APPENDIX

CIRCULAR ROLLOUT

Appendix

Bridging the design-implementation gap in circular economy

Graduation thesis appendix
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Contents

A. Interview questions

Interview questions: CE expert

Introduction (5 min)
Korte intro: Welkom, wie ben ik, doel van het onderzoek, werkwijze, toestemming opname, vragen?

General (5 min)
Kan je een korte introductie geven van jezelf? Wat is je leeftijd, positie in het bedrijf en ervaring?

Company (10 min)
Waarom en hoe ben je dit werk gaan doen? Wat is je doel, wat wil je bereiken, visie/missie?
Wat zijn de belangrijkste ontwikkelingen binnen de circulaire wereld?
Waarom schakelen bedrijven jou in en niet iemand anders?
Wat zijn jouw grootste uitdagingen?

Circular Economy (35 min)
Wat betekent CE voor jouw klanten?
    Veel/weinig? Kans/risico? Waarom?
Gaan klanten vaak over tot implementatie?
    Waarom wel/niet?
Kan je een voorbeeld noemen van een circulaire innovatie die een klant heeft gelanceerd of wilde lanceren?
    Welke stappen doorliep het implementatieproces?
Wat waren de grootste uitdagingen die je tegenkwam bij de implementatie?
    Hoe heb je deze overwonnen?
Welke factoren dragen volgens jou bij aan een succesvolle implementatie?
    Speelde samenwerking tussen bedrijven een rol in het proces? Hoe verliep dit?
    Was er sprake van experimentatie? Hoe heb je dit ervaren?
    Op wat voor manier was er commitment aanwezig? Top-down? Bottom-up?
    Is er gekeken naar de rol van systemen? Hoe beïnvloedde dit het proces?
Denk je dat hulp bij de implementatie het proces versnelt/vergemakkelijkt zou hebben?
    Waarbij? Hoe? Waarom? Waarom niet? Hadden jullie de benodigde kennis al?
Stel dat een bedrijf CE wil implementeren, welk advies zou je dan geven?
    Waarom?

Conclusion (5 min)
Dit is het einde van het interview. Bedankt voor de samenwerking en voor al je antwoorden. Heb je zelf nog vragen of opmerkingen?

Interview questions: Successful company

Introduction (5 min)
Korte intro: Welkom, wie ben ik, doel van het onderzoek, werkwijze, vragen?

General (5 min)
Kan je een korte introductie geven van jezelf? Wat is je leeftijd, positie in het bedrijf en ervaring?

Company (10 min)
Wat is het doel van het bedrijf? Visie/Missie? Welke kant wil het bedrijf op in de toekomst?
Hoe wil het bedrijf dit bereiken?
Wat zijn de belangrijkste ontwikkelingen/uitdagingen binnen jouw markt en industrie?
Waar liggen de grootste kansen voor jouw bedrijf?

Circular Economy (35 min)
Kan je een voorbeeld noemen van een circulaire innovatie die jullie hebben gelanceerd of wilden lanceren?
    Wat was de motivatie achter de innovatie?
    Welke stappen doorliep het implementatieproces?
Wat waren de grootste uitdagingen die je tegenkwam bij de implementatie?
    Hoe heb je deze overwonnen?
Welke factoren dragen volgens jou bij aan een succesvolle implementatie?
    Speelde samenwerking met andere bedrijven een rol in het proces? Hoe verliep dit?
    Was er sprake van experimentatie? Hoe heb je dit ervaren?
    Op wat voor manier was er commitment aanwezig? Top-down? Bottom-up?
    Is er gekeken naar de rol van systemen? Hoe beïnvloedde dit het proces?
Denk je dat hulp bij de implementatie het proces versnelt/vergemakkelijkt zou hebben?
    Waarbij? Hoe? Waarom? Waarom niet? Hadden jullie de benodigde kennis al?
Is deze circulaire innovatie onderdeel van een duurzaamheidsvisie?
    Wat is deze visie?
Stel dat een bedrijf CE wil implementeren, welk advies zou je dan geven?
    Waarom?

Conclusion (5 min)
Dit is het einde van het interview. Bedankt voor de samenwerking en voor al je antwoorden. Heb je zelf nog vragen of opmerkingen?

Interview questions: Aspiring company (short)

Circular Economy (30 min)
Jullie willen een nieuwe circulaire innovatie implementeren, welke stappen zal het implementatieproces doorlopen?

Wat zijn de grootste uitdagingen die je tegen denkt te komen bij de implementatie?
    Hoe kunnen die barrières overwonnen worden?
Welke factoren dragen volgens jou bij aan een succesvolle implementatie?
    Speelt samenwerking met andere bedrijven een rol in het proces? Hoe verloopt dit?
    Is er sprake van experimentatie? Hoe ervaar je dit?
    Op wat voor manier is er commitment nodig? Top-down? Bottom-up?
    Is er gekeken naar de rol van systemen? Hoe beïnvloedt dit het proces?

Denk je dat hulp bij de implementatie het proces versnelt/vergemakkelijkt?
    Waarbij? Hoe? Waarom? Waarom niet? Hebben jullie de benodigde kennis al?

B. Interview results

Interview results: Douwe Jan Joustra

Interview number: 1
Interview type: Expert
Participant name: Douwe Jan Joustra
Company name: C&A Foundation
Business: Charity
Date: 27-09-2017
Time: 09:30
Location: Amsterdam

Highlights

- Douwe Jan Joustra was one of the first to introduce CE in The Netherlands
- He thinks the problem is a lack of shared understanding, intrinsic motivation and vision to change throughout the different layers of a company
- He proposes to solve this using a design thinking approach.

Summary
Experience
Douwe Jan has always worked in sustainability. He started in sustainability and later got into Cradle2Cradle. Eventually, he met Ken Webster and Ellen MacArthur and helped them found the Circular Economy. He has worked in the field ever since, first as a civil servant, later as a freelance consultant together with architect Thomas Rau. Douwe Jan had a difficult time trying to bring CE to the public attention, until 2013 when TNO published a report about the opportunities for a CE in The Netherlands. Douwe Jan published a similar report in 2014 together with several Dutch ministries which he was allowed to present to King Willem-Alexander. Since then, things started to move a lot quicker.

Douwe Jan founded an accelerator for the Circular Economy, called RACE where he introduced the element of design, which he thinks is very important. He also founded CIRCO which performs circular business design workshops, NLCirculair which is a matchmaking platform for circular entrepreneurs in The Netherlands and NICE, the Northern Netherlands Innovation Lab for the Circular Economy. Recently, he joined the C&A foundation where he is in charge of the foundation's Circular Economy investment portfolio.

CE
Douwe Jan's drive is the economic side of CE and he has focused on implementing Circular Economy for a long time. In his opinion, one of the problems CE is facing is the so-called 'Valley of Death' of implementation. This is the difficulty of covering the negative cash flow in the early stages of an innovation, before their new product or service is bringing in revenue from real customers.

In his experience, many people in The Netherlands talk about CE, but not much action is undertaken. Also, many people misunderstand CE and mainly focus on recycling instead of preserving value through reuse or refurbishment.

Within companies, only few people focus on CE. Most of them are isolated and are still concerned with sustainability in a more traditional sense. This makes the transition to a CE hard, unless these people happen to be CEOs. The CE concept is hard to grasp for many businesses. It is difficult for them to imagine how a different business model would translate into their organisation. After all, a new business model has an enormous organisational impact, so how should they do it? In Brazil however, he noticed a different attitude. Brazilian businesses tended to focus more on the opportunity of a CE, and wanted to look into new ways to expand their business after the crisis of 2008. Dutch companies were mostly occupied with restoring the business they had before the crisis, looking back instead of looking ahead.

Examples of successful CE implementation
Brink is a climate control company located in The Netherlands. The CEO joined a CIRCO track and developed a performance-based business model in which he offers clients a certain air quality as a service. As an enthusiastic entrepreneur, he managed to sell and implement the concept with a client in Scandinavia.

The municipality of Apeldoorn wanted to renew its road and water infrastructure. However, instead of creating detailed specifications and choosing the cheapest proposal, they decided to set out a tender with a fixed budget and a set of qualitative demands. Construction companies were free to decide on the design and so the municipality chose the best one. This meant

construction companies were suddenly challenged to create a good design instead of a cheap one and to be creative with the materials and amount of materials they used. However, it also made selection much more difficult for the municipality.

Problem
According to Douwe Jan, the most important barrier preventing successful implementation is the fact that the issue of non-sustainability and the opportunity and importance of CE is not really felt by organisations. They don't feel ownership over the concept and never truly believe in it because they were only told of its importance by other people. They never discovered its potential themselves so real intrinsic motivation is missing. The question is; how do you create mental ownership of the CE in a company?

Solution
Douwe Jan has a solution. He thinks the answer lies in Design Thinking, Service Design and Co-creation. In order for a new business model and design to be implemented, a lot of activities have to change in an organisation. The only way to transform an organisation successfully is when everyone believes in the new way it is set up. This means people from different organisational layers have to be brought together to think about the new organisation and its new activities. This way all knowledge and creativity of the company can be used, and the amount of risks related to assumptions by upper management is reduced. He would do it in a workshop setting, rethinking a company's business using Simon Sinek's Golden Circles (why/how/what).

Why would a company be interested in this?
Long-term contact with clients is interesting for many companies
Potentially resource scarcity, but this will take a while
Preserving product value, earning more money from the same product
Every company likes to reflect on its business once in a while.

Success factors
Internal collaboration: Yes, very important. Connect people from different company layers and create a shared vision.
Value Chain collaboration: Difficult. Most companies don't have enough power to influence value chain partners. It is easier to start internally and look towards value chain partners later on. Also, companies often use the difficulty of collaborating with value chain partners as an excuse not to go into CE.
Customer collaboration: Yes, very important. Find out what your customer really needs.
Experimentation: Can be an excuse as well. Experimentation is important, but it has to lead to a parallel business, not a side track that ends in the middle of nowhere.
Commitment: A shared, intrinsic motivation is essential.
Systems thinking: Yes, very important to realise a change in business model. This is the core of CE.

Advice
Just do it! But watch out for prejudice and assumptions.

Interview results: Jos Mols

Interview number: 2
Interview type: Successful company
Participant name: Jos Mols
Company name: Schelde Exotech
Business: Industrial equipment
Date: 27-09-2017
Time: 17:00
Location: Vlissingen

Highlights

- Jos Mols is managing director of an industrial equipment manufacturing company
- His company also does maintenance, repair, refurbishment and recycling
- Jos realised the potential of increasing the lifetime of his products and is selling this more actively to his customers

Summary

Jos Mols is managing director at Schelde Exotech, an industrial equipment manufacturing company located in Vlissingen. His company focuses on the construction of heat exchangers, (petro)chemical equipment and offshore technology and currently employs 70 people.

How dit he get into CE?

Jos knew Critical Minds from a project they did previously. Bas Hillerström asked him to join a CIRCO track. Exotech already passed environmental regulation ISO 14001 and customers often asked him about the sustainability of his company and whether he passed the regulation. He also developed an interest for CE himself and was wondering what the topic would mean for his company.

CIRCO

Many other companies at the CIRCO track were looking into resource use. This was more difficult for Jos because he uses many specialised materials. He rather focused on his products, but these also have to pass certain regulations, demands and specifications. He did realise that extending the life of his products could be interesting. He found opportunities for maintenance, repair, refurbishment and remanufacturing of his products. He started to do this for a client, and discovered he could sell his remanufactured products for one third the price as new ones.

Barriers

Regulations can be difficult. Many regulations changed over time, most regulations got tougher to pass. This means refurbishment and remanufacturing is not always possible. As a solution, Jos opens a discussion with the party that decides on the pass/fail, and usually reaches an agreement, as long as he can prove his products are safe enough. This can be difficult, since there are different demands for new and remanufactured products and there is a grey area into which category his products fall.
Repairs in the field are more difficult than repairs in the Exotech workshop. The metalworkers prefer to do repairs in-house, unfortunately this is sometimes not possible because equipment is not detachable.
Raising awareness among customers. Most customers are still focused on using brand new products, so Jos gives presentations to make them aware of the possibilities of refurbished and remanufactured products.

Future vision

Jos wants Exotech to continue with innovating and improving. He wants to continue with doing maintenance, repair, refurbishment and remanufacturing. It is a lucrative business for Exotech, since they make more profit on these activities than production of new equipment. Jos also sees it as a good way to compete with companies in cheaper countries abroad.

Success factors

- Start small
- Gain experience and expand
- Collaborate with clients. His products are custom-built and start with a question from the customer, Jos advises with his technological expertise.
- Exotech was already doing maintenance, repair, refurbishment and recycling, but now Jos discovered its full possibilities and he focuses on it more consciously.

Interview results: Peter van Gemert

Interview number: 3
Interview type: CIRCO participant - short questions
Participant name: Peter van Gemert
Company name: Van Oord
Business: Dredging
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- Peter van Gemert developed a pay-per-use dredging concept in collaboration between Van Oord and IHC.
- Collaboration was essential to create a concept that is beneficial to both companies.
- The biggest challenge is getting commitment from both companies' top and middle management, but also from labourers.
- Peter wants to solve this by building a strong business case, presenting it as a shared concept and raising awareness and knowledge of the circular economy.

Summary

Peter van Gemert is Manager Projects and Developments at Van Oord, a Dutch dredging company. Together with his colleague Tonny Westerlaken, he participated in a three-day CIRCO track about circular business. During the track he analysed his company's value chain and developed a circular business proposal. He soon realised it was a good idea to team up with IHC, a dredging ship manufacturer which was also involved in the track. They collaborated and developed a concept for pay-per-use dredging. This means Van Oord will no longer pay for owning a ship but for the use of the ship. IHC will stay owner of the ship, this means Van Oord has lower capital expenses and IHC will be triggered to innovate and build a ship that is efficient and has a long lifetime.

Implementation process

According to Peter, the following steps will be necessary to implement the concept:

- Develop a business case.
- Pitch the business case together with IHC to the management teams of Van Oord and IHC.
- Convince stakeholders involved of the project.
- Redevelop:
    - The buying process
    - The plant management system
    - The fleet management system
    - The data management system
    - The financial structure
- Start executing a project

Challenges and success factors

Peter thinks the biggest challenge will be convincing people throughout the entire company that this is a promising innovation for Van Oord:

Top management
Middle management
Labourers

Nevertheless, Peter thinks implementation should not be very difficult. If he and his colleagues can present a solid business case, the board should be easy to convince. Especially if they present it as a shared concept developed in collaboration between Van Oord and IHC. He says the board has already expressed that they want to move into the pay-per-use direction. Engine manufacturer Wärtsilä, whose engines are used by Van Oord, is also exploring the possibilities of pay-per-use engines, similar to the Rolls Royce power by the hour concept.

Middle management might be a bit difficult to convince, because they often have personal goals and aspirations for their careers and might not want to join a risky project.

Labourers might be difficult to convince because their jobs will change and some jobs might not be needed anymore. This will make the change to the new business model very difficult for them. Peter thinks it will be necessary to raise awareness and knowledge of the circular economy by giving presentations and training employees.

Interview results: Martine Holtkamp

Interview number: 4
Interview type: CIRCO participant - short questions
Participant name: Martine Holtkamp
Company name: IHC
Business: Dredging
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- Martine Holtkamp developed a pay-per-cubic-meter dredging proposition for her company IHC, in collaboration with Van Oord.
- Ship design, financial structure, supply chain, monitoring systems, mid-life logistics, sales and service have to be redeveloped to implement the concept.
- The biggest challenges will be ship redesign, financial structure and mid-life logistics.

Summary

Martine Holtkamp is QSHE officer at IHC, a Dutch dredging ship manufacturer. Together with colleagues Bernadete Castro and Mariano Otheguy, she participated in a three-day CIRCO track about circular business. During the track she teamed up with Van Oord, a dredging service provider which was also involved in the track. They collaborated and developed a concept for pay-per-use dredging. This means Van Oord will no longer pay for owning a ship but for the use of the ship. IHC will stay owner of the ship, this means Van Oord has lower capital expenses and IHC will be triggered to innovate and build a ship that is efficient and has a long lifetime. Eventually, this should result in a win-win scenario where both companies profit.

Implementation process

The following steps will be necessary to implement the concept:

- Develop a business case.
- Pitch the business case together with Van Oord to the management teams of Van Oord and IHC.
- Convince stakeholders involved of the project.
- Redevelop:
    - Ship design
    - Financial structure
    - Supply chain
    - Monitoring systems
    - Mid-life logistics
    - Sales and service
- Start executing a project

Challenges and success factors

The biggest challenges will be:

- Ship design
- Financial structure
- Mid-life logistics

If IHC is to provide its ships using a performance-based business model, it can profit best if the ships last as long as possible, work as efficiently as possible and are easy to repair. This means the ship design has to be redeveloped. This will require extensive research, design and engineering activities and can be challenging.

In a performance-based business model, Van Oord will pay per cubic meter of sediment that is dredged. This requires a completely different financial structure. IHC will probably have to finance the entire ship beforehand, resulting in very high capital expenses. Van Oord will pay smaller amounts over a longer period instead of a big amount at once, this means the investment pays off after a longer period of time.

The performance model also has consequences for the logistics. If Van Oord is done with the dredging operation, the ship can be returned to IHC for use in a new operation. Also, if the ship requires maintenance and repair, IHC will be responsible. This means a lot of logistics will be required in the new business model that didn't exist before. These have to be developed in detail.

Interview results: Bastijn van Daalen

Interview number: 5
Interview type: CIRCO participant - short questions
Participant name: Bastijn van Daalen
Company name: Heerema
Business: Marine contracting
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- Bastijn developed a standardised, modular rigging and grillage solution for Heerema marine contractors, which could reduce the €50.000.000 of annual material waste.
- To adopt the new solution, company culture, project management, project procedure, certification and inventory management have to change.
- Convincing upper management, convincing project managers and changing company culture are observed as the most daunting challenges.
- These can be tackled by building a strong business case, using a top-down approach, proving the concept works and educating employees.

Summary

Bastijn van Daalen is Jr. Engineer Subsea at Heerema Marine Contractors and joined the 3-day CIRCO workshop with his colleagues Christof Westland and Vincent Doedée. Heerema is a marine contracting firm that transports and installs complete offshore platforms. Bastijn and his colleagues wanted to start with a topic that was easy to realise. Heerema works in projects and for every project, a steel rigging and grillage construction is custom-made. Projects last only 2 weeks, at the end all rigging and grillage material is disposed as waste. This results in €50,000,000 of material waste every year. Bastijn and his colleagues developed a plan to standardise, modularise and re-use this rigging and grillage to save costs and material.

Implementation process

Bastijn thinks the following steps will be necessary to implement the concept:

- Develop a business case.
- Pitch the business case to the management team.
- Determine how to change:
    - Company culture into “green = good”.
    - Project management
    - Procedure/organisation
    - Certification
    - Inventory management
- Start executing the project

Challenges and success factors

The biggest challenges for Bastijn will be:

- Convincing upper management
- Convincing project managers
- Changing the company culture

Convincing upper management is essential to initiate the project. A solid business case is needed to convince them and the project should be able to return money within 1 year. Bastijn: “For most projects, it doesn’t matter what it is about, if it earns us money immediately, we do it.”

Project managers work on projects with a short-term project budget. They have freedom to manage their projects, as long as they make profit. This means there is currently no incentive for them to invest in long-term cost saving. It will be difficult to convince them to invest in a long-term solution, so top-down commitment is needed to convince them. Bastijn: “I remember an instance where one project manager reused a rigging and grillage construction for a second project, but this was a lucky coincidence.”

Bastijn also thinks a culture change is needed within Heerema. Sustainability is mostly popular among the younger generation of Heerema employees, the older generation is very sceptical about the topic. Bastijn: “Most people actively work against sustainability. There is a lot of disbelief and scepticism, people think a focus on sustainability will lead to lower competitiveness and higher costs.” Upper management has already expressed some interest in sustainability by appointing Vincent Doedée as Sustainability Advisor. He tries to raise awareness of the importance of sustainability and is slowly gaining attention. Nevertheless, they still need to prove themselves. A strong business case and successful pilot project should convince most of the company, but people also have to be educated about the possibilities of sustainability and circular economy.

Interview results: Ruben de Nie

Interview number: 6
Interview type: CIRCO participant - short questions
Participant name: Ruben de Nie
Company name: Damen
Business: Industrial Shipbuilding
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- Ruben developed a decommissioning concept for his company Damen Shipyards to refurbish and recycle oil platforms at component level.
- The biggest challenges he foresees are to start partnerships with operators onshore, expand client network offshore, to redesign the wharf processes and to start a culture change within Damen.

Summary

Ruben de Nie is Business Development Manager at Damen Shipyards, a large industrial shipbuilding company. During the 3-day CIRCO track, he developed a plan to recycle oil platforms at component level with his colleague Elouise Reiff. Damen recently acquired a wharf that can decommission such platforms. If components can be detached from the platforms, they can be refurbished and sold again, resulting in a second life for the components and an extra cash flow for Damen.

Implementation process

Ruben thinks the following steps will be necessary to implement the concept:

- Develop a business case.
- Pitch the business case to the management team.
- Determine how to:
  - Start partnerships with operators onshore
  - Expand client network offshore
  - Create component passports
  - Design the wharf processes
  - Start a culture change within Damen
  - Start executing the project

Challenges

The following challenges will be most important:

- Start partnerships with operators onshore and expand client network offshore
- Design the wharf processes
- Start a culture change within Damen

Partnerships with operators onshore are going to be necessary to establish a steady income of old platforms. Onshore operators have to be convinced to bring their old platforms to the Damen wharf for decommissioning. Damen can then strip the platforms and sell the components. Also, the client network offshore has to be expanded to create a market for refurbished platform components. Currently, not such market exists. Also, most clients are not aware yet of the possibilities of installing refurbished components.

The wharf processes have to be redesigned. Damen is currently not active in the decommissioning of platforms and refurbishment of components, so new processes have to be developed to start doing this. Also, alongside the decommissioning process, the wharf will also host the construction of new platforms and ships. This results in a problem, because currently customers don't want their ships to be constructed next to what they view as a junkyard. Damen has to think of a clever solution to combine the two.

A culture change within Damen will be necessary to expand the decommissioning business in the future. Damen's CEO refuses to accept that climate change exists and although many younger employees are raising awareness of sustainability in the company, the current company culture does not stimulate sustainability. If Ruben is to convince upper management of the possibilities of decommissioning and refurbishment, he is best to prove it with financial arguments. If the project is successful, it could lead to a culture change but a lot of convincing is needed to change employees' minds.

Interview results: John Oosthoek

Interview number: 7
Interview type: CIRCO participant - short questions
Participant name: John Oosthoek
Company name: IHC
Business: Dredging
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- John Oosthoek developed a dam dredging concept. Since hydropower dams slowly fill up with sediment he wants to dredge them as maintenance.
- The biggest challenges he foresees are how to convince the World Bank of his project, alter regulations about sediment ownership and develop the sediment reuse production process.

Summary

John Oosthoek is Business Development Manager at IHC, a Dutch dredging company. He participated in a 3-day CIRCO track with his colleague Louwrens op de Beek. They developed a plan to start dredging sediment from hydropower dams. The problem with hydropower dams is that the river which flows into the lake slowly fills it up with sediment. This means less water can be stored in the lake and less power can be generated. Also, it causes a secondary problem; the river which flows out from the dam doesn't have any sediment. This means it doesn't contain any nutrients for vegetation and agriculture and it also causes erosion. It is especially a problem in developing countries, where the strong lobby of french and german dam builders only results in more dams instead of proper maintenance. John's proposition is aimed at dredging the dams to ensure maintenance and long life. He plans to partially reroute the dredged sediment in the river and partially reuse it as building material. IHC is already exploring this concept, but it requires backing from a large financial institution like the World Bank.

Implementation process

The following steps will be necessary to implement the concept:

- Develop a business case.
- Pitch the plan to convince internal stakeholders als financial institutions (world bank).
- Reconsider:
    - Regulation
    - HR
    - Design
    - Customer interaction and logistics
    - Knowledge
    - How to reuse sediment
- Start executing the project

Challenges

The following challenges will be most important:

- Convince financial institutions
- Alter regulations
- Reuse sediment

In order to start the project, John needs the backing of large financial institutions. Because he is working in a G2G (Government to government) environment, he is considering the World Bank, but a challenge arises; the World Bank does not listen to companies but to governments. So he has to convince the Dutch King and government of the importance of his project. They can then promote it during talks and trade missions.

Regulations also offer a challenge because currently, the company that dredges the sediment becomes owner of it. This means IHC is now responsible of the sediment and of what happens to it. This can be a problem because sediment can be contaminated. IHC will be responsible if people get into contact with this contaminated sediment. Either way the regulations have to change, or IHC has to figure out how to solve this issue.

If the dredged sediment becomes property of IHC, it is their responsibility to reuse it properly. Part of it can be rerouted into the river but it will be too much to reroute completely. Rather, IHC is planning to reuse it as building material but this production process is still in its early stages. It has to be developed in detail.

Interview results: Dirk Schennink

Interview number: 8
Interview type: CIRCO participant - short questions
Participant name: Dirk Schennink
Company name: Rijksrederij
Business: Shipping
Date: 4-10-2017
Time: 17:00
Location: Amsterdam

Highlights

- Dirk Schennink works for the Rijksrederij (Dutch shipping company) and determined a set of design requirements to start building a circular fleet.
- Collaboration with manufacturers will be required to develop the new ship design.
- Experimentation will be required to test the new manufacturing process, materials and design.
- This will require time and money, but Dirk thinks it is worth it in the end.
- Dirk thinks upper management will be easy to convince, although middle management might prove more difficult.

Summary

Dirk Schennink is Senior Advisor Business Control at the Rijksrederij, the shipping company of the Dutch government. He participated in a 3-day CIRCO track with his colleague Maarten Westerlaken. The Rijksrederij is responsible for the civilian fleet of the Dutch government. Since the government decided it wants to become 100% circular by 2050, the Rijksrederij is exploring opportunities for a circular fleet. Rijksrederij doesn't produce its own ships, but can determine the specifics and demand a design that allows the ship to last for a longer lifetime and better end of life. Also, since the Rijksrederij has to decrease its fleet by 50% in the coming years, they have to make it more flexible and usable by different parties.

Implementation process

According to Dirk and Maarten, the following things have to be determined:

- Convince upper management
- Convince middle management
- Determine:
    - Mechanical handling
    - Modular design
    - Process innovation
    - End of life
- Collaborate with manufacturer and experiment

Challenges and solutions

Dirk doesn't think it will be difficult to convince upper management to invest in a circular fleet. After all, the ministry decided it wants to become circular, so not investing in a circular fleet would be contradictory.

He thinks middle management could be more difficult to convince since they often have personal goals and career aspirations. They might not be willing to join a risky project, since their reputation is at stake.

Dirk thinks the best approach will be to start small with a simple ship and explore the possibilities. He thinks Rijksrederij should just go for it and experiment with their ship manufacturers. They will definitely encounter problems, but these can be solved along the way. After this has proven successful, it will be easier and less risky to apply a similar design to the rest of the fleet.

Interview results: Geanne van Arkel

Interview number: 9
Interview type: Successful company
Participant name: Geanne van Arkel
Company name: Interface
Business: Carpet tile manufacturing
Date: 6-10-2017
Time: 16:30
Location: Scherpenzeel

Highlights

- Geanne is head of sustainable development and helps her company Interface achieve an environmental footprint of zero by 2020.
- The implementation process at Interface started with the realisation of top management, creation of a project team, setting an ambitious goal and progress measurements, making own processes and products transparent, determining where biggest environmental impact is made and deciding where to start first project.
- Challenges were making processes and products more transparent, developing new technologies, convincing the people internally, partners and customers.
- Success factors were setting an ambitious goal, biomimicry, educating employees and helping them discover the power of sustainability themselves, cross-sector collaborations, long-term relationships with customers, taking a systemic approach to the sustainability shift, a lot of experimentation

Summary

Geanne van Arkel is head of sustainable development at Interface. Interface is the world's largest manufacturer of carpet tiles and has a global turnover of €1 billion. In the 1990's, Ray Anderson, CEO of interface, realised his company was destroying the world with its oil-based products. He decided to shift the company into a sustainable direction. Interface created its 'Mission Zero' statement, the goal of achieving an environmental footprint of zero with closed loop manufacturing (technical and biological) and to contribute positively to itself as a company and to society by 2020. In this view, a circular economy is bio-based, recycled and inclusive. Of course, this meant the entire company had to change the way it did business. This was not easy. In the 1990's no customers were interested in buying 'second hand' carpet. Customers also were not interested in paying through a different financial construction like leasing. There was no realisation whatsoever among customers and suppliers that sustainability was important not only to save the environment, but also to increase competitiveness. Nowadays, things have changed. Interface has managed to show other companies how sustainability can help them become more competitive. Geanne explains it is all about knowing what language to speak to people. For example: Sustainability can result in lower costs which is interesting for financial managers, it can increase a company's reputation which is interesting for marketing managers, it can contribute to more healthy and motivated employees which is interesting for HR managers, it can stimulate innovation which is inspiring for R&D managers and it can make a company more resilient against fluctuating prices which is interesting for shareholders and top management. Over the years, Interface kept on fighting and after more than 20 years it has almost reached its goal. What to do after 2020? After 2020 Interface wants to become a regenerative company, generating energy, storing CO2 into their products

Implementation process

Geanne explains the steps Interface took to become a more sustainable company:

- Realisation of top management that a shift to sustainability is needed
- Creation of a sustainability project team
- Setting an ambitious goal and progress measurements
- Making own processes and products transparent
- 7 steps:
- No waste
- No emissions
- Renewable energy
- Closing circles

- Efficient transport
- Creating involvement
- New business models
- Determining where biggest environmental impact is made and deciding where to start first project
- Challenge value chain partners to help you and find new ones if needed
- Involve customers, partners and employees throughout the entire company
- Experiment and be inspired by nature to develop new technology
- Let people inside and outside the company experience the possibilities themselves

Challenges and success factors
The first 10 years were difficult and had a lot of challenges. A lot of experimentation was needed, Interface constantly put out challenging questions to its partners to help them complete the shift.

Challenges

- Processes and products had to be made more transparent
- New technology had to be developed
- People had to be convinced
- Internally
- Partners
- Customers

Success factors

- Setting an ambitious goal
- Biomimicry
- Educating employees and helping them discover the power of sustainability themselves
- Cross-sector collaborations, outside of own value chain
- Long-term relationships with customers
- Taking a systemic approach to the sustainability shift
- A lot of experimentation

Interface's processes and products had to be made more transparent to discover where the biggest environmental impact was made. This turned out to be the yarn used in carpets. This is why Interface first started looking into recycled and bio-based yarn.

New technology had to be developed, for example: Interface first looked into the possibilities of remanufacturing or recycling old carpet into new carpet. Unfortunately, recycling requires high volumes of material as input and not enough old carpet was available. Interface stuck to its ambition and challenged its partners to find another way. Eventually, it had to say goodbye to one of its largest partners because it didn't want to join Interface's ambition. Interface continued its ambition with some of its smaller suppliers, and eventually found a way to recycle old fishing nets from the Phillipines into carpet.

Sticking the carpet tiles together without glue was also a challenge. Carpet tiles tend to slide around unless glued to the floor. This glue was environmentally unfriendly and made replacing the tiles difficult. A biologist gave Interface the inspiration to stick the tiles to each other (instead of the floor) using small stickers inspired by a gecko's foot. Biomimicry really helped Interface progress towards its Mission Zero. It provided a wealth of inspiration.

People had to be convinced of the new direction: Board members, managers and all other employees throughout the company but also partners in the value chain and customers. Different stakeholders and managers speak different languages, so speaking the right language is essential to convince them.

To realise its bio-based, recycled and inclusive business models, a lot of experimentation and collaboration was needed. This was both a challenge and a success factor. In order to realise its ambition, Interface constantly had to engage suppliers and other partners. It constantly challenged them to help Interface, to collaborate and experiment with new materials that were recycled or bio-based, to look to other sectors where the same materials were used in different products and to work together on a long-term basis.

Help
Most questions Geanne experienced were related to convincing people. Inside the company and outside. Especially to stimulate cross-sector collaboration. Different managers speak different languages, so listening well, finding their needs and speaking the right language is key.

Offering a fresh perspective on a company's business is also important. Helping them discover the possibilities of sustainability and circular economy themselves and changing the mindset.

Advice
Be ambitious. Aim for the moon!

Interview results: Thirza Monster

Interview number: 10
Interview type: CE Expert
Participant name: Thirza Monster
Company name: Cirkellab
Business: CE consulting
Date: 11-10-2017
Time: 11:30
Location: Rotterdam

Highlights

- Thirza Monster is founder of Cirkellab, a CE consultancy.
- The most important challenges companies face when implementing CE are social challenges, value chain and cross-sector collaboration, laws and regulations and legal issues between companies.
- The most important success factors for implementing CE are investing in people, top-down and bottom-up commitment, speaking the right language, experimenting and learning.
- CE implementation consultancy is promising because most companies are not experienced in CE, it's easy to get lost in the daily hassle, to get a fresh look at their business, to help start (cross-sector) collaborations, provide guidance and make sure the CE knowledge stays inside the company.

Summary

Thirza Monster is one of the founders of Cirkellab, a circular economy consultancy company. Cirkellab is located in Dordrecht and focuses on stimulating and realising circular economy on a regional level. Cirkellab promotes CE by organising events and offers consultancy in three services: Finding CE opportunities through its Cirkelscan service, development of opportunities by assisting during pilots and entrepreneurial services by starting their own initiatives. Cirkellab has worked with industrial companies before, in the construction and shipbuilding sectors. Thirza has bigger plans for the future. She plans on doing more projects on a national level.

Implementation process

Thirza explains implementing CE follows a similar process as other, regular change processes. A lot of literature has already been written about that topic.

Challenges

The following challenges often occur during implementation:

- Social challenges
- Value chain and cross-sector collaboration
- Laws and regulations
- Legal issues between companies

Social challenges are most important. Many companies set goals and requirements but in practice, many goals are not achieved. "Ultimately it is about people that want something and want fight for something to achieve it." "Companies can set goals, but if employees don't believe in those goals, they won't be achieved. This counts for circular economy as much as anything else."

Collaboration is often required, since most business processes are entangled with other businesses. Especially the front end and back end with suppliers and customers, but also during production other businesses are often involved. Without their collaboration, it is impossible to change anything. A fresh perspective is often required, and lessons from other industries can often be valuable. Cross-sector collaboration can be a key success factor but can be a challenge as well, since many companies have a restricted view on their business and value chain.

Laws and regulations can restrict the legality of CE initiatives. Many current laws and regulations are not suited for radical innovations and can provide challenges. Also, existing laws and regulations can be a mental barrier for organisations to create a CE vision. If they follow the law and pass regulatory tests, are they doing anything wrong? It can be an inhibitor for ambition.

Success factors

The following success factors often help during implementation:

- Investing in people
- Both top-down and bottom-up commitment
- Speaking the right language
- Experimenting and learning.

Investing in people is incredibly important to achieve top-down and bottom-up commitment. Look at Interface for example, a company that embedded CE in the entire organisation through its ambassador program that teaches employees about CE and what it can do for them.

Speaking the right language is important to trigger people throughout the entire organisation. Different employees in different departments have different priorities. CE can be valuable to all of them, but the trick is to find out what triggers them.

Experimenting is also important, but it follows from a vision. Without a shared vision, an experiment is less likely to be a success. Also, it is important that the insights gained from the experiments are captured in the organisation, that the organisation learns from it.

Help

Thirza thinks companies could use help with implementation, even though companies know their own business best. It's not that they don't want or can become more circular, but it's easy to get lost in the daily hassle. It can be valuable for companies to have an outsider look at their business with a fresh perspective. Companies could also use help in starting collaborations. Especially cross-sector collaborations can be more difficult to achieve. Help could also be in the form of guidance. In the CIRCO track, it was clear that all of the companies really enjoyed having someone to guide them through the process. Many companies are unsure how to start getting into CE. Teaching companies what CE means, how to become circular and what it can bring to them is also valuable. Finally, it is important that the gained CE knowledge stays inside the company. This is also valuable to them.

Advice

Just start somewhere.

Interview results: Pieter van Os

Interview number: 11
Interview type: CE Expert
Participant name: Pieter van Os
Company name: CIRCO / Reversed Concepts
Business: CE consulting
Date: 18-10-2017
Time: 09:00
Location: Amsterdam

Highlights

- Pieter van Os is founder of CIRCO and Reversed Concepts, a CE business design programme and a resource and energy effectiveness consultancy.
- There is a difference between implementing incremental CE innovations or completely shifting the business paradigm, each requires a different implementation. Pieter is unsure if existing companies are actually able to change the paradigm.
- Success factors are a focus on B2B industries, the use of customer needs and value destruction to design circular business and sell product/service benefits, top-down commitment and vision, new business model and system design, a new financial structure, a plan to use or reject existing investments, a focus on the added value of the company, long-term planning, collaboration and fitting CE with existing strategic company goals.
- CE implementation consultancy could be in the form of CE change agents to keep the change going, help in changing the business mindset, guidance in redesigning the business and managing CE pilot projects.

Summary
Pieter van Os is founder of CIRCO and Reversed Concepts. CIRCO is a circular business design programme that is subsidised by the Dutch ministry of infrastructure and environment. CIRCO hosts a series of 3-day design workshops, in which companies analyse their value chain and find opportunities to innovate in a circular way. They then design a more circular business proposal to pitch internally. Reversed Concepts is Pieter's consultancy company which focuses on helping companies increase their resource and energy effectiveness and less on circular economy.

Implementation process
The CIRCO proposition stops at implementation. Pieter thinks this is unfortunate. He notices many CIRCO participants are motivated after completing the workshops but only a small percentage actually implements the circular business propositions they designed. But what is implementation? "The ministry would love me to show them that companies have become circular, 6 months after joining a CIRCO track. Of course that is an impossible wish." Pieter thinks an opportunity exists to offer consultancy for implementation, because an enormous transition will be needed at the companies. Circular business is a fundamentally different way of doing business, it translates into production, sales, supply and so on. Many companies have invested capital in factories, distribution channels, sales networks and much more. It makes it difficult for them to change. Pieter decided to focus CIRCO on circular business design, become good at that and scale up. Other implementation services can pick up the work from there.

Pieter thinks there are two ways of consulting for implementation, both focus on a different scale of circular transformation: Help with small steps and quick wins or completely shift the existing business paradigm. Many businesses are able to take some of the small steps themselves, but eventually, if their entire business is to really become circular, a paradigm shift will be needed which will affect the entire company. This is usually paired with a completely new business model and system design like selling the product as a service. Pieter thinks the small steps are necessary to start the change and prove the circular economy has business potential, but he is still unsure how companies can do the paradigm shift. What should companies do if, for example, they no longer need their existing distribution channels? Should they start the new circular business as a separate start-up? Should they take a huge step and change their entire business at once? Should they collaborate with their distribution partners even though these partners are not needed anymore? This is an important question for implementation: Should you help with taking the smaller steps or focus on the big paradigm shift? Both will require completely different consulting services aimed at different people in the client companies.

Challenges
There is a big difference between starting a circular start-up and becoming a circular company. As a start-up you don't have any existing legacy or investments to risk, this allows you to be more radical. Pieter has experience in starting a circular start-up; a phone recycling company. Pieter's phone business used to buy old phones from Mediamarkt and other phone dealers. Buying the old phones wasn't difficult, it was more difficult for Mediamarkt. Mediamarkt was known as one of the strongest negotiators, with incredibly long payment terms. However, Mediamarkt was only used to buying phones from suppliers, not selling old phones to Pieter. They didn't realise the long payment term now counted for Pieter. Also, the Mediamarkt stores were not used to sending invoices. It required a lot thinking differently for Mediamarkt, which was very difficult for them.

Another example is a airconditioning company which joined a CIRCO track. After installation, the company never contacted their customers again. It had no idea how its airconditioners actually performed for their customers, so it decided to start contacting them. However, its employees had no knowledge or experience in customer service and had to be trained. Although it was only a small process change, it lead to a lot of knowledge about its products, better customer satisfaction and opportunities for innovation. Companies are highly interested in taking small steps like this.

Brink Industrial is a company that makes modular trash collecting stations. It designed a trash collecting station for the city of Berlin in which it looked at value destruction during trash collecting. It optimised its products to make trash collecting as efficient as possible. Also, it noticed different trash collecting companies collect different trash and use different trash collecting stations, Brink designed their stations to be modular, so every company can add or remove trash collecting modules. One of the success factors was that the company was already into circular economy and the CEO fully backed the project.

CT-plus is a water management hardware company. It designed a fully circular water pump switchboard, and added a more flexible pump switching feature. This fully aligned with the needs of local water administrations to be more flexible in their water reservoir use and decreased the required amount of reservoirs for the water administrations.

Success factors

- To make the bigger paradigm shift possible, the following steps will be needed:
- Circular concepts are easier to implement in B2B industries
- More direct customer relation makes value destruction visible more easily
- More rational decision-making process makes it easier to sell
- Discover how customers use products and focus on their needs
- Clearly find value destruction moments
- Use customer needs and value destruction to design circular business
- Use customer needs and value destruction to sell product/service benefits
- Top-down commitment and vision
- New business model and system design
- A new financial structure
- What to do with existing investments (factories, machinery etc.)
- An idea of the added value of the company
- Long-term planning
- Collaboration
- Fitting CE with existing strategic company goals

Help
One of the most important added values a consultancy can have in implementation is in having someone to keep pushing the circular implementation forward. Someone who leads the project not just as a project manager but as someone with knowledge of the circular economy who helps the company take small steps at a time.

Many companies have difficulties to take a different mindset and a fresh view on their business. They often have difficulties thinking 'outside the box', translating solutions from other sectors to theirs and applying abstract concepts to their business. Companies need guidance in this process, to help them analyse their company, value chain and added value. This also makes Pieter unsure if helping companies with the paradigm shift is really possible: "Maybe the paradigm shift will be too difficult for these companies. Maybe start-ups will be the ones to shake up the market with new business models"

A more circular business requires a long-term perspective, this frees companies from their short-term competitive thinking and creates room for collaboration. Companies could use help in bringing their people together to start long-term collaborations and use help to change from short-term competitive thinking to long-term collaborative thinking. Also, circular business often requires innovation throughout the value chain and knowledge of the complete value chain. Individual companies often do not have this knowledge, so collaboration is essential to gain this knowledge.

Pieter is also unsure about how to structurally organise a consultancy service like this. Knowledge exchange often concludes more knowledge and more research is needed, or an enormous database is made, but both in unsuitable. Of course, more research will help, but most knowledge is already available. A database is very static, it helps to search for data but the information is very generic. Instead, a dialogue has to be established between companies to help them learn from each other how they do business and how their value chains work. This way, companies can collaborate and discover together what problem to solve and how to solve it. Pieter is not sure how to organise this, except from just bringing people together.

Experimentation is important because often, the outcome of circular business propositions is unknown at the start. So either way you just go for it and improvise as you go along, or try to think through every possible scenario. Consulting could play a role in this, helping companies to manage their circular pilots. Also helping companies to overcome the problems they encounter along the way, helping them think in new and different solutions to improvise and make the pilot successful. Companies also often start pilots without knowing exactly what they want to test. Structure and guidance in this process could help them learn more from their pilots.

“What is the cost of doing nothing? What will happen to companies that do not innovate?” They are not likely to be able to compete with low-income countries on price, so focusing on circular economy and added services could be a better way to compete. This way you’re talking about circular economy as a means to achieve innovation and competitiveness as a goal.

Advice
Start with something that fits well with existing strategic goals of the company like reducing product and portfolio complexity or improving customer retention.

Interview results: Jos Manders

Interview number: 12
Interview type: Successful company
Participant name: Jos Manders
Company name: Van Houtum / WEPA
Business: Toilet paper manufacturer
Date: 23-10-2017
Time: 10:30
Location: Swalmen

Highlights
Jos Manders is Quality, Labour and Environmental coordinator at WEPA Netherlands, a C2C toilet paper manufacturer.
WEPA Netherlands improved its chemical use, energy use, CO2 emissions, resource use and waste streams.
Major challenges were convincing value chain partners to collaborate, selling sustainable products to customers, optimising products and processes, making transport more sustainable.
Success factors were top-down and bottom-up involvement, collaborating with value chain partners, PR and experimentation.
The biggest benefits C2C brought the company were insight into its environmental impact, good relationships with its value chain partners, a strong name and goodwill, more motivated employees and more competitive strength

Summary
Jos Manders is QLE-coordinator at WEPA Netherlands in Swalmen. WEPA Netherlands is a toilet paper company that manufactures toilet paper for the away-from-home-market from recycled paper and has sustainability embedded in its company. Jos is responsible for Quality, Labour and Environment within WEPA Netherlands.

History
WEPA Netherlands was founded 80 years ago as the company Van Houtum. Last June the company was bought by WEPA, a German toilet paper company and bigger player in the industry. The acquisition by WEPA is likely to influence Van Houtum’s sustainable ambition, Jos is unsure about the future. Van Houtum had CSR completely ingrained in its company and culture. As a family company, it came naturally to them. They have always been connected to the local village of Swalmen, its river (the Swalm) and its people.

Sustainability and C2C
Van Houtum started working on its sustainability 20 years ago. It was around 2007-2008 that its founders discovered the Cradle-to-cradle (C2C) philosophy. They saw the potential of the philosophy as a way to stay innovative and competitive and started using it in their company. Van Houtum started a pilot project in which they screened the resource use of their toilet paper manufacturing process. Today, WEPA Netherlands is still C2C certified and has expanded its product portfolio to dispensers and other toilet products.

The company’s dispensers are made of plastic, this puts them into the technological resource cycle. WEPA Netherlands has been able to reduce its virgin resource use by 70-80% by using recycled plastic. They are the first to do this in the market.

WEPA Netherlands’ has also worked on its soaps. It started to collaborate with its soap suppliers and looked at their gas and electricity use. It is only able to make their products more sustainable by starting long-term relationships with their suppliers and collaborating.

Chemicals
In 2007-2008, Van Houtum started to look at their chemical use. They did a screening, which resulted in a report, classifying their chemical use in color categories according to their sustainability. Red for harmful (substitute), yellow for doubtful (find a substitute if possible), green for sustainable (good). In the first screening, the report showed a lot of chemicals in the red category, so Van Houtum started to talk to their suppliers. They explained their C2C ambition and asked them to collaborate. They started collaborations with some suppliers to improve their resource use and optimise their products and processes. Van Houtum also had to say goodbye to the suppliers that were not willing to help them in their ambition, this took a lot of guts. In Jos’ experience, smaller companies are often more flexible and willing to help, larger multinationals are more rigid and less willing to collaborate on ambitions like Van Houtum’s. After a couple of years, Van Houtum managed to substitute all of its red chemicals and only used green or orange ones.

Energy
Van Houtum also wanted to improve its energy use and make it more sustainable. In the C2C philosophy, the amount of energy use is not important, but the source of the energy is. Van Houtum started to make its energy use greener by buying hydropower energy from Norway. The company also started to buy biogas to fuel its paper drying installations. Unfortunately, biogas is not widely available and is also rather expensive. Van Houtum also looked into producing its own energy, but solar doesn't provide enough power and the province didn't allow them to build a windmill.

CO2
WEPA Netherlands now focuses on its CO2 emissions. It used to have a combined heat-and-power generator which used gas to produce heat and electricity. However, this used a lot of gas. The company switched to a steam generator, which only produces heat. This greatly reduced their gas use and allows the company to buy more green electricity. In the long run, the company wants to get rid of its gas use completely and use green electricity to produce heat.

Resources
Traditionally, Van Houtum used to produce its toilet paper from cellulose. Around 40 years ago, the company switched to recycled paper as resource. However, since society uses less and less paper, recycled paper is becoming more scarce. To ensure a steady flow of resources, the company looked into alternatives. It found a solution in using paper labels from a local beer and soda producer. This is now 15-20% of WEPA Netherlands paper use.

In 2016, the company found a second resource alternative; it started to recycle drink cartons from milk and soda. It is the only company in the Netherlands that is able to recycle this material. This is now around 10% of the company's resources but it wants to grow it to around 20%.

The third resource alternative is making paper from elephant grass, a plant that grows quickly and easily without any demands on its soil or environment. WEPA Netherlands is now experimenting with corn farmers since both plants grows similarly but can be alternated between seasons.

WEPA Netherlands is also currently experimenting with a fourth alternative; coffee cups. Paper coffee cups can also be recycled into toilet paper.

Waste
WEPA Netherlands has 2 primary waste streams: deinking residue and rejects. Deinking residue is the largest waste stream. This waste stream is generated when printed paper is recycled. The ink is separated from the paper, the paper is used as a resource and the ink and some paper ends up as deinking residue. It also contains paper fibres that are too short to be recycled. This waste stream was first dumped, later incinerated, but nowadays almost 100% recycled. Partners recycle it into other paper products and C2C bricks.

The second major waste stream consists of rejects. Rejects are impurities in the recycled paper resource stream. This could be anything that is not paper: Metal, plastic, shoes, CD's, staples, rope or any other waste that ends up in paper recycling but is not supposed to. This waste is separated from the paper and since it contains so many different materials, it is almost impossible to recycle. This is why it is still incinerated.

During production, paper waste can simply be reused in the production process. Also, some smaller chemical waste streams exist, but these are minimal compared to the deinking residue and rejects.

Crossovers
WEPA Netherlands' C2C ambition doesn't restrict to the company itself, it also crosses over to their value chain partners. For example, the boxes WEPA Netherlands uses to pack their products. Their box supplier now produces certified C2C boxes because WEPA Netherlands asked them if it was possible. The same counts for their soap supplier who now produces C2C soap.

Implementation process
Jos views C2C as a tool to become more sustainable and become more circular. It is a means, not an end. He views it as small steps to change his business. WEPA Netherlands started to work on its sustainability on all fronts at the same time, rather than starting in one area and moving to another one next. Communicating the importance of sustainability throughout the organisation was very important. WEPA Netherlands spent a lot of effort in teaching its employees about sustainability. 10 years ago, a project team was founded with the director as president. A couple of important company functions were included: Purchasing, technology, production and QLE. A campaign was started to educate employees. The director explained the new company vision and mission personally to all employees, several times. As a result, all employees throughout the organisation know more or less what C2C is. The concept started to live and employees take the initiative themselves. For example, office managers now choose sustainable copying paper themselves. Also, they try to purchase goods locally as much as possible.

Challenges
The biggest challenges were:

- Convincing value chain partners to collaborate.
- Selling sustainable products to customers was difficult, customers were not aware of the product, it required direct promotion among end-users.
- Optimising products and processes was not annoying but important.
- Making transport more sustainable required purchasing locally.

Success factors
The most important success factors were:

- Top-down and bottom-up involvement was essential, making a department responsible wouldn't have worked.
- Collaborating with value chain partners, not accepting no for an answer.
- PR, showing the company's sustainability provided a lot of free press.
- Experimentation always existed throughout the process.

Benefits
Becoming C2C brought the company a lot of benefits:

- Insight into its environmental impact
- Good relationships with its value chain partners
- A strong name and goodwill
- More motivated employees
- Competitive strength

Help
Jos thinks smaller companies are more likely to become more sustainable, but a vision from top management is essential.

C. Interview statements and clusters

Clusters and related interview statements

Prepare			Create project proposal			Convince			Convince stakeholders		
Set goal						Convince board					
Making the CBM too radical	**Starting small**	**Help set ambitious yet realistic goals**	**Getting lost in the daily hassle**	**Having an ambassador for**	**Make it as easy as possible**	**Non-believing board**	**Speaking the right language**	**Help create a convincing project**	**Non-believing stakeholders**	**Speaking the right language**	**Involve stakeholders**
Start with something that fits with strategic goals like reducing portfolio complexity	The best approach will be to start small with a simple ship	A big transition is needed to become circular, consulting can help approach this	Companies get lost in the daily hassle	Board has already expressed interest in this field	Consultancy can help guide the process	CEO doesn't believe in climate change	Speaking the right language is important to trigger people throughout the organisation	A strong business case is needed to convince the board	Middle management might be difficult to convince because of personal agendas	(see left)	Consultancy can be in the form of convincing people in and outside the company
One of the problems with CE is the 'valley of death' of implementation, covering research investment	Small steps are needed to prove the potential of CE and initiate the change	Fitting CE with existing strategic goals is important	In my experience, companies are very motivated after CIRCO, but still fail to implement their CBM	C2C & CSR came naturally as a family company	The big added value of consultancy is to have someone push the project forward and guide the process	Convincing financial institutions will be a big challenge	Sustainability can help companies on many levels	Consulting could help create a solid project plan	Convincing middle management will be the biggest challenge		All knowledge in the company should be used to reduce assumptions from management
Many companies set goals but these are hardly ever achieved	An important success factor is to start small			Already developed an interest in CE but was unsure how to apply it		Because companies never experienced the potential of CE, intrinsic motivation is missing	Convincing people about sustainability is about knowing what language to speak		Labourers might be difficult to convince because their jobs will change drastically		
It is difficult for companies to imagine how to change their BM	Companies are highly interested in taking small steps			Realised extending product lifetime could be an interesting opportunity		A successful project could lead to a culture change but a lot of convincing is needed	Interface has proven sustainability increases competititveness		Labourers might resist the new business model		
	We would prefer to start with a pilot project			Is able to sell remanufactured product for one third			Becoming C2C brought a lot of benefits				
	C2C was a way to become sustainable in small steps			Product life extension is a lucrative business			Showing off sustainability brought a lot of free press				
				Product life extension is a good way to			Top-down commitment and vision is needed				
							Resource scarcity is a potential driver but this will				
							Earning more money from the same product is interesting for every				

Integrate						Collaborate								
Create long-term vision			Change mindset & culture			Change value chain			Involve customers			Solve legal challenges		
Overcoming compliance	CEO as ambassador	Help create long-term vision	Non-believing organisation	Shared understanding	Help change mindset & culture	Convincing partners	Value chain & cross-sector collaborations	Facilitate (cross-sector)	Involving customers	Customer collaboration	Facilitate (cross-sector)	Legality of CBM	Legal collaboration	Facilitate (cross-sector)
Laws and regulations can be a mental barrier to create a CE vision	Being CEO makes it much easier to initiate the CBM	Long-term planning is needed	Most people actively resist sustainability, there is a lot of disbelief and scepticism	Internal collaboration is a very important success factor, connect people and	Company culture towards sustainability needs to change	Most companies don't have enough power to change their value chain	We realised collaboration was needed, so we teamed up with our ship manufacturer	Consultancy can help set up cross sector collaborations	Raising awareness among customers of possibilities of remanufactured products	Customer collaboration is a very important success factor	(see left)	Laws and regulations can restrict the legality of CE initiatives	I usually open up a discussion and reach an agreement with the testing party	(see left)
If a company complies with laws and regulations, what are they doing wrong? This can be an inhibitor for ambition	Our founders discovered the potential of C2C and decided to shift the company direction	A why/how/what workshop could be used to rethink company vision	People think sustainability will lead to lower competetiveness and higher risk	Shared, intrinsic motivation is essential	The mindset of employees needs to change from short-term competitive thinking to long-term collaborative thinking	Starting partnerships and expanding our client network will be a big challenge	Partnerships will be necessary to provide a steady income of old oil platform for decommissioning	Consultanc can help bring people together, translating one language to another	Most clients are not aware of the possibilities of refurbished products	Collaborating with clients helped to make it a success		Current regulations make it very difficult to reuse sediment	Altering regulations is necessary, but this will be a big challenge	
An important barrier is that companies do not 'feel' the oppourtunity and importance of CE and the issue of non-sustainability	My vision is to keep improving and innovating and expand my remanufacturing business	A long-term perspective frees people from competition and leads to collaborative thinking	Changing company culture is a big challenge	Raising awareness of CE through training and presentations is necessary	Consulting can be teaching CE, raising awareness and understanding	We had to say goodbye to some suppliers, this was very difficult	We constantly challenged our partners to help us overcome our challenges	Companies can use help starting collaborations, especially cross-sector	In the 90's, customers didn't want to lease carpet	We decided to collaborate with our client and develop the CBM together		Regulations can be difficult, they change. This can restrict the legality of CE		
	The realisation of the potential of product-life extension caused a shift in focus		Sustainability is popular among young employees, but not among the older generation	Companies can create goals, but if employees don't believe in those goals, they won't be achieved.		Convincing partners to collaborate was a barrier	Smaller companies are often times more willing to collaborate	More information will not help, a dialogue between partners is needed	In the 90's, no realisation existed of the importance of sustainability	Nowadays, people are much more open to the concept of sustainability				
	Our CEO realised a change was needed and created our 'mission zero'		Sustainability still has to prove itself	Ultimately, it's about people that want something and that want to fight for something to achieve it		A lot of collaboration was needed to realise our new business model, this was both a challenge and success factor	Cross-sector collaboration was an important success factor	Consultancy can bring together partners and share knowledge	Customers didn't want to buy '2nd hand carpet'	Long-term contact with clients is interesting to all companies				
	Being CEO makes implementation much, much easier		Starting a culture change will be a big challenge	A strong business case will convince many, but sustainability education is also needed		Without value chain collaboration it is almost impossible to realise anything	Collaborating with value chain partners was a big success factor		Selling it to customers is a big challenge					
			CE managers are isolated and focus on traditional sustainability	Many younger employees are raising awareness of			We constantly challenged our partners							
			Company culture doesn't stimulate sustainability	Investing in people is important to create top-down and bottom-up commitment			We asked our suppliers to help reduce chemical use by collaborating							
			The CE concept is hard to grasp for many	The transformation can only be successful is the entire company believes in it			A lot of collaboration was needed to realise our new business model, this was both a challenge and							
			Social challenges are definitely most important	CE should be embedded in the entire organisation			We managed to become more sustainable by starting long-term relations with clients and partners							
			A culture change will be needed to expand the CBM in the future											

Design						Implement			Scale		
Redesign business model			Redesign product & process			Implement CBM			Learn & scale		
Linear mindset	Systems thinking	Guide them through the process	New expertise needed	Systems thinking	Guide them through the	Unforseen challenges	Experimentation	Facilitate experimentation &	Scalability	Gain experience along the way	Help scale up the CBM
A circular business is fundamentally different. This translates to every department and employee	A completely new system design is needed	Consulting can help translate examples from other industries and sectors as inspiration	The new business model required new processes, this could be challenging	(see left)	(see left)	Often times, a lot is still unknown at the start.	The best approach will be to experiment with our ship manufacturer	Consultancy can help setting up experiments and making sure the company learns from them	Experimentation is important, but it should lead to a parallel business that is scalable	After a successful project it will be easier and less risky to apply it to the rest of the fleet	A big transition is needed to become circular, consulting can help break this down into smaller steps and scale up
A paradigm shift is needed to become really circular	Systems thinking, yes, very important to realise a CBM	The big added value of consulting is to have someone to guide you through the process	The new processes require new expertise as well, this could be difficult				Experimentation is important to overcome unforseen challenges	Consultancy can help companies manage their pilot projects		Problems can be solved along the way	
For many companies it is unclear how to translate a new BM to their organisation	Becoming circular meant the entire company had to change	Consultancy can help guide the process	Many companies lack the required customer skills for a service-based business model, these have to be trained				Continuous experimentation is vital	Consultancy can help structure and learn from pilots			
It is difficult for companies to imagine how a new BM impacts their	CE requires different thinking from value chain partners as well	Consulting can help offer a fresh perspective					A lot of experimentation was needed to overcome challenges				
What to do with existing investments?	had to be made more transparent to determine their impact										

D. Experiment boards

Experiment 1

Customer	
Who am I targeting?	The Sustainable Minds team
Relevant characteristics	- Work at CM - Have a business or sales background - Have experience in project management - Have experience in dealing with CM clients - Have a common view of SM's future

Purpose	
What is the purpose of the experiment?	Verify if the prototype fits with the expectations of the SM team, if it helps to create a project plan and if the team can work with it
Most uncertain and crucial assumption	Clients struggle with creating a circular project plan
Sub-assumptions	Clients struggle with pinpointing the value they want to create with their circular business case and the relations among these values
	Clients struggle with identifying the risks of their circular business case
	Clients struggle with assessing the attractiveness of their circular business case
	Clients struggle with prioritising the actions they want to take when implementing their circular business case
	Clients struggle with creating an implementation roadmap for their circular business case

Methods	
Tool	Short presentation, prototype test, stakeholder (team) review
Main questions	- Does the SM team agree with the structure and goal of the prototype? - Can the prototype deliver the desired outcome? - Can the SM team work with the prototype?
Steps	- Present concept and assumptions - Test prototype - Gather team feedback
(Target) Metric	The team wants to move forward with this concept, but has some alterations/additions as constructive feedback
Hypotheses	- The prototype fits with the expectations of the SM team - The prototype helps to create a project plan - The team can work with the prototype

Results and actions		
Observations	- The team easily follows along and quickly understands the prototype. - They discuss names (people, planet, profit) - They discuss the design of the prototype (should it come as a package in a box and should it be more interactive?) - They discuss the way it should be used (as a standalone product or with guidance of the SM team)	
Learnings	- The SM team agrees with the overall structure of the prototype, but would like it to go more in-depth with the exercises. - More depth in the exercises and more guidance through the exercises will help clients create a solid circular project plan. - The qualitative analysis that the prototype contains is preferred over a more labourious quantitative approach. - The team still has some assumptions of client needs, future prototypes should be tested with an actual client.	
Actions	- Focus on the first 3 exercises (benefits, risks and attractiveness of the project) and make a second version of the prototype that features more depth and guidance. - Start involving clients in the experiments	

Experiment 2

Customer	
Who am I targeting?	The Sustainable Minds team
Relevant characteristics	- Work at CM - Have a business or sales background - Have experience in project management - Have experience in dealing with CM clients - Have a common view of SM's future

Purpose	
What is the purpose of the experiment?	Test whether prototype v2 fits with the expectations of the SM team
Most uncertain and crucial assumption	The prototype fits with the expectations of the SM team
Sub-assumptions	Circular value creation is possible for 6 stakeholders and the relations among them should be made clear. It is better to leave the types of value open to interpretation but give suggestions, since it is impossible to cover every possible type of value created.
	Circular project risk is related to business model changes. Bigger changes to more elements lead to bigger uncertainty, this increases project risk.
	Circular project attractiveness = circular value creation / circular project risk. To maximise project attractiveness, value creation should be maximised, risk should be minimised.

Methods	
Tool	Prototype v2
Main questions	- Does this prototype fit with your expectations? - Do you think a workshop like this could help clients to create a solid circular project plan? - Do you prefer to scale value creation on a predetermined 1-5 scale, or leave it open to interpretation? Why? - Do you agree with the relation between business model changes and risk? Why? - What do you think of the way project attractiveness is assessed? Is it detailed enough?
Steps	Present prototype, observe, ask questions, gather feedback
(Target) Metric	The team intuitively understands the prototype and it fits with their expectations, although they have some minor comments
Hypotheses	The prototype fits with the expectations of the SM team

Results and actions	
Observations	The team: - is positive about the prototype, but struggle to follow along with its explanation. - still has many assumptions about client needs. - prefers assessing value creation using an open worksheet that is free to interpret instead of a scale with 36 predetermined types of value creation. - likes the 7 stakeholders used in the value creation tool - understands the logic between business model changes and project risk - likes the worksheet used for assessing project attractiveness, the overview and calculation
Learnings	- Explaining the prototype to my audience makes it difficult to understand, making my audience experience it might work better - Future experiments should involve clients
Actions	- Create a prototype v3 to be tested with a client - Stage an actual workshop using a case example to let my audience experience the prototype.

Experiment 3

Customer	
Who am I targeting?	Geanne van Arkel - Interface carpet
Relevant characteristics	Carpet tile manufacturer - I1 billion revenue - One of the most sustainable companies in the world - Actively involved with achieving its 'mission zero' in 2020 (environmental impact of zero) - Over 20 years experience with implementing sustainability internally and externally - Continuously improving its environmental and business performance - Potential partner and client - Geanne van Arkel is Head of Sustainable Development - Geanne was also used as interview participant

Purpose	
What is the purpose of the experime	Assess problem-solution fit of the prototype
Most uncertain and crucial assumpt	Clients need a circular project plan to create internal support but struggle to create one
Sub-assumptions	Clients struggle with identifying the value their circular project creates
	Clients struggle with identifying the risks of their circular project
	Clients struggle with assessing the attractiveness of their circular project

Methods	
Tool	Prototype v3, presentation
Main questions	- Is the client able to use the prototype without much help? - Does the client believe that the assessment of value creation, risks and attractiveness is the main issue to raise internal support? - Does the prototype help to assess value creation, risks and attractiveness of the circular project? - Does the client see value in the prototype? - Is the client willing to use the prototype in their company?
Steps	- Explain purpose of the experiment and introduce prototype v3 - Go through the prototype using a (fictional) case from Interface and facilitate workshop session - Observe and ask questions
(Target) Metric	Client sees the value of the prototype v3 and wants to start using it in their company, but has some minor recommendations
Hypotheses	I believe industrial company managers fail to initiate circular projects because they struggle to assess value creation, risks and attractiveness of their circular project.

Results and actions	
Observations	<u>General</u> - Client quickly understands the prototype and is very positive. Thinks it is usable in a wide range of businesses and company layers (top-middle-bottom). Thinks it has potential to be used at her company as well. - Client thinks the biggest problem is communication, that managers struggle to communicate a circular project to others, because sustainability has a bad name and because they have difficulty assessing what value is created for each stakeholder. Client explains this before I introduced the prototype. - Client experienced difficulties in pitching circular and sustainable projects in her own company because of wording. The word sustainability scares off a lot of managers with a conservative, rational, money focused mind-set (e.g. financial managers, investors, shareholders, board members). Experienced others having this struggle as well. Stopped using the word sustainability and replaced it with innovation, this was much more successful. - Client stressed the importance of quick experimentation. It is easy to talk about sustainability and CE, but this makes the challenge of implementing it only bigger. The only way to get it done is by starting somewhere and learning while doing. <u>1. Circular value creation</u> - Client is very positive about the prototype, thinks it will be very useful after completing a CIRCO track or after completing a quick scan to assess CE ideas. Thinks this will help increase insight into types and amount of value creation, stresses the importance of alinging the project outcome (value creation) with business objectives. - Client idea: Make a digital version, that can be used to present insights in a presentation - Client idea: Include the 17 sustainable development goals in business objectives. - Stresses that for many businesspeople, monetary value is the only important type of value. - Client idea: Make a customisable presentation that can be used to communicate the various types of value depending on the type of stakeholder. <u>2. Circular project risk</u> - Random idea: Include organisational barriers/risks? Or are they covered by the BM elements? - Practical issue: Each business model element may have various changes, but only one scale to assess required development. How do you fill this in? Should the development scale be more free? - Client misses: What is the risk of doing nothing? Client thinks this is a very important risk factor that is often overlooked. <u>3. Attractiveness:</u> - Idea: Does attractiveness also have to do with newness of the project? Could there be different barriers that are not included in the assessment?
Learnings	- Client is very positive and confirms main assumptions and hypothesis. - Client added some interesting ideas, including the importance of communication and the risk of doing nothing.
Actions	- Include client feedback in prototype v4 - Organise a creative session with a group of students to diverge once more on the design, explore different ways to achieve the goal of raising sense of urgency with company managers. - Test prototype v4 in the Welzorg and Damen implementation studies

Experiment 4

Customer	
Who am I targeting?	Supervisory team
Relevant characteristics	Giulia Calabretta, has more theoretical expertise Bas Hillerstrom, has more practical expertise AND is end user

Purpose	
What is the purpose of the experiment?	Assess problem-solution fit of the prototype
Most uncertain and crucial assumption	Clients need a convincing circular project plan to convince the board but struggle to create one
Sub-assumptions	Clients struggle to choose the right scope for their project, project scope has to be in line with business objectives and project demands
	Clients struggle with identifying value creation of their project, this is determined for various stakeholders
	Clients struggle with identifying risks of their project, this is determined by BM changes
	Clients struggle with assessing attractiveness of their project, this is determined by value/risks=attractiveness

Methods	
Tool	Prototype v4, presentation
Main questions	- What does the supervisory think of the prototype, from their expert opinion and opinion as end user? - Is it theoretically grounded? - Is it easy to understand and intuitive to use? - Is it practically appliccable? - Are any design skills required? - Is it low budget and quick to implement?
Steps	- Explain design progress, theory behind the prototype and introduce prototype v4 - Go through the prototype - Observe and ask questions
(Target) Metric	Supervisory team sees the value of the prototype v3 and Bas wants to start using it himself, but they have some minor recommendations
Hypotheses	I believe industrial company managers fail to comvince their board to invest in a CBMI project because they struggle to choose the right scope for their project, assess value creation, risks and attractiveness of their circular project.

Results and actions	
Observations	- The supervisory team understands and approves the overall idea begind the design - Bas: Most companies only care about financial value, this has to be included - Bas: Include 3 basic financial parameters: Investment, return and payback period - Bas: The right language? That is financial language in case of a company board - Bas: The structure of the circular attractiveness sheet is confusing - Giulia: Make it more circular - Bas: Attractiveness = in line with company goals - Giulia: Include more explanation and an introduction, you have to get the user into a circular mindset - Giulia: Include a use scenario, product in use in various situations. - Giulia: The dynamics and relations among the sheets are confusing, this has to be clear.
Learnings	- Attractiveness = in line with goals in stead of value/risk. - Financial value/language has to be more prominent - Improve structure, explanation and dynamics among the sheets - Make it more circular
Actions	- Develop an improved and iterated prototype v5 - Present it at the green light meeting - Test it with a client and with the SM team

Experiment 5

Customer	
Who am I targeting?	Supervisory team
Relevant characteristics	Giulia Calabretta, has more theoretical expertise Jan Konietzko, has more theoretical expertise Bas Hillerstrom, has more practical expertise AND is end user

Purpose	
What is the purpose of the experiment?	Explain and convince supervisory team of the prototype
Most uncertain and crucial assumption	Clients need a convincing circular project plan to convince the board but struggle to create one
Sub-assumptions	Clients struggle to choose the right scope for their project, project scope has to be in line with business objectives and project demands
	Clients struggle with identifying value creation of their project, this is determined for various stakeholders
	Clients struggle with identifying risks of their project, this is determined by BM changes
	Clients struggle with assessing attractiveness of their project, this is determined by comparing the project with business objectives

Methods	
Tool	Prototype v5, presentation
Main questions	- What does the supervisory think of the prototype, from their expert opinion and opinion as end user? - Is it theoretically grounded? - Is it easy to understand and intuitive to use? - Is it practically appliccable? - Are any design skills required? - Is it low budget and quick to implement?
Steps	- Explain design progress, theory behind the prototype and introduce prototype v5 - Go through the prototype using a client example - Observe and ask questions
(Target) Metric	Supervisory team is convinced of the prototype and Bas wants to start using it himself, but they have some minor recommendations
Hypotheses	I believe industrial company managers fail to comvince their board to invest in a CBMI project because they struggle to choose the right scope for their project, assess value creation, risks and attractiveness of their circular project.

Results and actions	
Observations	- Take a good second look at the toolkit. Is it the right solution to the problem? Especially taking the mindset as biggest barrier into account. - Explain the process that comes before the toolkit more clearly: What happens before the toolkit? Who is at the table? Hoe does the workshop work? This should be more clear. Maybe a service blueprint will help. - Make sure the workshop ends with a call to action, this makes sure the CBM will be followed-up with. Experimentation could play a role here as well. Consider using the small, bigger, biggest approach Bas is using at Welzorg. - Encourage users to think about non-financial business objectives as well. Innovation is about more than cost-cutting - Project demands could be renamed into general project requirements. The current name is a bit confusing - Consider making it a bit more creative. Also to get the users (client companies) into a more creative mode. Think about using card-sets for example, to explain the 10 circular activities in more detail.
Learnings	- Toolkit is not (yet) a complete solution to the problem - Process before the toolkit should be more clear - Call to action could be included - Non-financial objectives could be included - Naming is important - Toolkit could spark creativity better
Actions	- Redesign toolkit using feedback - Make it a complete solution to the problem statement - Think about process before and after the toolkit, using service blueprint - Test the toolkit with the SM team and in a client project

Experiment 6

Customer	
Who am I targeting?	SM team
Relevant characteristics	Kester Meursing, works 1 year at CM, SM team member Henk Duit, works 1 year at CM, SM team member

Purpose	
What is the purpose of the experimen	Usability test: Test if the SM team members are able to use the toolkit without much help
Most uncertain and crucial assumptio	The SM team is able to use the toolkit independently
Sub-assumptions	The SM team is able to choose varying scopes for a series of projects
	The SM team is able to identify value creation of a series of projects for various stakeholders
	The SM team is able to identify risks of a series of projects
	The SM team is able to assess the attractiveness of a series of projects, select the most promising one and develop a set of arguments for this project

Methods	
Tool	Workshop, Presentation, Prototype v6
Main questions	- What does the SM team think of the prototype, from their opinion as end user? - Is it easy to understand and intuitive to use? - Is it practically applicable? - What elements do they miss? - Do they see themselves using it in their projects?
Steps	- Explain workshop using a short presentation - Explain the Welzorg case - Develop a series of projects and choose the most promising one, using the toolkit - Observe and ask questions, intervene as little as possible
(Target) Metric	The SM team members are able to intuitively use the toolkit and want to start using it in their CE projects, but they have some minor recommendations
Hypotheses	I believe the SM team members are able to independently use the circular project toolkit to create and assess a series of potential CE projects and select the most promising one.

Results and actions	
Observations	- Scope: Step 1 and 2 might be in a confusing order - Value: The purpose of the value creation circle with the 6 stakeholders is unclear. After explanation the team is able to use it and likes it very much - Canvas: the investment per project is written down in the value creation section but is assessed later on in the risk assessment, this is confusing. - Canvas: the overall structure of the 4 projects is confusing. It is unclear that the horizontal rows are different projects, the arrow towards 'doing nothing' indicates a decreasing scope while this is not the purpose. The larger and smaller scope is also unclear at first sight. - The summaries below each in-depth tool (scope, value and risk) might be a bit double work. - The in-depth analysis is most valuable the first time. The other projects are assessed quicker, without using the in-depth tools. - Kester took the lead using the toolkit, Henk had a more difficult time following along. the team did, however, cooperate and discuss each step of the toolkit. - the team liked the structure between the canvas (as overview) and 3 tools (as depth analysis). - the team liked the design, it is attractive, clear and the colour coding between the canvas and tools works intuitive. - The team had a difficult time to fully understand the content of the Welzorg case, this made it more difficult for them to intuitively assess each project. - The risk assessment boxes are a little small. - Both team members are enthusiastic about the toolkit and can't wait to start using it in their projects - They would like to use the toolkit in co-creation with their client. The toolkit could potentially be sold, but then it has to be a more complete product.
Learnings	- The SM team likes the prototype very much. - it is easy to understand and intuitive to use, but it could be improved further - it is practically applicable, both team members see themselves using it. - some additions were developed to further improve the toolkit
Actions	- Design an improved version of the toolkit - Test it with the 2 other SM team members: Bas & Meike - Test it in the Alewijnse project

Experiment 7

Customer	
Who am I targeting?	The Sustainable Minds team: Bas & Meike. Also: Maarten-Bas
Relevant characteristics	Knowledge & experience in CBM implementation: Bas: Medium-high Meike: Limited Maarten-Bas: Limited

Purpose	
What is the purpose of the experiment?	Test whether the Sustainable Minds team members are able to independently use the toolkit
Most uncertain and crucial assumption	The Sustainable Minds team members are able to independently use the toolkit to turn circular opportunities into an actionable circular project
Sub-assumptions	Able to create, compare and select 3 projects of varying scope
	Able to determine actions per phase of the chosen project
	Able to create a big hairy audacious goal

Methods	
Tool	presentation, workshop, toolkit
Main questions	- What does the SM team think of the prototype, from their opinion as end user? - Is it easy to understand and intuitive to use? - Is it practically applicable? - What elements do they miss? - Do they see themselves using it in their projects?
Steps	- Explain workshop using a short presentation - Explain the Welzorg case - Develop a series of projects and choose the most promising one, using the toolkit - Observe and ask questions, intervene as little as possible
(Target) Metric	The SM team members are able to intuitively use the toolkit and want to start using it in their CE projects, but they have some minor recommendations
Hypotheses	I believe the SM team members are able to independently use the circular rollout toolkit to create, compare and select 3 potential CBMI projects and select one.

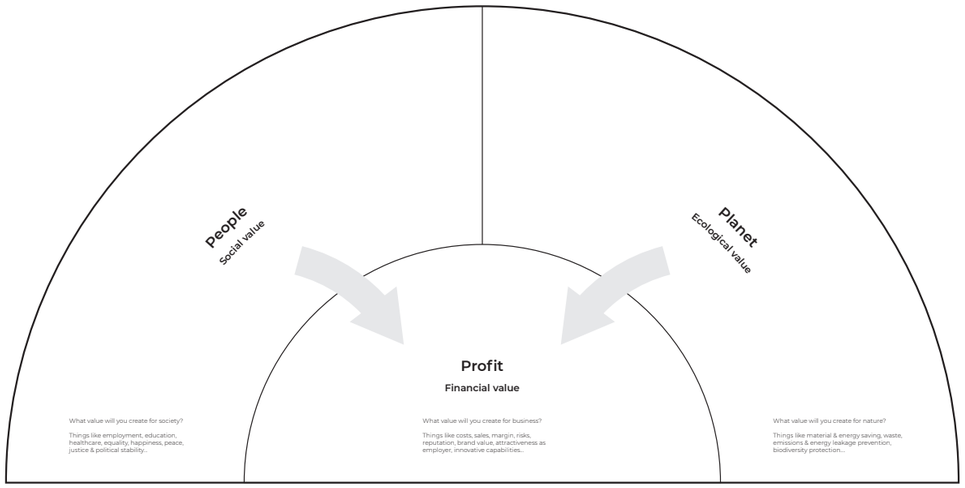
Results and actions	
Observations	- The team members are able to independently use the toolkit and apply it to the Welzorg case. - They are very enthusiastic and positive about the workshop and the toolkit - They have some difficulties fully understanding the Welzorg case, because they were not involved in the quick scan. - They see themselves independently use the toolkit after completing a quick scan. - Selector: Rename value destruction into value destruction/opportunities - Scope: Maybe turn around the order in which the circular activities are listed? - Selector: Change ecological/other value into most important value created? - Selector: Reposition financial arguments to the last column? - Bas: A brainstorm about opportunities would have been nice to do beforehand. - Scope: Determine scope per project before assessing each project? - Meike: A lot of writing has to be repeated, maybe this could be minimised. - Rollout: Project description could be more brief, this reduces rewriting and leaves more room for the actions, adding time required per phase, investment and goal.
Learnings	- The toolkit is usable by the SM team members and applicable to their projects - It has to be clear that the user should have identified circular opportunities beforehand.
Actions	- Use feedback to further improve the prototype

E. Prototypes and final design

Sprint 1

Circular opportunity

Write down the different types of value you create and the relations between them



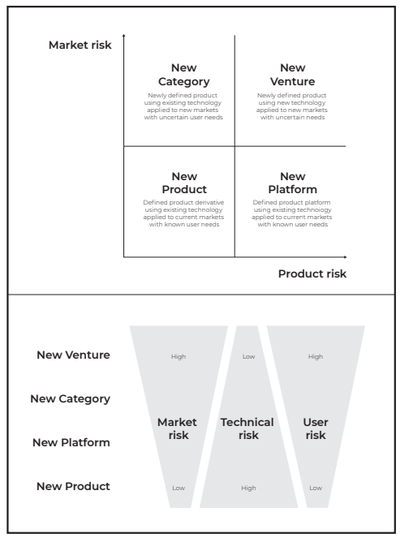
Project attractiveness & actions

Evaluate your project and determine the actions you have to take

How big is the opportunity?	**List your assumptions, can you test them?**
How big is the risk?	**How can you decrease the risk of your project?**
Is the project attractive?	**What actions will you take?**

Risk analysis

What is your portfolio category and what are the relevant risks?



	Market risk	Technical risk	User risk
New Venture	0.45	0.10	0.45
New Category	0.40	0.20	0.40
New Platform	0.35	0.35	0.30
New Product	0.30	0.60	0.30

What are your largest risks?

Market risk

	1	2	3	4	5
	Some or all value chain requirements are not present inside the company or with existing partners		All value chain requirements present, some using partners		All value chain requirements exist internally in the company
Value chain					
Market segment	New target segment, or the company has no presence in the target market segment		Company sells other products to customers in the target market segment(s)		Company is a market leader in the target market segment(s)

Technical risk

	1	2	3	4	5
	New technology, proof-of-concept stage with limited testing		New technology, working prototypes developed and tested		Incremental use of well-understood technology
Innovation					
Capabilities	Incomplete team and limited experience in similar projects		New team of experienced developers with some experience in similar projects		Established development team with experience in similar projects

User risk

	1	2	3	4	5
	No user research performed, user attributes determined by internal staff		User research not performed, but secondary product research performed		Primary user product research performed or planned prior to development
Interaction					
Specification	New design and performance specification in new market segment		New design and performance specification in existing market segment		Extension of existing product design and performance specifications

Optional

Risk score = Total score / 0.3	Total score =	Risk score = %

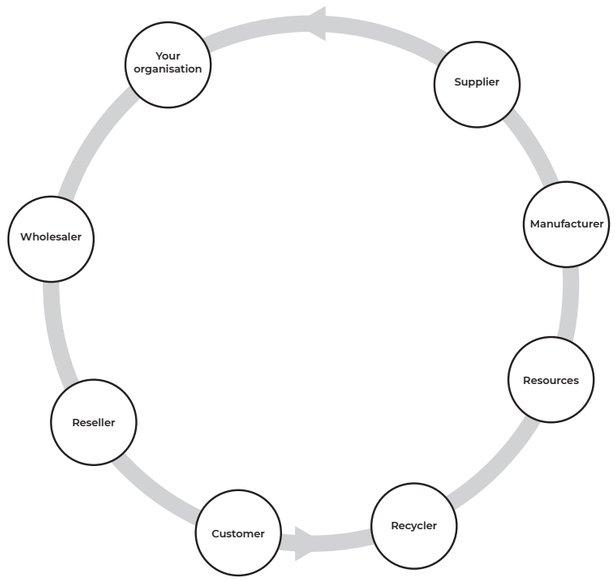
Roadmap

Plot all actions against a timeline to achieve your short-, medium- and long-term goals

	Past	Now	Short-term	Medium-term	Long-term	Vision
Market						
Business model						
Product/ Service						
Technology						
Resources						

Sprint 2

Business system

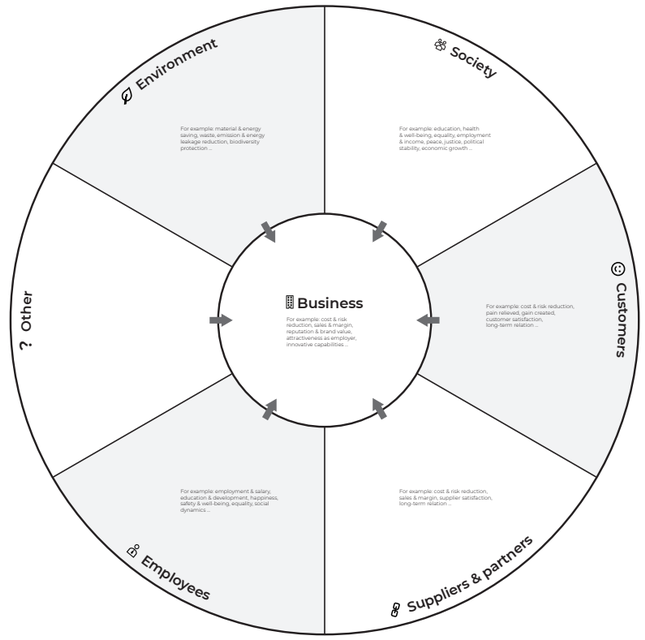


Business Model Canvas

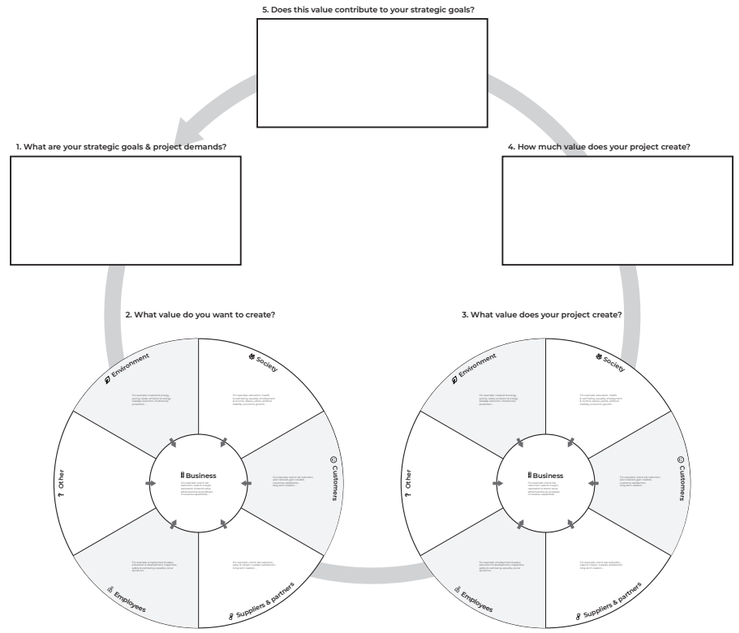
Designed for:	Designed by:	Date:	Version:

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure		Revenue Streams		

Circular value creation



Circular value creation



Circular project risk

	Changes to business	Development needed	Possible risks
Key partners		Low 1 2 3 4 5 High	
Key activities		Low 1 2 3 4 5 High	
Key resources		Low 1 2 3 4 5 High	
Value proposition		Low 1 2 3 4 5 High	
Customer relationships		Low 1 2 3 4 5 High	
Channels		Low 1 2 3 4 5 High	
Customer segments		Low 1 2 3 4 5 High	
Cost structure		Low 1 2 3 4 5 High	
Revenue stream		Low 1 2 3 4 5 High	

Risk of the project

Underlying assumptions

Circular attractiveness

Value created / Project risks = Project attractiveness

↓ ↓

Increase value? / Decrease risk? = Increased attractiveness?

Circulaire waardecreatie

SUSTAINABLE MINDS

1

Bedrijfsdoelen & projecteisen

Bedrijfsdoelen	Projecteisen
Bv: kosten besparen, minder klantverloop ...	Bv: binnen X jaar terugverdiend, > X € opbrengst ...

Waarde - doelen match

4

Draagt de gecreëerde waarde bij aan je bedrijfsdoelen & projecteisen?

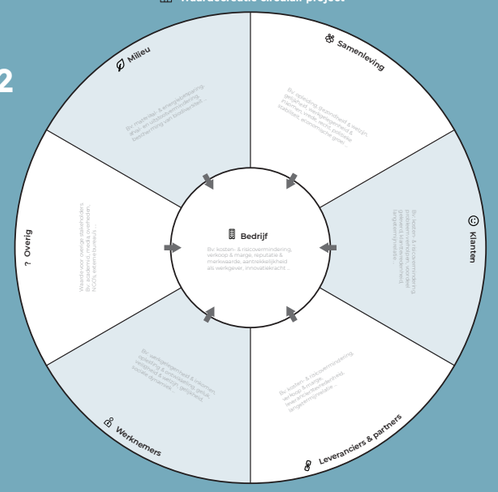
Belangrijkste waardecreatie

3

Wat zijn de belangrijkste vormen van waardecreatie in jouw circulaire project? Hoe verhoudt waarde voor andere stakeholders zich tot waarde voor jouw bedrijf?

2

Waardecreatie circulair project



Tip: probeer de waarde te kwantificeren.

Tip: Laat de relaties tussen de vormen van waarde zien met lijnen en pijlen.

5

Circulair statement

Beschrijf in 1 zin welk bedrijfsdoel je wilt bereiken en hoe jouw project daar aan bijdraagt.

Wij willen ...

Circulair projectrisico

SUSTAINABLE MINDS

1

	Veranderingen aan bedrijf	Benodigde ontwikkeling	Mogelijke risico's
Key partners	Bv: samenwerken met leveranciers, van leverancier veranderen	Laag 1 2 3 4 5 Hoog	Bv: leveranciers willen niet samenwerken
Key activities	Bv: productie efficiënter maken, terugnameproces stroomlijnen	Laag 1 2 3 4 5 Hoog	Bv: technologie moet ontwikkeld worden
Key resources	Bv: overstappen op gerecyclede grondstoffen, nieuwe fabriek bouwen	Laag 1 2 3 4 5 Hoog	Bv: onbekend met nieuwe grondstoffen
Value proposition	Bv: productontwerp aanpassen, ander product inkopen	Laag 1 2 3 4 5 Hoog	Bv: samenwerking producent vereist
Customer relationships	Bv: langetermijnrelatie met klanten aangaan, duurzaamheid promoten	Laag 1 2 3 4 5 Hoog	Bv: klanten staan niet open voor samenwerking
Channels	Bv: duurzame transportkanalen inzetten, retourlogistiek opzetten	Laag 1 2 3 4 5 Hoog	Bv: samenwerking transporteur vereist
Customer segments	Bv: nieuw klantsegment aanboren	Laag 1 2 3 4 5 Hoog	Bv: klanten zijn (nog) niet bekend met circulaire economie
Cost structure	Bv: kostenvermindering, langetermijninvesteringen doen	Laag 1 2 3 4 5 Hoog	Bv: toekomstige prijzen lastig te voorspellen
Revenue stream	Bv: nieuw verdienmodel gebruiken, van product naar dienst	Laag 1 2 3 4 5 Hoog	Bv: nieuw verdienmodel niet rendabel

2

Grootste projectrisico's

Wat zijn de grootste risico's van jouw project? Op welke elementen van je bedrijf hebben ze betrekking?

3

Onderliggende aannames

Welke aannames liggen ten grondslag aan je risico's? Kan je deze testen?

Aantrekkelijkheid circulair project

SUSTAINABLE MINDS

1

Titel project

Verzin een titel voor je project

2

Gecreëerde waarde

Schrijf de belangrijkste vormen van waardecreatie voor de verschillende stakeholders in je project op. Hoe verhouden deze zich tot waarde voor je bedrijf? Kun je de waarde kwantificeren?

/

Projectrisico's

Schrijf de belangrijkste risico's van je project op. Op welke elementen van je bedrijf hebben ze betrekking? Welke aannames liggen hier ten grondslag aan?

=

Aantrekkelijkheid project

Vergelijk de belangrijkste waardecreatie van je project en de grootste risico's. Ziet je project er aantrekkelijk uit of niet? Wat zijn de voor- en nadelen?

3

Verhoogde waarde

Kun je manieren bedenken om de waarde van je project te verhogen?

/

Verlaagd risico

Kun je manieren bedenken om de grootste risico's van je project te verminderen?

=

Verhoogde aantrekkelijkheid

Verhoogt dit de aantrekkelijkheidvan je project? Op wat voor manieren?

Circular value creation

SUSTAINABLE MINDS

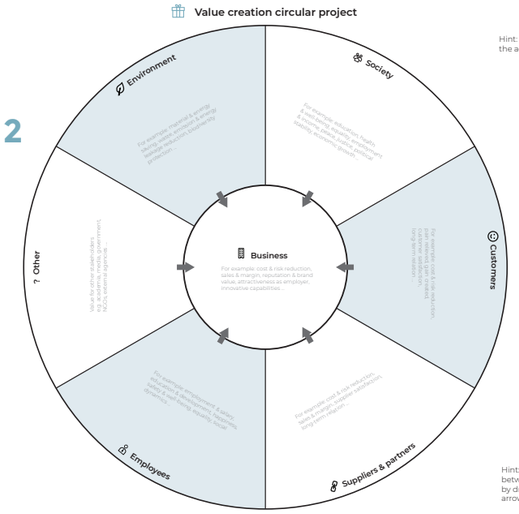
What is the added value of the circular project?

1

Project title

2

Value creation circular project



Hint: try to quantify the added value

3

Value destruction

How much value destruction does the project prevent? For which stakeholders?

4

Most important value creation

What is the most important added value of the project? How much value does the project create for which stakeholders?

Hint: show the relations between types of value by drawing lines and arrows

Circular project risks & challenges

SUSTAINABLE MINDS

Determine the risks and challenges of the circular project

1

Project title

2

	Changes to business	Required development	Potential risks
Key partners	E.g. collaborating with suppliers, switching suppliers	Low 1 2 3 4 5 High	E.g. suppliers not willing to collaborate
Key activities	E.g. improving manufacturing efficiency, developing take-back process	Low 1 2 3 4 5 High	E.g. technology has to be developed
Key resources	E.g. switching to recycled resources, building a new factory	Low 1 2 3 4 5 High	E.g. unfamiliar with new resources
Value proposition	E.g. changing product design, buying a different product	Low 1 2 3 4 5 High	E.g. collaboration of supplier required
Customer relationships	E.g. starting long-term relation with customers, promoting sustainability	Low 1 2 3 4 5 High	E.g. customers not willing to collaborate
Channels	E.g. switching to sustainable transport, setting up return logistics	Low 1 2 3 4 5 High	E.g. collaboration of transport company required
Customer segments	E.g. targeting a new customer segment	Low 1 2 3 4 5 High	E.g. customers not familiar with circular economy
Cost structure	E.g. using TCO, doing a long-term investment	Low 1 2 3 4 5 High	E.g. future prices hard to predict
Revenue stream	E.g. using a new revenue model, servitising	Low 1 2 3 4 5 High	E.g. new revenue model not profitable

3

? Other risks & challenges

Organisational challenges	Trends & developments
E.g. employees do not believe in sustainability.	E.g. changing regulations and customer demand

4

! Biggest risks & challenges

What are the biggest risks and challenges of the project? To which elements of the business are they related? How can these risks be decreased?

Circular project attractiveness

SUSTAINABLE MINDS

Determine the attractiveness of a few potential projects

1

Business objectives

E.g. save costs, prevent customer churn ...

Project demands

E.g. profitable within 1 year, minimum €1 million revenue increase ...

4

Chosen project

Which project fits the objectives and demands best?

2

Project title	Value creation	/ Project risks	= Project attractiveness
Create a title for the circular project	What is the added value of the circular project?	What are the biggest risks of the project?	Is the project attractive?
Increase the scale of the project	Does value creation increase as well?	Do the risks increase as well?	Does this improve the attractiveness of the project?
Decrease the scale of the project	Does value creation decrease as well?	Do the risks decrease as well?	Does this improve the attractiveness of the project?
Continue the status quo and do not execute the project *"Do nothing"*	Is value destroyed when not executing the project?	What is the risk of doing nothing?	How attractive is this scenario?

3

Circular project canvas

SUSTAINABLE MINDS

Compare potential circular projects & select the most promising one

1

Business objectives

E.g. save costs by €20 million, reduce customer churn by 5% ...

€ Financial project demands

Investment	€
Return	€
Payback period	

? Other project requirements

E.g. No collaboration with partners required, finish in 1 year ...

2

T Project scope

E.g. "We want to reduce material use by €1 million through refurbishing old products."

€ Financial value

Investment	€
Return	€
Payback period	

Other value

What other value is created for business and stakeholders?

! Risks & challenges

What are the biggest risks and challenges of the project?

↓

Increase the scope of the project, try focusing on multiple activities

Investment	€
Return	€
Payback period	

Does value increase for all stakeholders?

Do the risks and challenges increase as well?

Decrease the scope of the project, try focusing on only 1 activity

Investment	€
Return	€
Payback period	

Does value decrease for all stakeholders?

Do the risks and challenges decrease as well?

3

Continue the status quo

"Do nothing"

Investment	€
Return	€
Payback period	

Is value created or destroyed?

What is the risk of doing nothing?

4

Chosen project

Which project fits the objectives and demands best?

Why is it the most promising project?

Financial arguments	Value creation arguments	Risk arguments

Circular project scope

Determine the scope of the circular project

1 Describe current value destruction to focus on

E.g. €1 million worth of refurbishable products are wasted every year.

2 Choose circular activity to create value

Circular value

○ **Refuse**	**Make the product obsolete** (e.g. sell a service)
○ **Rethink**	**Increase product use effectiveness** (e.g. sharing)
○ **Reduce**	**Reduce resource use** (e.g. use less material)
○ **Reuse**	**Reuse or sell a functioning product**
○ **Repair**	**Repair or maintain a product**
○ **Refurbish**	**Restore an old product to its original state**
○ **Remanufacture**	**Reuse product parts in their original function**
○ **Repurpose**	**Turn old product or parts into a different product**
○ **Recycle**	**Recycle materials**
○ **Recover**	**Burn materials to recover energy**

3 Describe circular project scope

E.g. "We want to reduce material use by €1 million through refurbishing old products."

Circular project value

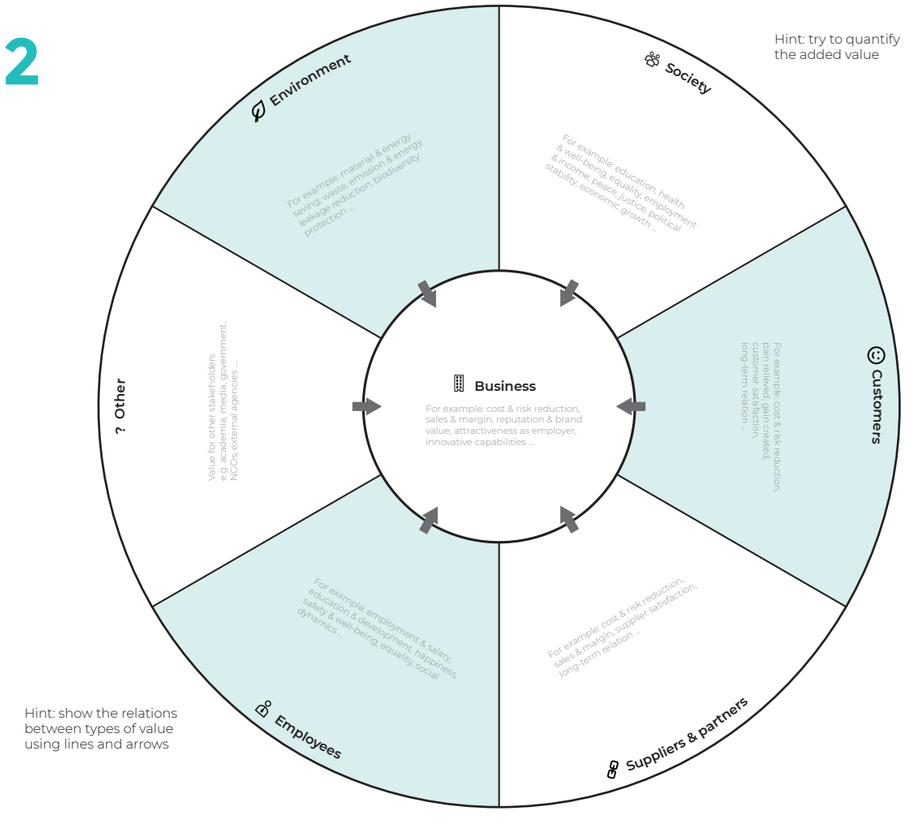
What is the added value of the circular project?

1 Circular project scope

E.g. "We want to reduce material use by €1 million through refurbishing old products."

2 Value creation circular project

Hint: try to quantify the added value



Hint: show the relations between types of value using lines and arrows

3 Most important value

Summarise the most important value that the project creates for its stakeholders

€ Expected return

€

Circular project risk

What are the risks and challenges of the circular project?

1 Circular project scope

E.g. "We want to reduce material use by €1 million through refurbishing old products."

2

Activity	+ / ++	Changes to business	+ / ++	Potential risks
Refuse	+ / ++		+ / ++	
Rethink	+ / ++		+ / ++	
Reduce	+ / ++		+ / ++	
Reuse	+ / ++		+ / ++	
Repair	+ / ++		+ / ++	
Refurbish	+ / ++		+ / ++	
Remanufacture	+ / ++		+ / ++	
Repurpose	+ / ++		+ / ++	
Recycle	+ / ++		+ / ++	
Recover	+ / ++		+ / ++	
		€ Estimated investment		€

3 Other risks & challenges

Organisational challenges	Trends & developments
E.g. suppliers not willing to collaborate	E.g. changing regulations and customer demand

4

Most important risks & challenges	€ Investment
Summarise the most important value that the project creates for its stakeholders	€

Circulair projectcanvas

SUSTAINABLE MINDS

Vergelijk potentiële circulaire projecten en kies het meest veelbelovende project

1

Bedrijfsdoelstellingen

Bv. €20 miljoen kosten besparen, klantverloopt met 5% verminderen..

€ Financiële projectvereisten

Investering	€
Inkomsten	€
Terugverdientijd	

? Overige projectvereisten

Bv. Geen samenwerking met partners nodig, af te ronden in 1 jaar ...

2

T Projectomvang

Bv. "Wij willen materiaalgebruik met €1 miljoen verminderen door oude producten te reconditioneren."

€ Financiële waarde

Investering	€
Inkomsten	€
Terugverdientijd	

Overige waarde

Bv. Marketingwaarde voor het bedrijf, kostenvermindering voor klanten.

! Risico's & uitdagingen

+ / ++

Bv. Geen ervaring met refurbishen van producten

↓

Projectomvang

Vergroot de omvang van het project, probeer je op meerdere activiteiten te richten.

€ Financiële waarde

Investering	€
Inkomsten	€
Terugverdientijd	

Overige waarde

Hoe verandert de waarde voor de betrokken stakeholders?

! Risico's & uitdagingen

+ / ++

Hoe veranderen de risico's en uitdagingen?

Projectomvang

Verklein de omvang van het project, probeer je op slechts 1 activiteit te richten.

€ Financiële waarde

Investering	€
Inkomsten	€
Terugverdientijd	

Overige waarde

Hoe verandert de waarde voor de betrokken stakeholders?

! Risico's & uitdagingen

+ / ++

Hoe veranderen de risico's en uitdagingen?

3

Projectomvang

Ga door met de huidige stand van zaken.

"Niks doen"

€ Financiële waarde

Investering	€
Inkomsten	€
Terugverdientijd	

Overige waarde

Wordt er waarde vernietigt? Hoe?

! Risico's & uitdagingen

+ / ++

Wat is het risico van niets doen?

4

Gekozen project

Welk project past het best bij de bedrijfsdoelstellingen?

Waarom is dit het meest veelbelovende project?

Financiële argumenten	Waardecreatie argumenten	Risico argumenten

Circulaire projectomvang

Bepaal de omvang van een circulair project

1 Beschrijf op welke huidige waardevernietiging het project zich richt

Bv. €1 miljoen aan herbruikbare producten wordt jaarlijks weggegooid.

2 Kies een circulaire activiteit om waarde te creëren

Circulaire waarde

○ **Refuse**	**Maak het product onnodig** (bv. digitaliseren)
○ **Rethink**	**Verhoog de gebruiksgraad** (bv. delen)
○ **Reduce**	**Verlaag materiaalgebruik** (bv. slimmer ontwerpen)
○ **Reuse**	**Hergebruik van een functionerend product**
○ **Repair**	**Onderhoud en reparatie van een product**
○ **Refurbish**	**Een product in originele staat herstellen**
○ **Remanufacture**	**Onderdelen hergebruiken in hun originele functie**
○ **Repurpose**	**Een oud product of onderdelen hergebruiken in een nieuwe functie**
○ **Recycle**	**Materialen recyclen**
○ **Recover**	**Materialen verbranden om energie terug te winnen**

3 Beschrijf de circulaire projectomvang

Bv. "Wij willen materiaalgebruik met €1 miljoen verminderen door oude producten te reconditioneren."

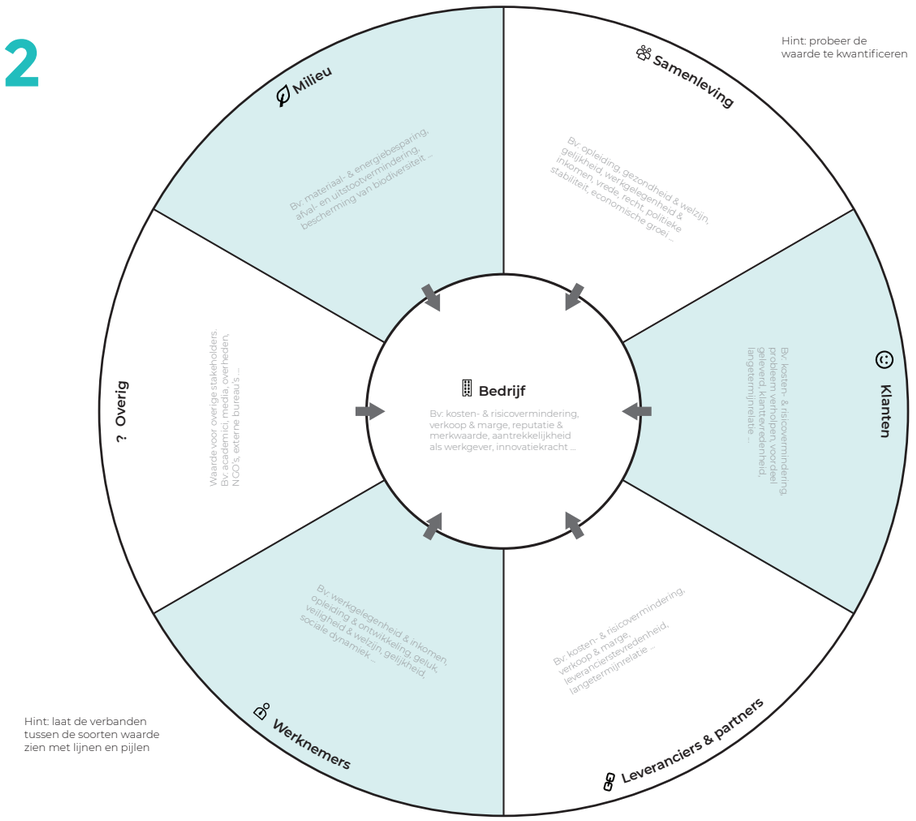
Circulaire projectwaarde

Wat is de toegevoegde waarde van het circulaire project?

1 Circulaire projectomvang

Bv. "Wij willen materiaalgebruik met €1 miljoen verminderen door oude producten te reconditioneren."

2 Waardecreatie circulair project



Hint: probeer de waarde te kwantificeren

Hint: laat de verbanden tussen de soorten waarde zien met lijnen en pijlen

3 Belangrijkste waarde

Wat is de belangrijkste waarde van het project voor de verschillende stakeholders?

€ Verwachte inkomsten

€

Circulaire projectrisico's

Wat zijn de risico's en uitdagingen van een circulair project?

1 Circulaire projectomvang

Bv. "Wij willen materiaalgebruik met €1 miljoen verminderen door oude producten te reconditioneren."

2

Activiteit	+ / ++	Bedrijfsaanpassingen	+ / ++	Potentiële risico's
Refuse	+ / ++		+ / ++	
Rethink	+ / ++		+ / ++	
Reduce	+ / ++		+ / ++	
Reuse	+ / ++		+ / ++	
Repair	+ / ++		+ / ++	
Refurbish	+ / ++		+ / ++	
Remanufacture	+ / ++		+ / ++	
Repurpose	+ / ++		+ / ++	
Recycle	+ / ++		+ / ++	
Recover	+ / ++		+ / ++	
		€ Geschatte investering		€

3 Overige risico's en uitdagingen

Organisatorische uitdagingen	Trends & ontwikkelingen
Bv. leveranciers willen niet samenwerken	Bv. veranderingen in wetgeving en klantvraag

4

+ / ++	Belangrijkste risico's & uitdagingen	€ Investering
	Wat zijn de belangrijkste risico's en uitdagingen van het project?	€

CIRCULAR
PROJECT SELECTOR

SUSTAINABLE MINDS

Compare and select a circular project

1 Analyse company

Business objectives	Financial project requirements		Other requirements	Value destruction or opportunities
Eg. save costs by €20 million, differentiate product portfolio ..	Investment	€ 500.000	Eg. No collaboration with partners required	Eg. €50 million material unnecessarily wasted
Save costs by 20 million	Return / saving	€ 1.000.000	*No collaborations required*	*Products lifetime is short & design is not universal.* *Valuable product parts are not reused.* *Waste is not separated & recycled*
	Payback period	1 year		

2 Compare projects

	Project description (Tip: use the project description tool)	Financial value (Tip: use the project value tool)		Ecological and other value		Project challenges (Tip: use the project challenges tool)
Small project	Propose a small project. Eg. "We want to reduce waste costs by €100.000 within 1 year by better separating and recycling our waste streams."	Investment	€ 50.000	Eg. Waste reduction for the environment, better relationship with waste company	+	Eg. Limited purity in separation possible.
	Reduce waste cost by better separating & recycling	Return / saving	€ 100.000	*E: Waste reduction* *B: Cost reduction*	++	*Limited purity in separation possible* *Return is still unknown*
		Payback period	6 months			
Bigger project	Propose a bigger project.Eg. "We want to reduce material use by €1 million within 1 year by refurbishing old products."	Investment	€ 200.000	Eg. Marketing value for the company, cost reduction for customers	+	Eg. No experience in refurbishing products
	Reduce material cost by remanufacturing product parts	Return / saving	€ 1.500.000	*E: Waste & material reduction* *B: Cost reduction & margin* *S: Employment*	++	*Limited experience in refurbishment* *Setting up storage space for reman. parts*
		Payback period	1 year			
Biggest project	Propose the biggest project. Eg. "We want to create a new market segment within 5 years by moving from a product to service."	Investment	€ 1.000.000	Eg. Risk reduction for customers, competitive power for the company	+	Eg. Suppliers might not be willing to collaborate
	Improve product design to last long and be easy to repair and maintain	Return / saving	€ 5.000.000	*E: Material saving, waste reduction* *B: Cost reduction, margin, competitive edge* *S: Employment* *C: Cost reduction*	++	*Suppliers willing to collaborate?* *Technical uncertainties related to design* *High investment, long-term*
		Payback period	5-10 years			

3 Select project

Chosen project		Why this project?	
Project description	**Financial arguments**	**Value creation arguments**	**Challenges arguments**
Which project best fits with the business objectives?			
Reduce material cost by remanufacturing product parts	*Exactly fits financial requirements.* *Short-term, low risk, high return*	*Creates environmental, social & business value* *Direct impact, visible result*	*Challenges are limited* *Storage space is only real issue.*

CIRCULAR
PROJECT DESCRIPTION

SUSTAINABLE MINDS

What is the scope of your circular project?

Describe value destruction to focus on

1 Describe value destruction

Eg. €1 million worth of reusable products is wasted per year.

Valuable product parts are not reused.

Choose one or more circular activities to create value

2 Choose scope

Circular value

○ Refuse	**Make the product redundant** (eg. digitise)
○ Rethink	**Increase product use intensity** (eg. sharing)
○ Reduce	**Decrease material use** (eg. more efficient design)
○ Reuse	**Reuse a functioning product**
○ Repair	**Maintain and repair a product**
○ Refurbish	**Restore a product in its original state**
☑ Remanufacture	**Reuse product parts in their original function**
○ Repurpose	**Reuse a product or its parts in a new function**
○ Recycle	**Recycle materials**
○ Recover	**Burn materials to recover energy**

Describe the circular project scope

3 Describe scope

Eg. "We want to reduce material use by €1 million by refurbishing old products."

Reduce material cost by remanufacturing product parts

CIRCULAR
PROJECT VALUE

SUSTAINABLE MINDS

What is the added value of the circular project?

Circular project description

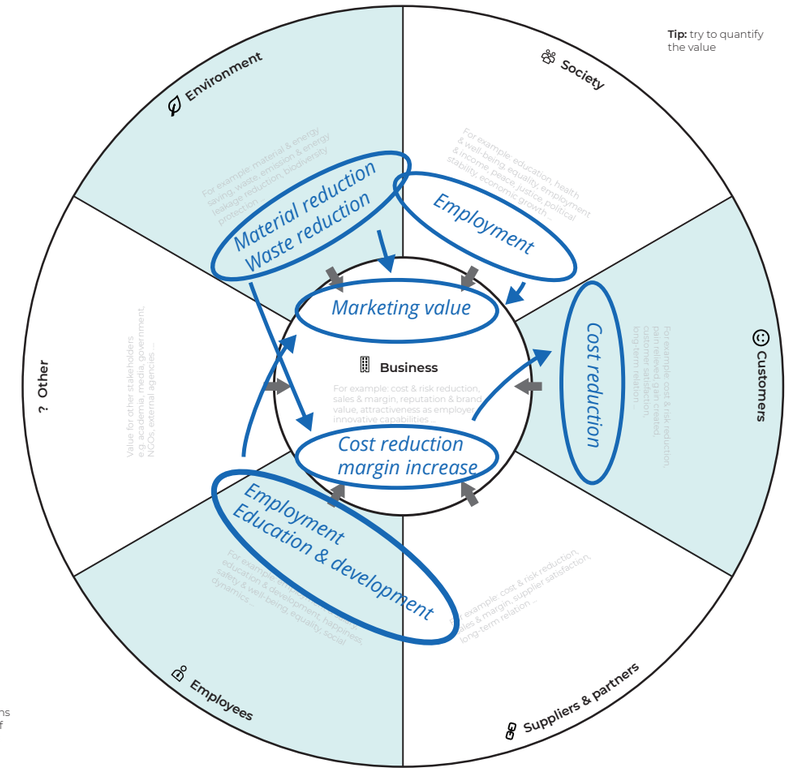
1 Describe project

Eg. "We want to reduce material use by €1 million by refurbishing old products."

Reduce material cost by remanufacturing product parts

Circular project value creation

2 Determine value creation



Tip: try to quantify the value

Tip: show relations between types of value using lines and arrows.

Most important value created

€ Estimated return / saving

3 Conclude

What is the most important value created by the project for the company and its stakeholders?	€ Estimated return / saving
E: Waste & material reduction *S: Employment* *B: Cost reduction & margin*	€ *1.200.000*

CIRCULAR
PROJECT CHALLENGES

SUSTAINABLE MINDS

What are the challenges of your circular project?

1 Describe project

Circular project description

Eg. "We want to reduce material use by €1 million by refurbishing old products."

Reduce material cost by remanufacturing product parts

2 Determine challenges

Activity		Required changes		Potential challenges
Refuse	+ ++		+ ++	
Rethink	+ ++		+ ++	
Reduce	+ ++		+ ++	
Reuse	+ ++		+ ++	
Repair	+ ++		+ ++	
Refurbish	+ ++		+ ++	
Remanufacture	+ ++	*Set up reman. line* *Separate reman. inventory*	+ ++	*Limited experience, limited storage & parts selection process*
Repurpose	+ ++		+ ++	
Recycle	+ ++		+ ++	
Recover	+ ++		+ ++	

Attention: also think about changes to business model and product design

3 Determine developments

Trends & developments

Eg. Changing laws and changing customer demand

Rising resource prices, rising prices of parts. Governments requesting circular products

4 Conclude

	Most important challenges	Estimated investment
+ ++	What are the most important challenges of the circular project? *Limited experience in refurbishment* *Setting up storage space for remanufactured parts*	€ *200.000*

CIRCULAR ROLLOUT

SUSTAINABLE MINDS

1 Proposed project

Project description	Financial value	Ecological & other value	Project challenges
Eg. save cost by €20 million, reduce customer churn by 5% .. *Reduce material cost by remanufacturing product parts*	Investment € *200.000* Return / saving € *1.500.000* Payback period *1 year*	Eg. No collaborations with partners required ... *E: Waste & material reduction* *B: Cost reduction & margin* *S: Employment*	Eg. €50 million of material unnecessarily thrown away and bought again ... *Limited experience in refurbishment* *Setting up storage space for reman. parts* *Selecting which parts to remanufacture*

2 Project phases & actions

Phase small	Phase bigger	Phase biggest
Duration *1 month*	Duration *3 months*	Duration *8 months*
Objective Eg. successfully refirbish 1 product *Successfully remanufacture 1 part*	Objective Eg. Set up a refurbishing line *Set up remanufacturing line & storage space for 1 part type*	Objective Eg. set up a highly efficient refurbishing line *Expand remanufacturing line to multiple parts*
Actions *- Create team* *- Choose part to focus on* *- Try remanufacturing 1 part*	Actions *- Set up dedicated remanufacturing line* *- Select valuable parts to focus on for remanufacturing* *- Find dedicated storage space for remanufactured parts* *- Train workshop employees for remanufacturing* *- Create display to count amount of parts remanufactured* *- Start remanufacturing parts* *- Keep track of material & cost saving* *- Keep track of storage to prevent overstocking parts*	Actions *- Select other valuable parts for remanufacturing* *- Expand dedicated storage space for remanufactured parts* *- Train workshop employees for remanufacturing other parts* *- Update display to count amount of parts remanufactured* *- Expand remanufacturing* *- Keep track of material & cost saving* *- Automate storage and remanufacturing request to prevent overstocking*

3 BHAG

BHAG Big Hairy Audacious Goal

Eg. Zero waste in 2025, CO2 emission of zero in 2030, fully circular in 2035 ...

Zero waste in 2025