable opportunities for its wider adoption and maintaining higher value in the waste hierarchy.

Companies should check out new technologies and incentives that ease and encourage product return and the recycling of materials. There are also digital platforms which can help your company to find demand for your recovered resources, such as the Excess Materials Exchange.

MY OPPORTUNITY

- Is this business model relevant to my business?
- Do you know what happens to the materials and products after the use phase?
- Or do you have access to recover other disposed resources? What innovations and concepts are needed to make the unit economics of the resource recovery economically viable?
- Are you able the estimate the value of such materials (reused by you or someone else)?
- How much does it cost to organise the logistics needed for efficient recovery of the resources?
- Can you improve the design or sales of your product to ease the resource recovery of your products?
- Could your logistical setup and network help recover other materials from the market?
- How will extended producer responsibility impact your business in the future?

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

CASE STUDY: BETOLAR – TURNING WASTE INTO SUSTAINABLE CONSTRUCTION MATERIAL 1/2

Betolar is a Finnish frontrunner in low-carbon material solutions for a sustainable built environment, focused on turning industrial side streams into value. The company's eco-friendly concrete production technology can enable more sustainable construction practices and help to solve the waste problem in several industries.

PROBLEM/ INEFFICIENCY

Housing the growing human population requires huge amounts of materials and energy. Cement is key to construction, but the cement industry alone causes 7% of the world's greenhouse gas emissions and is quickly depleting the world's sand resources.

SOLUTION

Betolar's circular economy technology turns industrial waste streams from the energy, mining, steel, and forestry industries into environmentally friendly geopolymer concrete. The final product has up to 95% waste materials. Replacing virgin concrete with Betolar's concrete has the potential to cut CO_2 emissions up to 80%. Betolar's technology solutions are scalable and easy to implement into existing production processes.

Sources: Betolar's webpage, Sitra's webpage

CASE STUDY: BETOLAR – TURNING WASTE INTO SUSTAINABLE CONSTRUCTION MATERIAL 2/2

KEY IMPACTS

Betolar is a circular economy native, meaning their business has been built on circular economy principles from the start.

The benefits for the client include low-carbon solutions for more sustainable construction, cost-effectiveness compared to current materials, and transparency in the supply chain.

The key benefits for the industries that produce the side streams include reduced environmental burden of their operations, reduced risks associated with waste materials, reduced waste disposal feed, and freed up storage capacity.

WHAT CAN WE LEARN FROM THE CASE?

- All waste materials have some value. Collection costs and sorting / processing costs have to be factored in, but various technologies and concepts motivate companies to make business out of almost any type of waste stream.
- Often the most environmental impact can be made in cases where you can replace unsustainable materials with disposed, currently wasted materials – high environmental impact means a big business opportunity if you're able to convert materials more cost-efficiently than your peers.

Sources: Betolar's webpage, Sitra's webpage

MORE EXAMPLES OF COMPANIES WITH RESOURCE RECOVERY

Company
HONKAJOKI: UPCYCLING ANIMAL-BASED WASTE. Honkajoki uses animal-based waste from farms, slaughterhouses and meat-cutting plants and processes them into raw materials for the production of, for instance, pet food and biofuels. Read more about the case on Sitra´s website.
ALTIA: MATERIAL EFFICIENT DISTILLERY. Altia's distillery wastes just 0,1% of the barley it uses as a raw material. The plant produces most of the steam energy it needs in its own bioenergy power plant, which uses barley husk as its main fuel and is generated as a side stream from plant production. As a fuel, barley husk replaces peat. Read more about the case on Sitra´s website.
LI-CYCLE: ADVANCED LITHIUM-ION BATTERY RESOURCE RECOVERY. Li-Cycle uses its patented Hub and Spoke technology to recover between 80-100% of materials within batteries. By the end of 2020, they had capacity to process 7,500 tonnes of lithium-ion batteries per year. Read more about the case on Sitra´s website.
NETLET: ONLINE SHOP FOR SURPLUS MATERIALS FROM CONSTRUCTION. Netlet's collection and sales service reduces the waste costs of construction companies and makes lower-cost building materials available to renovators. Read more about the case on Sitra´s website.
VILJAKAS: ECOLOGICAL DRYER FOR FIELD PRODUCTS. Viljakas manufactures mobile, cost-efficient solar-powered grain dryers. The dryer technology enables the drying of any plant species, and the payback period of the investment is significantly shorter than that of conventional dryers. Read more about the case on Sitra´s website.
RENEWCELL: PUTTING TEXTILE WASTE BACK TO THE FASHION CYCLE. Renewcell's chemical recycling process turns used cotton and viscose textiles into biodegradable Circulose pulp. The product can be made into new textile fibres and fed into the textile production cycle repeatedly. Read more about the case on Sitra´s website.

Sources: Sitra´s online publications

MORE CIRCULAR ECONOMY COMPANY CASE STUDIES

Circular economy business models are spreading worldwide and there are already thousands of success stories and inspirational examples in all industries. Here are a few more examples of circular economy business model company case studies.

MOST INTERESTING COMPANIES IN THE CIRCULAR ECONOMY IN FINLAND 2.1, BY SITRA

First published in 2017, the listing of the most interesting Finnish companies in circular economy currently includes 124 companies. The list was updated with new exciting business cases in autumn 2021. Find the list on Sitra´s webpage.

CASE STUDIES BY THE ELLEN MACARTHUR FOUNDATION

EMF's case study database includes a number of global case studies both from the private as well as the public sector. Find the case studies on EMF´s webpage.

CASE STUDIES BY THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT

WBCSD's webpage contains a couple of deep dive cases on circular businesses. Find the case studies on WBCSD´s webpage.

INSPIRING CIRCULAR ECONOMY SOLUTIONS FROM AROUND THE GLOBE, BY SITRA

An extensive list containing 39 inspiring circular economy solutions. With examples from six continents, these solutions range from circular fashion to magnetic ink and from upcycling solar panel waste to podcasts and games demonstrating a circular economy in practice. Find the list on Sitra´s webpage.

MY OPPORTUNITY

- What are my competitors up-to?
- Who should we benchmark our circular economy business model against?
- Are there any insights or practices from players in other industries that we could learn from and be inspired by?
- How have others succeeded? What challenges have they faced?

Sources: Board of Innovation (2021): Business models that work in circular economy; Deloitte Insight

SITRA

COMMON CHALLENGES WITH CIRCULAR BUSINESS MODELS 1/2

Companies face different types of challenges in the implementation of circular business models – collaboration across the ecosystem is often needed to overcome barriers and be able to scale circular businesses.

The capabilities of well-established companies are often honed for linear business. This makes implementing new circular business models a challenge. This and the next page provide an overview of challenges relating to circular business models.

First, it's important to note that implementing circular business models makes companies face the same basic problems that any type of new business venture would face, such as getting funding, finding the right team, proving the concept with right customer segments, finding the right revenue model, and so on. However, there are also typical challenges that relate specifically to the implementation of circular business models.

Three typical challenges across circular business models include internal, customers and ecosystem challenges.

Sources: Deloitte insight

COMMON CHALLENGES WITH CIRCULAR BUSINESS MODELS 2/2

1. Internal

Applying circular business models requires new skills across the organisation: in procurement, product design, manufacturing, sales, after-sales, finance, and legal. This may absorb significant investments and time. A company's internal organisational culture is a crucial element for realising the business transition.

Companies should take the transition costs into account in the business case of the circular economy opportunities and invest in training and acquiring new circular capabilities (recruiting, services) to support implementation. In the short term, this will hinder the attractiveness of the circular business case, but in the long term, companies able to go through a successful transformation will stand apart from competitors and realise the full potential of circularity.

The implementation of circular business models is often easier for early-stage companies, internal startups and pilot-like set-ups than for big corporations, which are burdened with heavy structures and established linear practices.

2. Customers

Some circular business models also implicate fundamental changes in the behaviour of customers – like buying access to a product versus owning it. Companies need to carefully design incentives to harness the ongoing shift to sustainable consumption and help customers to see the benefits.

3. Ecosystem

A comprehensive implementation of circularity and closing material loops in the companies' value chain can't be done alone. The transformation entails building up the circular economy ecosystem and models for continuous cross-sector collaboration, not only with your peers, suppliers and customers, but also regulators, research organisations and institutions. This is perhaps the most overlooked area of scaling circular business models.

Sources: Deloitte insight

COMMON CHALLENGES PER EACH BUSINESS MODEL

Some of the challenges companies face are more specific to certain business models. Overcoming these challenges becomes easier as the industry moves towards circularity and as reusing materials becomes a priority for all stakeholders. Pioneering companies will have to pave the way, but the prize is worth the effort.

Typical challenges specific to each circular business model

CIRCULAR INPUTS

- Access to and cost of obtaining appropriate circular feedstock (collection, sorting, quality assurance are costly)
- Complex regulation and standards relating to the use of secondary materials (although the direction of regulatory development is to favour secondary materials)
- Building an image equal or superior to alternatives and proving the properties of secondary materials

SHARING PLATFORM

- Finding supply and demand simultaneously
- Customisation needs of the shared resource when it's offered to a variety of new customer segments
- Changing the ownership mentality of consumers

PRODUCT AS A SERVICE

- Investments and the financial valuation model of companies are tied to the traditional production and sale of goods.
- As a service models fundamentally change cash flows and may require significant upfront investments in skills

PRODUCT USE EXTENSION

- Engaging customers in concepts to take back the (broken) products and materials
- Readiness and cost of labour for industrial remanufacturing
- Changing revenue logic (from sales closing to value of customer over the product lifetime)

RESOURCE RECOVERY

- Lack of knowledge concerning the material content of products, lack of modular and circular product design, lack of education and regulation for recycling, especially in emerging countries
- Lack of conveniently available waste materials
- Building up reverse logistics networks or other effective concepts for resource recovery is challenging as waste is often dispersed and thus costly to collect

Sources: Deloitte insight

SITRA

TOOL: ELABORATE YOUR CIRCULAR OPPORTUNITY

Take advantage of the inefficiencies you identified on page 43 while going through the circular business models and case examples.

1. Which circular business models would best address the waste streams and/or inefficiencies in your value chain?

2. What kind of benefits do you expect to get from these new business models? What about costs?

- Revenue generation
- Cost savings
- Brand enhancement
- Risk mitigation
- Environmental and societal impact
- Costs

1. DEFINE THE SUITING CIRCULAR ECONOMY BUSINESS MODEL

2. EVALUATE THE BUSINESS POTENTIAL

3. Who are the customers of your circular business? What circular economy value can you create for them?

3. IDENTIFY YOUR CUSTOMERS

4. What is your company's readiness to start developing the circular business? What are the main challenges relating to your idea, how can you overcome them?

4. EVALUATE YOUR COMPANY'S READINESS FOR THE CIRCULAR ECONOMY

Sources: Deloitte insight

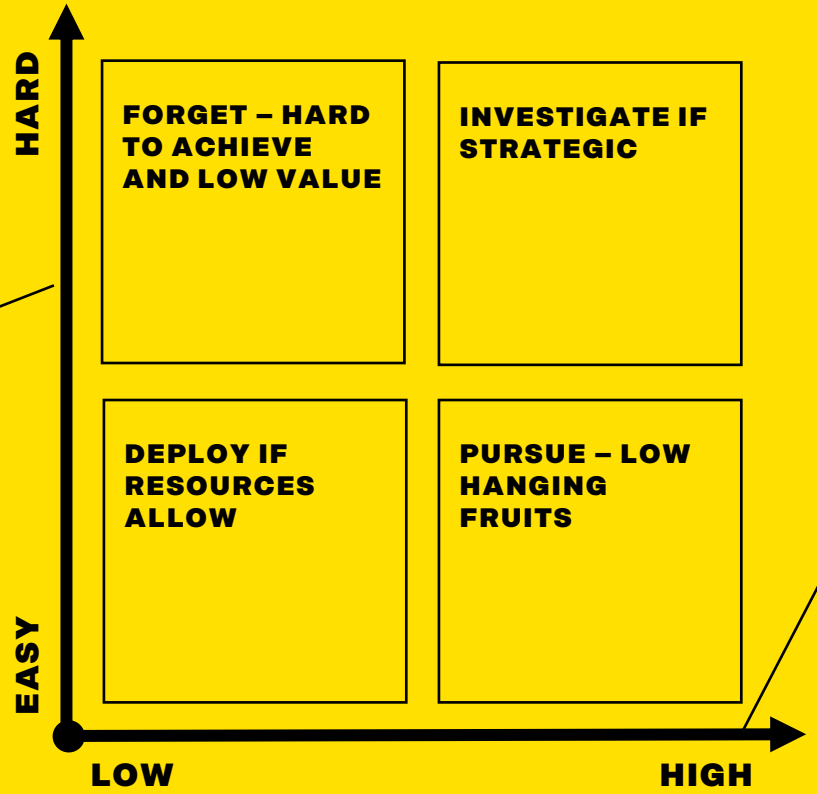
TOOL: PRIORITISE YOUR CIRCULAR OPPORTUNITY

ACHIEVABILITY VERSUS VALUE. If you have identified various circular business opportunities, this tool will help you gain a high-level understanding of which initiatives to prioritise. Use the "Opportunity description template" from the previous page and roughly estimate the achievability and the value of each circular opportunity.

1. HOW EASY WILL IT BE TO IMPLEMENT YOUR SOLUTION AND ACHIEVE THE BENEFITS (the vertical "achievability" axis)

2. WHAT WILL BE THE VALUE OF YOUR SOLUTION? (horizontal axis)

To answer the above questions, simply place your opportunities on the matrix and pick the best opportunities (easiest with highest value – low-hanging fruits) for further development → and fill in the business model canvas on the next page.



ACHIEVABILITY
The ease of implementing the initiative and achieving value.

Typical metrics include:
COST, SPEED AND YOUR CAPABILITY TO DO IT

VALUE
The estimated value of the initiative.

Typical metrics include:
REVENUE UPLIFT, REPUTATION, CUSTOMER SATISFACTION

Sources: Deloitte insight

SITRA

TOOL: COMMON CHALLENGES WITH CIRCULAR BUSINESS MODELS

MY POTENTIAL CHALLENGES

- Identify problem areas and challenges concerning the adoption of your circular business model with these questions.

INTERNAL

- Is your organisational culture supportive of circularity or open to the idea?
- What needs to change in your organisation to improve understanding of circular business?

CUSTOMERS

- Would your circular business model require customers to change their behaviour and, if so, how radically?
- What needs to happen for the customers to change their behaviour and accept the new business model? Is this change possible?

ECOSYSTEM

- What is your relationship with you suppliers? Are they advanced with circularity and would they be open to the concept?
- Would your circular business model require your suppliers to change their practices and, if so, how radically?
- What needs to happen in order for the supplier to adapt their behaviour and accept the new business model? Is this change possible?

Sources: Deloitte insight

THE BUSINESS MODEL CANVAS

Continue filling in the business model canvas for the prioritised circular opportunity. If you have various opportunities that are attractive, fill in a business model canvas for each one. Use the supporting questions below. The last parts of the canvas will be discussed in the next chapter.

KEY QUESTIONS TO DEFINE YOUR...

KEY ACTIVITIES:

- What measures are needed to deliver your circular value proposition and set up the business?

VALUE PROPOSITION:

- What unique value can you create with circular economy and for whom?
- What is your compelling circular economy story line?

CUSTOMER RELATIONSHIP:

- How can you engage with customers to gain meaningful feedback and include them in the journey?

CUSTOMER SEGMENTS:

- Who are your main customers?
- Who else can benefit from your value proposition?

CHANNELS:

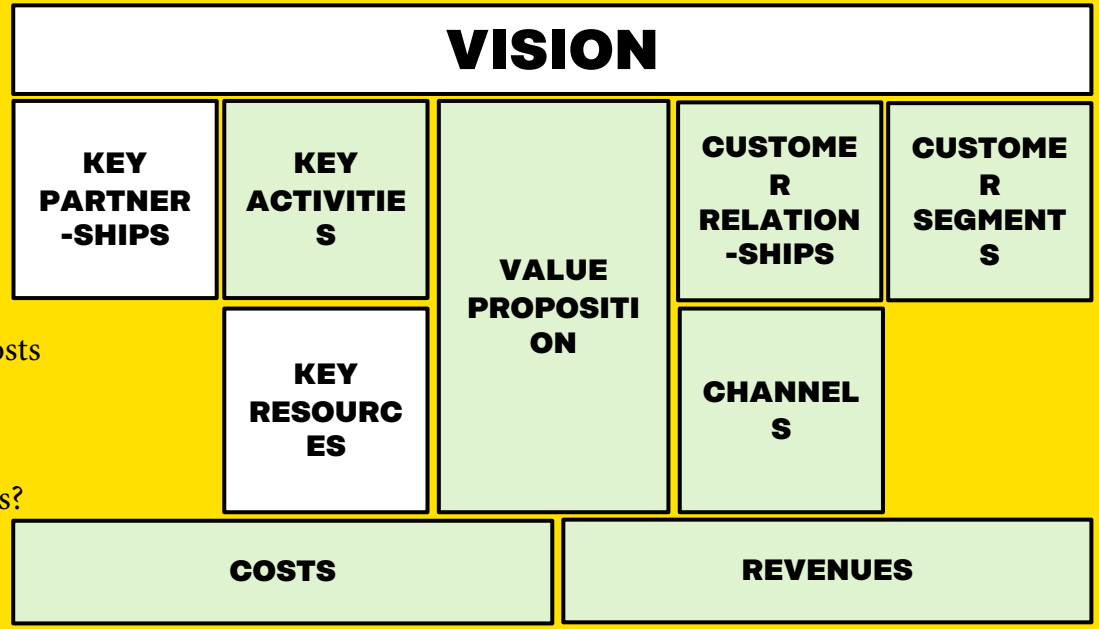
- What channels will you use to sell your products or services?

COSTS:

- What is your cost structure?
- Where can circular thinking decrease costs of operations?
- Where could partnerships and the utilisation of shared assets decrease costs?

REVENUE:

- How do you generate revenue?
- What types of other values are created with your circular vision and how do they impact the value of your business?



Sources: Deloitte Insight

SITRA

4. ASSES THE CAPABILITIES NEEDED FOR CIRCULARITY

This chapter introduces the key capabilities for circularity.

AFTER READING THIS CHAPTER YOU WILL:

- Understand what capabilities you need to transform to a circular economy company.
- Be able to assess which capabilities you need to develop further in order to reach your circular opportunities.

Yes we can!

SITRA

SUMMARY OF CHAPTER 4

WHAT CAPABILITIES ARE NEEDED FOR CIRCULAR BUSINESS TRANSFORMATION? A company should identify and strengthen capabilities that support the transition to the circular economy. These are often associated with organisation and culture, activities and innovation, and circular economic ecosystems.

There are a number of capabilities that foster circular business transformation and help companies to move from linear to circular. Companies that want to transform their businesses should identify the most important capabilities for them and act to strengthen those areas in which they underperform.

The capabilities can be divided into three main categories:

1. **Organisation and culture**
2. **Functions and innovations**
3. **Circular economy ecosystem**

After you have gained an understanding of the various types of capabilities that are typically needed for circularity, you're invited to assess which are the most crucial capabilities in your context and define ways to improve them.

THE KEY CAPABILITIES FOR CIRCULARITY

Improving your organisation's circular economy business capabilities can enable it to do circular business. The core capabilities for circularity can be divided into three main areas.

1. Organisation and culture

Circular economy principles need to be embedded into the fabric of an organisation: from procedures and guidelines to culture, leadership and KPIs.

2. Functions and innovations

The production processes need to be aligned with the principles of circular economy and the design of products and services should focus on value creation throughout a product's life cycle.

3. Circular economy ecosystem

Partnering with public and private sector actors won't only be key to your business model, but will also enable a collective transformation to circularity. In the circular economy ecosystem, organisations can create new value together benefitting each other and with fewer resources.

1. Organisation and culture

- Core activities and culture
- Management and metrics
- Rethinking sales
- Financing

2. Functions and innovations

- Product and service design
- Operational functions
- Technology and data
- Acquisitions and internal start-ups

3. Circular economy ecosystem

- Ecosystem and partnerships
- Production chain
- Return systems

Sources: Adopted from: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte Insight

ORGANISATION AND CULTURE: CORE ACTIVITIES AND CULTURE

Strengthen core business activities and culture capabilities by investing in circular economy practices, company culture and competence building.

INCORPORATING CIRCULAR ECONOMY PRACTICES INTO DAY-TO-DAY OPERATIONS

Incorporate the circular economy into the company's core business through new practices, processes and procedures. Define values and working methods to support circular economy in different units. Enhance internal co-operation between functions (for example RDI, procurement, sustainability and business development).

Keep in mind that circular economy can't be the sole responsibility of a single function. A circular economy team consisting of representatives of different functions can help accelerate change.

CREATING A COMPANY CULTURE ALIGNED WITH CIRCULAR ECONOMY

Build a circular economy company culture. Motivate employees to promote circularity by explaining its benefits and by building an increased understanding of circular economy. Find ways to communicate about the circular economy within the company and focus on circularity in external marketing. This will engage the commitment of employees while also helping the company find new circular economy specialists and partners.

CIRCULAR ECONOMY SKILLS BUILDING

Enable circular economy skills building in all areas of your business. The circular economy changes all jobs, and every employee must be able to apply the operating practices of the circular economy in their work.

Make sure to develop skills and abilities that are relevant to your company's circular economy transition (for example product design). Skills building can be achieved through training and the exchange of information between functions, for example.

CASE STUDY: INNOCENT DRINKS, the juice and smoothie company (owned largely by the Coca-Cola Company), built an employee engagement plan as part of their 2020 sustainability strategy. The company asked each member of its workforce to add a sustainability role to their job description. Employees could choose to be an 'agitator', 'activator', 'ambassador' or 'protector.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight; Company webpages

ORGANISATION AND CULTURE: MANAGEMENT AND METRICS

Key management and metrics capabilities include defining the vision and strategy, measuring progress and creating systems of rewards.

DEFINING THE CIRCULAR ECONOMY VISION AND STRATEGY

Define a clear circular economy vision and strategy for the company or business unit, including metrics. Present clear and measurable background information on the long-term benefits of circularity and the opportunities associated with the circular economy.

Ensure that the management of the company or business unit is committed to implementing the circular economy. Internally communicate the company's and its management's commitment to the circular economy.

A company can promote circular economy at various levels, for example: 1) with the help of selected metrics, 2) by seizing the opportunities presented by circular economy in individual business units, or 3) through the company's strategy at the company level.

MEASURING PROGRESS

Establish clear and quantifiable circular economy targets as part of the company's operations. The targets can be defined in the company's circular economy vision or strategy, for example.

Make sure that the targets are relevant to your company and not in conflict with other targets.

REWARDING THE CIRCULAR ECONOMY

Establish links between reward schemes and progress towards circular economy targets.

For example, set a target for the amount of recycled materials in a product and link progress towards that target with reward schemes.

CASE STUDY: ELECTROLUX

applies circularity to reach its 2030 climate neutral operations target. In 2020, it started linking financial rewards to delivery sustainability targets: 20% of the annual share-based rewards for Electrolux's 300 top leaders will be based on how effectively they have managed to reduce CO2 emissions, for example in the manufacturing process, product design and product use phase.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight; Company webpages

ORGANISATION AND CULTURE: RETHINKING SALES

Rethink sales by providing comprehensive solutions, leveraging closer customer relationships and using circular economy to differentiate your company from its competitors.

PROVIDING COMPREHENSIVE SOLUTIONS INSTEAD OF SELLING PRODUCTS

Expand your sales perspective from "closing deals" to providing customer-driven services for the full product life cycle. Instead of focusing on the quantity of products sold, find new value from the full product life cycle.

For example, take advantage of a product as a service model, offer maintenance and repair services, or enable products to be returned to be subsequently resold.

LEVERAGING CLOSE CUSTOMER RELATIONSHIPS

Leverage the benefits of close customer relationships – such as observations of customers' additional needs and lessons learned from customer feedback – to achieve additional sales and support the development of new products and services.

Explore the opportunities presented by technologies (such as IoT, customer data) to improve your customer insight and better respond to their needs (such as proactive maintenance or offers aimed at generating additional sales).

USING THE CIRCULAR ECONOMY FOR DIFFERENTIATION

Make sure that your stakeholders understand the new value that your solution delivers. Ensure that they are sufficiently informed when purchase or investment decisions are made.

In your communications, instead of focusing purely on the economic benefits (why the circular economy solution is more valuable than a linear solution), highlight the solution's benefits for the environment and people. Also keep in mind the indirect positive impacts of the circular economy at all stages of the value chain (for example reducing emissions in the supply chain).

Make use of existing methods and evaluation practices that ease comparisons between the circular economy solution and the traditional approaches. Use that information in your communications with customers.

Sources: [1] FVCA - Pääomasijoittajat & Recycling Startups; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte insight

ORGANISATION AND CULTURE: FINANCING

Financing capabilities are related to understanding risks and opportunities, attracting sustainable financing and being prepared to adapt to changes.

UNDERSTANDING THE RISKS OF LINEAR ECONOMY

Assess how the changing business environment influences the company over different time horizons. Make sure that you have taken national and EU-level circular economy initiatives (for example legislation) into consideration.

Find out how the pricing of negative externalities (such as emissions trading) will change in the future and affect your company's business.

UNDERSTANDING THE ADDED VALUE CREATED BY THE CIRCULAR ECONOMY

Evaluate the benefits of circular economy from the perspectives of new business, efficiency, cost savings and branding.

Can you calculate the economic value of the improved environmental impacts of products and services?

ATTRACTING SUSTAINABLE FINANCING THAT IS ALIGNED WITH THE CIRCULAR ECONOMY

Look for investment partners that understand the principles of circular economy and have developed financial instruments that are suited to circular economy business models.

In Finland, public financing entities, such as Business Finland and Finnish Industry Investment, and many private sector organisations, including venture capital firms and banks, already understand circular economy and offer specialised financial instruments.

Significant investments in the circular economy are being made at the European level. A third of the EUR 1.8 billion in investments under the EU Recovery and Resilience Facility and the EU's seven-year budget is earmarked for financing the Green Deal. Of that amount, EUR 530 million will be channelled to Finnish companies through the Business Finland Sustainable Growth Programme.

BEING PREPARED TO ADAPT TO CHANGES IN THE COMPANY'S OPERATIONS

Consider that circular economy business models can lead to changes in your cost structure and cash flow as well as the valuation of your company.

Keep in mind the special characteristics of circular economy business models from the perspective of financing.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Kasvuryhmä (2019): Kasvua kiertotaloudesta –työkirja; Lacy, Long & Spindler (2020): The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight; Company webpages

BUSINESS MODEL SPECIFIC FINANCIAL IMPLICATIONS

INCREMENTAL INVESTMENTS TO CHANGE OPERATIONS OR EXTEND OFFERING PORTFOLIO

Circular inputs

Requires operational changes in sourcing, design, and production processes. May require investment to modify production equipment or set up reverse logistics processes. Try to find solutions that fit your current processes to cut costs.

Resource recovery

Requires operational changes in the current production processes or/and waste-management. May need to invest in new recycling technology or take-back system or utilise external partners for it.

Product use extension

Requires companies to start operations in the used product market or to develop up new service offering in maintenance. Extending operations to these new areas to extend offering portfolio may require substantial Investments.

Level of risk/return: **LOW**

SIGNIFICANT INVESTMENT TO FINANCE BALANCE SHEET EXTENSION

Product as a service

Requires changes in the service offerings. May require new products that are better suited for the service model, which require working capital increases due to changes in cashflow and extension of balance sheet (assets offered to customer as a service need to be pre-financed). May also need new capabilities for product maintenance, repair and storage. Development of service functions and building a model for communicating with the customers may require capital investment.

Level of risk/return: **MEDIUM**

SIGNIFICANT INVESTMENT TO FINANCE NEW AND POTENTIALLY DISRUPTIVE OFFERING

Sharing platforms

Requires completely new business segments. High investments are required to develop the platform due to the “winner takes it all” effect. Sharing platforms require a critical mass to function and attract customers. There is a potential to disrupt industry but success is uncertain and the risks are higher than for other models.

Level of risk/return: **HIGH**

Sources: Adopted from Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Original source of the business models: Accenture

HOW TO MEASURE CIRCULARITY?

What are the most commonly used circular economy indicators by companies? Most circularity-related measurable KPIs relate to material flows, although circular economy goes beyond material flows into service business and digitalisation, though for these two areas there are fewer clearly measurable indicators. The table below illustrates popular indicators per different stages of a product life cycle. The first step is to expand from energy-related indicators to resource inputs and outputs.

	TAKE, MAKE	RETURN, RECYCLE	USE	REUSE, REPAIR	WASTE AND SIDESTREAMS
INCREASE	• % renewable energy in production & distribution • % products designed with recyclability/ repairability in mind	• % compliance with local recycling regulations • # kg products/ materials collected • € value products/ materials collected	• Product lifetime (years) • Product utilization (%)	• € value on secondary market • % of products that can be upgraded to keep value over time • # repairs executed (professional, consumer) • Availability of spare parts & repair information • After sales service quality (NPS)	• % products captured as feedstock to downstream businesses • € value of products as feedstock to downstream businesses • % data available: information on where installed base (products) ends up
DECREASE	• % or # kg virgin material input (sourced from the environment) • % or # kg waste to landfill in manufacturing	• # kg collected to landfill or incineration • € cost to return • € cost and time sorting and processing	• € cost of maintenance/ operating a product • % year over year value depreciation • % idle time • # energy needed to operate • Emissions and environmental discharge • # of products in the field (lower footprint)	• € cost and time of repair • # discarded products • Cost of spare parts (% compared to neew)	• % products ending up in landfill • % products incinerated • % products discarded to nature

Sources: Board of Innovation (2021): Business models that work in circular economy; Deloitte Insight

SITRA

FUNCTIONS AND INNOVATIONS: PRODUCT AND SERVICE DESIGN

The design of products and services is driven by customer insight and the integration of circular economy principles into design decisions.

CUSTOMER INSIGHT AND CUSTOMER-DRIVEN THINKING

Develop your customer insight and your understanding of what kinds of solutions your customers need. Leverage that insight in designing products and services.

Involve the customer as early as possible and provide services that span the full product life cycle (design, use, return, recycling) in close interaction with the customer. Continually evaluate your product range and shape it according to customer needs.

INTEGRATING CIRCULAR ECONOMY PRINCIPLES INTO PRODUCT AND SERVICE DESIGN

Systematically develop processes that reduce the use of natural resources and align products with the principles of circular economy by making them durable, repairable, recyclable and service-based. Choose recycled materials whenever possible.

Integrate circular economy thinking into product and service design, for instance by organising internal training, offering external training opportunities or recruiting new talent.

CASE STUDY ABBOT : Since 2010, for, reduced product packaging has eliminated about 41 million pounds of packaging and resulted in more than US$100 million in savings.

DID YOU KNOW?

There are various good circular design guides, that help practitioners implement circular design in real life. You can get started with the tips on this page and keeping these three key objectives of circular design in mind:

1. **Production phase and materials:** use only circular or more sustainable materials and reduce and eliminate the need for packaging and use of materials.
2. **Product use phase:** design to keep in useful life for as long as possible and reduce impact while in use (for example sensors to maximise utilisation).
3. **Product recovery**: enable materials or components to be easily brought back into a value chain.

Check out IDEO and the Ellen MacArthur Foundation's Circular design guide.

Sources: [1] Abbott Media centre (2020): How green goals are good for business; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Ellen MacArthur Foundation: The Circular Design Guide; Deloitte insight

FUNCTIONS AND INNOVATIONS: OPERATIONAL FUNCTIONS

Operational capabilities are related to the development of activities, the use of recycled and renewable raw materials and being informed of the materials used and the energy consumed.

MAKING FUNCTIONS SUSTAINABLE

Identify and secure quick wins related to circular economy. You can often find development opportunities in the following areas:

1. Material efficiency and waste minimisation: use materials and production equipment efficiently and in ways that don't produce waste.
2. Energy use: reduce the energy consumption of operations, improve energy efficiency and switch to renewable energy sources.
3. Emissions: reduce emissions from your company's operations or the production chain.
4. Water consumption: minimise water consumption, increase water reuse and find ways to conserve water.

USING RECYCLED AND RENEWABLE RAW MATERIALS

Assess which of the materials your company uses could be replaced with recycled or renewable raw materials. Look for such materials in the market.

Get in touch with local waste management operators or other companies whose side streams you could utilise. Carry out your own collection activities to gain access to the recycled materials you need.

AWARENESS OF SUSTAINABLE MATERIALS AND ENERGY

CONSUMPTION IN PRODUCTION PROCESSES

Integrate circular economy thinking into production processes by organising internal training, offering external training opportunities or recruiting new talent.

Incorporate circular economy principles into your company's procurement activities and subcontracting chains by updating procurement guidelines and metrics, for example.

Carry out calculations to give visibility to the extent to which your company wastes value in the form of energy, emissions, water and materials.

CASE STUDY: Sustainable materials company **Newlight's technologies** use the carbon captured from greenhouse gases to produce AirCarbon, a bioplastic material that can match the performance of crude oil-based plastics.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; The Chemical Industry Federation of Finland, Sitra & Business Finland (2020): Sustainable and circular business models for the chemical industry

FUNCTIONS AND INNOVATIONS: TECHNOLOGY AND DATA

Technology and data capabilities are often related to the collection and use of data, increasing utilisation rates and finding and adopting new technologies.

LEVERAGING DATA TO OPTIMISE BUSINESS OPERATIONS

Determine what data you require to reduce resource consumption, better respond to customer needs and increase production efficiency.

Leverage digital technologies that enable you to collect data on your production chain (for example sensors and product passports) and use that data to optimise the use of materials and products as well as the effectiveness of your production chain.

MAXIMISE PRODUCT AND RESOURCE USE

Determine whether you can use sharing platforms, in the role of either provider or user, to maximise the utilisation rate of products and resources such as office premises, equipment or logistics.

FINDING AND ADOPTING NEW TECHNOLOGIES

Find new digital, physical and biological technologies to support business transformation: for example, the recovery and utilisation of materials in higher-value products, developing new biomaterials and recycled materials, and developing service business or sharing platforms.

DATA ON YOUR COMPANY'S OWN MATERIAL FLOWS

Chart your organisation's material flows to understand in what quantities and processes your company uses materials. Use consultants specialising in the analysis of material flows or carry out the work internally.

This will help you identify the stages of your production chain where material consumption is high and where there is significant circular economy potential. You may also identify stages where virgin materials can be replaced with recycled materials.

CASE STUDY: Maersk is developing a cradle-to-cradle passport – a database listing the material composition of the main parts of the ship enabling better recycling of materials and parts used in vessel construction. The database will cover about 95% (by weight) of the ship's materials and updating it involves around 75 suppliers.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Kasvuryhmä (2019): Kasvua kiertotaloudesta –työkirja; Deloitte insight; Company webpages

FUNCTIONS AND INNOVATIONS: ACQUISITIONS AND INTERNAL START-UPS

Acquisitions, venture capital investments, internal start-ups and autonomous teams are important capabilities in the transition to business that is aligned with circular economy.

ACQUISITIONS AND VENTURE CAPITAL INVESTMENTS

Acquisitions and close co-operation with high-growth companies are effective ways to increase your company's circular economy expertise. They help build capabilities and a culture that is aligned with circular economy. When initiating changes, an acquisition or venture capital investment may be a more cost-effective way to promote the circular economy than developing your in-house capabilities.

Large corporations have dedicated units for carrying out acquisitions. If your company doesn't have the capacity to do that, consider more lightweight alternatives to venture capital investments, such as co-operation agreements, or development through internal start-ups and autonomous development teams.

USING INTERNAL START-UPS AND AUTONOMOUS TEAMS IN BUSINESS DEVELOPMENT

For large corporations, existing processes and decision-making structures can be a significant obstacle to experimentation with circular economy business models.

Assess opportunities to turn your experiment into an internal start-up or autonomous team. This can help accelerate development, the collection of customer feedback and the validation of the idea.

For a large Finnish company, the traditional business development cycle can often involve 9–12 months of internal development before any feedback is obtained from customers. An internal start-up can accomplish that in as little as 8 weeks.

CASE STUDY: The Finnish children's outdoor clothing manufacturer **REIMA** developed a new clothing-as a service business model Reima Play and started a pilot with first customers after only eight weeks. The business model was developed in a cross-functional team that included both Reima's own experts as well as external support from the circular platform LOOP Ventures. The team worked independently and it could progress in a light startup mode without Reima's corporate policies and processes slowing them down.[1]

Sources:[1] Circular Economy Loop webpage; Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Deloitte insight

FROM PRODUCT TO SERVICE INNOVATION

In the circular economy, companies should shift from product innovation to service innovation. With service innovation, companies can find ways to create value for their clients – for example in terms of practicality, economic attractiveness, and enabling sustainable lifestyles. The graph below illustrates core changes that companies should make and take into consideration when shifting from product to service innovation.

DIFFERENCES BETWEEN PRODUCT AND SERVICE INNOVATION

	PRODUCT INNOVATION	SERVICE INNOVATION
WHAT	Understand customer usage and expected product attributes	Design and live customer experience or journey
HOW	Leverage traditional and robust processes	Perform iterative design and prototyping (to test, fail, learn and rebound quickly)
WHO	Leverage companies' distinctive forces and expertise around product/service	Manage an open ecosystem and perform open innovation –acquiring/partnering with new talents
SKILLS	Draw on traditional product/service know-how	Apply design thinking and big data or analytics
DURATION	Perform innovation cycle in years	Perform innovation cycle in weeks or months

Sources: Sitra, Techology Industries of Finland & Axxenture: Circular economy business models for the manufacturing industry

SITRA

TECHNOLOGIES OF THE PAST, THE PRESENT AND FUTURE ENABLE CIRCULARITY

Emerging technologies can be divided into three time horizons and three types of categories of technologies, enabling the transformation to circular data business models.

THE TIME HORIZONS

THE PAST: ENABLERS. Digital experience, data and analytics, and cloud have spawned multiple innovative business models.

THE PRESENT: DISRUPTORS. Digital reality, artificial intelligence, and distributed platforms are here today and are on the path to broad adoption, shaping the next decade of business innovation and circularity.

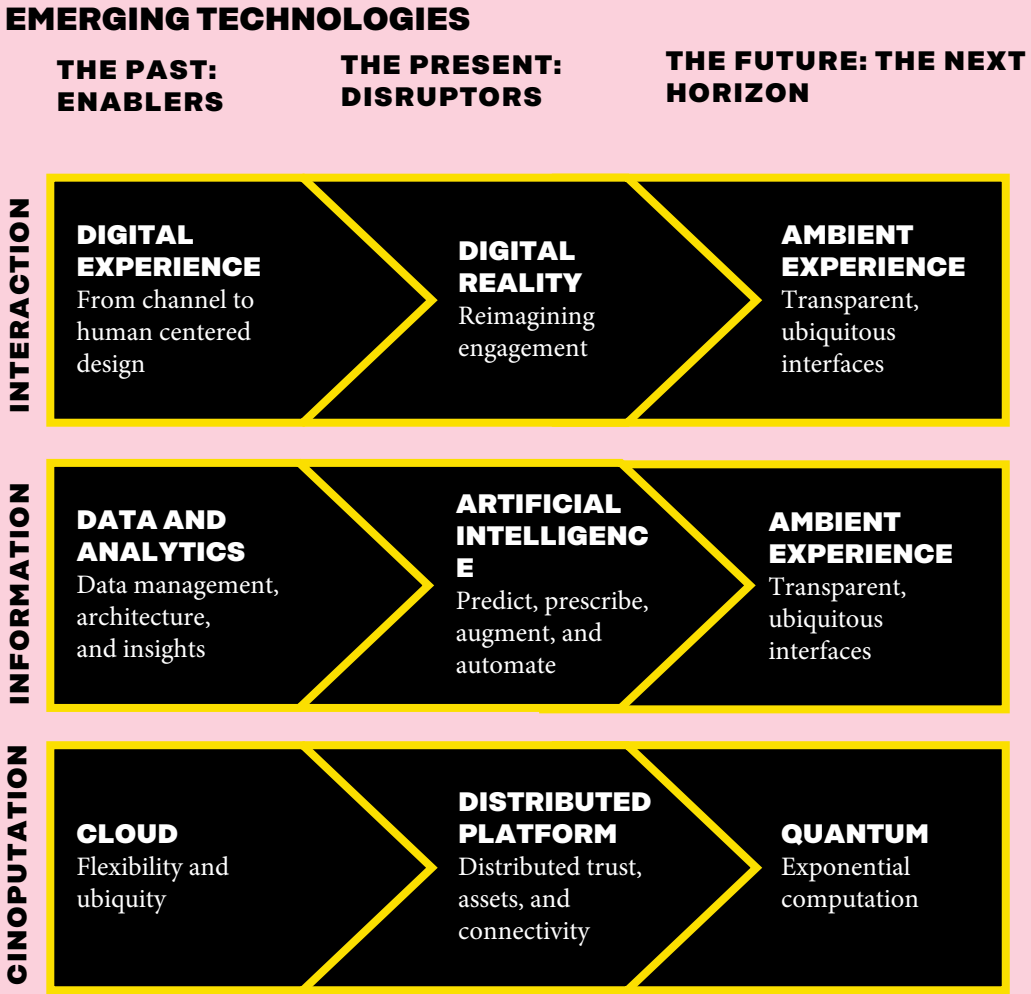
THE FUTURE: THE NEXT HORIZON. These technologies will shape business innovation of the future.

THE TECHNOLOGY CATEGORIES

INTERACTION technologies aim for simplifying the human-technology interaction, for example sensors that enable transparency.

INFORMATION: from data management to omniscience – machines that combine insights and understanding to recognise causation, such as advanced industrial predictive maintenance models.

COMPUTATION: as computation abilities scale, we are moving towards abundance: the limitless ability to work with and gain benefits from technology and information, such as real-time mapping of global material flows.



Sources: Deloitte (2021): Tech Trends 2021

SITRA

CIRCULAR ECONOMY ECOSYSTEM: ECOSYSTEM AND PARTNERSHIPS

Strengthen capabilities related to ecosystems and partnerships through ecosystem management, knowledge sharing and influencing regulation and industry development.

ECOSYSTEM MANAGEMENT AND PARTNERSHIP BUILDING

Ecosystems are often a precondition for the successful implementation of the circular economy. In a circular economy ecosystem, companies operate in a value chain where each company plays a role in enabling circulation and earns revenue from it.

Ecosystems require purposeful management and development. Establish industry-specific or cross-industry partnerships that enable circulation and support your business.

Use existing business networks and events to build your network: for example, WBCSD (FIBS in Finland), the World Circular Economy Forum WCEF and the Ellen MacArthur Foundation's CE100 network.

SHARING KNOWLEDGE IN YOUR ECOSYSTEM

In a business ecosystem, companies benefit from each other's skills, services and knowledge. An ecosystem can provide you with a solution to a problem that your company can't independently solve. Make your company's competencies visible and determine what types of proficiency are beneficial for you in the ecosystem.

An ecosystem can generate new business and innovation. Foster an open innovation culture and find non-competitive co-operation with industry peers.

Support initiatives aimed at sharing knowledge and skills and solving shared challenges through collaboration between peers.

INFLUENCING REGULATION AND INDUSTRY DEVELOPMENT

Monitor circular economy regulatory developments and participate in related stakeholder efforts. Support the progress of regulations that are favourable to the circular economy from your company's perspective – for example through co-operation with an industry association and its member companies.

Get involved in international networks and forums that can provide you with important information on future policy measures at the EU level, for example.

Start with regulatory compliance, move on to influencing the national and international business environment, and aim to become a thought leader in your industry.

Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Kasvuryhmä (2019): Kasvua kiertotaloudesta –työkirja; Lacy, Long & Spindler (2020): The Circular Economy Handbook: Realizing the Cricular Advantage; Deloitte insight; Company webpages

CIRCULAR ECONOMY ECOSYSTEM: PRODUCTION CHAIN

Transparency and partnerships that support the circular economy play a key role in production chains that are aligned with circular economy.

INCREASING PRODUCTION CHAIN TRANSPARENCY

Co-operate closely with your production chain participants to learn about their operations, use of materials and the attributes of the materials used. This helps you ensure the availability of the right kinds of materials, develop the use and recycling of materials and guarantee the sustainability of your production chain.

Human rights are also an emerging issue, particularly in global circular economy supply chains. Consider whether the sourcing of recycled raw materials may involve inhumane working conditions or the use of child labour.

PARTNERSHIPS THAT SUPPORT THE CIRCULAR ECONOMY

Focus on partners that have the circular economy on their agenda. This can also mean finding new partners to replace previous ones.

In your company's network, you can encourage partners and the subcontracting chain to move towards the circular economy by giving visibility and assigning priority to circularity.

As increasingly ambitious nature and climate targets are introduced, large corporations and public sector entities will require their subcontracting chains and service providers to operate in alignment with the circular economy. Develop your company's products, services and ESG processes accordingly.

Sources: [1] Accenture (2020): Open new revenue streams with product as-a-service; Business Functions Blog & Customer-centric supply chains: A license for growth (2020); Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage, Deloitte insight

CIRCULAR ECONOMY ECOSYSTEM: RETURN SYSTEMS

The use and development of return systems enables the circulation of materials.

DEVELOPMENT OF RETURN SYSTEMS

Return systems can allow you to resell little-used products from customers or circulate reusable materials as raw material for new products.

Identify opportunities to collect your materials or products from customers at the end of their life cycle. Find suitable external partners or recruit professionals who have experience with return systems (including data competence and logistics). As a company, make a promise to your customers that end-of-life products or surplus materials can be returned.

DEPOSIT SYSTEMS

Deposit systems provide effective incentives for customers to return products or materials. Determine whether you could take advantage of deposit systems to reuse valuable products and materials.

MATERIAL MONITORING AND MANAGEMENT

Develop the monitoring of products and materials to maximise returned products and materials. Monitoring can be developed and improved by accurate supply chain management, tracing technologies and the Internet of Things.

INSIGHT: WHAT IS A TAKE-BACK SYSTEM?

Takeback systems, also called reverse logistics, refers to the process of moving goods from their typical final destination for the purpose of capturing value, or proper disposal. Moreover, it can be associated with utilising the unused capacity of a vessel, for example of a truck, after the delivery of goods to the customer. Reverse logistics are a crucial part of a circular value chain, as it closes the loop and enables the return and recovery of products from the (first) customer.

Sources: Business Functions Blog & Customer-centric supply chains: A license for growth (2020); Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage, Deloitte insight

FROM VALUE CHAINS TO ECOSYSTEMS

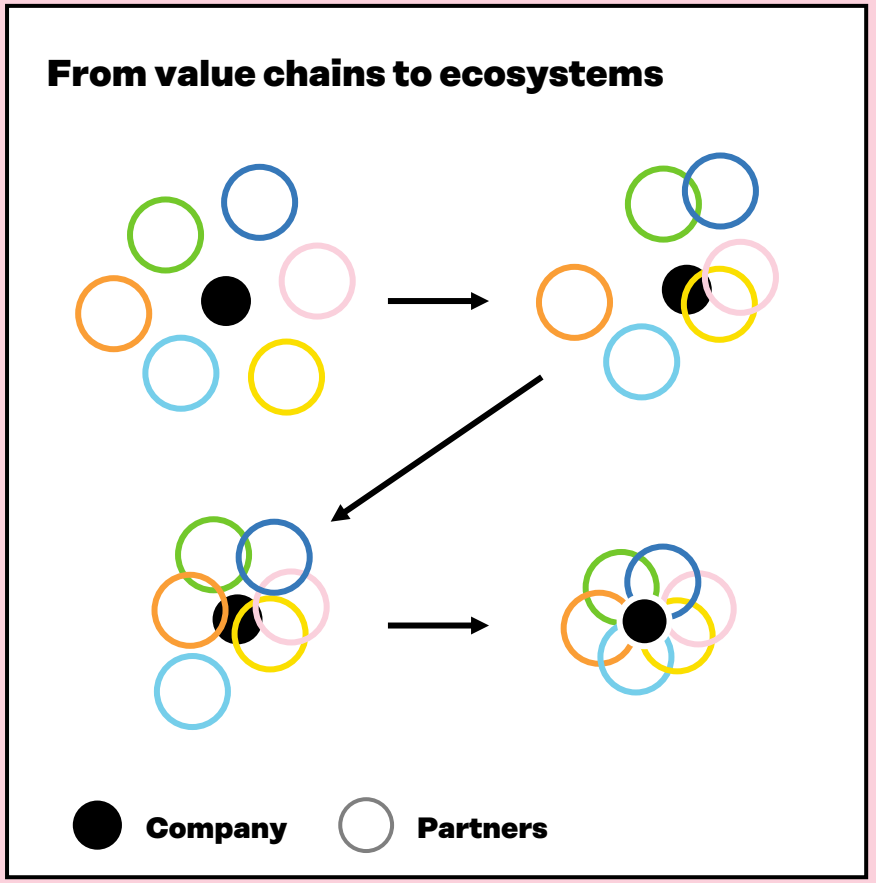
Building and engaging with your circular economy ecosystem is perhaps the most critical capability and success factor for validating and scaling your circular business.

Finding the right partnerships and building up an ecosystem – a cross industry network of players – is one of the most important capabilities when going circular. It is also often under looked, as the meaning and importance of the ecosystem can seem ambiguous, until you experience the importance in practice yourself, for example around your circular business model pilot.

Why is it important? Sourcing renewable and circular inputs and selling excess waste to other industries require ecosystem development, in order to ensure that there are enough suppliers, buyers and cost-effective options to scale circular solutions.

Moreover, fulfilling the customer needs along the product life cycle may require partnerships to complement your capabilities and offering. Economic feasibility of secondary raw material use is often reached only with certain number of collaborators.

In practice, building a circular economy ecosystem means partnering with other players. You are partnering in order to fill gaps in your core capabilities, close the material loops and deliver comprehensive customer value. Partners can be players in the same market (including pre-competitive collaboration with peers), in adjacent markets and throughout the value chain, including investors, institutions, government bodies, NGOs and academia. The figure on the right illustrates the change from an industry value chain to cross-industry value networks, or in other words, ecosystems.



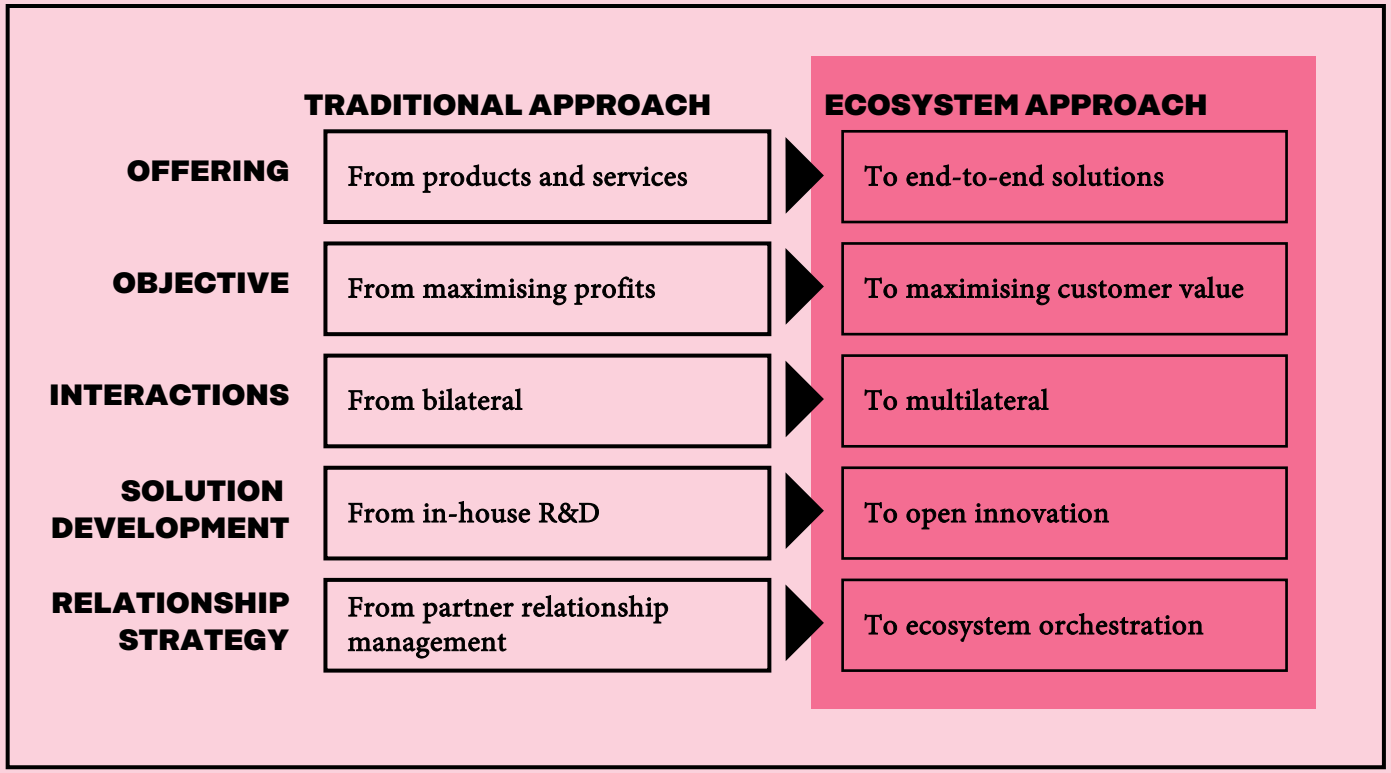
Sources: [1] Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

FROM TRADITIONAL TO AN ECOSYSTEM APPROACH

DEVELOPING AN ECOSYSTEM APPROACH REQUIRES ALSO A MINDSET CHANGE

This process will help you to grow your circular business, by offering new and extended value propositions and creating customer-oriented partnerships that foster innovation. The figure on the right depicts the change needed in different key areas of your business.

The good news is that you don't need to change overnight. The most practical way forward is to build your ecosystem through a concrete business development initiative, so that you can test what is needed and what works, rather than building extensive processes and a pre-defined transformation roadmap without knowing what actually works.



Sources: Nordic Innovation & Sitra (2021):The Circular Economy Playbook – Circular business models for Nordic manufacturing industries; Lacy, Long & Spindler (2020):The Circular Economy Handbook: Realizing the Circular Advantage; Deloitte insight

CASE STUDY: CIRCULOR – TRACEABILITY AS-A-SERVICE 1/2

Circulor is a UK-based startup that empowers more sustainable business by tracing raw materials throughout the supply chain. The solution uses a combination of blockchain, machine learning, GPS, biometrics and QR codes. It is currently scaling up and has received investments companies, including Volvo and Jaguar.

A DATA SOLUTION FOR SUSTAINABLE SUPPLY CHAINS

It is difficult for businesses to gain visibility to their complex and global supply chains, and to know where their materials come from. Moreover, the chains of custody of several materials, notably plastics, are weak, which hinders the recyclability.

Circulor's traceability as a service includes supply chain mapping, verification, expertise on responsible sourcing, and support on implementing improvements. The mapping of supply chains increases visibility to materials' origin—information that supports more responsible sourcing and recycling practices— and can verify sustainable production.

On top of checking the provenance of their raw materials, customers can also secure deliveries and manage payments through Circulor.

Sources: Circulor website

CASE STUDY: CIRCULOR – TRACEABILITY AS-A-SERVICE 2/2

FUNCTIONAL BASICS

Circulor's platform gives manufacturers more visibility to their supply chain. The solution tracks supply chain data from source to components and finished products. It creates a digital identity for commodities, people, and locations. The digital identities be inherited onwards by connecting the inputs and outputs.

Circulor uses machine learning algorithms to verify the chain of custody and information on responsible sourcing. The platform is based on a distributed ledger, in which all parties only have access to information they have permission to see. The customer can set the rules/ criteria for their supply chain materials, such as certain responsible sourcing standards.

WHAT CAN WE LEARN FROM THE CASE?

- There is growing demand for data platforms supporting the circular economy.
- Most big international companies are looking to get more data out of their own operations and their supply chain.
- Comprehensive data of, for example, material flows in the value chain, is needed to truly enable a resource-efficient circular economy ecosystem and closed loop circulation of materials.
- Blockchain is one example of technologies that can enable full traceability of material flows – it's already happening, just in a limited scale

Sources: Circulor website

MORE EXAMPLES OF CIRCULAR ECONOMY COMPANIES

Company
METSÄ GROUP. Metsä Group works with a network of companies to utilise every production side stream at its highest possible value. One tree can be used to produce sawn timber, plywood, paperboard, and pulp, biotextiles, biocomposites and lignin for various uses from medicine to advanced materials, in the food industry for concentrate in juices and ice creams and in pharmaceuticals. Metsä Groups therefore has a strong focus on ecosystems and its collaboration with partners from various industries – the ecosystem partnerships drive resource efficiency and innovation. Currently, 92% of the Metsä Group's production side streams are directed into reuse as materials (such as pulp-based textiles or bio-composites) or energy. The cooperative is responsible for 15% of Finland's renewable energy.
DANONE. Danone has formed an innovative multilateral alliance bringing together leaders from the full agricultural value chain, including animal health companies, crop nutrition specialists and an artificial intelligence agri-food startup. This alliance explores how to apply regenerative agriculture practices to dairy farms, from growing animal feed and rearing animals to producing milk, working closely with farmers in the United States, Europe, and Russia.
COCA COLA. Coca cola announced that, by 2030, it would collect a bottle or can for each one that it put in the market. To reach its targets, it needs to work within both its direct value chain and with competitors to move the entire industry forward.

– Sources: Deloitte Insight, company websites

CAPABILITY ASSESSMENT

In this chapter you have learned about the core capabilities for going circular. Use this tool to start thinking about the most relevant circular capabilities of your company and the areas where you need to improve.

CAPABILITY AREA	MOST RELEVANT CAPABILITIES FOR YOU: What are the most relevant capabilities for your company to succeed in circularity and reach your circularity vision?	IDENTIFY IMPROVEMENT AREAS: What are the most critical improvements needed to develop your key circular capabilities?	DEFINE ACTIONS: What are the initiatives needed to improve your key circular capabilities? Consider which capabilities you should develop internally and which capabilities you should source from external partners.
ORGANISATION AND LEADERSHIP			
FUNCTIONS AND INNOVATIONS			
THE CIRCULAR ECOSYSTEM			

Sources: Deloitte Insight

THE BUSINESS MODEL CANVAS

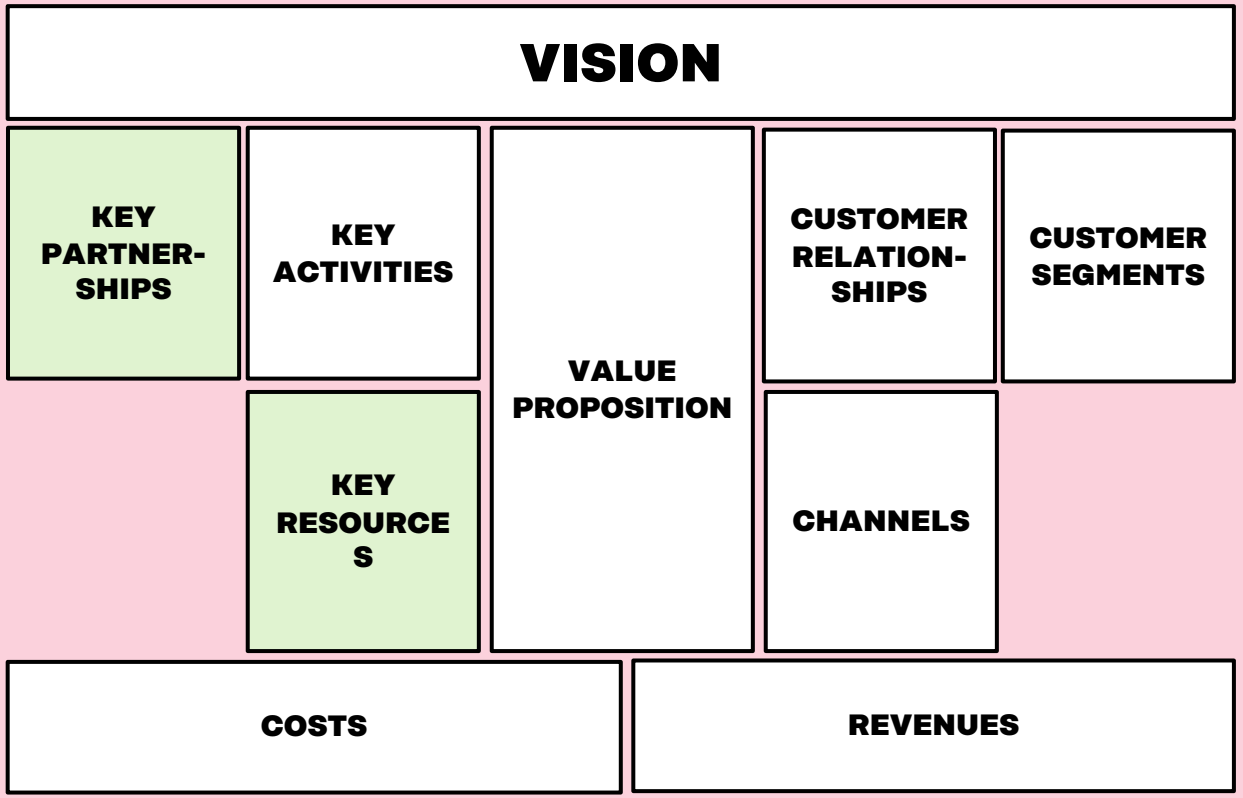
Continue to fill in the business model canvas. The questions below will help you get started.

KEY PARTNERSHIPS:

- Who are the key players you should partner with to (a) benefit from existing circular opportunities in the system or (b) create new circular opportunities?
- Are there specific problems that you need to solve before moving forward? Who could you partner with for this?
- Are there players missing from your ecosystem, have you identified a need and demand for an enabling circular business?

KEY RESOURCES:

- What material or immaterial capabilities are needed to realise your value proposition?
- Do you possess all this capabilities? Can you acquire them?



Sources: Deloitte Insight

SITRA

5. CREATE AND EXECUTE YOUR JOURNEY TO CIRCULAR BUSINESS

In this chapter, you will learn about two alternative approaches forward to support your circular business development. You can then proceed with the more detailed steps and approach tailored to your business.

AFTER READING THIS CHAPTER YOU WILL:

- Understand how to quickly validate your circular business idea and take the steps to scale up circular solutions.
- Understand how circularity relates to strategy, and how to start a comprehensive transformation to the circular economy in your company.
- See how example companies have embarked on their journey to circularity.

Almost there!

SUMMARY OF CHAPTER 5

HOW TO MOVE FORWARD? This chapter presents two different approaches that will help any company craft their own way forward towards circular business transformation. Companies that want to move forward quickly to pilot a new business idea, and tolerate failure well, should begin to pursue Path A (test and validate). Companies that pursue a longer-term, comprehensive and strategic business transformation should look into Path B (vision and roadmap).

PATH A: TEST AND VALIDATE:

Engage yourself in a lean startup mindset, finalise your circular business model canvas and mobilise your company resources to initiate quick piloting and validation of your circular business idea.

Perform testing and iteration on the feedback from customers, hit (or miss) your pilot targets, and finally, decide what to do with the pilot (scale up, pivot, or kill it).

PATH B: VISION AND ROADMAP:

Engage yourself in future-oriented, strategic business development for a complete transformation to circularity. Follow the footsteps of companies like Ikea and Neste, and begin a comprehensive journey to circularity. Start by envisioning where you want to be in 10 or 15 years. Integrate circularity and the full business potential it brings into your company strategy and define the needed initiatives that allow you to reach the potential and fulfil your circular vision.

TWO PATHS FORWARD – CHOOSE THE MOST SUITABLE FOR YOU OR COMBINE

The circular economy opportunities that different companies have identified vary in size and ease of implementation. The ambition and readiness of companies to implement the circular economy also varies greatly. For one company it might makes sense to quickly and lightly pilot a new business model opportunity that concerns just one of their products. Another company might have the appetite and opportunity for a larger, company wide transformation journey to circularity. A third company may need to investigate opportunities further – and perhaps revisit chapters 2 and 3 – and continue internal and external discussions before moving further on the topic.

In this chapter we briefly present two alternative and fundamentally quite different approaches forward: **A) TEST AND VALIDATE** and **B) VISION AND ROADMAP**. Understanding these two approaches will help any given company to move forward on their circularity journey.

- Are you up for rapid validation of your idea; an agile, action-oriented approach that thinks of failure as a one of the best ways to learn? (Test and Validate)

- Or would you prefer a more elaborate, comprehensive and vision-oriented approach that integrates circularity in your strategy? (Vision and Roadmap)

Don't hesitate to combine the two approaches to speed up the transformation.

A: TEST AND VALIDATE

What: A lean startup-style methodology to quickly test, learn and validate if your idea creates value, if customers are willing to pay for it and if you have the capabilities to implement the solution in scale.

For whom: For any company that wants to move forward rapidly, has a focus on value creation and tolerates failure, uncertainty and risks quite well.

Outcome: A successful pilot, or, learnings on what did not work (if the idea was killed).

B: VISION AND ROAD MAP

What: A future-oriented strategic approach to integrate circularity in your strategy and define a roadmap to reach your vision.

For whom: For any company that wants to integrate circularity holistically in its strategy.

Outcome: The definition of your preferred circular future (where you want to be) and actions driven by strategy that get you there.

Sources: Deloitte Insight

TEST AND VALIDATE – THE PROCESS

1. SET THE MINDSET

Understand the mindset needed to succeed in rapid testing and validation.

- Understand the innovation spectrum and where you position on it
- Understand the basics of lean startup based business development
- Make sure that your idea is backed internally, also in the board

2. MOBILISE

Finalise the circular business model concept you want to pilot and mobilise your company resources to start testing.

- Complete and revise your business model canvas to have a good overall idea of your circular business venture
- Assign a lead and a cross-functional team for your circular business venture.
- Consider creating an independent team or an internal startup, that has its own funding and can create its own processes.
- Set targets for your venture, with actionable metrics, set a timeframe and set a budget – you're ready to start experimenting.

3. TEST

Use lean startup-style methods to quickly be able to pilot your initiative and iterate on the feedback.

- Choose the best approach for your company to engage in lean startup experimenting – on your own or with your trusted partners.
- There are various good freely available resources online, search for "Lean startup methodology". See the overview of the methodology on page 135.
- Common tools used within conducting lean startup experimentations are various, and they include, for example: *Live prototyping, customer testing, interviews, business model canvas, value proposition canvas, revenue model calculations, value driver trees, venture organisation charts, venture capability maps, transaction map, minimum-viable-product (MVP).*

4. NEXT STEPS

Scale successful pilots; pivot ones with potential, kill ideas that are not viable.

- Once the budget or timeframe of your lean startup venturing has finished, you'll need to conclude on the success of the pilot and determine the next steps.
- If your pilot was successful and you're ready to scale, have a look at the typical options to scale your circular venture on page 137.

THE FIRST THREE STEPS CAN BE COMPLETED IN AS LITTLE AS 8-12 WEEKS!

Sources: Deloitte Insight

SITRA

1. SET THE MINDSET – UNDERSTAND THE INNOVATION SPECTRUM

The successful development of new business models begins with the recognition that innovation lies on a spectrum. Innovators need to understand:

1. How does your company view failure

2. The predominant mindset of your company

3. The degree of certainty your company is comfortable with.

If your company is positioned on the left side of the picture below, you're not ready to start testing and validating. If you are (or are able to move to) on the right side, you have the right mindset to start.

	INCREMENTAL IMPROVEMENTS		NEW INVENTIONS
DEGREE OF CERTAINTY	Relatively high	Medium	Relatively low
PREDOMINANT MINDSET	Execution / discipline	Experimentation	Exploration and testing
APPROACH TO FAILURE	Failure is negative	Failure is tolerated	(Some) failure should be expected to gain insight

WHERE ARE YOU IN THE INNOVATION SPECTRUM?

Can you set-up an innovation environment where you are at the right-side end of the spectrum and have the ability to trial and create new innovations?

Sources: Deloitte Insight

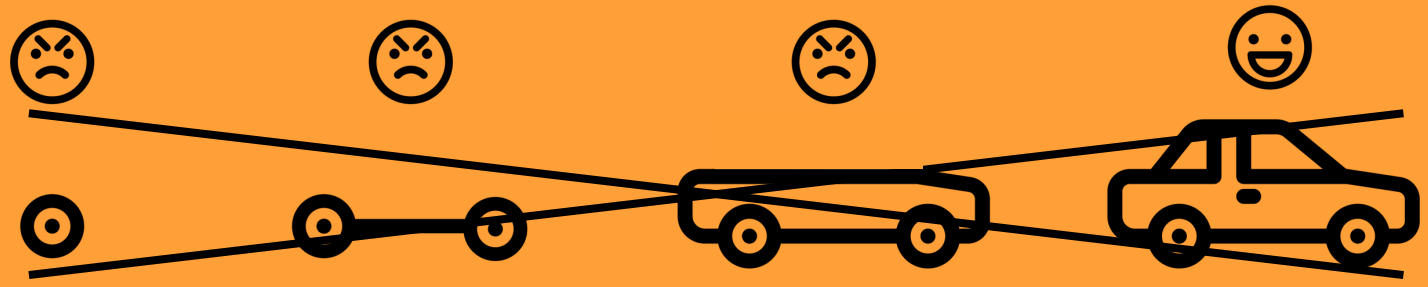
1. SET THE MINDSET – UNDERSTAND LEAN STARTUP

The basic idea of lean startup methodologies is to learn while developing your business concept: first learn, then grow.

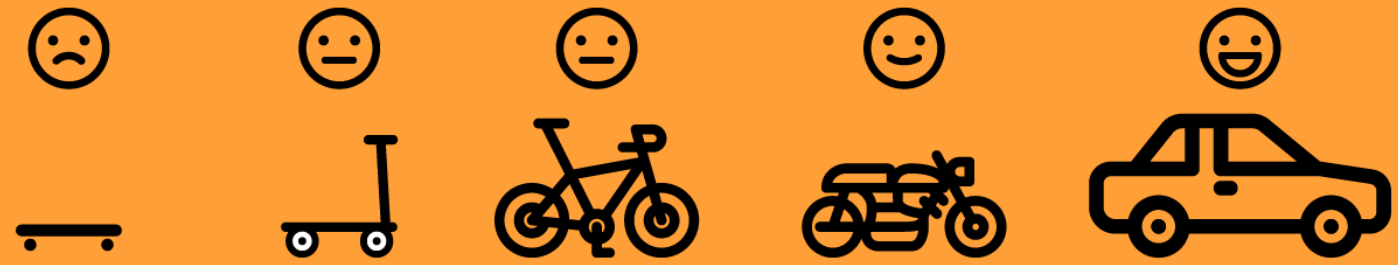
By developing minimum viable products as early as possible, you're able validate your business idea with customers and partners. The lean startup method has been popularised by successful startups, but today it's used as a tool to create new business concepts by leading companies of all sizes.

How lean startup method can be implemented?

Not like this....



But like this!



Sources: Deloitte Insight

2. MOBILISE – REVISE YOUR BUSINESS MODEL CANVAS

After you have completed the business model canvas, you can start to consider if you have what it takes to be successful.

The key questions to test your business model canvas with and the specific business model canvas sections they relate to are:

Is there demand?

Test: customer relationship, customer segments, and channels.

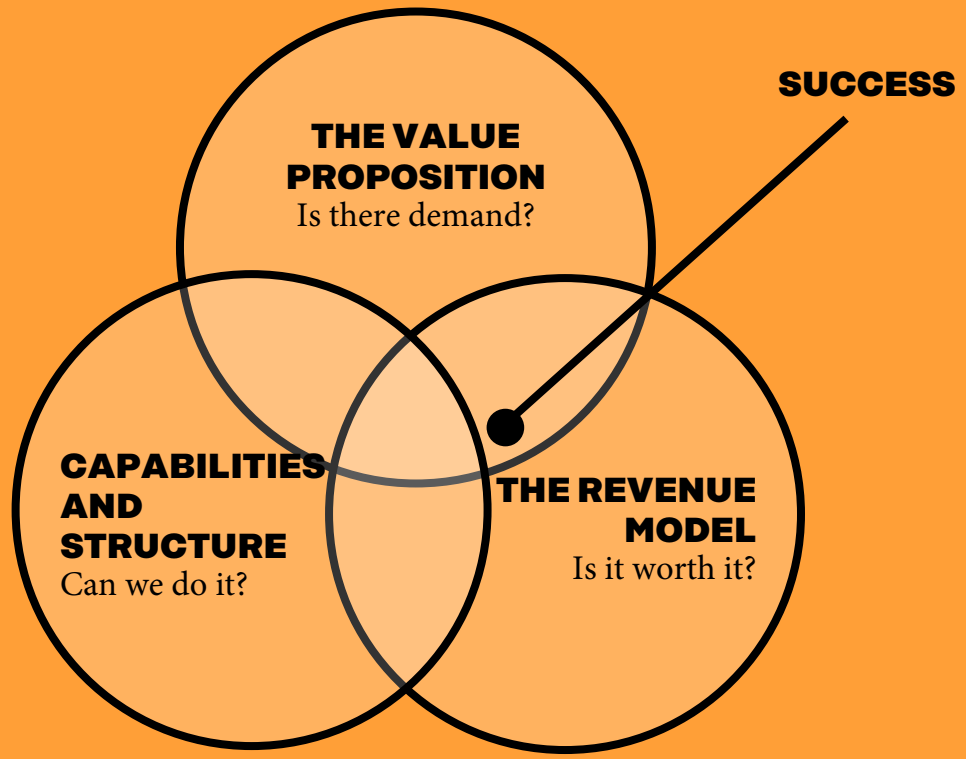
Can we do it?

Test: key partnerships, key activities, value proposition and key resources.

Is worth it?

Test: costs and revenues.

THE THREE KEY QUESTIONS THAT THE LEAN STARTUP METHODS VALIDATE



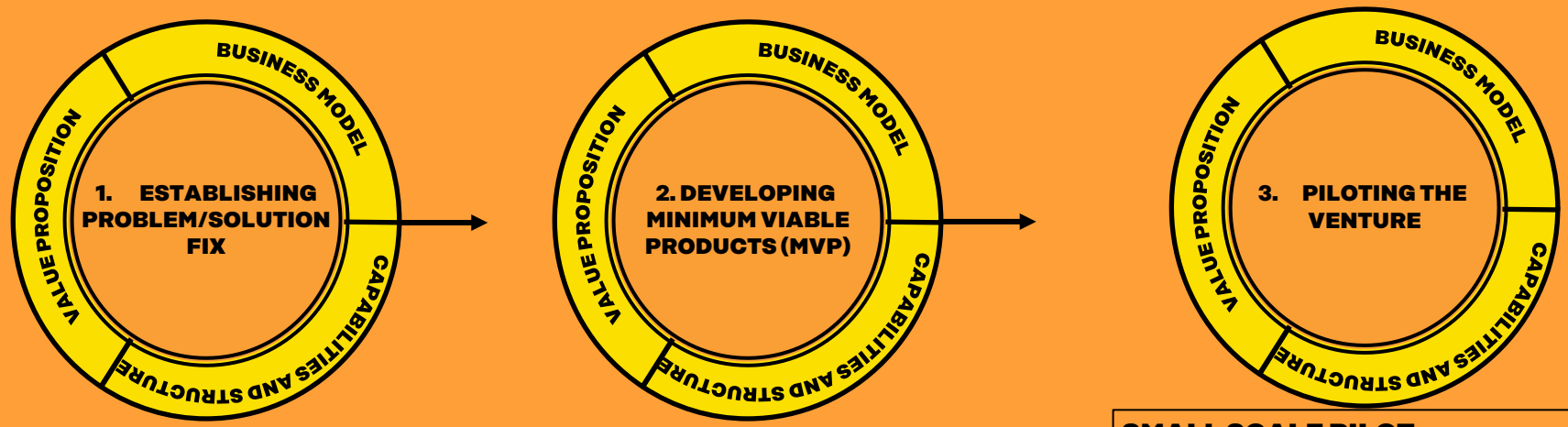
Sources: Deloitte Insight

SITRA

3. TEST – THE VENTURE PATH MODEL

After you have conceptualised your best circular ideas in the business model canvas, gained internal buy-in and formed a team, you're ready to start validating the idea using lean startup methods. Venture Path is a three-stage methodology to help you take your circular opportunity from idea stage to piloting. This can be done in 8-12 weeks. On this page you can gain an overview of what this process entails.

THE VENTURE PATH MODEL



FOCUS	**STRATEGIC EVALUATION:** Determine whether the idea deserves examination	**QUICK AND DIRTY EXPERIMENTATION:** Test, refine and validate key hypotheses	**SMALL SCALE PILOT:** Prove customers will actually buy the solution and it works technically and operationally
OUTPUTS (illustrative)	**PITCH DECK:** Idea summary & rationale (e.g. iterated bus. model canvas), light research, ballpark commercial assessment, visual mock-ups	**PROTOTYPE** A crude solution which performs (or simulates) critical functionality of the ultimate circular solution	**BETA PRODUCT:** A basic circular solution which delivers core functionality. May not be integrated with business systems, hence scalability may be limited

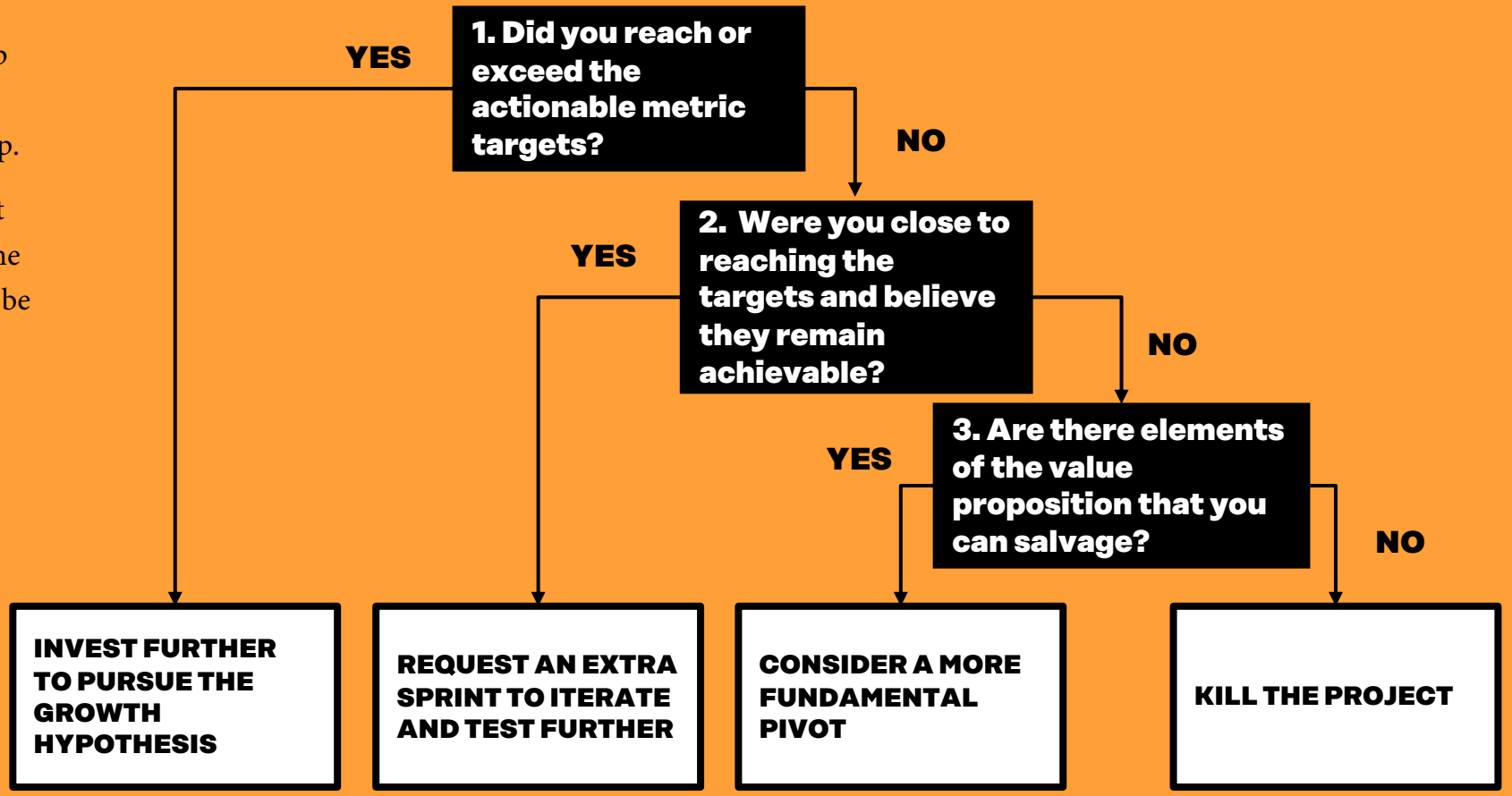
Sources: Deloitte Insight

SITRA

4. NEXT STEPS – DID YOU SUCCEED?

Once the budget or timeframe of your lean startup venturing has finished, you'll need to conclude on the success of the pilot and determine the next step.

With lean startup thinking, failing is not the worst outcome – but rather a necessary outcome (at some point) that allows you learn things you would not be able to learn without the experiment.



Sources: Deloitte Insight

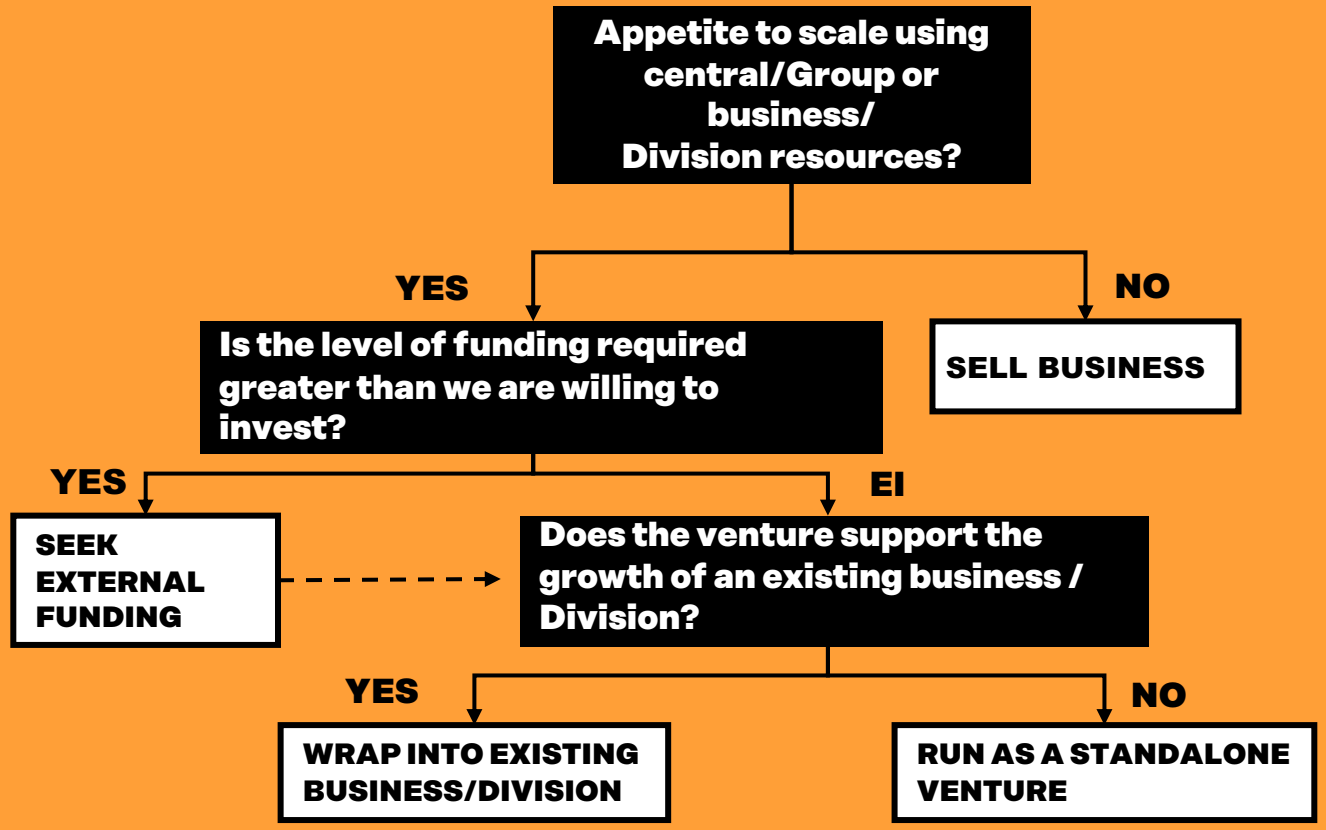
SITRA

4. NEXT STEPS – SCALING UP YOUR PILOT

If your pilot was successful and you're ready to scale (to go for further investments, revenues and scale), there are various options for your new venture.

One of the key considerations is if you want to keep the new circular business within your company, or should it be a separate legal entity?

DECISION TREE – OPTIONS TO SCALE YOUR VENTURE



Sources: Deloitte Insight

SITRA

TOOL: HOW TO GET STARTED WITH TEST AND VALIDATE –METHOD

1. SET THE MINDSET

Start by examining the following questions:

1. DEFINE WHERE are you on the innovation spectrum? Are you able to move towards the right end of the spectrum?

2. FIND OUT if your organisation has experiences with lean startup based business development? What can you learn from those experiments?

2. MOBILISE

Start by examining the following questions:

1. IS YOUR circular business venture clearly documented? Revise the business model canvas once more.

2. ARE YOU ABLE find an internal sponsor for the venture?

3. DO YOU HAVE the right people and team to start the venture? Do you need external support to succeed?

3. TEST

Start by considering the following questions:

1. DO YOU KNOW suitable approaches and tools to start the lean startup based testing of your circular business venture?

2. IF NOT, MAKE A PLAN to find the suitable approach for you and use external support where needed. Lean startup experiments can be simple and light, and they also suite small companies with shoe-string budgets.

4. NEXT STEPS

Start by considering the following questions:

1. **DID YOUR PILOT SUCCEED?** Determine the next steps based on page 119.

1. **IF YOUR PILOT WAS SUCCESFUL AND YOU'RE READY TO SCALE,** define the typical options to scale your circular venture based on page 120.

Sources: Deloitte Insight

SITRA

VISION AND ROADMAP – WHAT DOES IT MEAN?

The vision and roadmap refers to a comprehensive journey to circularity, looking at 1) where you want to be in the next 10 years (the circular vision)? 2) what are the initiatives that will take you there (the roadmap)? This will be a journey to unlock the full potential of circularity. Ikea and Neste are good examples of companies using this path. Hopefully this playbook will inspire you to start or accelerate your journey to your circular vision.

The following page introduces the backcasting method, which allows you to define the measures necessary to achieve a circular economy vision.

1. DISCOVER

Use this playbook to holistically assess what circularity brings to your current (and new) businesses and to discover what are the models you need to implement to unlock the potential. Complement your assessment with additional analysis and studies.

THE FOCUS OF THIS PLAYBOOK

2. INTEGRATE

Fully integrate circularity into your strategy and your strategy process. Reflect on your current circular vision, the portfolio of opportunities you have identified, your current capabilities and opportunities and threats relating to the development of the market and your competitors.

3. REFINE

Refine your circularity targets and strategic choices.

4. CREATE PATH

Define the needed initiatives to unlock your full circular economy potential and reach your vision.

5. MAKE IT HAPPEN

Start carrying out the initiatives and further invest in partnerships and building your circular economy ecosystem.

INTEGRATE IN YOUR COMPANY'S STRATEGY PROCESS

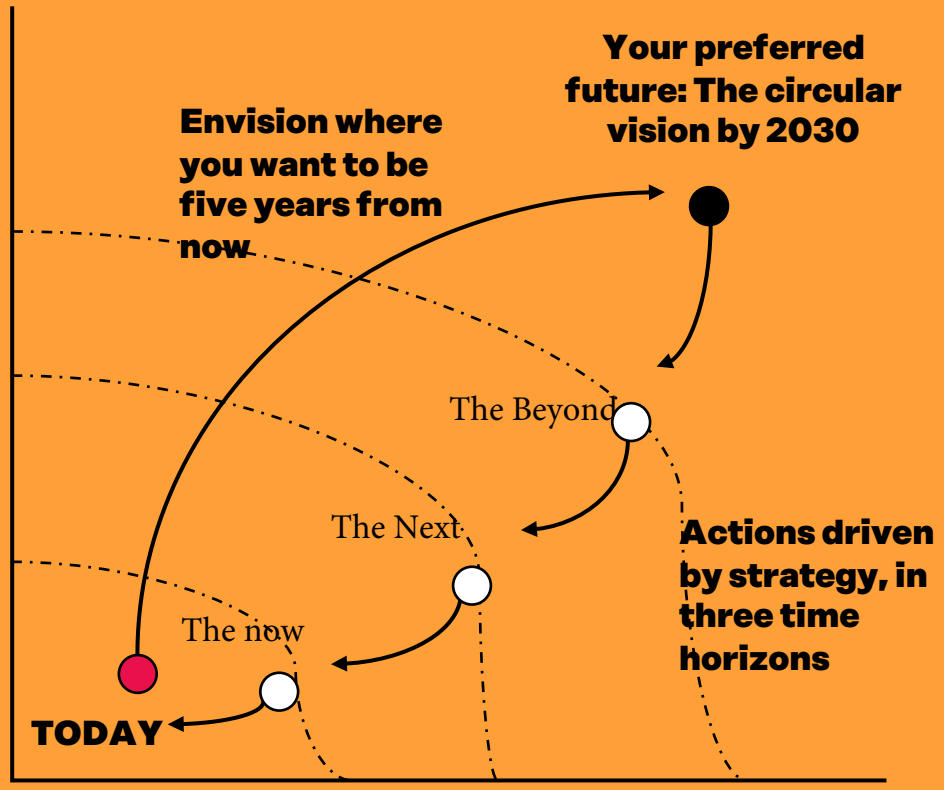
Sources: Deloitte Insight

THE BACKCASTING APPROACH

Backcasting, also known as strategies of trajectory, starts with a view of the future and works back to the requirements for action in the present. First, figure out where you want to be (your preferred future), then plot the path that will be most likely to get you there quickly, taking into consideration three time horizons: the now (6-12 months), the next (1-5 years) the beyond (5-10 years).

Your circular economy vision (integrated in the company strategy) forms your preferred future. Backcasting allows you to look from the future back to the present to the most value adding actions.

The more detailed structure of a roadmap to the circular vision will be company specific. It is important to continuously operate on all three time horizons, and avoid focusing on only the short-term. This will inhibit you from reaching your circular vision.



ADDITIONAL RESOURCES!

See, for example, John Hagel's (Co-Chairman, Deloitte Center for Edge Innovation) short and insightful two articles that explain the future-casting approach and how to define the actions that take you to your preferred future: Part 1 and Part 2

Sources: Deloitte Insight

SITRA

CASE STUDY: IKEA'S JOURNEY TOWARDS 100% CIRCULARITY 1/2

First, the Swedish home-furnishing giant Ikea revolutionised the way we buy furniture. Now, the company is looking to completely transform circular business models and produce 100% circular products, use only renewable and recycled materials, and enable customers to obtain, care for and pass on products in circular ways.

FROM DESIGNING FOR RECYCLABILITY TO FOSTER CIRCULAR ECONOMY

IKEA started its strategic transformation journey towards 100% circularity in 2017. The core elements of the transformation include its sustainability strategy and roadmap, material assessments, and development of circular product design principles. To achieve this goal, IKEA is embracing several circular business models. Since the start and initial trials, IKEA has integrated the circular economy into its business strategy, leadership and group wide KPIs.

Resource recovery: As one of its first circular economy initiatives, IKEA developed an approach to identify and prioritise materials most valuable for recycling to foster circular resource chains, and started collecting and reusing packaging materials.

Since then, the company has established take-back services for old IKEA furniture and textiles. These function with a voucher mechanism and use digital solutions to make the returning as easy as possible for the customer. In 2019, 47 million products were given a second life through the service. They are resold in circular hubs that function as part of standard IKEA department stores.

Sources: IKEA website, Deloitte Insight

CASE STUDY: IKEA'S JOURNEY TOWARDS 100% CIRCULARITY 2/2

Circular inputs: IKEA is committed to use only renewable and recycled materials. Currently, 60% of the IKEA product range is based on renewable materials, and more than 10% contains recycled materials. This and similar targets by other multinationals offer a big opportunity for companies that can enable IKEA's transformation.

Product-life extensions: IKEA's circular hub concept includes a dedicated space for customers to learn about product use extension, upcycling and reducing consumption.

Product as a service: IKEA is currently trialling a furniture as a service model, in which customers can rent furniture or furniture sets for a monthly fee – access over ownership.

BECOMING A LEADER

IKEA is serious about becoming a circular economy business leader. The company is working closely with policymakers, gathering insight from customers, testing and piloting, establishing valuable partnerships, and involving the whole value chain in this transformation process.

WHAT CAN WE LEARN FROM THE CASE?

- To make a full circular economy transformation, the circular economy principles have to be embedded at all levels of the company and partnerships (ecosystem).
- Set clear, guiding KPIs for the transformation
- Don't limit yourself to one circular business model but find synergies and new opportunities amongst many of them. Circular business models are often the most powerful when combined.
- Consumers can be ready to change their practices – you just need to give them the right incentives and make the change effortless and attractive.
- IKEA combines a comprehensive strategic transformation with pilots and experiments to speed up its journey.
- When giants like IKEA set ambitious circular targets, it creates a massive demand and opportunity for circular solutions

Sources: IKEA website, Deloitte Insight

CASE STUDY: VALTRA'S CIRCULAR BUSINESS 1/2

Valtra is a manufacturer of tractors and agricultural machinery based in Finland that has undergone a company-wide transformation to the circular economy and expanded its operations into service-based circular business models and smart-agriculture. This has been done by adopting new ways of thinking and doing within Valtra.

REMANUFACTURING

Valtra's circular business started initially from providing maintenance services across Europe. As part of the concept, in 2012 Valtra started to refurbish old gearboxes to give them a second life. The concept was named Reman.

Reman's business model is based on a product exchange facilitated by a deposit model. When customers buy a remanufactured product they return their old product and pay a deposit for the remanufactured gearbox, which is about 50% of the price.

The added value of the Reman service to customers is about 30-40% lower price and shorter delivery time.[1] It is also easy and care-free for the customers, as Valtra is responsible for the functionality of the products and takes care of the cost of logistics. Today, Reman's share of Valtra's business is notable, and the turnover has increased about 25-35% annually[1].

Sources: [1] Sitra (2017): Case study – Tehdaskunnostetut traktoreiden vaihdelaatikot; [2] Business Europe (2017): Circulary – Project Valtra; Deloitte insight

CASE STUDY: VALTRA'S CIRCULAR BUSINESS 2/2

SMART AGRICULTURE

The European Green Deal and the related Farm to Fork strategy have outlined a clear direction for agriculture: we need smart farming to optimise the use of fertilisers and pesticides and to improve our farming operations overall.

Valtra's digital agricultural solutions support smart farming and help to deliver sustainable agricultural objectives. The solutions can help optimise the use of materials needed in farming, which decreases excess usage and enables a better harvest. The technologies can be integrated to Valtra's tractors.

Collecting, exchanging and utilising data are central for the smart solutions.

WHAT CAN WE LEARN FROM THE CASE?

- Refurbishing service business doesn't necessarily eat the profits of other operations, even if the remanufactured products are cheaper than new ones. Instead, they enable a better, more diversified service portfolio that attracts more customers.[2]
- The remanufacturing process can give good insight for product development and supports the better circular design of products.[2]
- Valtra solved the tricky question of logistics in Reman's business by encouraging its customers with a deposit model.
- Valtra shows that a small circular economy experiment can turn into significant business, investments in new factories and a mindset shift in the company's leadership.
- Valtra shows how adding "intelligence" to products (tractors) opens up a new data-driven circular business that saves resources and increases productivity.

Sources: [1] Sitra (2017): Case study – Tehdaskunnostetut traktoreiden vaihdelaatikot; [2] Business Europe (2017): Circulary – Project Valtra; Deloitte insight

CASE STUDY: ORTHEX'S PRODUCTS ASPIRE CIRCULAR ACTION 1/2

The Orthex Group is a Finnish group of companies that manufactures plastic household goods. Orthex's product range includes products manufactured from post-consumer and post-industry plastic waste, which it sources from the energy- and waste processing company Fortum.

WITH CIRCULAR ECONOMY THINKING TOWARDS CARBON NEUTRAL PRODUCTION

Using recycled materials from industrial processes is nothing new to Orthex, which has been making such items as buckets and boxes from post-industrial plastics already since the 1990s. In 2017, the company started to utilise post-consumer plastic waste in their production, enabled by increased collection of separate plastic-waste in households.

Orthex has set a goal to reach carbon neutral production by 2030, and the circular economy is a central tool for reaching the company's ambition. The core actions include increasing the share of sustainable raw materials to 80% by 2030, and promoting the circular economy.

Currently, 15-20% of Orthex's production is based on recycled materials and the company aims to continuously increase the amount of recycled and bio-based materials in their production.

Sources: Orthex's webpage; Deloitte insight

CASE STUDY: ORTHEX'S PRODUCTS ASPIRE CIRCULAR ACTION 2/2

ACKNOWLEDGED CIRCULAR DESIGN

Among Orthex's products is the SmartStore™ Collect, which is a modular recycling station for home.

The product is made from 100% recycled materials. Its design is modular and multifunctional, as the storing system can be tailored to everyone's own needs with inner storing boxes of different sizes. The product can also be used as a stool or side table.

SmartStore Collect is a product that is not only based on recycled materials, it also improves household's capability to recycle their waste.

In 2020, the product won a German Design Award, a Red Dot Design Award, and an Innovation Interior Award.

WHAT CAN WE LEARN FROM THE CASE?

- Carbon neutrality and the circular economy go hand in hand – circular business models are one of the most obvious ways to reach carbon neutrality to the masses of companies.
- Orthex started using waste as a resource very early on, which has perhaps helped them to secure the supply of secondary resources and develop skills and competences inside the company. These are some of the advantages of an early mover.
- Modularity and functional versatility are attractive qualities for many consumer products.
- Use of recycled materials doesn't need to hinder product design, and circular economy design can be an important way to educate consumers and mainstream the circular economy.

Sources: Orthex's webpage; Deloitte insight

WHAT NEXT?

You have reached the end of this guide. We hope it has provided insight, examples and hands-on tools.

Now is the time to continue developing your business towards the circular economy.

1. You understand the importance of the circular economy. You have learned the main changes in the business environment and identified your risks and opportunities.
2. You have discovered how the circular economy can turn inefficiencies into opportunities. You have identified the inefficiencies in your value chain and reflected how the circular economy can add value.
3. You have studied the five circular economy business models and perhaps even picked the right ones for your company.
4. You have learned what the transformation to circularity requires from a company. You have also studied the capabilities and challenges of your company.
5. You have perhaps picked a suitable transformation path for your company.

Here are a few tips to engage your employees and colleagues.

1. Share the things you have learned with your team, business unit or board of directors.
2. Use the insight to make the circular economy a priority for the directors of your company or business unit.

We recommend setting up a team to promote circular change.

1. Review your strategy and assess whether it takes into account the main changes in the business environment.
2. Uncover the opportunities of the circular economy throughout the value chain.
3. Sketch a plan to carry out the planned operations.
4. Make sure your colleagues, customers and partners are involved in revising and validating the plan.

KEY RESOURCES

CIRUCLAR ECONOMY BUSINESS MODELS FOR THE MANUFACTURING INDUSTRY

Circular economy playbook for Finnish SMEs by Sitra, Technology Industries of Finland and Accenture. Download the publication from Sitra´s website.

CIRCULAR BUSINESS MODELS FOR CHEMICAL COMPANIES

Circular economy playbook for the chemical industry by Chemical Industry Federation of Finland, Business Finland and Sitra. Download the publication from Sitra´s website.

THE CIRCULAR ECONOMY PLAYBOOK – CIRCULAR BUSINESS MODELS FOR NORDIC MANUFACTURING INDUSTRIES

Nordic circular economy playbook for the manufacturing industry by Nordic Innovation. Download the publication from Nordic Innovation´s website.

THE WINNING RECIPE FOR A CIRCULAR ECONOMY

Sitra explored what factors combine successful circular economy solutions. Download the publication from Sitra´s website.

MOTIVATION PROFILES OF A SUSTAINABLE LIFESTYLE

Seven sustainable lifestyle motivation profiles help you understand different motivations as well as identify more relevant practices in the transition to a more sustainable lifestyle.. Read the publication on Sitra´s website.

ADDITIONAL RESOURCES

CIRUCLAR ECONOMY BUSINESS MODELS FOR THE MANUFACTURING INDUSTRY

Circular economy playbook for Finnish SMEs by Sitra, Technology Industries of Finland and Accenture. Download the publication from Sitra´s website.

CIRCULAR BUSINESS MODELS FOR CHEMICAL COMPANIES

Circular economy playbook for the chemical industry by Chemical Industry Federation of Finland, Business Finland and Sitra. Download the publication from Sitra´s website.

THE CIRCULAR ECONOMY PLAYBOOK – CIRCULAR BUSINESS MODELS FOR NORDIC MANUFACTURING INDUSTRIES

Nordic circular economy playbook for the manufacturing industry by Nordic Innovation. Download the publication from Nordic Innovation´s website.

THE WINNING RECIPE FOR A CIRCULAR ECONOMY

Sitra explored what factors combine successful circular economy solutions. Download the publication from Sitra´s website.

MOTIVATION PROFILES OF A SUSTAINABLE LIFESTYLE

Seven sustainable lifestyle motivation profiles help you understand different motivations as well as identify more relevant practices in the transition to a more sustainable lifestyle.. Read the publication on Sitra´s website.

TOOL: ADDITIONAL RESOURCES

Board of Innovation (2021)
Business models that work in circular economy

Circle Economy (2021)
Circularity Gap Report

Ellen MacArthur Foundation (2020)
Financing the Circular Economy

Ellen MacArthur Foundation (2019)
Completing the picture: How the Circular Economy Tackles Climate Change

Ellen MacArthur Foundation (2021)
The Nature Imperative: How the circular economy tackles biodiversity loss

Lacy, Long & Spindler (2020)
The Circular Economy Handbook: Realizing the Circular Advantage

Sitra (2020)
Rethinking ownership

Sitra (2021)
How does the circular economy change jobs in Europe?