

Circular Value Creation Pilot Initiative Co-creative Feedback Workshop #businessmodels Documentation

14. April 2025



National Research Council Canada

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Introduction

The Canadian-German EUREKA Co-Chair aims to utilize the opportunities offered by the network to solve a wide range of transformative tasks. During the year of the Canadian-German EUREKA Chairmanship, one focus is on "circular value creation" (CVC). A series of Design Thinking Workshops were held to make use of the broad experience and expertise of the EUREKA network.

These last workshops contributed to identify research needs regarding

#focusonpeople
#systemic
#datatechnologies #dataecosystems
#cirulartechnologies
#businessmodels

Each workshop took up on one of these different aspects of the vision and was discussed and further developed by a group of "subject matter experts".

The following workshop documentation summarizes the results for **#businessmodels**.

Workshop set up

#businessmodels

Location:FairmontTheQueenElizabeth,MontréalDate:14.04.2025

Objective: Challenge & complement the outcomes of the previous workshops from a business model perspective by industry experienced experts

Process: 2 Step process with a focus on

- **1. Evaluation** of results from previous workshops to identify and add research needs, questions and innovation areas that are still missing.
- 2. Deep Dive: Focused discussion on two priority topics (fictitious personas/SMEs) to identify and enrich their needs and brainstorm ideas and solutions on how to unlock and scale their business models.



Step 1: Evaluation Method: Recap

Why

The final call of EUREKA is for research, development and innovation (R&D&I) projects, leading to marketable products, services and processes, which enable the development of circular value creation (CVC) systems. In this final workshop on #businessmodels, we aimed to challenge and complement the existing research questions and innovation areas with insights from industry experienced experts.

How

- Individual reflection of previous outcomes
- Sharing of insights with team

Outcomes

• List with additional insights (research questions, recommendations, innovation areas etc.) for each of the Vision Clusters (Posters)



Step 1: Evaluation Outcomes (see details on next slides)



Step 1: Evaluation Outcomes #focusonpeople

List with additional insights from the experts:

Recommendations

- Define "people": Users, supply chain, partners, B2B, B2C
- Focus on working world potentially overlooks innovation comingfrom DIY entrepreneurs. How can we include?

(Research) questions

- What supports does management or companies and their management need to **incentivize employees** to adopt a circularity mindset?
- What is the **role of academia and vocational schools** to support on-the-job learning?
- **Role of Unions:** What are the roles of unions in empowering workforce to experiment in circular approaches?
- How to motivate people through **positive reinforcement** (i.e. getting paid to recycle etc.)?
- What should be the place of circulatory in high school education programs?
- How would **finance-related indicators** support and foster a circularity culture? (CFO caring about circularity, in-house expertise ...)
- How can people help improve data accuracy (circular data accuracy)?
- How are CEOs bring green procurement into their companies?

Research Questions

#focusonpeople

- How can people in the working world be encouraged to experiment with circular approaches? How can transdisciplinary exchange in/among organisations be supported?
- How can people working in circular value creation processes be supported to shape those processes?
- How can new (transdisciplinary) skills and knowledge regarding circular value creation be acquired, e.g. focusing on circular economy principles, remanufacturing skills, sustainability practices, data competence and transfer competence? Which elements can be addressed onthe-job?
- How can AI-based decision support for complex remanufacturing tasks be integrated?
- How can new learning formats be explored and how can these be developed or adapted?









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Step 1: Evaluation Outcomes #systemic

List with additional insights from the experts:

Recommendations

- Need an ecosystem for companies to innovate w/ CVC, such as incentivization or funding for audits
- In software & research, bug bounties play an important contribution is there an equivalent approach for circularity?

(Research) questions

- How do legislative vs. voluntary approaches to circular economies work together?
 → Consider global contexts
- How does better circular value creation affect national and regional policies and strategies e.g. from resilience and critical raw material (*perspective*?)
- How does your project define & address CVC
 - use cycle instead of life cycle
 - knowledge of product composition
 - design for circularity
- How do we identify what element in the CVC has the biggest value/impact?
- What reporting tools or indicators would best reflect an holistic circular initiation for a given organisation?
- How can regulations support value creation in circular solutions? (*State or central*?) vs. pollution and safety)

Research Questions

#systemic

- How can efficiency in circular approaches be increased?
- · How does your project support to extend circular approaches across national borders?
- How can transparency be increased for every stakeholder throughout the whole life cycle of the product?
- How can new value chains and products can be established?
- How does your project support to extend value creation networks across different (industry) sectors?







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Step 1: Evaluation Outcomes #datatechnologies #dataecosystems

List with additional insights from the experts:

Recommendations

- ISO 59040 & PCDS
- Global marketplaces for circular tech + competitive sourcing of new materials
- Digital Product Passport \rightarrow collaboration environment for SMEs to leverage knowledge reuse

(Research) questions

- How can large companies secure decentralised data spaces accept OR interoperate with cloud-based centralized SME solutions?
- Can blockchain solutions offer the right tools for traceability? How can this technology be deployed in SME?
- What are the best approaches to (...) data? Does the human have an important role to play in supply chain data?
- What are the incentives for being open when you are capturing value? Can we imagine royalties on people using + publishing?
- How to use applied AI in CVC in targeted manner in various industry domains?
- Can data be scrubbed to remove sensitive IP to enable boundaryless sharing and collaboration?

Research Questions

#datatechnologies #dataecosystems

- · How does data support collaborative, trust-based working in the value chain? How is data shared, which platforms exist and how can they be connected and used?
- What technologies do companies/SMEs need ... for data acquisition
- ... to measure the benefits, costs and risks of their circular value creation e.g. to fully utilise the value of existing CVC-related data?
- · How How can Al-driven recognition systems, e.g. image recognition, contribute to the evaluation of materials and products/components and help decide which R-strategy is best to use?
- · How How to provide up-to-date information on international/country-specific CVC-related regulations to provide SMEs with reliable information on circular economy requirements for their markets?
- Digital Product Passport: How can SMEs be supported in designing the Digital Product Passport? How can cost-efficient standardised solutions be developed that can be adapted to the specific product/industry requirements?
- · What does a standardized data ecosystem look like that internationally networked companies want to use?





Federal Ministry of Education and Research









Step 1: Evaluation Outcomes #circulartechnologies

List with additional insights from the experts:

Recommendations

- Marked in text (remanufactured products, reproduction of products) \rightarrow both terms narrow the solution scope and should rather stress trans-sectoral approaches*
- Need public/private collaboration to get new materials certified easier

(Research) questions

- Circular technologies are not always the cheapest solutions. \rightarrow How should finance industry adapt to provide support for SMEs?
- How can we promote technical innovation (investment) in circular technologies? Academia

- Industry

- How do we increase the level of adoption for digital technologies required
- How to (use?) traceability system (...?) a circular technology itself for support of R-strategies – i.e. to add important data (...)

Research Questions

#circulartechnologies

- How should support systems for product designers be designed to deal with difficult. conflicting and circular design requirements?
- What systems are needed to make remanufactured products comparable and how can the viability of reused, remanufactured and recycled components be assessed? What role could simulation/virtual validation, flexible, configurable end-of-line tests play for remanufactured products?
- Which technologies are needed for enhanced product maintenance and repairability?
- · What systems are needed for Reverse Manufacturing (e.g. adaptive automation for high variance, sorting,...) and what does the network design of reverse supply chains look like (e.g. sophisticated logistics systems)?
- · How can the implementation of r-strategies make the reproduction of products truly scalable and price competitive?
- · Which Industry 4.0 technologies are needed (IoT, big data analytics) for monitoring and managing circular value chains?



*interpretation from the coach based on vocal explanation of expert

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Step 1: Evaluation Outcomes #businessmodels

List with additional insights from the experts:

Recommendations

- Describe the innovative aspect of your business model to support circularity
- Describe the reach of your business model into the supply chain across borders
- Describe the collaborative aspects of your business model
- To better identify gaps, there could be classification of topics...
- IP Blockchain \rightarrow Zero knowledge proof
- Quantified environmental benefits?

(Research) questions

- How does your project (...?) redefining to planned obsolescence?
- How would the project benefit from/contribute to a cluster consisting in related activities in your value chain
- What other activities or organizations would best complement your own project?
- How to incent investors to fund <u>collaborative</u> business models?
- How can governments support trans-sectoral clusters

 private sector + regional (physical) + trade partners (virtual)
- How does your new CE improve upon the existing linear model?
- How to create collaborative business models without friction? What are the platform patterns for new circular business models?
- Are there areas or topics in your project you would seek a collaboration ("the unsolvable problem")
- How does the system both reduce costs and increase sustainability?
- How does the project support collaboration of different SMEs in circular value creation?

Research Questions

#businessmodels

- How does your project support to facilitate the transformation to a circular economy by innovative business models?
- How does your project increase the economic benefit of circular products for your company?
- How does your project support the design of product-service systems that extend product life cycles through maintenance and upgrading services?
- How does your project support to identify bottlenecks and optimize workflows in circular production systems?
- How does your project foster the early integration of SME in the data ecosystem to allow for the development of new (joint) business models?
- How does your project contribute to the development of incentives and business models for data sharing (e.g. data monetization, platform economy, governance)?
- At what stages of the circular value creation system lifecycle do business models have the most impact?







Step 2: Deep Dive Methods: Fictitious personas + Brainstorming

Why

In order to gain an in-depth understanding on two priority topics - that were discussed in the previous workshops - the experts were asked to "tune" into two fictitious personas - to enrich (research) needs with hands-on industry experience and brainstorm solution to develop and scale business models for circular value creation.

How

- Part 1: Embody & roleplay needs
- Part 2: Brainstorm solutions

Outcomes

• Specific research needs and ideas for solutions for 2x priority topics



Step 2: Deep Dive Outcomes | John (details next slide)



John Doe (30), financial manager of a manufacturing company

NEEDS economic incentives for decentralized product-related data sharing for value creation

IN ORDER TO maximise value from their circular business models (remanufacturing, product-as-a-service etc.) across borders and industries



Step 2: Deep Dive



John Doe (30), financial manager of a manufacturing company

NEEDS economic incentives for decentralized product-related data sharing for value creation

IN ORDER TO maximise value from their circular business models (remanufacturing, product-as-a-service etc.) across borders and industries

NEEDS & CHALLENGES

Expected Benefits

- cheaper materials
- robust supply chains
- new markets
- sharing best practices

Potential barriers for implementation

- Time + Change management
- Data Gaps
- Lack of standar
- Lack of competence & willingness to share data
- poor product design \rightarrow high repair

Other needs, if company is implementing

- Defined targets
- Reporting frequency
- design for disassembly

IDEAS FOR SOLUTIONS

What are top 1-3 potential circular business models - the company could develop, pilot and scale to create and monetize circular value?

- PaaS Product design product content asset on balance sheet
- Design for Modularity help the product be upgrade easier
- 3-sided business model: used product owned // Repair // Remanufactured

What are top 3 (key) enablers to transfer research needs/innovation areas for these business models into practical implementation?

- Consumer aaceptance willingness to buy <-> company provides guarantee for functionality
- Trustworthy data \rightarrow quality // \rightarrow certification/guarantee
- Circular Design Process
- Financing \$\$\$

What could be 1-3 concrete research questions to unlock this potential with a EUREKA call?

- What are the better suited markets? \rightarrow What materials are relevant?
- Define + Describe your business model \rightarrow SWOT // \rightarrow Metrics // \rightarrow Market Context

Step 2: Deep Dive Outcomes | Maria (details next slide)



Maria (38), CEO of a disassembly specialist

NEEDS products, components, materials with defined digital data inputs

IN ORDER TO disassemble products into components, parts, materials for reuse and to make her business model profitable.



Step 2: Deep Dive Outcomes | Maria



Maria (38), CEO of a disassembly specialist

NEEDS products, components, materials with defined digital data inputs

IN ORDER TO disassemble products into components, parts, materials for reuse and to make her business model profitable.

NEEDS & CHALLENGES

Expected Benefits

- Knowing about what I want to disassemble \rightarrow information needed
- **Out;** Higher Material Valu Output // **In:** Revenues from companies who want to "get rid of" stuff
- Design efficient and effective processes \rightarrow feedback loop toward design

Potential barriers for implementation / (research) questions

- Legacy products \rightarrow how do i get data from those?
- How do I get physical products from whom/where \rightarrow sufficient input flow
- something comes with data, something comes without
- How does my network (need to) change?
- certifications + permits

Other needs, if company is implementing

- Use AI or other for pricing market guidance
- multiple systems to handle multiple product
- area of disassembly (building // electronics // textiles)
- $\bullet \qquad \text{contacts of potential users (customers)} \rightarrow \text{sales platform}$
- new machinery / processes for disassembly \rightarrow FINANCE

IDEAS FOR SOLUTIONS

What are top 1-3 potential circular business models - the company could develop, pilot and scale to create and monetize circular value?

- Consulting on material substitution
- Disassembly as a service
- design for disassembly consultant to help inform material supervision

What are top 3 (key) enablers to transfer research needs/innovation areas for these business models into practical implementation?

- Data on material compositions
- large scale collection program (regional)
- cluster on circular supply chains / trans-sectoral (regional)

What could be 1-3 concrete research questions to unlock this potential with a EUREKA call?

- How is this process more effective?
- How to scale up a business model to become profitable?
- How can we collectively optimize the usage of our natural resources for a given application?

Contact CVC Core Team



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