

Iceland Liechtenstein Norway grants

(De)construct for Circular Economy
(Des)construir para a Economia Circular

WP 7 – Information, awareness and training

Activity 7.2 – Participatory actions for municipalities and construction companies

Participatory Workshop – Results from Session C

Regional strategy to promote circularity in the construction sector
(construction companies)

Final report

December 2021

Operador do Programa:



Promotor:



Parceiros:



*Conceptualization, methodological approach, workshop organization,
data treatment, report*

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1. Introduction

The participatory workshop “Regional strategy to promote circularity in the construction sector” was held on December 14th of 2021, integrated in the (De)construct for Circular Economy project, promoted by CIMBAL (*Comunidade Intermunicipal do Baixo Alentejo*). It was developed within the work package (WP) 7 – Information, awareness and training, led by FCT NOVA (NOVA School of Science and Technology), more precisely in the Activity 7.2 – Participatory actions for municipalities and construction companies.

The methodology for WP 7 was developed by FCT NOVA, complemented with contributions from project partners (FCT NOVA, 2021a). Two specific groups were selected, namely *Baixo Alentejo* municipalities and regional micro and small construction companies, because specific constraints for construction and demolition waste (CDW) management have been identified, especially in the last decade, for these types of stakeholders (Martinho *et al.*, 2013; European Commission, 2017; Ramos *et al.* 2020; Ramos & Martinho, 2021 and 2022).

This workshop with *Baixo Alentejo* construction companies is the third (Session C) of three sessions scheduled to present and discuss the following specific themes:

- Session A: constraints and solutions for CDW management, as well as the training needs identified by the participants (held on April 21st of 2021) (FCT NOVA, 2021b);
- Session B: CDW management and the application of the circular economy principles to the construction sector (held on September 14th of 2021)¹ in articulation with WP 2 and regarding the common regulation to be developed for *Baixo Alentejo* region (FCT NOVA, 2021c);
- Session C: development of a proposal for strategic action to promote circularity principles in the construction sector (held on December 14th of 2021)², in articulation with WP 6.

This report presents the results of the participatory activities carried out in the scope of the *Baixo Alentejo* construction companies’ workshop (Session C), and is structured in the following chapters:

- Introduction (current chapter);
- Programme, workshop dynamics and participants (chapter 2);
- Results of activities (chapter 3);
- Workshop evaluation (chapter 4);
- Conclusions (chapter 5).

¹ The workshop date was changed from August to the beginning of September of 2021, due to the vacation period of municipal technicians.

² The workshop date was anticipated from January of 2022 to December of 2021, to allow for a better articulation with WP 6 planning.

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2. Programme, workshop dynamics and participants

2.1. Programme

This participatory workshop (Session C), with *Baixo Alentejo* construction companies, took place on December 14th of 2021 (images of the workshop in Annex I). The programme and contents are described in Table 1. The programme was structured in an awareness and training component (five presentations), and in an information gathering component (two participatory activities).

Table 1. Programme of the workshop with construction companies, main objectives and responsibilities.

Programme topic		Main objective	Responsibilities
09h30	Opening session.	<ul style="list-style-type: none"> Brief presentation of the project and partners. Contribution and importance of the involvement of <i>Baixo Alentejo</i> municipalities. 	CIMBAL (promoter)
09h40	Framework of the workshop in the project and presentation of the programme.	<ul style="list-style-type: none"> To present the framework of the workshop in the project, within WP7 - Activity 7.2 (participatory actions dedicated to municipalities and construction companies); Programme brief presentation. 	FCT NOVA (project partner, WP7 leader)
09h50	Presentation: component 1.	<ul style="list-style-type: none"> To present materials passport tool (in relation to the work in progress in WP 3). 	LNEG – Laboratório Nacional de Energia e Geologia (Cristina Rocha) (project partner, WP 3 leader)
10h00	Presentation: component 2.	<ul style="list-style-type: none"> To present pre-demolition audits tool (in relation to the work in progress in WP 4). 	LNEG (Ana Paula Duarte) (project partner, WP 4 leader)
10h10	Presentation: component 3.	<ul style="list-style-type: none"> To present the project (De)construct mathematical model tool (in relation to the work in progress in WP 5). 	LNEG (Joaquim Duque) (project partner, WP 5 leader)
10h20	Presentation: component 4.	<ul style="list-style-type: none"> To present the importance of the social dimension to the regional strategy (in relation to WP 6). 	Cercibeja (Vera Neca) (project partner)
10h30	Presentation: component 5.	<ul style="list-style-type: none"> To present the regional strategy to promote circularity in the construction sector, to be developed within WP 6. 	Resialentejo (Pedro Sobral) (project partner, WP 6 leader)
10h40	Debate.	<ul style="list-style-type: none"> Questions and answers about the exhibition components and other topics related to circularity in the construction sector, and in specific about CDW management. 	All participants
11h00	Activity 1 (in group).	<ul style="list-style-type: none"> To discuss the vision to the regional strategy (in relation to WP 6). 	FCT NOVA and representatives of construction companies
11h10	Activity 2 (in group).	<ul style="list-style-type: none"> To discuss communication strategies applied to construction companies. 	FCT NOVA and representatives of construction companies

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Programme topic		Main objective	Responsibilities
11h30	Closing session.	– Session wrap-up and closing.	FCT NOVA

2.2. Workshop dynamics

The participatory workshop, dedicated to *Baixo Alentejo* construction companies, that took place by videoconference, due to Covid-19 pandemic restrictions, was planned and organized considering two main and interrelated components: awareness and training, and activities and information gathering.

2.2.1. Awareness and training component

The awareness and training component was planned considering the training needs identified in the previous workshops held on April and September of 2021 (Sessions A and B, respectively), but focusing this time on the project tasks' results dissemination.

To accomplish the mentioned purpose, five entities were invited to be involved in this process, presenting specific topics about the regional strategy and the new tools being developed within the project (De)construct. Those entities and the contents presented are described in Table 2.

Table 2. Contents list and responsible entities of the exhibitions of the workshop.

Exhibition's themes and responsible entity	Main contents list
<p>Presentation 1</p> <p>Materials passport</p> <p>Responsible entity:</p> <p>LNEG – Laboratório Nacional de Energia e Geologia (project partner, WP 3 leader)</p>	<ul style="list-style-type: none"> – Presentation of LNEG institution and activities (common to WP 3, WP 4 and WP 5); – What is a materials passport?; – What are materials passports used for?; – Examples of materials passports; – Materials passports within the project (De)construct.
<p>Presentation 2</p> <p>Pre-demolition audits</p> <p>Responsible entity:</p> <p>LNEG (project partner, WP 4 leader)</p>	<ul style="list-style-type: none"> – What is a pre-demolition audit?; – What are pre-demolition audits used for?; – Consulted guides for pre-demolition audits; – Different stages and requirements for pre-demolition audits; – Pre-demolition audits within the project (De)construct.

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Exhibition's themes and responsible entity	Main contents list
<p>Presentation 3 Mathematical model</p> <p>Responsible entity: LNEG (project partner, WP 5 leader)</p>	<ul style="list-style-type: none"> – General concepts and description of the model components: location of collection sorting centres, inter-municipal network for the reuse of construction materials, and inter-municipal network for CDW recycling; – Mathematical model parameterization; – Mathematical model within the project (De)construct.
<p>Presentation 4 The social dimension to the regional strategy</p> <p>Responsible entity: Cercibeja (project partner)</p>	<ul style="list-style-type: none"> – Presentation of Cercibeja, and activities developed, as a private social solidarity institution; – Cercibeja vision for the involvement in the project (De)construct, namely through the engagement in the preparation for reuse of construction materials within the specific network to be created on the regional strategy (WP 6).
<p>Presentation 5 The regional strategy to promote circularity in the construction sector</p> <p>Responsible entity: Resialentejo (project partner, WP 6 leader)</p>	<ul style="list-style-type: none"> – Presentation of Resialentejo, as a municipal solid waste management operator working with the municipalities of <i>Baixo Alentejo</i> region; – Objectives of the regional strategy for the promotion of circularity in the construction sector in the <i>Baixo Alentejo</i> region;

2.2.2. Activities and information gathering component

During this workshop with *Baixo Alentejo* construction companies, the following participatory activities were organized (the methodological approach is detailed described jointly with the results, in order to facilitate the understanding; in chapter 3):

- Activity 1 (in group): building up a vision to the strategy to promote circularity in the construction sector in *Baixo Alentejo* region (specifically in subchapter 3.1);
- Activity 2 (in group): development of communication strategies applied to construction companies (specifically in subchapter 3.2).

To carry out the participatory activities described above, participants were requested to contribute with their ideas, that were registered in specific forms, completed with the assistance of the project operational representative in each municipality.

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2.3. Organization and characterization of participants

2.3.1. Organization of participants in the participatory activities

This participatory workshop with *Baixo Alentejo* construction companies (Session C), was expected to take place in a face-to-face format. However, due to the restrictions of Covid-19 pandemic, it was required to carry it online.

Prior to the workshop, several contacts were developed with construction companies with their headquarters registered in each municipality. The contacts were performed by the municipal representative for the project, jointly with other municipal technicians, to find out their interest in contributing to the project. Only construction companies with a certificate or with a construction permit title until Class 4 could participate. Therefore, the focus was on micro and small construction companies, a methodological objective previously established for the workshop (see methodological approach in FCT NOVA, 2021a). The contact approaches differed depending on the municipality, due to the different existing realities. After defining the date and time of the workshop, as well as its duration (which was reduced to allow the participation of more construction companies), a new participation interest verification was performed.

For the organization of the workshop itself, each municipality was previously asked to gather the construction companies in a common physical space, considering the physical distance imposed by the security restrictions due to the Covid-19 pandemic, and to ensure a good image and sound conditions, to allow for an adequate involvement in the debate and participatory activities.

Fourteen representatives of *Baixo Alentejo* micro and small construction companies participated in the workshop, distributed through the (virtual) rooms in accordance with the registration established in Table 3. Regarding the municipalities of *Alvito*, *Barrancos*, *Beja*, *Cuba*, *Ferreira do Alentejo*, *Moura*, *Serpa* and *Vidigueira*, it was not possible to have the participation of these municipalities construction companies.

Table 3. Number of participants in the workshop, by municipality.

Municipalities	N.º participants (representatives of construction companies)
<i>Aljustrel</i>	3
<i>Almodôvar</i>	2
<i>Castro Verde</i>	3
<i>Mértola</i>	4
<i>Ourique</i>	2
Total	14

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2.3.2. Participant's characterization

Construction companies were asked if they have a construction activity certificate, or if they are qualified with a construction permit class title, indicating in this case in which class. The results are shown in Figure 1. The results indicate that class 1 is predominant (36%), followed by companies with permit classes 2 and 3. On the other hand, one construction company did not know to answer.

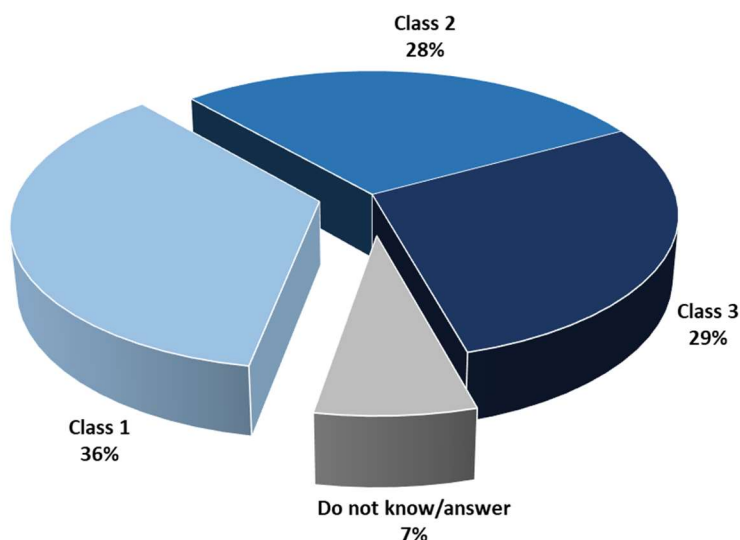


Figure 1. Distribution of participants, by construction permit class.

2.4. Complementary information

After the participatory workshop (Session B), each participant was asked to evaluate what they liked more and less, to give suggestions for the improvement of other events, as well as to rate their satisfaction, in general. These contributions, and the comments of FCT NOVA, are presented in chapter 4.

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3. Results of activities

3.1. Activity 1 – Vision to the regional strategy

In this group activity, participants were asked to reflect about the vision to be considered in the strategy to be developed for the *Baixo Alentejo* region, aiming to promote circularity in the construction sector (within WP 6). In this context, participants were asked to identify relevant keywords to be included in the vision.

The identified keywords are presented in Table 4. The answers from the participants were analysed and organized in decreasing order of responses frequency. The frequency refers also to the number of times that each keyword (including words with similar meaning) was identified in each municipality. The ones that have the greatest consensus are those related to local solutions/proximity, transport/distance, costs, recycling and reuse.

Table 4. Keywords to be considered in the vision to the regional strategy.

Keywords (including words with similar meaning)	Frequency (n.º)
Local solution, proximity	7
Distance, transport	5
Costs	4
Recycling	3
Reuse	3
Treatment	1
Opportunity	1
Sorting, separation	1
Information	1
Storage	1
Awareness	1
Legislation	1

3.2. Activity 2 – Communication strategies to construction companies

In this activity, participants were asked to discuss and to give contributions about communication strategies to micro and small construction companies, in respect to:

- The content of messages: each participant was asked to choose, in each of three groups of messages, the one preferred;
- The communication channels: in first phase, it was requested to each participant to identify the communication channels where they remember to see or hear information about CDW management (without the help of given examples or the support of the operational municipal project representative); in second phase, each participant was asked to choose the communication channels

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they prefer to be used, in the future, to spread information about CDW management, from a pre-defined list.

Regarding the **content of messages**, the results are presented in Table 5. The construction companies representatives prefer messages stating: the benefit for not abandoning CDW, information about CDW treatment solutions, and messages focusing in the costs for CDW management.

Table 5. Content of messages to spread among micro and small construction companies.

Group	Content of message		Frequency (n.)	
A	A1	An image (e.g., CDW illegal dumpsite) with a general message (e.g., “Do not harm nature”).	5	14
	A2	A message stating that municipality's costs related to the removal of abandoned CDW could be used for other purposes (e.g., hiring more personnel).	9	
B	B1	A message stating the penalty value for abandoning CDW.	2	14
	B2	A message stating the distance to the nearest licensed waste management operator where CDW can be delivered.	12	
C	C1	A message stating what are the CDW fractions with mandatory sorting on construction sites (e.g., mineral fraction, plastic, glass), according to legal requirements.	1	14
	C2	A message stating that the company may have a reduction on costs by separating onsite hazardous from non-hazardous CDW, and even more if separating non-hazardous CDW in specific fractions.	13	

Concerning **communication channels**, the contents identified by the construction companies’ representatives were organized considering the decreasing order of responses frequency. The frequency refers to the number of times that each aspect was identified by the participants.

In relation to the communication channels where companies representatives remember to see or hear information about CDW, the results are presented in Table 6. About the results, communication channels like municipal inspectors, municipal technicians, other construction companies, (De)construct project workshops, and training actions, seem to be more effective.

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Table 6. Communication channels remembered to be used in the past.

Communication channel	How long?	What did they see or hear?	Frequency (n.º)
Municipal inspectors (on-site action).	Not able to specify.	General aspects referring to CDW management.	4
Municipal technicians.	1 week.	Invitation to the project (Des)construir workshop.	4
Other construction companies (conversation).	Not able to specify.	High costs and lack of solutions for CDW management.	4
Municipal technicians.	Not able to specify.	Distance to final destination for CDW delivery.	4
Previous (De)construct project workshops.	3 to 8 months, respectively.	General aspects referring to CDW management; good practices about CDW management on construction sites; regulation aspects concerning CDW.	3
Outdoor.	Did not answer.	Message informing not to abandon CDW.	3
Municipality (general).	2 to 3 weeks.	Unavailability of the municipal CDW collection service.	3
Training action.	2 years.	CDW delivery to appropriate (licensed) sites/facilities; general aspects referring to CDW.	2
Municipal technicians.	3 months.	Information about CDW management in the licensing phase.	2
Municipality (general).	Since always.	Prohibitions about CDW management.	1
Television.	Did not answer.	Waste illegal dumping.	1

On the other hand, the communication channels that construction companies representatives prefer to be used, in the future, to spread CDW management information, are shown in Table 7. The results show that construction companies representatives prefer the municipality website, municipal inspectors, municipal technicians, social networks, and telephone (green line).

Table 7. Communication channels chosen to be used in the future.

Communication channel	Frequency (n.º)
Municipality website.	12
Municipal inspector.	10
Municipal technician.	10
Social networks.	9

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Communication channel	Frequency (n.º)
Telephone (green line).	9
Radio.	7
Outdoor.	6
Flyer.	5
Mobile phone (app).	5
SePNA (police authority, with environmental responsibility)	4
Newspaper.	3
Television.	3

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4. Workshop evaluation

Participants were asked to complete a form, in an anonymous and confidential way, regarding the workshop evaluation. Fourteen responses were received (response rate of 100%). From those, 36% were involved in the two previous sessions, 36% participated in one previous session (22% in session A, and 14% in session B), and 28% were participating for the first time. The overall evaluation of the workshop, measured on a 7-point Likert scale (between 1 “very bad”, and 7 “very good”), was 5,9 (see details of the evaluation in Figure 2).

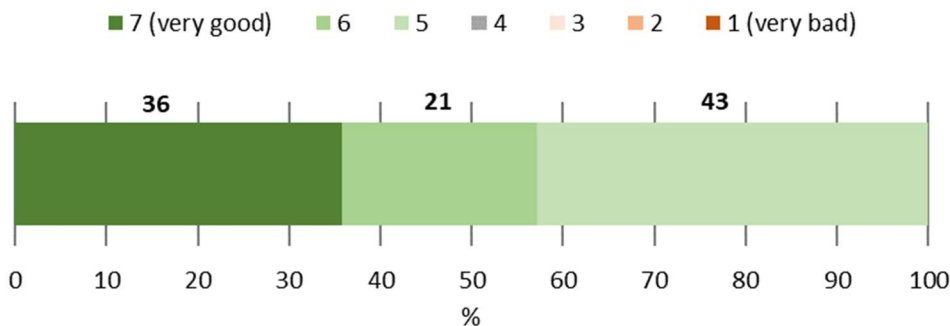


Figure 2. Overall evaluation of the workshop with construction companies, in relation to total respondents.

The results are detailed below, where comments from the FCT NOVA team are also presented. The questions to be answered were:

- What the participant liked more and less, according to pre-selected options, but allowing to add other choices, and accepting, in both cases, more than one answer (Table 8);
- Improvement suggestions for the next workshops (
-
- Table 9).

Table 8. Evaluation of the workshop by the respondent participants - what they liked more and less.

Topics evaluated	Answers (in relation to total respondents)		Feedback from FCT NOVA
	N.º	%	
What you liked more			
Structure and organization.	13	92,9	<ul style="list-style-type: none"> - Maintain/reinforce in other events, especially in the contents and structure/organization, but also trying to improve the dynamics in the participatory actions (and rhythm/dynamics), although fulfilling the approved requirements/programme, and the previously agreed with other stakeholders/partners/participants.
Utility.	12	85,7	
Participatory activities.	10	71,4	
Contents (exhibitions).	9	64,3	

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Topics evaluated	Answers (in relation to total respondents)		Feedback from FCT NOVA
	N.º	%	
Rhythm/dynamics.	7	50,0	
What you liked less			
Contents (exhibitions)	4	21,1	<ul style="list-style-type: none"> - Regarding the contents, the results are registered so they can be consulted by the project partners and be considered in future events' organization. - It is recognized that, by videoconference, the participatory activities, as well as the rhythm/ dynamics, are compromised, so FCT NOVA will try to improve these aspects in other events.
Participatory activities.	1	5,3	
Rhythm/dynamics.	1	5,3	

Table 9. Evaluation of the workshop by the respondent participants – improvement suggestions.

Improvement suggestions	Answers (in relation to total respondents)		Feedback from FCT NOVA
	N.º	%	
The contents should be more practical and with less technical information.	2	14,3	<ul style="list-style-type: none"> - The exhibition components aimed to present the current main results from the project, with the participation of the main tasks' leaders (project partners); - Nevertheless, the recommendations are registered so they can be consulted by the partners and be considered in future events organization. - The suggestions are registered so they can be consulted by the partners and be considered in future events' organization.
Provide lunch to participants.	1	7,1	
Provide better logistic conditions (e.g., chairs more comfortable).	1	7,1	

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5. Conclusions

Within the scope of the (De)construct for Circular Economy project, more precisely WP 7 (information, awareness and training), this report presents the results of the participatory workshop (Session C), held online on December 14th of 2021, entitled “Regional strategy to promote circularity in the construction sector” (construction companies). This workshop was articulated with the main objectives of WP 6 (proposal for strategic action), namely in what concerns the development of a proposal for strategic action to *Baixo Alentejo* region in respect to the circular economy principles application to the construction sector.

Regarding the **awareness and training component**, it is important to highlight the accomplishment with the project tasks dissemination, but also with the lack of technical knowledge identified in the previous workshops, held on April and September of 2021 (Sessions A and B, respectively).

On the **participatory activities component**, carried out with *Baixo Alentejo* construction companies, the following main conclusions stand out:

- Fourteen construction representatives of companies from *Baixo Alentejo* region participated in the workshop, where construction permit class 1 title was predominant, representing 36%;
- Regarding the vision to the regional strategy, the keywords identified that have the greatest consensus are those related to local solutions/proximity, transport/distance, costs, recycling and reuse;
- Regarding communication, namely the contents to be spread regarding CDW management, construction companies’ representatives prefer messages stating: the benefit for not abandoning CDW, information about CDW treatment solutions, and messages focusing the costs for CDW management;
- Considering the spread of CDW information in the past, communication channels like municipal inspectors, municipal technicians, other construction companies, (De)construct project workshops, and training actions, seem to be more effective;
- In a complementary way, construction companies’ representatives indicate that the communication channels to be used, in the future, to spread CDW management information, should be: municipality’s website, municipal inspectors, municipal technicians, social networks, and telephone (green line).

As **next steps**, one more workshop is scheduled to be performed in Czech Republic or Romania (Activity 7.3 – project partners capacitation) in April of 2022, where it is planned to present the main results of the (De)construct project and to discuss with partners the adaptation to different realities. The event organization is being discussed with the project partners.

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for Porto Metropolitan Area by FCT NOVA – NOVA School of Science and Technology (NOVA University of Lisbon) and 3drivers. Available at (in Portuguese):
http://portal.amp.pt/media/documents/2020/09/21/5_PD_GuiasPD_jun2020.pdf

Operador do Programa:



Promotor:



Parceiros:



Annex I – Images from the workshop with *Baixo Alentejo* construction companies

(Des)construir para a Economia Circular

WP 7 – Informação, sensibilização e formação
A.7.2 – Ações de participação (municípios e empresas de construção)

Estratégia regional para promover a circularidade no setor da construção
(empresas de construção)

14 de dezembro 2021

Equipa FCT NOVA

NOVA SCHOOL OF SOCIAL & TECHNOLOGY

Graça Martinho
Professora

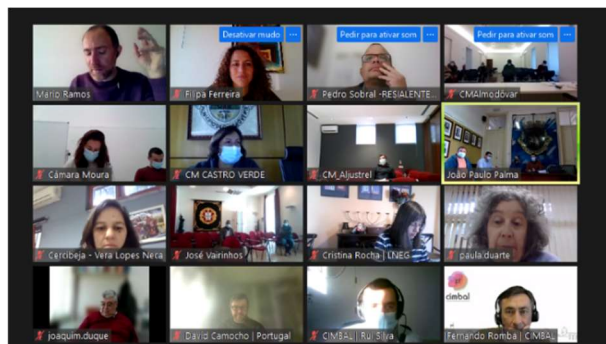
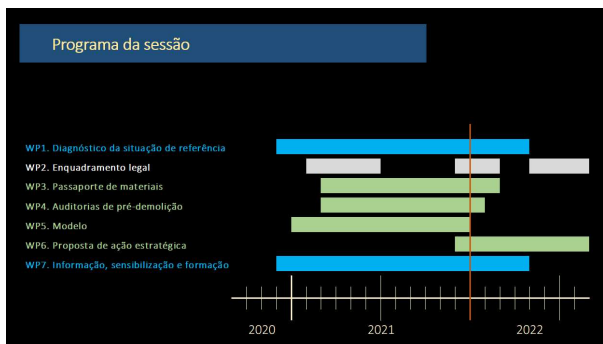
Mário Ramos
Me., estudante PhD

Lia Vasconcelos
Professora

Filipa Ferreira
Me., estudante PhD

Gestão dos resíduos
Resíduos de construção e demolição

Governança e literacia
Ações de participação



Exemplo 1

A MATERIAL PASSPORT FOR A HOME:

MATERIAL	QUANTITY	REUSABILITY INDEX	AVAILABILITY
Concrete piles	50,000 kg	4	4
Concrete foundation	14,000 kg	4	4
Distilled glass	75 kg	4	4
Glass	1,500 kg	4	4
Reused window frames	200 kg	4	4
Bam wood	2,000 kg	4	4
Concrete ground floor	21,000 kg	4	4
Concrete system floor	100,000 kg	4	4
Wooden roof structure and facade	2,000 kg	4	4
Red tiles	4,000 kg	4	4
Sand stone back	50,000 kg	4	4

<https://www.metabolic.nl/news/circular-economy-materials-passports/>

Auditorias de Pré-demolição

Resultado do WP4: Guia de auditorias de pré-demolição

Proporcionar um exame cuidadoso e sistemático do edifício a reabilitar/demolir, de modo a identificar e fornecer uma estimativa dos materiais a recolher, tendo em vista a sua reutilização, reciclagem e encaminhamento adequado.

(Des)construir para a Economia Circular

LNEq

(Des)construir para a Economia Circular

Descrição gráfica da modelos

Ficheiro de parametrização

Modelo matemático (escrito em GAMS).

Resultados da otimização.

cimbal LNEq NOVA Instituto de Ambiente e Qualidade RDP CERTEJA IDNE ENVIROS