CISUFLO

CIRCULAR SUSTAINABLE FLOOR COVERINGS

Circular Business Modelling

Handbook for Practitioners

CISUFLO project has received funding from the European Union's *Horizon 2020* Research and Innovation Programme under Grant Agreement No 101003893

Outline of handbook

1. Motivation and purpose of handbook

What is the context and why is it relevant?

2. Circular business modelling – Process description and tool explanation

- Self-assessment of circular strategies
- Future value chain development
- Evaluation of outcomes for future value chain

3. Recommendations and guidelines

Take-aways to consider when applying the process and general best practices

Motivation and purpose of the handbook

In this handbook, we propose a practical, step-wise process to guide flooring companies in moving towards circular business practices.

We recognize that – given **supply chain complexity, diverse product characteristics and shifting legislation** – it can be important for flooring companies to take steps towards circularity

This handbook offers handholds to companies to explore and analyse relevant options.

It incorporates useful tools to help companies in supporting their decision-making on the **what, why and how** of circular business models.

This process is based on the findings presented in D3.6, part of the H2020 CISUFLO project.

Circular Business Models

Through desk research and interviews with stakeholders from practice, we identified **5 types of circular business models** that can be used to support circular business practices.

Business models for circular material design
Through this business model, organizations aim for circular impact by using secondary materials to design and fabricate their products

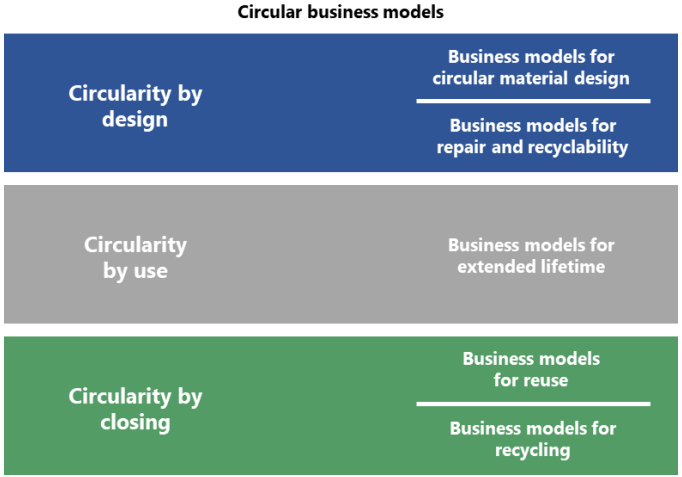
Business models for repair and recyclability
Through this business model, organizations aim for circular impact by modularizing their products for easy of repair and recycling post-use

Business models for extended lifetime
Through this business model, organizations aim for circular impact by extending the lifetime of products through repair and maintenance

Business models for reuse
Through this business model, organizations aim for circular impact by ensuring the reuse of products after their use, avoiding production

Business models for recycling
Through this business model, organizations aim for circular impact by recycling products, extracting (secondary) materials for new products.

Business models can be used **simultaneously** and **strengthen each other:** designing a product for repair can make recycling post-use easier.



Collaboration is essential to achieve circular impact …

Although organizations can (and should be encouraged to) take initial actions towards circular business practices, **collaboration is essential.**

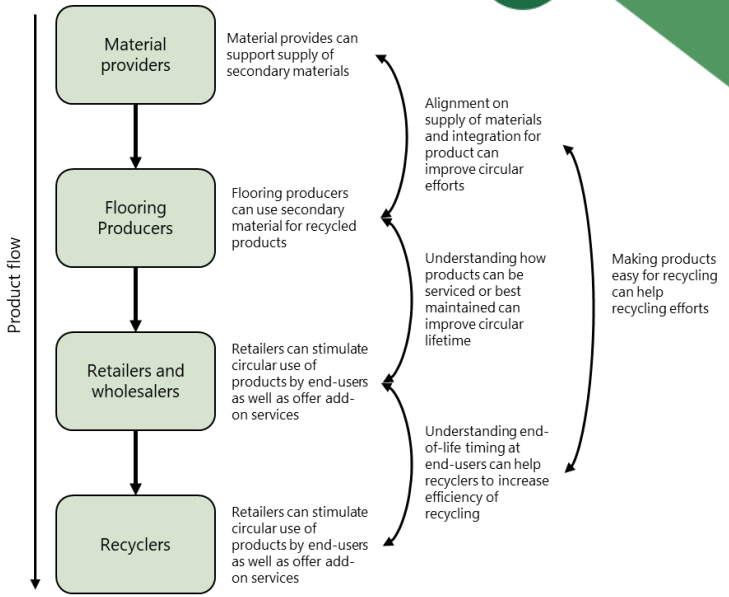
A value chain for new products generally consists of many **different stakeholders** – material providers, producers, retailers, recyclers – each **impacting circularity.**

- Material providers can enable the supply of **secondary or recycled material**
- Producers can tweak products in a **modular or circular way**
- Retailers can engage with end-users to **encourage circular use**
- Recyclers can **process waste streams for material reuse**

As a result, circular actions taken by organizations should ideally be aligned with the efforts of others, ensuring that these actions remain valuable throughout the value chain. For example:

- **1. Designing a recyclable product** and **2. working with recyclers that are knowledgeable on how to recycle the product post lifetime.**
- **1. Developing modular products** and **2. ensuring that end-users can receive repair and maintenance leveraging the modular properties of the product.**

All-in-all, taking a **value chain perspective** for circular business practices can significantly help to achieve and improve circular performance.



… But collaboration requires relationship building and value distribution

However, establishing collaboration is not trivial: organizations may not have formal relationships in place or may have competing ambitions.

To this end, it is important to understand:

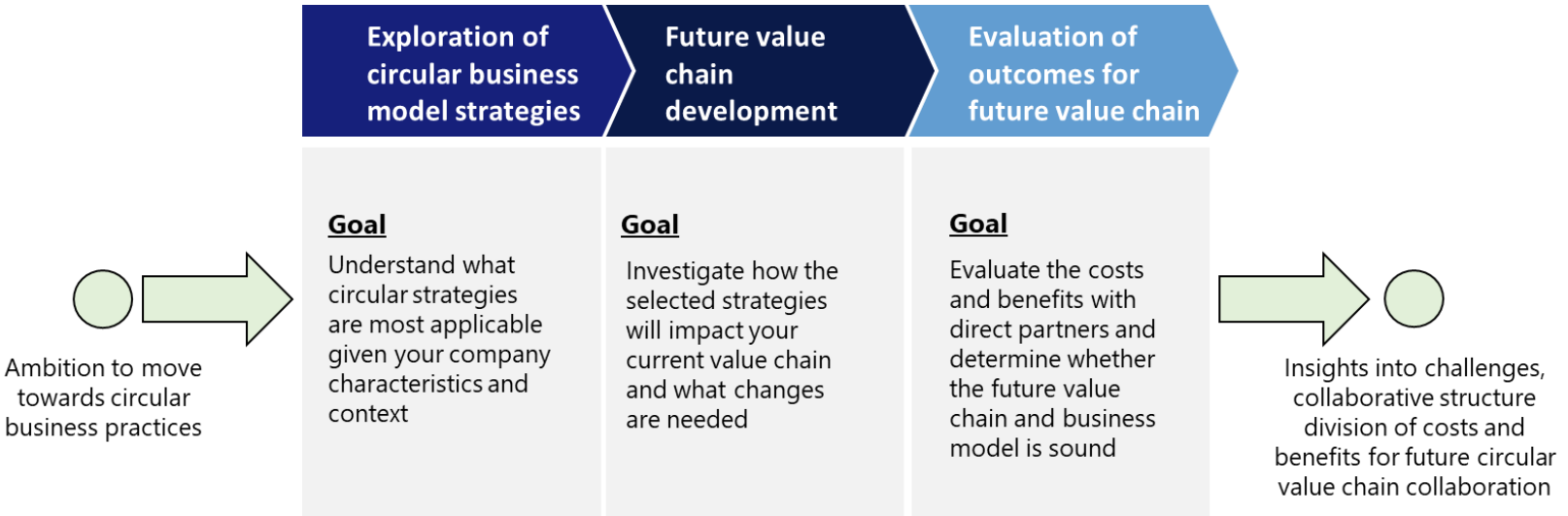
- How **collective value** will be created
- What **roles and dependencies** exist between stakeholders
- How **each stakeholder** can benefit through collaboration

To enable do so, insights from **individual ambitions** of stakeholders, structure and roles for the **future circular value chain,** and **business model analyses** are needed.

In this handbook, we offer a set of tools to help in this task.

Circular Business Modelling – Process Description

We propose the following **process** to guide organizations in the flooring industry in moving **towards circular business practices**



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Circular Business Modelling

Tool 1: Exploration of Circular Strategies

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Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

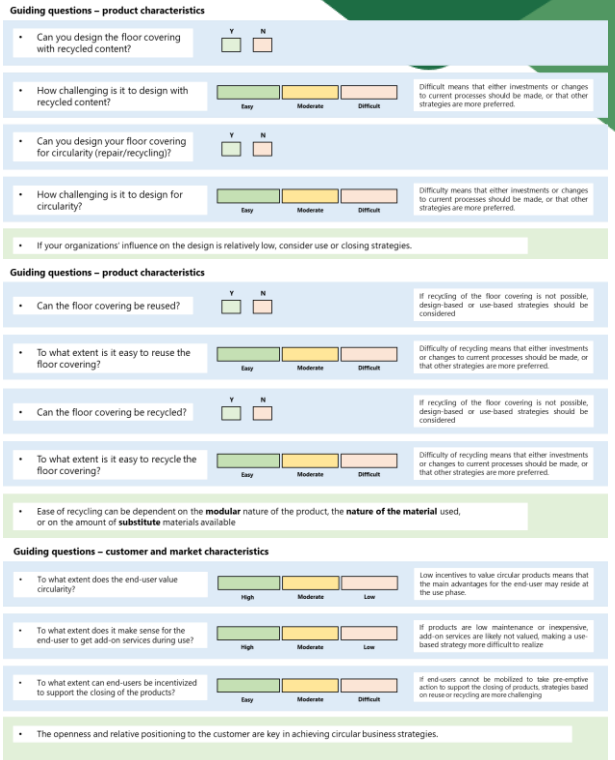
This tool offers a set of **guiding questions** that organizations may use to explore what circular business model strategies can be employed to foster circular business practices.

The tool is **qualitative in nature.**

The questions address different aspects of the organization:

- the type of floor covering it offers
- the type of market and end-users it services
- the value chain it operates for and the relationships with partners

The questions help to assess the **attractiveness** of circular business model strategies given the characteristics of the organization and its context.



Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

Description: Evaluate drivers and challenges faced by your company and context to compare different circular strategies

Guiding questions – product characteristics

• Can you design the floor covering with recycled content?	Y ☐ N ☐	If designing the floor covering with recycled material is not possible, other design-based, use-based or closing-based strategies should be considered.
• How challenging is it to design with recycled content?	Easy / Moderate / Difficult	Difficult means that either investments or changes to current processes should be made, or that other strategies are more preferred.
• Can you design your floor covering for circularity (repair/recycling)?	Y ☐ N ☐	If designing the floor covering for repair and recyclability is not possible, other design-based, use-based or closing-based strategies should be considered.
• How challenging is it to design for circularity?	Easy / Moderate / Difficult	Difficulty means that either investments or changes to current processes should be made, or that other strategies are more preferred.

• If your organizations' influence on the design is relatively low, consider use or closing strategies.

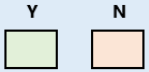
Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

Description: Evaluate drivers and challenges faced by your company and context to compare different circular strategies

Guiding questions – product characteristics

- Can you extend the lifetime of the floor?



If extending the lifetime of the floor covering is not possible, recycling-based strategies should be considered to preserve the value of the coverings

- To what extent is it easy to extend the floors' lifetime?

If it is difficult to extend the floor's lifetime, one should challenge whether it is still (financially) worthwhile to do so, and what the potential circular value of other strategies (design) recycling can yield

- Lifetime extension services can be valuable as they **avoid production or destruction**, but they are also difficult to orchestrate as they require **high interactivity** with the customers. One should always consider their respective value chain position and partners for this strategy.

Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

Description: Evaluate drivers and challenges faced by your company and context to compare different circular strategies

Guiding questions – product characteristics

• Can the floor covering be reused?	Y ☐ N ☐	If reusing of the floor covering is not possible, other closing-based design-based or use-based strategies should be considered.
• To what extent is it easy to reuse the floor covering?	Easy / Moderate / Difficult	Difficulty of recycling means that either investments or changes to current processes should be made, or that other strategies are more preferred.
• Can the floor covering be recycled?	Y ☐ N ☐	If recycling of the floor covering is not possible other closing-based, design-based or use-based strategies should be considered.
• To what extent is it easy to recycle the floor covering?	Easy / Moderate / Difficult	Difficulty of recycling means that either investments or changes to current processes should be made, or that other strategies are more preferred.

- Ease of recycling can be dependent on the **modular** nature of the product, the **nature of the material** used, or on the amount of **substitute** materials available

Exploration of Circular Business Model Strategies

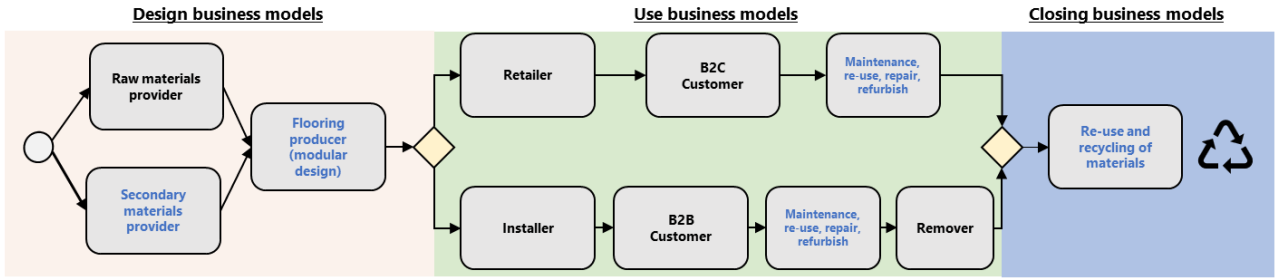
Tool: Self-assessment of circular challenges

Guiding questions – supply chain characteristics

- What is your role in the value chain?
- What other roles are included in your value chain?
- What is your current relationship to these roles?
- What and how many roles for design / use/ closing should be added for your current value chain?

Materials provider	Retailer	Collector	Service Provider
Flooring producer	Installer / Remover	Recycler	Logistics provider
Materials provider	Retailer	Collector	Service Provider
Flooring producer	Installer / Remover	Recycler	Logistics provider

Strong | Moderate | Weak / does not exist



- The greater the distance to the customer, the more difficult it is to directly influence the behaviour of the customer. This calls for **value chain collaboration and integration** to use other parties to mobilize customers and enable use or closing business models.
- If capabilities or relationships to partners are missing, this can complicate business model strategies. For example, in case no recyclers or collectors are part of the value chain, closing business models will be difficult to realize. Alternatively, lacking access to secondary materials will make business models on circularity by design challenging to implement.

Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

Description: Evaluate drivers and challenges faced by your company and context to compare different circular strategies

Guiding questions – customer and market characteristics

• To what extent does the end-user value circularity?		Low incentives to value circular products means that the main advantages for the end-user may reside at the use phase.
• To what extent does it make sense for the end-user to get add-on services during use?		If products are low maintenance or inexpensive, add-on services are likely not valued, making a use-based strategy more difficult to realize.
• To what extent can end-users be incentivized to support the closing of the products?		If end-users cannot be mobilized to take pre-emptive action to support the closing of products, strategies based on reuse or recycling are more challenging.

- The openness and relative positioning to the customer are key in achieving circular business strategies.

Exploration of Circular Business Model Strategies

Tool: Self-assessment of circular challenges

Description: Evaluate drivers and challenges faced by your company and context to compare different circular strategies

Guiding questions – supply chain characteristics

• To what extent does value chain collaboration and coordination exist for your flooring supply chain (design – use – closing)?	High / Moderate / Low	Without value chain collaboration, an organization needs to possess all capabilities itself to conduct design, use or closing-based strategies.
• To what extent does your organization possess the capabilities to influence the design of the floor covering?	High / Moderate / Low	Lack of capabilities to influence the design means that design-based strategy may be inviable, or value chain coordination is needed to access capabilities.
• To what extent does your organization possess the capabilities to influence the use of the flooring?	High / Moderate / Low	Lack of capabilities to influence the use means that use-based strategy may be inviable, or value chain coordination is needed to access capabilities.
• To what extent does your organization possess the capabilities to influence the closing of the flooring?	High / Moderate / Low	Lack of capabilities to influence the closing means that closing-based strategy may be inviable, or value chain coordination is needed to access capabilities.

- Positioning of your organization vis-à-vis the partners in the value chain influences the likelihood a design, use or closing strategy can be executed. For example, lacking service providers as part of the use phase severely limits circular options that can be taken (repair, maintenance).

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Circular Business Modelling

Tool 2: Future Value Chain Development

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Future value chain development

Tool: Value chain modelling to understand roles

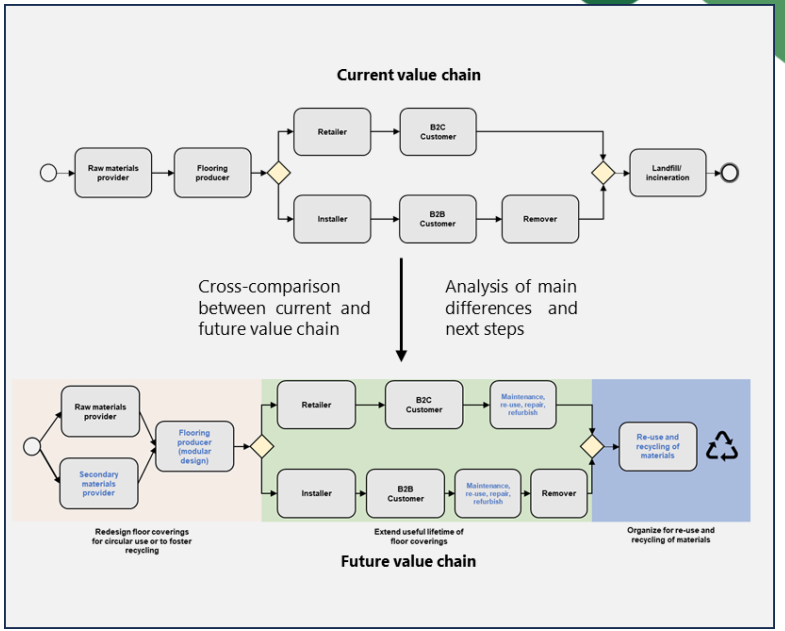
This tool enables users to explicate and assess the impact of working towards circular business models, by modelling how the value chain is expected to change.

The tool helps users to model the **current** as well as **future** value chain to enable a circular business model strategy, including roles and responsibilities.

The tool is **qualitative in nature.**

Comparing between the current and future value chain, it

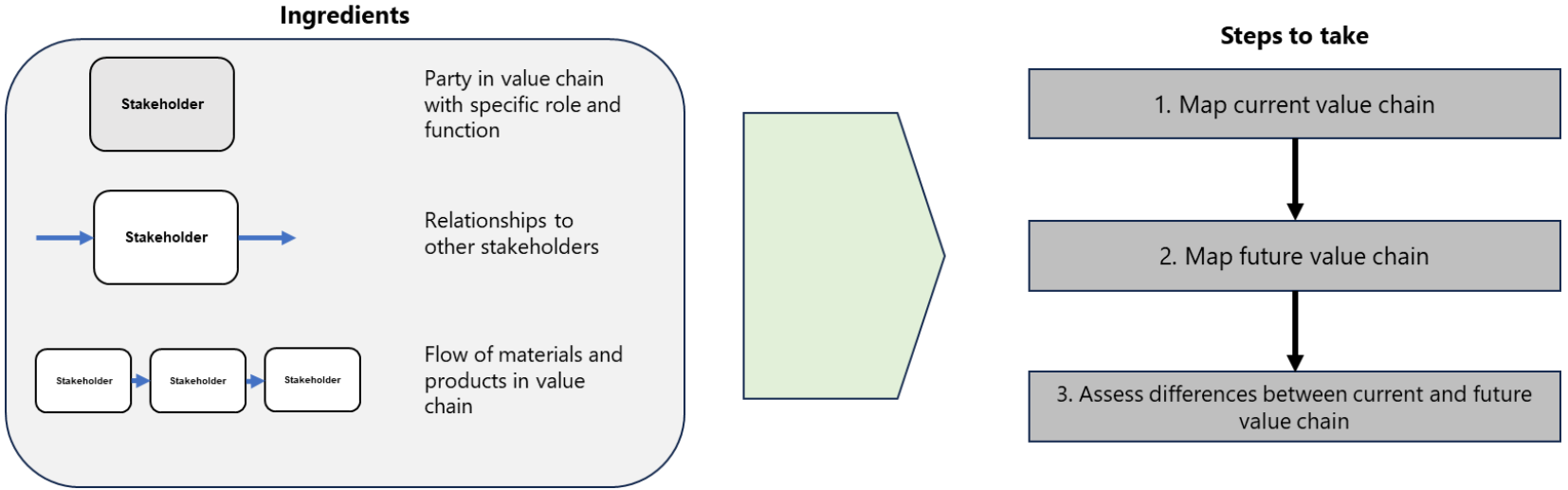
- sheds light on the **amount and scale of changes** needed to enable future value chains.
- helps to identify what **new collaborations should be formed** which currently do not exist**.**
- makes explicit what **timing** and **alignment** is needed between stakeholders to enable circular strategies.



Future value chain development

Tool: Value chain modelling to understand roles

Description: Map the **current** and **future** value chain to identify the implications of working towards a circular strategy



Future value chain development

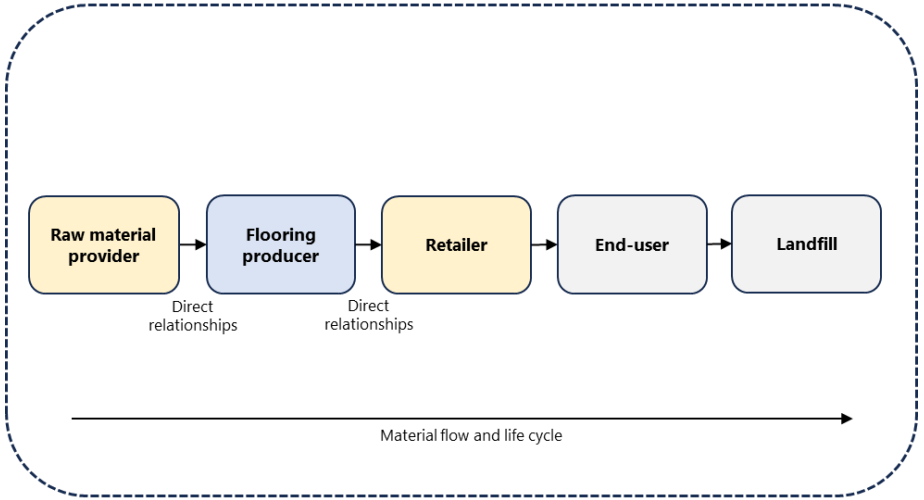
Tool: Value chain modelling to understand roles

Objective: identify the current players in your value chain, starting from direct relationships to your partners. Subsequently, complete the material flow and life cycle, adding additional players active in your value chain.

Steps to take

1. Map current value chain
2. Map future value chain
3. Assess differences between current and future value chain

Example – current value chain



Assumptions: flooring producer does not have a link to end-users, and end-users discard their floor coverings post-use (to landfill).

Future value chain development

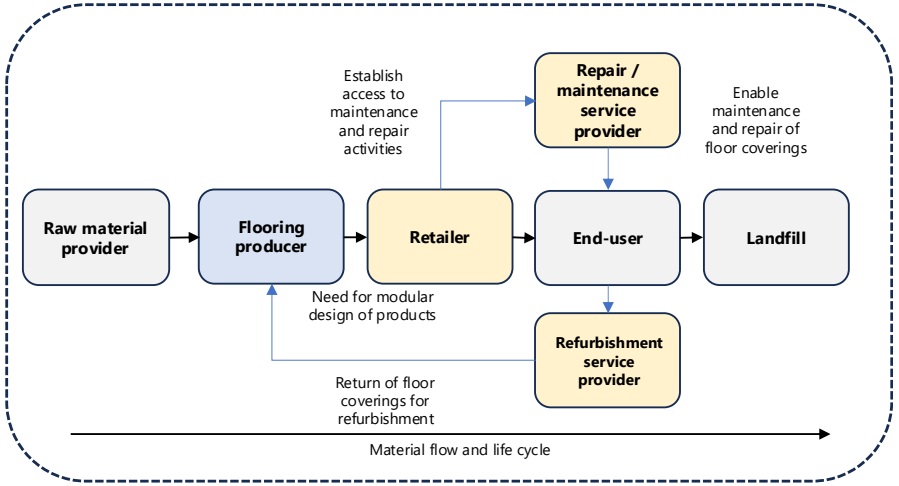
Tool: Value chain modelling to understand roles

Objective: add new roles needed to enable circular business model strategies, and make explicit why these roles are needed and to what extent these collaborations already exist (to a lesser degree) or can be established.

Steps to take

1. Map current value chain
2. Map future value chain
3. Assess differences between current and future value chain

Example – future value chain



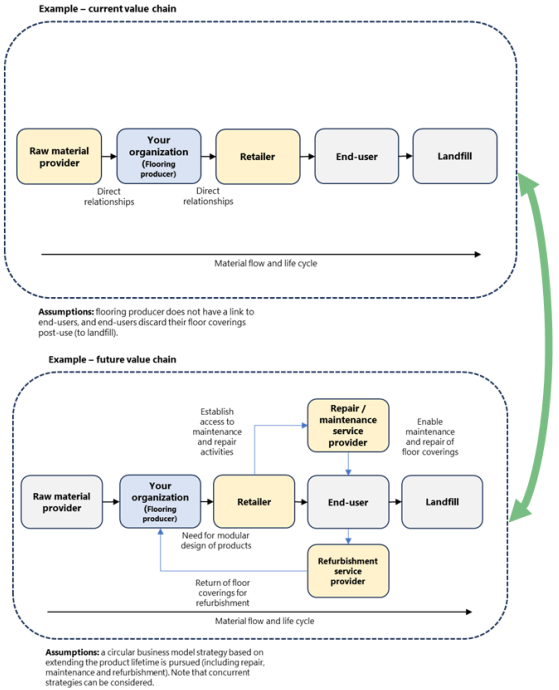
Assumptions: a circular business model strategy based on extending the product lifetime is pursued (including repair, maintenance and refurbishment). Note that concurrent strategies can be considered.

Future value chain development

Tool: Value chain modelling to understand roles

Steps to take

1. Map current value chain
2. Map future value chain
3. Assess differences between current and future value chain

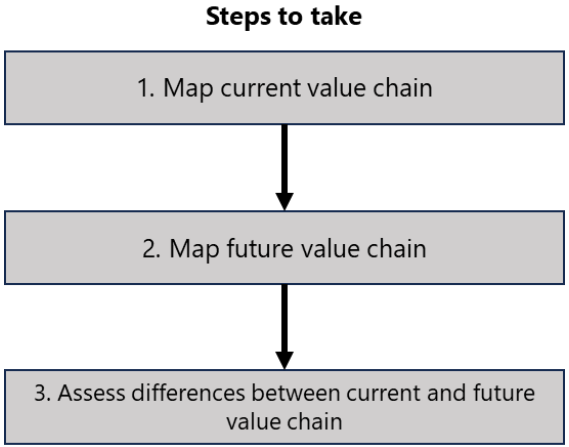


Cross-comparison based on the following criteria:

- What new structures are required? Retailer should provide repair, maintenance and refurbishment services.
- What new collaborations are needed? The retailer can either do repair, maintenance and refurbishment *themselves* or establish *new collaborations* with dedicated service providers. Note that expenses (logistic, collection) are needed to enable this.
- What alignment between partners is needed? End-user can varyingly indicate a need for repair. On-site repair can be directly handled, but refurbishment calls for capacity at the flooring company or retailers to handle this.

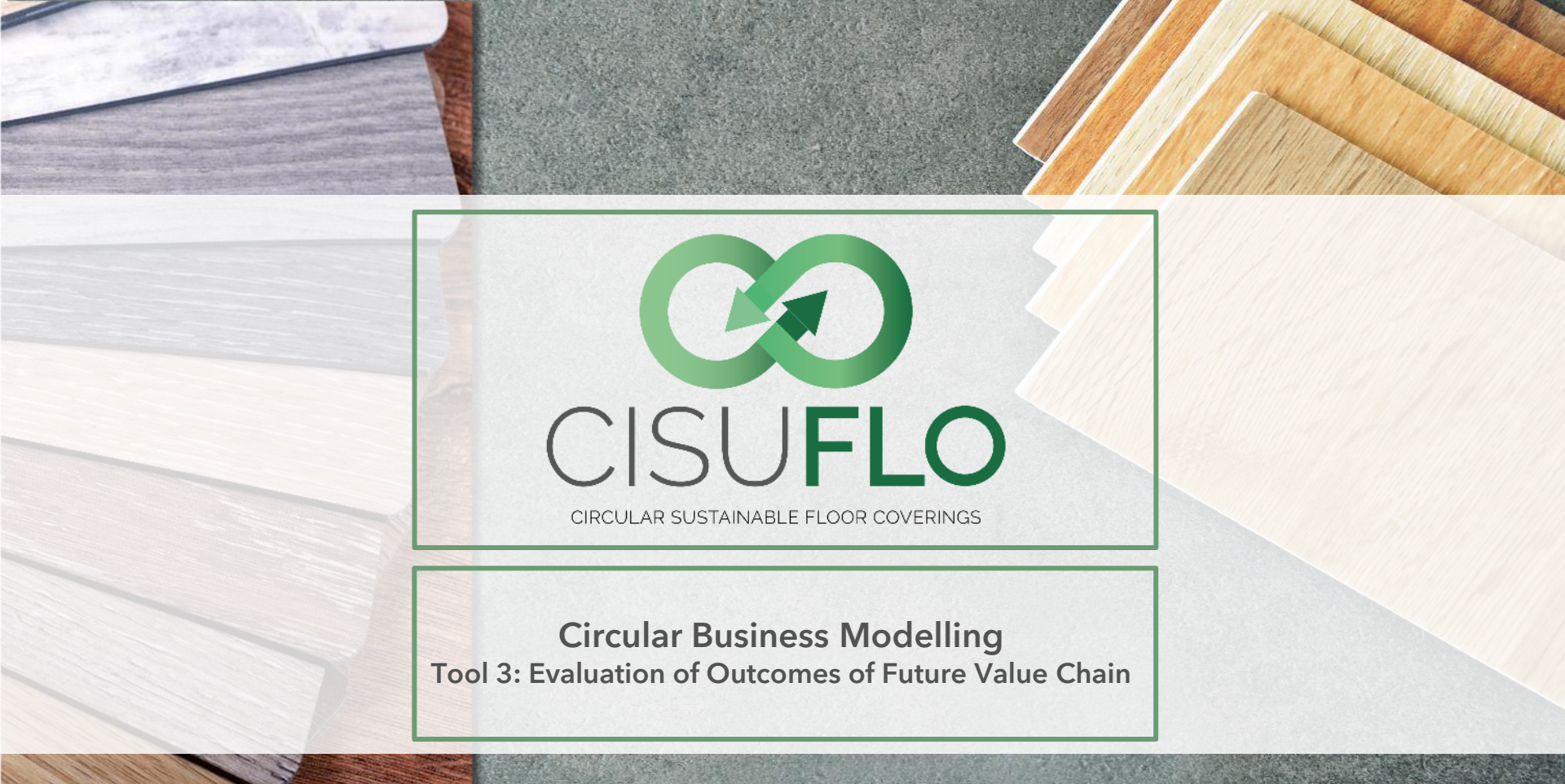
Future value chain development

Tool: Value chain modelling to understand roles



Conclusions on value chain modelling

- Users should evaluate how impactful, but also how feasible the changes identified through the comparison are. This can offer explicit guidance on whether a circular strategy makes sense to pursue (e.g. many changes are needed to the current value chain, or changes require extensive investments to be facilitated).
- Different combinations of circular strategies can be compared. For example, users may assess a combination of design and closing based strategies versus a portfolio of use and closing based strategies. This way, comprehensive strategies (as well as their individual differences, strengths and weaknesses) can be compared, as well as explore the synergies between strategies.
- The value chain assessment can be complemented through quantified information, to help shed light on the impact and investments needed to further substantiate claims made regarding the feasibility of certain strategies.



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Tool 3: Evaluation of Outcomes of Future Value Chain

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Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

This tool helps organisations in value chains, working towards new circular business models, to identify where potential costs and benefits will be generated. By understanding which stakeholders bear the costs, or which stakeholders can potentially capture additional benefits, we can work towards agreements between stakeholders to shift costs and benefits were applicable.

The tool is **qualitative** in nature, although **quantitative information** can be used to support the analysis.

	Raw material providers	Secondary raw material providers	Floor manufacturers	Retailers	Installers	Customers B2B	Customers B2C	Service providers	Collection	Logistics	Recyclers
Co-created circular value in the value chain	**Circular value chain for floor coverings**										
Circular strategy Design-Use-Closing	Design-Use -Closing	Design-Use -Closing	Design-Use - Closing	Use	Use-Closing	Use-Closing	Use-Closing	Use-Closing	Use-Closing	Design-Use -Closing	Closing-Design
Risks 											
Costs 											
Benefits 											

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

Description: In the table below, you can fill in the associated risks, costs, and benefits for every relevant actor in your future circular business model. Depending on what strategy is selected, certain actors may potentially not appear. The resulting risks, costs and benefits mapped provide insights on how 'viable' or 'feasible' a business model will be for this actor.

How to: Indicate the new circular strategy for each stakeholder and link the corresponding risks, costs, and benefits. This will provide an overview of where opportunities or barriers for the new co-value exist from a value chain perspective. It provides a clear overview of potential obstacles and opportunities, guiding strategic decisions for fostering collaboration.

	Raw material providers	Secondary raw material providers	Floor manufacturers	Retailers	Installers	Customers B2B	Customers B2C	Service providers	Collection	Logistics	Recyclers
Co-created circular value in the value chain	**Circular value chain for floor coverings**										
Circular strategy Design-Use-Closing	Design-Use -Closing	Design-Use -Closing	Design-Use - Closing	Use	Use-Closing	Use-Closing	Use-Closing	Use-Closing	Use-Closing	Design-Use -Closing	Closing-Design
Risks ☐ Similar ☐ High											
Costs ☐ Similar ☐ High											
Benefits ☐ Similar ☐ High											

In the appendix a more detailed overview of relevant risks, costs and benefits to include for this evaluation is provided.

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

An example of implementing a collaborative business model for extended lifetime and re-use.

Step 1 is to identify the relevant actors for this collaborative business model. The output from the previous exercise on the future value chain can be used for this. In this example the involved actors are marked green.

	Raw material providers	Secondary raw material providers	Floor manufact.	Retailers	Installers	Customers B2B	Customers B2C	Service providers	Collection	Logistics	Recyclers
Co-created circular value in the value chain	Recycled floor coverings										
Circular strategy Use-Design-Closing	Reduce	Recycle	Redesign	-	-	-	-	-	-	-	Recycling
Risks Low Similar High											
Costs Low Similar High											
Benefits Low Similar High											

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

An example of implementing a collaborative business model for extended lifetime and re-use.

Step 2 is to identify for each organization whether the new collaborative business model creates lower, similar, or higher risks for the involved partners. If you find it challenging to assess this; you can find more inspiration by looking at the table in the appendix.

	Raw material providers	Floor manufact.	Retailers	Installers	Customers B2B	Service providers	Collection	Logistics
Co-created circular value in the value chain	Recycled floor coverings							
Circular strategy Use-Design-Closing	Reduce	Redesign	-	-	-	-	-	-
Risks ☐ Low ☐ Similar ☐ High								
Costs ☐ Low ☐ Similar ☐ High								
Benefits ☐ Low ☐ Similar ☐ High								

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

An example of implementing a collaborative business model for extended lifetime and re-use.

Step 3 is to identify for each organization whether the new collaborative business model creates lower, similar, or higher costs for the involved partners. If you find it challenging to assess this; you can find more inspiration by looking at the table in the appendix.

	Raw material providers	Floor manufact.	Retailers	Installers	Customers B2B	Service providers	Collection	Logistics
Co-created circular value in the value chain	Recycled floor coverings							
Circular strategy Use-Design-Closing	Reduce	Redesign	-	-	-	-	-	-
Risks Low Similar High								
Costs Low Similar High								
Benefits Low Similar High								

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

An example of implementing a collaborative business model for extended lifetime and re-use.

Step 4 is to identify for each organization whether the new collaborative business model creates lower, similar, or higher benefits for the involved partners. If you find it challenging to assess this; you can find more inspiration by looking at the table in the appendix.

	Raw material providers	Floor manufact.	Retailers	Installers	Customers B2B	Service providers	Collection	Logistics
Co-created circular value in the value chain	Recycled floor coverings							
Circular strategy Use-Design-Closing	Reduce	Redesign	-	-	-	-	-	-
Risks Low Similar High								
Costs Low Similar High								
Benefits Low Similar High								

Evaluation of Outcomes of Future Value Chain

Tool: multi-actor evaluation method

An example of implementing a collaborative business model for extended lifetime and re-use.

The tool shows which organizations may be reluctant to participate in the co-created circular value and highlights those for whom participation is particularly attractive. Additionally, it helps to understand which organizations face the highest risks and costs, and whether this is compensated by higher benefits.

This example demonstrates the type of information that can be extracted using this evaluation tool. The organization most negatively affected is the raw material provider. However, this organization remains essential for part of the material supply, so it is important to account for this. For the recycler and secondary material provider, this co-created circular value is the most lucrative. Some actors find the new value to have minimal implications. Additionally, further research might be needed for some organizations to determine if the benefits are substantial enough to outweigh the costs and risks.

	Raw material providers	Floor manufact.	Retailers	Installers	Customers B2B	Service providers	Collection	Logistics
Co-created circular value in the value chain	Recycled floor coverings							
Circular strategy Use-Design-Closing	Reduce	Redesign	-	-	-	-	-	-
Risks Low Similar High								
Costs Low Similar High								
Benefits Low Similar High								

Take aways

The tools presented in this handbook help users navigate the process of identifying, selecting and concretizing circular business model strategies.

The tools offer different levels of detail on the viability and feasibility of circular business model strategies.

- The **set of guiding questions** are a quick, robust tool to assess what circular business model strategies may be relevant for your business.

- The **value chain modelling tool** helps users to understand the implications of a circular business model strategy for their value chain. This explicates the changes needed to enable a circular business model strategy as well as the required investments needed. It also enables users to cross-compare different (combinations of) strategies.

- The **multi-actor evaluation method** offers users a detailed, quantified perspective on the costs and benefits associated to the implementation of circular business model strategies. It delineates for what stakeholders additional costs and benefits are incurred, and therefore which shoulders bear the most 'risk'. This can support users deciding how costs can potentially be reallocated.

Working towards circular business practices is an iterative process: it is therefore advocated and expected that the tools are reused or revisited as uncertainties are removed, different stakeholders are identified, or new business model challenges occur. The practical nature of the tools means that users can quickly consider different alternatives or generate new insights.

Appendix – type of risks to consider

Step 2: Determine risks

As many type of risks can emerge from venturing into new circular business models, it can sometimes be complex to determine whether the risks increase, decrease or remain the same. The sheet below offers a more detailed overview of the some of the most common risks associated to new circular business models. Per risk, one can evaluate whether these are relevant and how they change resulting from pursuing a circular business model strategy.

Once all risks have been mapped, one can then aggregate the risks together to determine a 'total' risk, which can be used for the multi-actor evaluation method. Note that any quantified information can help to support this analysis further.

	Raw material providers	Secondary raw material providers	Floor manufacturers	Retailers	Installers	Customers B2B/B2C/B2G	Service providers	Collection	Logistics	Recyclers
Policies (Global, EU, country specific)										
Permits										
Regulatory										
Supply/demand synchronisation										
Value chain										
Social/safety										
Price/costs										
Investment decision										
Total risks										
Risks ☐ Low ☐ Similar ☐ High										

Appendix – type of costs to consider

Step 3: Determine costs

Analogously to step 2, a list of potential costs to consider is indicated in the table below. Again, this can help to determine whether the costs have increased, decreased, or remained the same for a specific actor.

	Raw material providers	Secondary raw material providers	Floor manufacturers	Retailers	Installers	Customers B2B/B2C/B2G	Service providers	Collection	Logistics	Recyclers
Social costs										
Safety										
Labor										
Security										
Health										
Environmental costs										
Toxicity										
Pollution										
Economic costs										
Logistic costs										
Material costs										
Operational costs										
R&D costs										
Equipment costs										
Total costs										
Costs Low Similar High										

Appendix – type of benefits to consider

Step 4: Determine benefits

Analogously to step 3, a list of potential benefits to consider is indicated in the table below. Again, this can help to determine whether the benefits have increased, decreased, or remained the same for a specific actor.

	Raw material providers	Secondary raw material providers	Floor manufacturers	Retailers	Installers	Customers B2B/B2C/B2G	Service providers	Collection	Logistics	Recyclers
Social benefits										
Job creation										
Affordable access of floor coverings for clients										
Environmental benefits										
Reduced emissions										
Reduced needs for virgin materials										
Reduced waste generation										
Economic benefits										
More continuous revenue streams										
Customer satisfaction										
Market reach										
Brand strength										
Total benefits										
Benefits: Low / Similar / High										

References and further reading

Previous work used to inspire value chain analysis approach for circular flooring industry

- Individual and system uncertainties in hydrogen value chain developments. Hajonides et al. (2023).
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- Value chain analysis as the engine for industrial transformation: An analysis of the raw materials transition. Oukes et al. (2024). White paper TNO.
  Available at: Ketenaanpak als motor voor industriële transformatie: Een analyse van de grondstoffentransitie

- Value network analysis and value conversion of tangible and intangible assets. Allee (2008). Journal of Intellectual Capital.
  Available at: Value network analysis and value conversion of tangible and intangible assets | Emerald Insight

Further reading

- D5.1. White paper: strategy for implementing industry-wide collection schemes for the flooring industry. Gardner & Finetti (2023). H2020 CISUFLO.
  Available at: https://www.cisuflo.eu/download/d5-1-white-paper-strategy-for-implementing-industry-wide-collection-schemes-for-the-flooring-industry/

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CIRCULAR SUSTAINABLE FLOOR COVERINGS

Circular Business Modelling

Handbook for Practitioners

Contact: Tamara.oukes@tno.nl
rick.gilsing@tno.nl

CISUFLO project has received funding from the European Union's *Horizon 2020* Research and Innovation Programme under Grant Agreement No 101003893