



## First session of the international/regional one-day technical seminar

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## Executive Summary

*CINDERELA is developing and testing the CINDERELA One-Stop Shop (CinderOSS), an interactive providing access to all aspects of the value chain of SRM-based construction products. CinderOSS aims to become a complete digital business environment structured in three main parts: (i) the CinderOSS database; (ii) the CinderOSS Digital Business Ecosystem (CinderDBE); and (iii) the CinderOSS Community.*

*The CinderOSS database accumulates information on all the research and demonstration actions that are performed within CINDERELA. Furthermore, the goal is to complement this information with the existing knowledge and experience of best practices throughout Europe, from effective circular policies and insightful material flow maps to successful circular business models and applicable product databases. Finally, the CinderOSS database is combined with an interactive digital business ecosystem that offers digital services that have already been developed and tested, such as the marketplace and the business finder, and the digital services that we are integrating into the platform, such as the CINDERELA BIM library. Released in June 2020, the CinderOSS beta version was presented to and tested with the international stakeholders for the first time on 14 July 2020 during the “Initial Workshop for Stakeholders Involved in Testing of CinderOSS Business Digital Environment”.*

*Co-creation and co-design have become vital business model factors, and, throughout the co-design process in CINDERELA, we are continuing to build a viable and productive history of good practice by involving end-users in CinderOSS design processes as well as understanding their relevance to the entire CINDERELA project. For the development of CinderCEBM and CinderOSS, CINDERELA uses a three-step process involving an agile approach typically used for development of software solutions, aiming to build feedback loops with stakeholders on the customer readiness of its tools as well as to create a network for their exploitation and dissemination. More specifically, the idea is to build an adaptive approach to the development of the CINDERELA tools involving local/regional communities of stakeholders, including all the actors from the value chain with whom the co-creation and co-design of the tools can be initiated, and to continue working with them throughout the development process.*

*This three-step collaborative approach involves the organization of three series of international or regional technical seminars in different countries that demonstrate different levels of innovation as environments for the co-creation, co-design, and testing of the digital solutions developed in the project by real operators and end-users and from the perspective of the continuous integration and development of CinderOSS. Since each series of international/regional technical seminars corresponds to the verification of a subsequent CRL level of the offered tools, the launch of the technical seminars represents an important milestone as it allows the identification of the next step<sup>1</sup> of technological development of CinderOSS.*

*The purpose of this document is to summarize the first session of the one-day technical seminars organized in Italy, Spain, the Netherlands, and Slovenia between November 2020 and January 2021 by CINDERELA's partners. The main objectives of the first session of the regional/international technical workshops were:*

- to launch the CinderOSS co-design process with local stakeholder communities from four countries (NL, SO, ES, and IT) to improve the digital services developed so far, making them increasingly able to meet the needs of users, and to identify any new services to be developed;*
- to collect feedback on the current CinderOSS services in relation to standard practices and companies' information/support needs when developing business models, for example based on the business canvas approach; furthermore, to confirm the usefulness of CinderOSS as a tool to support business-model development and to advance its development to match users' needs and expectations;*

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<sup>1</sup> The first CinderOSS technical development step was the one that led to the realization of the CinderOSS beta version (D4.2).

- to validate the identified needs and detect new needs of potential users (of both online and offline services) as a step towards checking its added value, system integration potential, and market demand;
- to identify further useful elements for defining the business model of CinderOSS's online and offline services (services beyond the digital platform);
- to reach CRL4, that is, the refinement and verification of the product hypothesis through additional market/product analysis, including engagement with potential customers/users.

The document also exemplifies the objectives achieved thanks to the technical seminars: (i) the launch of the process of involving local communities in the process of continuous development of CinderOSS; (ii) the collection of feedback useful for defining the future steps of optimization and development of CinderOSS at both frontend and backend level; and (iii) the validation of CRL4.

The validation of CRL4 particularly allows us to proceed with the second technical development sprint of CinderOSS.

The first section of this document shows how the seminars, organized under the title “Digital Services for the Circular Economy in the Construction Sector”, were held and managed. The second section delves deeper into how the feedback collected during the co-design activities of the seminars was analysed to verify the achievement of CRL4 and transformed into input for software development in a continuous process of analysis and verification of users' needs, co-design, and technical development. The third section summarizes the conclusions and the follow-up pathway for the further development of CinderOSS towards CRL6, to be validated again during the second round of international/regional technical seminars.

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## Keywords

Stakeholder workshop, circular economy, digital services, CinderOSS co-design, UX testing, secondary raw materials, construction sector, CINDERELA project.

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## Explanation of acronyms and abbreviations

Acronym	Full name
BIM	Building Information Modelling
CinderCEBM	CINDERELA Circular Economy Business Model
CinderDBE	CINDERELA Digital Business Ecosystem
CinderOSS	CINDERELA One-Stop Shop
D	Deliverable
DBE	Digital Business Ecosystem
IETU	Instytut Ekologii Terenów Uprzemysłowych
KplusV	KplusV organisatieadvies B.V.
LCA	Life Cycle Assessment
Opencontent	Opencontent Società Cooperativa
SME	Small and Medium Enterprises
SOA	State of the Art
SRM	Secondary Raw Materials
TECNALIA	Fundacion Tecnalia Research & Innovation
UX	User Experience
ZAG	Zavod Za Gradbeništvo Slovenije

## 1. INTRODUCTION

The software development methodology that seems to be most suitable for the needs and purposes of the CINDERELA One-Stop Shop (CinderOSS) is agile development.<sup>2</sup> Agile software development focuses on incremental delivery and continual planning and learning. In contrast to the classical waterfall software development approach, in the agile approach, there is no huge initial theoretical concept that will be tested for its practical suitability after months of development. Instead, in agile development, the requirements are defined in an iterative process and re-evaluated every iteration according to the external changes, resources, and time remaining. It is especially suitable for CinderOSS since the project scenarios for the pilots had to be developed first and thus the requirements could not be fully defined at the beginning of the project.

Agile development consists of many continuous improvement cycles, so the first prototypes are already developed at a very early stage of the project. These early results pass through a number of iterations before being finalized. As feedback is gathered and implemented continually, the method is very communication oriented and people focused.

Because the development is carried out in many small iterations with the agile methodology, quick reactions to changing requirements are possible. The agile methodology accepts that changes cannot be avoided, and the requirements, research, and development is being implemented in parallel. In addition, the iterations provide opportunities to assess the direction of a project throughout the development life cycle. The agile methodology is a good addition to the design thinking approach, which we also followed when creating personas and user stories: design thinking explores the problem and focuses on understanding the users' needs, while the agile methodology describes the way in which we adapt to changing conditions within the software implementation. Figure 1 shows the agile methodology used in CinderOSS.



Figure 1: Agile methodology used in CinderOSS

Participatory design, as it is referred to within the agile methodology, describes the act of stakeholders designing with one another rather than in separate silos. An important detail for agile teams, this shared or co-design activity serves to meet the needs of the end-users and, most importantly, guarantees that solutions are usable and rewarding.

<sup>2</sup> <https://agilemanifesto.org>



In the commercial Internet world of today, the competitiveness of a digital solution relies less on the actual performance and capabilities of systems, as they have similar functionality, and more on building long-lasting and deep relationships with developers and partners and facilitating the impact on real communities. Integrating co-design and testing activities (also called a development sprint) into an agile process provides us with an opportunity to verify the customer readiness level of CinderOSS (see Chapter 2.2). Figure 2 shows how development sprints are included in the software development process of CinderOSS.

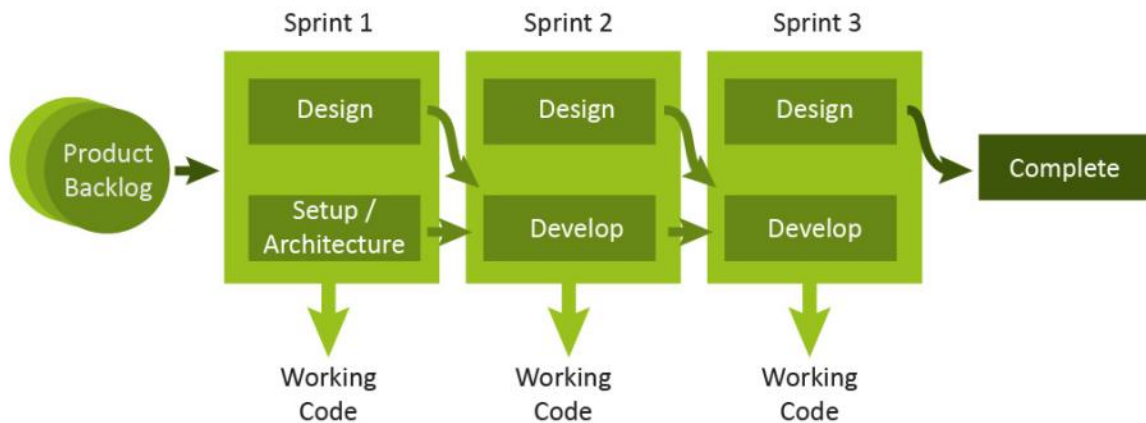


Figure 2: Development sprints in an agile frame

## 2. METHODOLOGY AND GOALS

The co-design and testing activities of CinderOSS are divided into external and internal activities. While the internal activities are aimed at testing, designing, and applying the CinderOSS platform in real environments using the CINDERELA project pilots (see <https://www.cinderela.eu/Pilots>), the external activities (technical seminars) are aimed at the co-design and continuous testing of CinderOSS with the international community of stakeholders of the CINDERELA project and with the local communities that will be increasingly involved in the co-design of CinderOSS.

The image below shows that technical seminars represent the main external activities of the CinderOSS co-design and testing with the local communities of stakeholders, preceding the optimization of CinderOSS in both the business and the technical development.

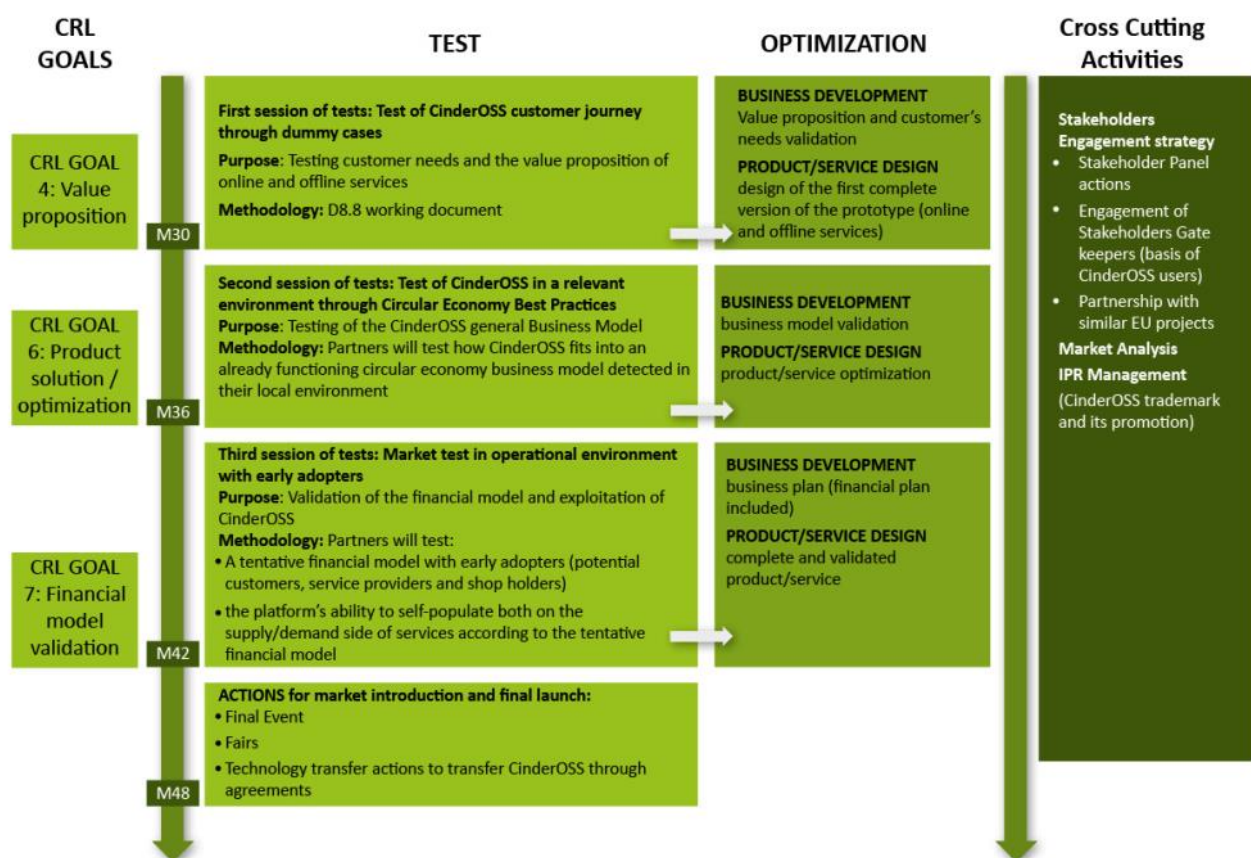


Figure 3: General overview of the technical seminars

The approach used is the lean start-up approach,<sup>3</sup> which proposes a validated learning process for the development and improvement (technical and business) of the product/service through successive cycles of end-user engagement. Each test requires the product design team to define assumptions and hypotheses internally; these must then be verified with the end-users (TEST). The feedback allows us to validate the assumptions and obtain the data necessary to pursue the initial strategy or to carry out pilots.

The lean start up and agile approaches are often used together to develop new digital solutions, and the figure (Figure 4) shows how they are combined in the CinderOSS development process.

<sup>3</sup> Ries, Eric. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business, 2011.

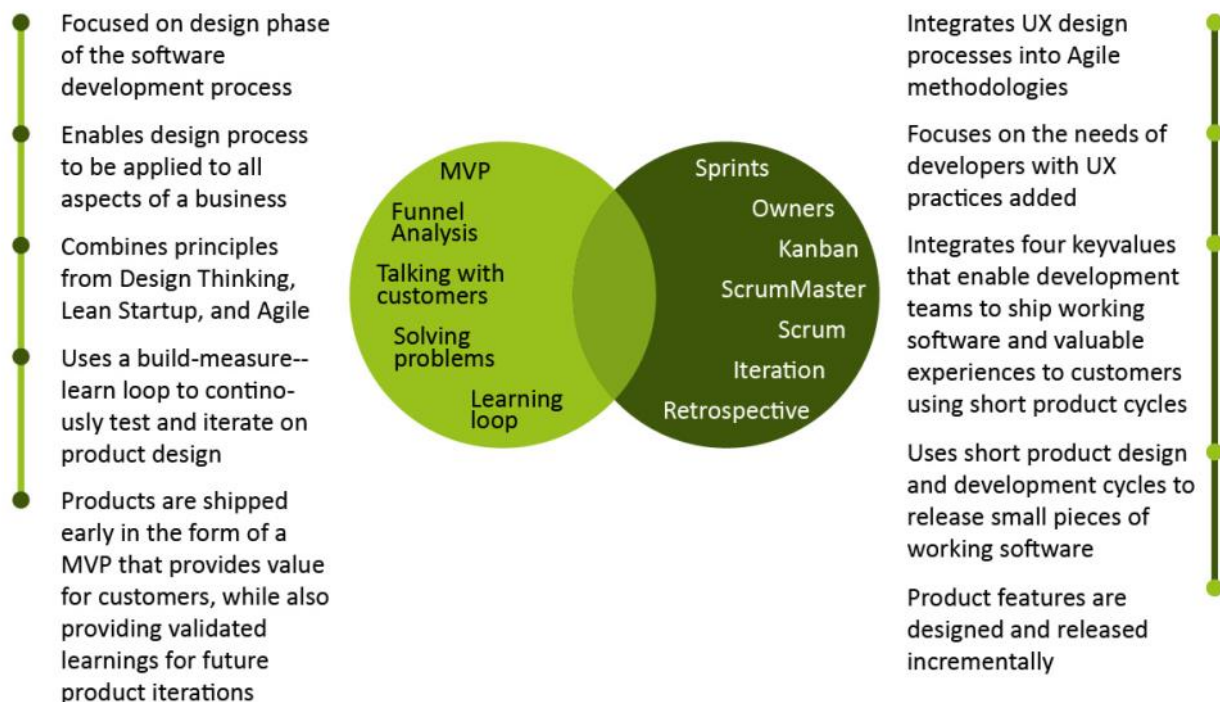


Figure 4: Lean startup and agile approaches in the CinderOSS development process

The overall technical seminars within the CINDERELA project are designed as a three-stage path, with each part of the path focusing on verifying a subsequent commercial readiness level (CRL) from CRL4 to CRL7.

### First session of the technical seminars

**Goal:** to achieve CRL4 (value proposition) by verifying the assumptions developed internally by the consortium on CinderOSS's value proposition with respect to customer needs.

The verification methodology provides for the definition of dummy cases based on the value proposition and client assumptions, which are proposed to the test participants for the collection of feedback. Thanks to the feedback, it is possible to verify the assumptions and to collect further elements concerning the needs of the final users.

### Second session of the technical seminars

**Goal:** to achieve CRL6 (product/service optimization) by verifying the consortium's assumptions regarding the platform's overall business model: in addition to the value proposition, the consortium needs to confirm the assumptions about other key points of the business model: the key partners, key activities, customer relationship, channels, cost, and revenue structure.

The test methodology will consist of determining how CinderOSS fits into the already-functioning circular economy business models detected by project partners in their local environment.

### Third session of the technical seminars

**Goal:** to achieve CRL7 by validating the financial model, which will ensure the economic and financial sustainability of CinderOSS beyond the project's conclusion. The methodology will consist of testing the cost and revenue structure's functioning with the involvement of early adopters (potential customers, service providers, and shop holders). At the same time, through dissemination and promotional actions, partners will test the platform's ability to self-populate on both the supply and the demand side of services.

## 3. DESIGN AND ORGANIZATION OF FIRST TECHNICAL SESSION

As mentioned above, the first technical session is to achieve the CRL4 of CinderOSS, which involves the value proposition validation process. The validation process includes the following steps:

### STEP 1. Definition of CinderOSS's value proposition assumptions with respect to customer needs.

The value proposition was developed internally within the consortium through the definition of the following assumptions:

- a. CinderOSS, thanks to a combination of online and offline services, allows acceleration of the business of companies that already operate according to a circular business model based on SRM-based products because:
  - It stimulates and facilitates the interaction between the actors of the SRM-based product value chain by offering new business and collaboration opportunities;
  - It provides knowledge, insights, and consultancy that facilitate innovation and improvements (across the different modules of CinderOSS) in the business of value chain actors.
- b. CinderOSS, due to its combination of online and offline services, allows a new circular business model to be set up because:
  - It provides tools to scout initially for partners interested in the use of the waste and allows the community to interact and ask for support;
  - It offers consulting services to set up and implement a new CEBM in a local area from scratch or to exploit one of the CEBMs of the CINDERELA CEBM international database.

### STEP 2. Construction of dummy cases based on the assumptions regarding the value proposition to be presented in the CinderOSS demonstration session during the tests.

The dummy cases are customer journeys through the various online and offline services of CinderOSS, carried out by potential end-users of the platform, with the aim of showing the features, services, and advantages of CinderOSS.

### STEP 3. Presentation of dummy cases and collection of user feedback regarding the CinderOSS value proposition.

### STEP 4. Verification of the assumptions regarding the value proposition through a comparison with user feedback on the dummy cases.

## 3.1. Organization and communication

### 3.1.1. Location

Due to mobility restrictions related to the COVID-19 situation, the technical seminars were organized in the form of a two-hour webinar instead of a physical meeting. However, taking into account the objectives of the technical seminars, holding these events online provided a number of benefits. For instance, it allowed the use of different online tools, like a Q&A session using the Mentimeter tool, which gave the opportunity to collect feedback in an easy and visual way, animating the discussion. It also provided the participants with access to CinderOSS during the webinars and enabled the users to conduct their CinderOSS trial at a time that was convenient for them and to give honest responses on their impressions during the debate.

### 3.1.2. Organization, invitation, and agenda

To organize the technical seminars in the four national languages of the countries involved, a board of

organizers was created at the end of October 2020. The organizers' board was established by CINDERELA partners: KplusV for the Netherlands, ZAG for Slovenia, OC and PoloPN for Italy, TECNALIA, FGP, and AEDHE for Spain, and the IETU, with the following aims:

- to define the general outline of the seminars;
- to identify the stakeholders to be invited to the various local seminars and send them the invitations;
- to ensure that a group of stakeholders able to represent the entire value chain participated in the various seminars;
- to translate all the materials into the national languages (including the communication materials, initial presentation, CinderOSS presentation, Mentimeter questions, and final questionnaire);
- to act as the organizer of the various local seminars.

All the events were built around the same objectives and had a similar reference agenda (Table 1) and materials to be used. However, some flexibility was allowed for events to enable them to be embedded into a specific local/regional context, increasing their attractiveness to the participants as well as helping them to understand better how CinderOSS could work in local/regional environments. It was also important that the participants included representatives of the entire value chain in the construction sector (construction companies, architecture and design companies, waste collection and transportation companies, waste processing companies, SRM producers, SRM-based product producers, laboratory services and waste analysis companies, public bodies, policy and decision makers, research institutions, and investors).

Table 1: Structure of agendas of first technical seminars

Title	What	Who
Welcome		The organizer
Introduction to CINDERELA (5 min)	Slide presentation CINDERELA introduction and presentation of results, demonstrations, lab test, and first market analysis (MVP)	Each local organizer prepares the CINDERELA presentation
The policy landscape (5 min)	The place of CinderOSS at the policy and tool level, how it fits into the landscape, which gaps and needs it fills, etc.	Each local partner decides what to present from a policy point of view
Presentation of other circular tools (5 min)		Each regional partner decides what to present from a policy point of view
Introduction to the co-design session	Brief explanation of the work that will be performed in the co-design session	Douwe Huitema – Simona Zelli
CinderOSS presentation – demonstration	Demonstration of the platform functions using a dummy case; two demo videos	Douwe Huitema – Simona Zelli
Collecting feedback from stakeholders	Collection of feedback and suggestions using Mentimeter	Douwe Huitema – Simona Zelli
Conclusions		The organizer

### 3.1.3. Communication of the event and its visual identity

For the communication of the technical seminars to the stakeholders, communication efforts were made by designing invitations and banners tailored to the specific needs of the local event organizers. The local organizers sent these personalized invitations to the identified key stakeholders to ensure engagement and



full value chain representation in the webinars. Over a hundred personalized invitations were distributed in the national languages (Italian, Dutch, Macedonian, and Spanish) by phone and email.

The webinar's presentations were prepared using the CINDERELA presentation template. The invitations and banners also used the CINDERELA visual identity (logo and project colours), keeping them consistent with the rest of the project's promotional materials. The overall promotion material is available in Appendix 6.1. Participants were required to register for each event using a registration form.

## 3.2. Participants

The webinars drew a total audience of 57 participants, including construction companies and waste stream holders, and the goal of representing the entire value chain was achieved in all four webinars. The composition of webinar attendees by country and by type of stakeholder was as follows (Figure 5 - Figure 8),

In total, over 74% of the participants were from industry, 14% were from the scientific community, and 12% were policymakers (Figure 8).

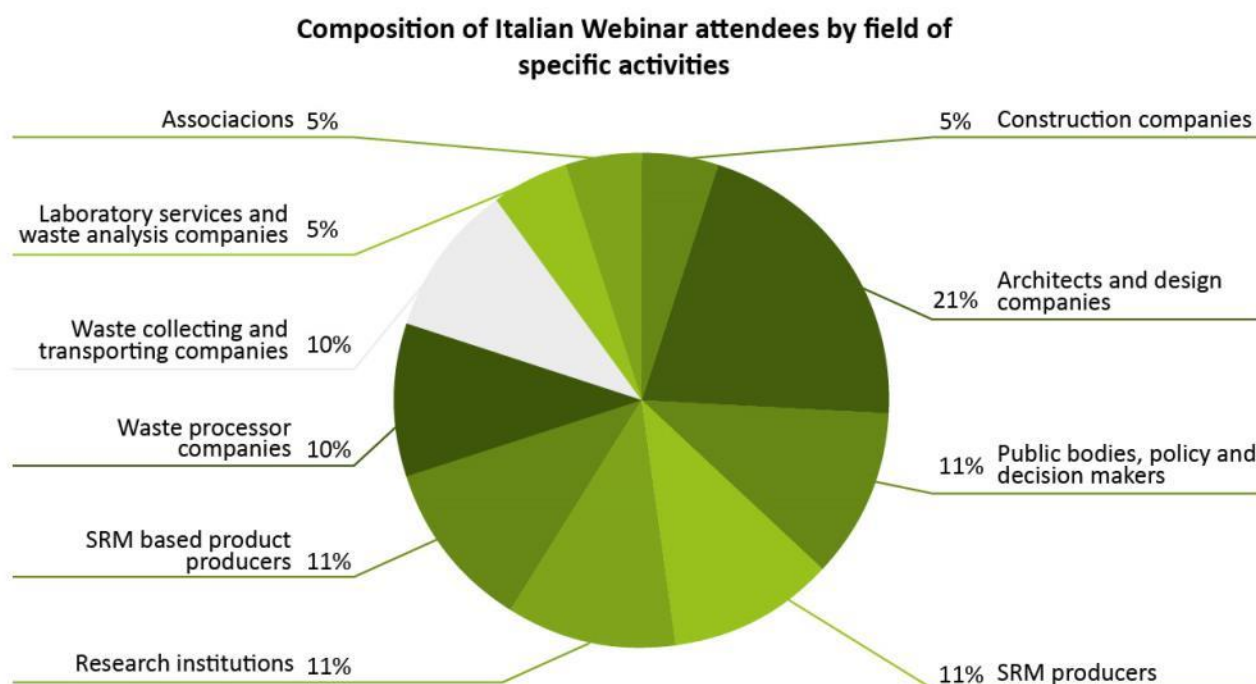


Figure 5: Composition of the Italian webinar attendees by field of activity

## Composition of The Netherland Webinar attendees by field of specific activities

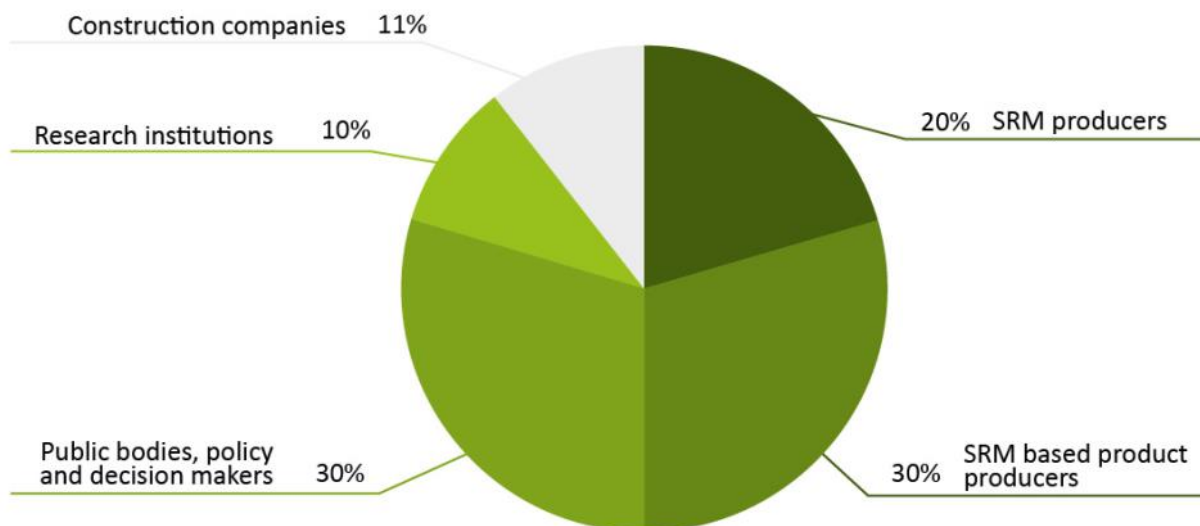


Figure 6: Composition of the Netherlands webinar attendees by field of activity

## Composition of Slovenian Webinar attendees by field of specific activities

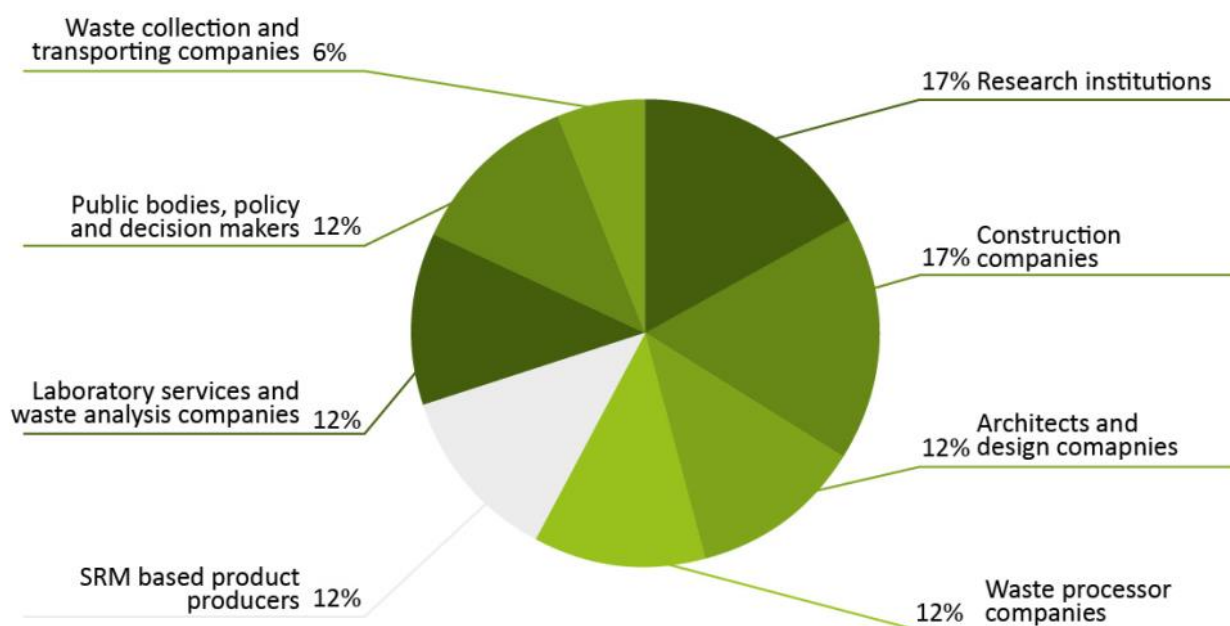


Figure 7: Composition of the Slovenian webinar attendees by field of activity

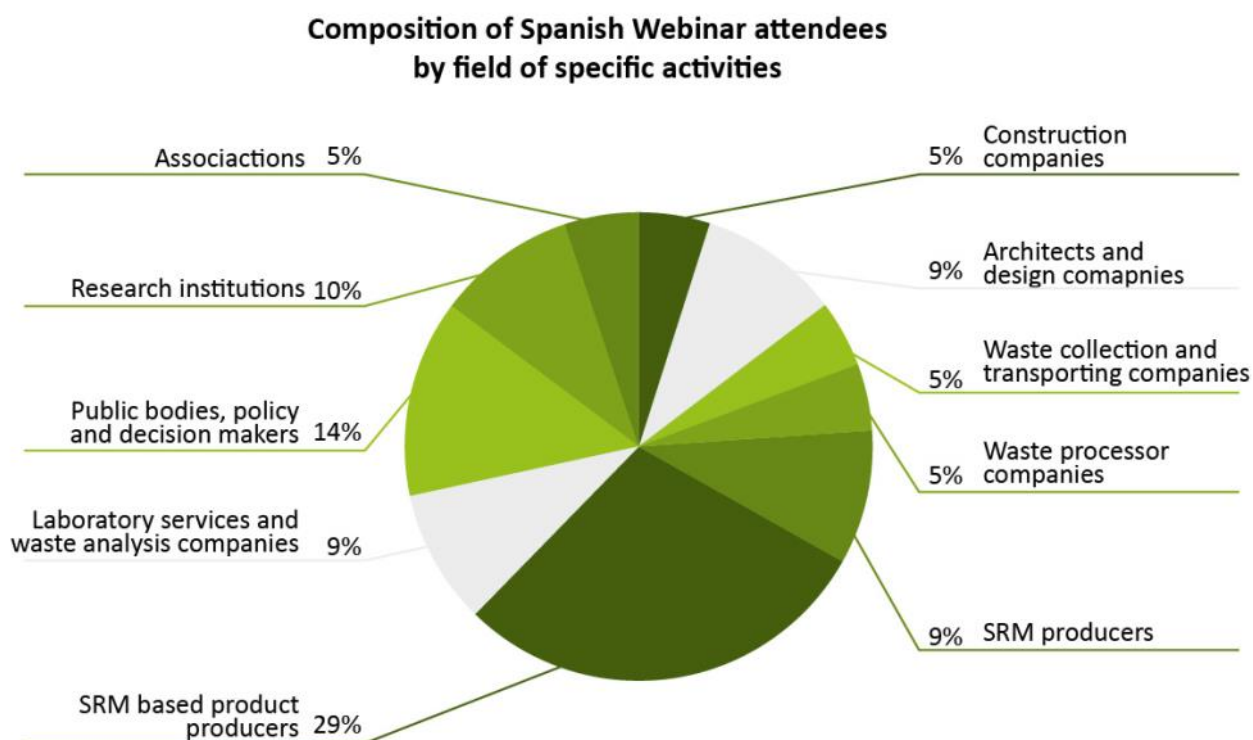


Figure 8: Composition of the Spanish webinar attendees by field of activity

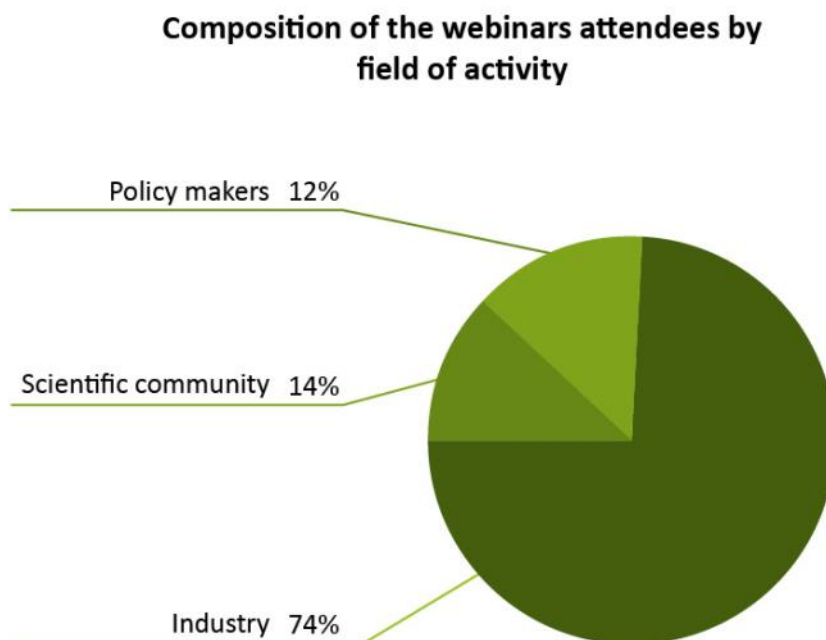


Figure 9: Composition of the webinar attendees by field of activity



## 4. IMPLEMENTATION OF FIRST TECHNICAL SESSIONS

### 4.1. Introductory session

All the seminars started with an official welcome by the organizers and the presentation of all participants. Then, an introduction to the national/international current situation of the CWD sector, the CINDERELA project, and CinderOSS was offered. The introductory session of the technical seminars highlighted the differences between the national and regional contexts in the use of secondary raw materials and the application of CinderOSS as well as the development and operationalization of potential business models based on the tool. Other digital platforms and existent technological solutions to improve the circular economy in the construction sector were shown to contextualize the state of the art (SOA). In this presentation, the services within these tools were discussed and compared with CinderOSS. These included services like a marketplace, data storage, traceability, or industrial symbiosis. We continued by showing that the CinderOSS design offers some unique services in comparison, like the material flow analysis tool (GDSE), BIM library, administrative documentation database, and offline consultation. Finally, we highlighted what CinderOSS is *not* designed for: urban scanning, LCA calculation and costs, financial transactions, and value chain design or planning.



Figure 10: Introduction to the CINDERELA project by Pierre Menger, TECNALIA (Spain)

Additionally, each local organizer was free to focus on other aspects of its national and local scenario that were relevant to setting the scene for the presentation of CinderOSS and nurturing the feedback loops for the co-design process. The introductory sessions were completed with an explanation of the co-design and testing process of CinderOSS.

### 4.2. CinderOSS demonstration session

The demonstration session of the webinar aimed to present CinderOSS and the variety of services that it

offers to actors involved in value chains for urban construction work with the use of secondary raw materials (SRM) recovered from local/regional waste streams. The presenters of the demonstration were Simona Zelli (OC) in Italy and Spain and Douwe Huitema (KplusV) in the Netherlands and Slovenia.

Digital services create an excellent opportunity for making the urban construction sector more circular. In particular, the possibility of buying and selling SRMs and SRM-based products from locally available and recycled waste represents a great challenge. Furthermore, the application of digital platforms in the construction sector is still challenging in terms of scale, technological feasibility, and economic viability.

These challenges, as well as CinderOSS's meaning and structure, were discussed during the CinderOSS presentation and demonstration session. To facilitate the demonstration, two videos were developed, tailored to the specific needs of the target groups and aiming to demonstrate the specific functionalities of CinderOSS: the CinderOSS database, business finder, marketplace, and other services that we are currently integrating (the BIM circular library, etc.). The videos are available on the CINDERELA Youtube channel.

The demonstration sessions ended with a short open discussion that brought together all the ideas for a resource-efficient SRM-based construction sector and the opportunities offered by the data and the use of digital tools for the development of (i) a circular community without geographical boundaries and (ii) local circular communities.

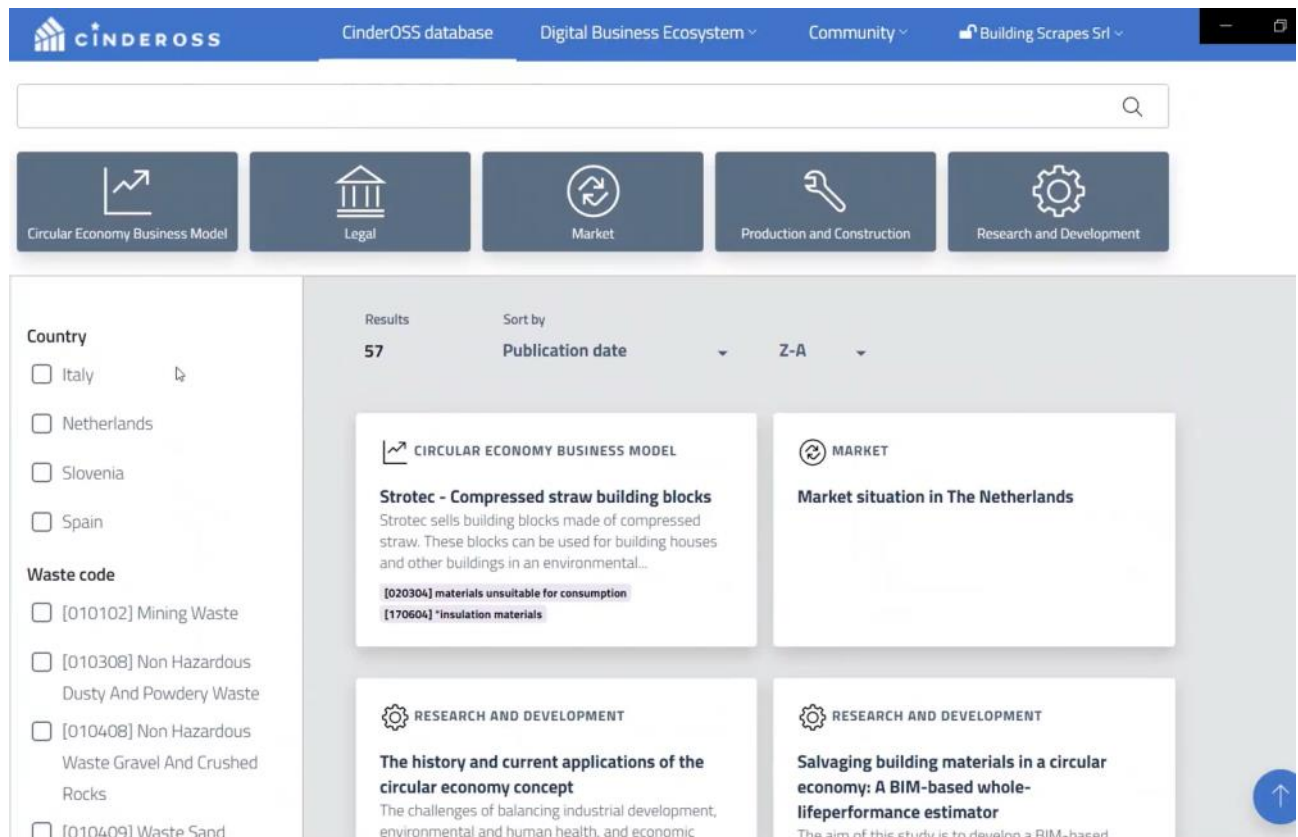


Figure 11: Screenshot of the CinderOSS database

## 4.3. Co-design session, feedback collection, and feedback analysis

The aim of the co-design session that followed the demonstration of CinderOSS's functionalities was to collect as many useful suggestions as possible for the continuous integration<sup>4</sup> of the CINDERELA digital

<sup>4</sup> Continuous integration is a software development practice used to improve software quality and reduce deployment risk in every step of the development process – from prototyping to final product deployment.

environment (CinderOSS) and to verify once again the capability of the digital services developed so far to meet the needs of the users.

The co-design session was animated through the use of a digital Q&A tool called Mentimeter. The Mentimeter presentations were structured using 22 quick questions about the usefulness and completeness of the information on the different modules and digital services of CinderOSS, which were used to verify the achievement of CRL4 and to start the discussion on different aspects of CinderOSS, such as the use of data to generate useful information for the implementation of circular business models. Since the debate was productive, this was a highly co-creative and inspiring moment in all of the webinars. Some screenshots of the Mentimeter presentations are presented below (Figure 12).

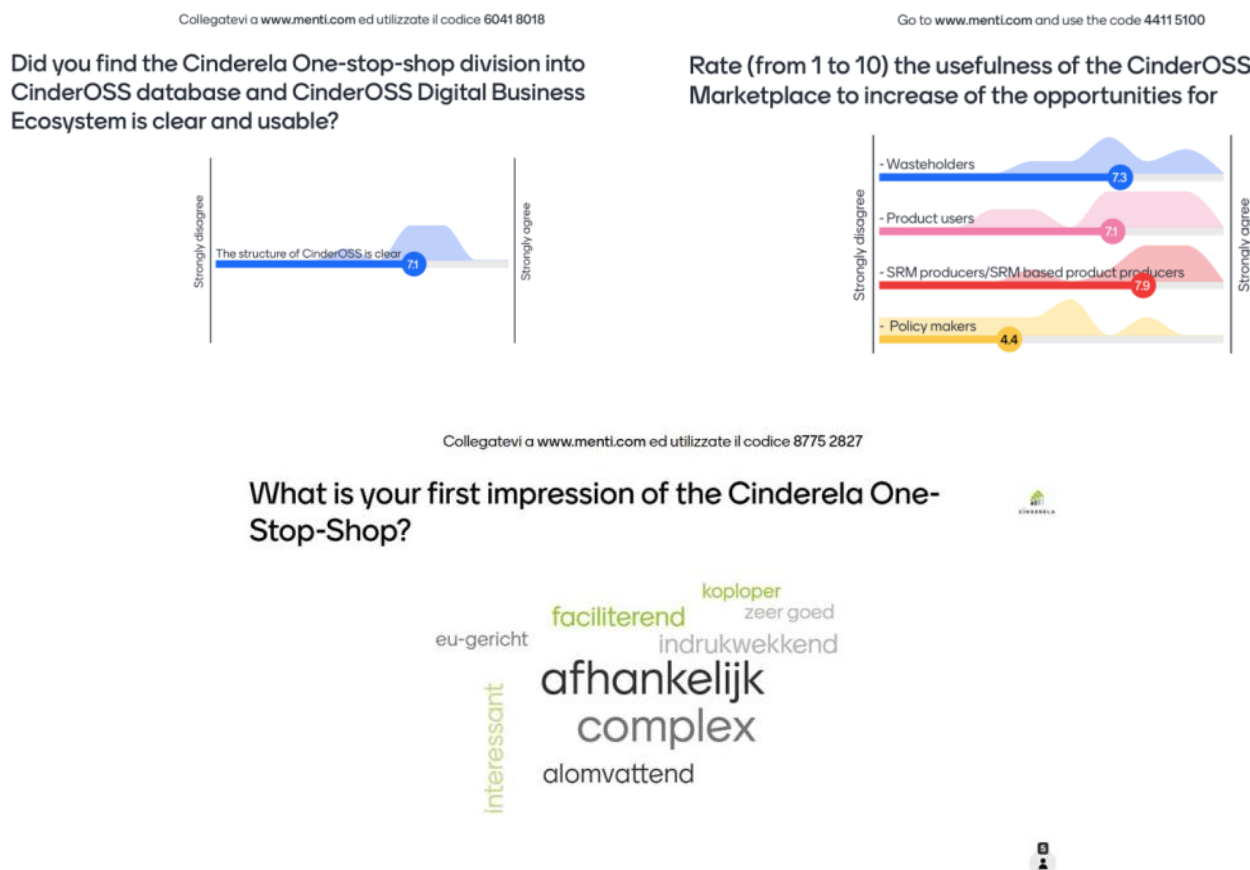


Figure 12: Mentimeter screenshots

The stakeholders' feedback was collected using both the Mentimeter tool and the debate that took place during the co-design session of the webinar. After that, the feedback that emerged from the co-design session was sorted using a single scheme that allowed us to group the feedback by stakeholder and suggestion type (Figure 13) and later, for the analysis phase, by macro-area of possible architectural and/or technical development of CinderOSS (Figure 14). All Mentimeter questions and answers are available in Annex 6.2.

Co-Design session	Description	Stakeholder type	Suggestion type	
Italy	How can the CinderOSS cover the refining process of the waste (from Waste to SRM)?	Public bodies, policy and decision makers	New features	
Italy	The waste presented in the CinderOSS is raw?		Fix features	
Italy	How should a waste manager (collector/refiner of waste) register to CinderOSS?			
Italy	CinderOSS should involve more Architects and Designers to promote SRM-Based Projects	Public bodies, policy and decision makers	New features	
Italy	P&C is not useful	Waste collecting and transporting company	Fix features	Questionnaire analysis
Italy	CEBM is not useful, P&C is not useful, M&L is not useful	Waste processor company	Fix features	Questionnaire analysis
Italy	Marketplace is not useful	Public bodies, policy and decision makers	Fix features	Questionnaire analysis
Italy	CinderOSS is not so usable		Fix features	Questionnaire analysis
Netherlands	Could CinderOSS include specific knowledge on the certification and guarantees of (refurbished) products?	SRM based product producer	New content	
Netherlands	What value does CinderOSS provide to a local entrepreneur? why should I bother in supplying information to an international database? Response from someone else: for international companies, this tool does help to convince 'the office in Austria'.	Construction company	Fix features	
Netherlands	Can we display our innovative circular projects through CinderOSS as well?	Construction company	New features	
Netherlands	As an construction company, we are hesitant in sharing information on circular business models. We are more likely to share information on products and cases.	Construction company	Fix features	
Netherlands	We really don't believe in marketplaces, but rather in connections between companies. This is mostly from a perspective on needed certificates and guarantees. With a marketplace, you don't get an guarantee easily.	Construction company	Fix features	
Netherlands	R&D not useful		Fix features	Questionnaire analysis
Netherlands	Business finder most useful, for all parties		Fix features	Questionnaire analysis
Netherlands	M&L most useful for product users and governments		Fix features	Questionnaire analysis
Netherlands	R&D only useful for producers		Fix features	Questionnaire analysis
Netherlands	Marketplace not useful for governments, might be useful for others		Fix features	Questionnaire analysis

Figure 13: Image showing how the feedback from the first technical seminars was collected

Type	Suggestion	Priority	Implementation cost	Research cost
Development [new content]	Make a home page	High	Low	Low
Optimization [fix function]	Make it easier to write waste codes	High	Medium	Low
Development [new function]	Design and incorporate CO2 equivalents in shipping costs	High	High	Medium
Optimization [fix content]	Design and implement classes as newly defined	High		
Development [new content]	Make the dynamic sections of the CinderOSS multilingual	High	Low	Medium
Development [new content/new feature]	Find extra benefit for local users to use the platform	High	High	High
Development [new content/new feature]	Think of ways to include legitimacy to the CinderOSS	High	High	High
Development [new content/new feature]	Relate BIM as a certification tool	High	High	Medium
Development [new feature]	Add a review option for seller on products	Medium	Medium	Medium
Optimization [fix content/fix feature]	Improve user interface	Medium	Medium	Medium
Development [new feature]	Make a blog / forum	Low	Medium	Low

Figure 14: Image showing how the feedback collected from the first technical seminars was grouped by macro-area of possible architectural and/or technical development of CinderOSS

The feedback received was analysed by the CinderOSS co-design team, a dedicated team made up of CINDERELA partners (OC, KplusV, and Polo PN) that is transforming the analysed feedback into inputs for the continuous development of CinderOSS.



## 5. CONCLUSIONS AND FOLLOW-UP STEPS

This deliverable has outlined the technical seminar strategy and practice currently adopted within CINDERELA for the co-design, testing, and dissemination of its digital environment (CinderOSS) based on the CRL approach. The objective of determining whether CinderOSS can be considered to have achieved CRL4 by demonstrating the functionality and added value of these services to an external audience of early adopters relevant to the targeted value chain from countries with different levels of innovation was reached. This was accomplished by checking the robustness of CinderOSS in different legal and economic environments, its connectivity and complementarity with these environments, and the potential to meet the users' demands and needs.

The workshops provided valuable input from the business practitioners' perspective on the points and issues that need to be improved or added to if the full potential of CinderOSS is to be achieved. To reach CRL6, the collected feedback will also be iteratively updated, especially with information and knowledge gained through the implementation of large-scale demonstrations of CINDERELA.

Basically, the feedback collected on the CinderOSS functionalities can be grouped into two categories: content and reliability/quality assurance. These two categories also indicate the key areas or directions for the development and improvement of CinderOSS.

### CONTENT

The participants suggested inserting more content (from different countries), in particular on the law (such as incentives and policies), the CEBM, and the marketplace (such as resources and resource availability). Publishing more content can increase the interest and trust in the platform. Therefore, efforts should be made now to collect data on CinderOSS by opening the platform to new users.

### RELIABILITY/QUALITY ASSURANCE

If CinderOSS is to be used, its actors and content must be trustworthy and its quality assured, as the credibility of CinderOSS is defined by the credibility and quality of its content. The participants in the co-design sessions stressed the need for SRM certification, quality checks on SRM-based products, and even moderation of the content published in the CinderOSS database.

Below we summarize some problems that have emerged on this topic and that the CinderOSS co-design team is to take account of and propose solutions to in the subsequent stages of CinderOSS's development:

- How can CinderOSS ensure the quality and credibility of its content?
- How can we make the CEBM credible?
- How can the market and legal content be moderated?
- Who can moderate it? How?
- Could the potential certification scheme be based on existing tools, for example BIM libraries?

Based on internal experiences and the external feedback from the workshops, we currently see the following areas for development and optimization of CinderOSS:

### DEVELOPMENT

- ➔ Use ontologies and semantic data as defined by the EU. In this way, we can grant the interoperability of CinderOSS;
- ➔ The BIM libraries can be connected to every element of CinderOSS, improving the quality of the data. In more detail, the BIM libraries should be connected to every element of the CinderOSS database and marketplace, so their contents can have the metadata (and certification of the quality of the components) of the BIM;
- ➔ Add a blog to the CinderOSS community to enhance the communication between actors;
- ➔ Add feedback on the sellers in the marketplace;

- ➔ Implement a multilingual approach;
- ➔ Filter the content based on the dimensions of companies.

## OPTIMIZATION

- ➔ Make the interfaces easier to use (for example the filter for waste type in the database);
- ➔ Add a warning system to the transportation cost calculator when the environmental impact of the shipping is too high.

Beside the feedback on CinderOSS's functionalities, the participants shared some issues, suggestions, and concerns referring to the bigger picture, highlighting, for example, the "need for a Business Model for the CinderOSS", as well as to country-specific contexts, for example the "need for definition of the end of waste for the Spanish Government". Some other suggestions referred to the need to create a blog associated with CinderOSS as a discussion and interaction space for circular economy actors in the form of a blog, identifying an incentivization system for local companies to use CinderOSS and extending the functionality of CinderOSS by offering space for advertisements for products and cases (more than CEBM).

## 6. APPENDICES

### 6.1. Communication materials

Promotional banners were developed in Italian, Dutch, Spanish, and Slovenian to be used on websites, on social media, and in emails.



The banner is a promotional graphic for a workshop. It features a blue and green color scheme. At the top left is the CinderOSS logo. The main text is in Italian: "Workshop online", "Partecipa alla co-creazione della piattaforma di servizi CinderOSS", "Servizi digitali per l'economia circolare nel settore costruzioni", and "25 Novembre 2020 10:30 am - 12:30 am (GMT)". On the right, there is a hand pointing at three circular icons: a sad face, a neutral face, and a happy face. At the bottom left is the European Union flag and text about funding from the Horizon 2020 program. At the bottom right is the text "PROGETTO CINDERELA SEMINARIO TECNICO".

Figure 15: Italian version of the banner



**Join us online**

**Designing a circular one-stop-shop**

**Digital services for circular economy in construction sector**

26 November 2020  
09:30 am - 11:00 am (UTC + 01:00, Amsterdam)

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no 776751

CINDERELA PROJECT TECHNICAL SEMINAR

Figure 16: English version of the banner for the Dutch webinar



**Vljudno vabljeni!**

**Spletni seminar projekta CINDERELA**

**Digitalne storitve v krožnem gradbeništvu**

27. november 2020  
od 11:00 do 13:15

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no 776751

Figure 17: Slovenian version of the banner

## 6.2. Overview of all the Mentimeter presentations and results

### Dutch Mentimeter presentation

[https://static.mentimeter.com/screenshot/pdfs/First%20Technical%20Seminar%20-%20the%20Netherlands%2026%20november%202020.pdf?seriesId=7c043728757b791df5c2cc597200fa92&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&\\_ga=2.246360644.178630700.6.1615542112-218013266.1615542112](https://static.mentimeter.com/screenshot/pdfs/First%20Technical%20Seminar%20-%20the%20Netherlands%2026%20november%202020.pdf?seriesId=7c043728757b791df5c2cc597200fa92&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&_ga=2.246360644.178630700.6.1615542112-218013266.1615542112)

## Slovenian Mentimeter presentation

[https://static.mentimeter.com/screenshot/pdfs/First%20Technical%20Seminar%20-%20CinderOSS.pdf?seriesId=869092d0ea853966720204ebefa2a9eb&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&\\_ga=2.23596410.1786307006.1615542112-218013266.1615542112](https://static.mentimeter.com/screenshot/pdfs/First%20Technical%20Seminar%20-%20CinderOSS.pdf?seriesId=869092d0ea853966720204ebefa2a9eb&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&_ga=2.23596410.1786307006.1615542112-218013266.1615542112)

## Italian Mentimeter presentation

[https://static.mentimeter.com/screenshot/pdfs/CinderOSS\\_First%20Technical%20Seminars.pdf?seriesId=55f2f3f39c14af122c88fdb4edd4885&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&\\_ga=2.177928679.31339963.1615375469-526810358.1605784369](https://static.mentimeter.com/screenshot/pdfs/CinderOSS_First%20Technical%20Seminars.pdf?seriesId=55f2f3f39c14af122c88fdb4edd4885&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&_ga=2.177928679.31339963.1615375469-526810358.1605784369)

## Spanish Mentimeter presentation

[https://static.mentimeter.com/screenshot/pdfs/CinderOSS%20Primero%20seminario%20tecnico.pdf?seriesId=fd514eaac7effc320e2f861ed34f15f5&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&\\_ga=2.176969191.31339963.1615375469-526810358.1605784369](https://static.mentimeter.com/screenshot/pdfs/CinderOSS%20Primero%20seminario%20tecnico.pdf?seriesId=fd514eaac7effc320e2f861ed34f15f5&screenshotTargetUrl=https%3A%2F%2Fwww.mentimeter.com%2Fpreview&_ga=2.176969191.31339963.1615375469-526810358.1605784369)