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(De)construct for Circular Economy

(Des)construir para a Economia Circular

WP 3 – Materials Passport

Activity 3.3 – Stakeholder's consultation for the validation of the Materials Passport

WP 4 – Pre-demolition audits

Activity 4.2 – Stakeholder's consultation

Stakeholders: Municipalities

Workshop occurred on the 1st of February of 2022

Final report

8th of March of 2022

Operador do Programa: REPÚBLICA PORTUGUESA AMBIENTE E AÇÃO CLIMÁTICA

Promotor: cimbal COMUNIDADE INTERMUNICIPAL DO BAIXO ALENTEJO

Parceiros: LNEG, NOVA SCHOOL OF SCIENCE & TECHNOLOGY, POLITÉCNICO DE PORTALEGRE, RESIALENTEJO E.I.M., Smart Waste Portugal, RDF CONSTRUÇÕES SOCIEDADE IMOBILIÁRIA, LDA., cercibeja, IDN, ENVIROS

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Operador do Programa: REPÚBLICA PORTUGUESA AMBIENTE E AÇÃO CLIMÁTICA

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1. Introduction

This report is part of the (De)construct for Circular Economy project, promoted by CIMBAL, and it concerns the workshop held with the municipalities of Baixo Alentejo region on the 1st of February of 2022. The workshop is part of work package (WP) 3, activity 3.3 - Stakeholder consultation for the validation of the PM and of WP 4, activity 4.2 - Stakeholder consultation. The organization of the workshop was supported by FCT NOVA, as part of WP 7 - Information, Awareness and Training, and therefore is also part of activity 7.2 - Participatory actions for municipalities and construction companies.

As these are new tools, both material passports and pre-demolition audits raise practical implementation issues, so stakeholder consultation is essential to identify opportunities, constraints, and conditions for success, with the following objectives:

- Integrate recommendations and outcomes of stakeholder interactions into tool development wherever possible;
- Elaborate recommendations that can be included in the circularity strategy for the construction sector, which will be developed within WP6 and is an important outcome of the project.

The report presents the results of the participatory activities carried out in the workshop, and is structured in the following sections:

- Introduction (current section);
- Participants, programme and dynamics of the workshop (section 2);
- Results (section 3);
- Recommendations and conclusions (section 4).

2. Participants, programme e workshop dynamics

The 13 municipalities of Baixo Alentejo Intermunicipal Community (CIMBAL) were invited to participate and collaborate in the project, through emails sent by CIMBAL and LNEG.

Considering the work to be developed and the objectives of the session, LNEG requested each municipality in Baixo Alentejo, in addition to the project interlocutor, the participation of technicians from the following areas of inspection and urban planning.

Table 1 shows the 9 municipalities and the 27 employees participating in the workshop.

Table 1 - Participating municipalities and collaborators

Municipalities	Name of participants	Function
Aljustrel	Elisabete Benedito Rita Lança	Environment Urbanism
Almodôvar	Nelson Santos Luís Marques Nadine Caldeira	Head of the Organic Unit of Environmental Management, Public Hygiene and Green Spaces Project and supervision of public works Project and supervision of public works
Alvito	Joana Isabel Coelho	Forestry Technical Office
Castro Verde	António Simões António Angelino João Arsénio Sara Romão Natália Pacheco Miguel Alhinho	Civil Engineer - Head of Environment and Public Spaces Division Municipal Inspector Municipal Inspector Environment Urban Planning Technician Architect - Head of Division of Works and Urban Management
Mértola	Vera Batista	Environment
Moura	Ana Poeiras Pedro Ângelo João Cavaqueiro	Environment Designer and licensing officer Municipal inspector
Ourique	José Vairinhos Luís Silva Inês Ramos Heliodoro Delfino	Environment Engineering Architect in the licensing area Fiscal
Serpa	Ana Franco João São Brás Hélder Victória	Leader: Architect Architect Senior Technician Environment
Vidigueira	Sara Brito Joaquim Godinho Rui Alhinha Marta Silva	Environment Civil Eng. Municipal Tax Senior Officer for Municipal Policies for Housing and Urban Rehabilitation

The session was structured in two, according to the objectives for the presentation and feedback gathering from the participants about the two tools under development within WP3 - Material Passports and WP4 - Pre-demolition audit guides (table 2).

Table 2 - Workshop programme - Municipalities

10.00 – 10.10	Welcome and presentation of the workshop programme and work in parallel rooms
10.10 – 10.25	**Presentation of the material passport model (plenary)**
10.25 – 10.30	Q&A
10.30 – 10.50	Working in parallel rooms • Opportunities • Constraints • Conditions for success (internal and external)
10.50 – 11.05	Presentation of the results of the work in parallel rooms (plenary)
11.05 – 11.20	**Presentation of the model of pre-demolition audits (plenary)**
11.20 – 11.25	Q&A
11.25 – 11.45	Working in parallel rooms • Opportunities • Constraints • Conditions for success (internal and external)
11.45 – 12.00	Presentation of the results of the work performed in parallel rooms (plenary)
12.00	Closing

After detailed presentations of the tools and a short question and answer period in plenary, the participants were distributed into different rooms, moderated by one or more project partners (table 3).

Table 3 - Distribution of participants per virtual working room

Room 1	Room 2	Room 3	Room 4	Room 5
António Simões António Angelino João Arsénio Sara Romão Natália Pacheco Miguel Alhinho - Castro Verde Municipality	Ana Poeiras Pedro Ângelo João Cavaqueiro – Moura Municipality	Elisabete Benedito Rita Lança - Aljustrel Municipality	Nelson Santos Luís Marques Nadine Caldeira – Almodôvar Municipality	João São Brás Hélder Victória - Serpa Municipality
Vera Batista – Mértola Municipality	José Vairinhos Luís Silva Inês Ramos Heliodoro delfino –Ourique Municipality	Sara Brito, Marta Silva, Joaquim Godinho, Rui Alhinha - Vidigueira Municipality	Joana Isabel Coelho Alvito Municipality	Joaquim Duque - LNEG
Cristina Rocha – LNEG	Paula Duarte – LNEG	Mário Ramos – FCT NOVA	David Camocho Ana Gonçalves – LNEG	Rui Silva – CIMBAL

Room 1	Room 2	Room 3	Room 4	Room 5
Ana Catarina Lopes – CIMBAL	Filipa Ferreira – FCT NOVA	Graça Martinho – FCT NOVA		
Ana Carolina Queirós – FCT NOVA				

The discussion and joint reflection between the participating municipalities and the project partners were guided by a template, developed for this purpose and with relevant issues in structuring the feedback collection according to the experiences and needs of the participating municipalities.

For both, the material passport tool and the pre-demolition audit guide, the questions for sub-group discussion were broadly as follows:

- What are the opportunities and constraints associated with the implementation of the tool?
- Which internal and external conditions are necessary for the successful application of the tool by companies?

It was the task of the partners to animate the debate and record the ideas proposed by the participants.

Once again in plenary, the results of the parallel rooms were presented, and a debate was promoted.

3. Results

After the workshop, LNEG team analysed the ideas recorded in the templates and organised them by eliminating repetitions and including other comments that emerged in the plenary session. In order to systematise the results obtained, the following dimensions associated to opportunities, constraints and conditions for success were considered:

- Technical;
- Economic;
- Environmental;
- Legal;
- Competencies.

3.1. Materials passport: results of the discussion in working groups

Table 4 shows the results of the discussion of the working groups regarding the tool under development in WP3, the materials passport.

Table 4 – Opportunities, constraints and conditions for success identified by the municipalities - materials passport

Opportunities	
Technical	• In new buildings it is easier to apply this material passport • Allows better knowledge of the characteristics of the materials • Allows the compilation of various materials • Available technical information can be a base of information. • It will make it possible to organise the existing information in each municipality, classifying the constructions by period, for example decades, and characterising the construction techniques and the type of materials. • In addition to the waste management plan, the passport can be included and adjusted throughout the construction • Link to existing information • In the new building it can be part of the project • Some registration and some material recoveries are already done (in the historic centre of Mértola) - opportunity for buildings with heritage value. The public ones are already recovered, pass the word to the private ones • New works - information survey in the project phase • More useful in the remodelling of buildings
Economic	• Good opportunity, materials are being used for landfill or paths, it is rare to try to reuse.
Environmental	• It is important for the municipality to know what materials make up the buildings • Good opportunity, materials are being used for landfill or paths, it is rare to try to reuse.

	• Useful information for the designer (i.e., better 'sustainability' decisions for new projects) • Promote the use of building materials that consider reducing water consumption • Knowing what materials, you have (regarding recyclables and non-recyclables) makes it easier to manage the materials and the waste itself • You will have some interest effectively in the recycling issue because using the materials in their original physical form is very difficult to be reused (material removed from the construction site).
Legal	• The tool is complementary to the issuance of the habitability document
Competencies	• -
Constraints	
Technical	• It is difficult to apply to older buildings • Complexity this characterization can have (sometimes difficult to find the information and transpose information to the document) - Operationality of the tool (can be a bit dense) • For existing buildings, it is difficult to identify materials • Reuse of materials has constraints in private contractors' works. Reuses are for sub-bases. • Reuse potential stated today may not be real in future i.e., window frames - thermal concepts evolving • Difficulty in proving the use of materials (considered at design stage), at works stage, in private works (although easier to prove in public works) • Possible difficulty of registration for composite materials • Identification of materials (i.e., metals - discriminate the type of metal; same for wood - several types of wood) • Building rehabilitation (i.e., age of materials, which makes registration difficult) • From an engineering point of view there should be more information about materials • Difficult to implement in old buildings • Information has to be available throughout the lifetime of the building
Economic	• The result of using the tool (products for reuse) may not meet the demand. There is also the issue of material quality • Cultural constraints - people usually prefer new
Environmental	• -
Legal	• Municipalities cannot monitor information
Competencies	• Trained staff available to input the information • Lack of technical capacity of contractors to fill
Internal conditions for success	

Technical	• Useful information to enhance the reuse of building materials in direct labour works (or even in other types of works - private/public) • It can promote the creation of building material banks, for later re-use • More applicable to public buildings • Easier to do for large works. In the case of small works, they (companies) already have the concern of doing the separation and forwarding to the adequate place.
Economic	• -
Legal	• The passport can be part of the building process and available at the municipality. • Question: include in the procedures the obligation to fill in this passport? Possible to put in the specifications, but then comes the operationalisation part. • Possible to implement in terms of internal regulations
Competencies	• Human Resources • Sensitisation of the political wing (the whole board and the parish councils themselves) - fundamental, if they don't exist it will be difficult to have sufficient human resources, which will condition operability • Parish Councils are closer to implementation - sometimes they have knowledge that we (the municipality) do not have • Training and awareness raising of human resources on this issue
External conditions for success	
Technical	• Support from the municipality in disseminating the tool to companies, given their willingness to do so
Economic	• Reused products are cheaper
Legal	• It would work better if it is imposed by legal provision
Competencies	• Awareness-raising of construction companies • Training and availability of contractors • Changing mentalities • Involvement and motivation of all those involved in the construction sector, in the various phases (project and work), to make the tool effective

From the analysis and debate generated in the session, for the materials passport, considered by all participants as a tool with potential for the sector, several **opportunities** related to its implementation were identified. In technical terms, this tool is considered relevant in characterising, organising and registering relevant information of the materials that constitute the buildings. The tool will have a better applicability in new buildings and in refurbishments.

The passport, by registering technical information, can be a basis for organising the existing information in each municipality, classifying the constructions by period of time (i.e., decades), and characterising the construction techniques and the type of materials.

The passport also makes it possible to establish a link to existing information in the licensing and construction process and makes information available throughout the useful life of the building.

In economic terms, the tool may be relevant in promoting the reuse of components and materials. Currently, these end-of-life products and materials are destined for landfill or filling of roads and paths.

Regarding environmental factors, the passport promotes the use of more sustainable products by designers, facilitates the management of these resources at the various stages of the life cycle, facilitating re-use and leading to more efficient recycling.

From a legal point of view, the tool is complementary to the issuance of the habitability document for buildings.

In terms of **constraints**, and on a technical level, the characterisation of materials and products can be complicated due to the difficulty of access to the necessary information and its transposition into the fields of the tool.

In the case of existing and older buildings, as well as at the rehabilitation level, it will be very complicated to have the necessary information, which may make its application unfeasible.

In the medium/long term, there may be significant context changes and that may make the information less relevant; the reuse potential declared today may not be real in the future, as it is the case, for instance, of window frames (thermal concepts evolving).

The identification and characterisation of some materials, like composites, might be a challenge and maybe the tool could integrate more information on materials.

Another challenge will be to prove the use of the materials (considered in the design phase), in the construction phase, mainly in private works.

As regards economic factors, the promotion of reuse of materials and components may not be aligned with the demand for these, mainly for cultural reasons, as there is a general preference for new items and a perception of the quality of these items.

From a legal point of view, municipalities cannot supervise the information. Being a non-mandatory tool, the responsibility for the data lies with the author of its completion.

The identification and systematisation of the necessary information requires trained and available personnel, and it is currently considered that there is no technical capacity of the contractors for an efficient completion.

Conditions for success were also identified for the implementation of material passports. Internally, it is necessary to create and promote banks of construction materials, for later reuse.

The availability of useful information may enhance reuse, mainly in direct administration works (or even in other types of works - private/public). In general, the applicability of passports will be more successful in public buildings and large works.

From a legal point of view, integration into the licensing process will be important. The passport could be part of the building process and available in the municipality, or even integration in the specifications, or a possible

implementation in terms of internal regulation of the municipality, although its operationalisation could be a challenge.

Regarding competences, it is necessary the existence of human resources with competences allocated to this activity, the awareness of political decision-makers and the integration of parish councils in the process, due to their proximity on the ground.

Externally, it will be important the support of municipalities in disseminating the tool and raising awareness among construction companies, the training and availability of contractors, the change of mentalities and the involvement and motivation of all stakeholders in the construction sector, in the various phases (project and work).

A legal imposition would be an important factor to ensure the implementation of material passports.

3.2. Pre-demolition audits: results of the working groups discussion

Table 5 presents the results of the working group discussions regarding the tool under development in WP4, pre-demolition audit guides.

Table 5 – Opportunities, constraints and conditions for success identified by municipalities - pre-demolition audit guide

Opportunities	
Technical	• It will be easier to apply the guide in works where the developer is a public entity and in non-funded works • Interconnection with other documents, i.e., legal framework for urban regeneration (RJRU in Portuguese) and waste management plan • Creation of a municipal centre for the collection and storage of materials/products • Development of an Auditors' Stock Exchange
Economic	• Reduction of waste management costs • Improved management of municipal resources • Reduction of workers' health costs through better identification of hazardous materials
Environmental	• Increased reuse rate • Increased recycling rate • Better characterisation of construction and demolition waste • Better material characterisation and quantification
Legal	• -
Competencies	• -
Constraints	
Technical	• Difficulty in quantifying and characterising the materials, especially in older buildings • Risk of the auditor not being able to do the audit with impartiality, total freedom, objectivity and without constraints from other stakeholders • Difficulty in finding specialised labour • Lack of solutions for the storage of products and materials and waste in the municipalities resulting from deconstruction

	• Lack of accessible laboratories for the characterization of materials, including hazardous materials in the region • Not applicable to buildings in a state of ruin
Technical	• Increased construction costs for the private and public developer (time, labour, payment of auditors) • Financial availability of the municipality, to contract an external auditor • Lack of speed and higher costs for products/materials resulting from deconstruction (combined with payment for necessary interventions for reuse) is critical for success and can lead to purchase of new materials • Cost of storage and transport of products and materials • New material is often cheaper
Environmental	• -
Legal	• Stricter legislation in force limits the use of reused products from older buildings • Lack of clear definition of the responsibility of each municipality throughout the life cycle of the building • Who validates the integrity and results of the audit?
Competencies	• Lack of training of auditors • Difficulty in finding external auditors with experience in the municipalities • Lack of training and awareness of the municipalities' human resources
Internal conditions for success	
Technical	• Start by exemplifying the application of the pre-demolition audit guide on a public construction site • Interlinking with other construction documents, including material passports • Creation of a municipal collection, sorting, and storage centre for materials/products • Definition of the scope of application of pre-demolition audits
Economic	• There are incentives at municipal level: reduction of urban taxes, of the license fee or another fee for the owner of the work, for those who do a pre-demolition audit (if this is optional) • Purchase of more efficient equipment with greater capacity: computers, for example • Reduction of transport costs through the creation of a centre for the collection, sorting, and municipal storage of materials/products • It is fundamental to reduce costs with the time to complete and develop the audit - reducing labour costs
Legal	• -
Competencies	• Training and raising the awareness of municipalities' human resources • Training and awareness-raising of politicians
External conditions for success	
Technical	• Creation of flexible storage spaces • The guide should be implemented by auditors from outside the municipalities

	• Validation and certification of products/materials removed from the site and going for reuse
Economic	• Tax incentives at central administration level: for example, on Municipal Property Tax, VAT- Value Added Tax, others • Establishment of a schedule of fees by area ranges for auditors
Legal	• Existence of a policy for taking back materials and products that come out of deconstruction • Legal imposition (obligation) to apply the guide • Identification of who carries out the verification of the demolition project on site (e.g., site managers)
Competencies	• Auditor training and awareness • Training and awareness for contractors, architects, designers, etc...

Regarding **opportunities**, only the technical, economic, and environmental categories were identified in the session. At the technical level, it is indicated that it will be easier to apply the guide in works where the owner is a public entity and in non-funded works and that it is a great opportunity for the creation of a municipal centre for the collection and storage of materials/products taken from selective demolition. The opportunity for interconnection with other documents was also pointed out, for example with the Legal Regime of Urban Rehabilitation (RJRU) and aligned with the waste management plan. It was also indicated as an opportunity for the development of an Auditors Stock Exchange.

In economic terms, it was referred the possibility of decreasing costs due to a better waste management, better management of municipal resources (technicians' labour) and decreasing costs in workers' health due to a better identification of hazardous materials that may exist in the buildings.

At the environmental level, it was observed that through a better identification, characterisation and quantification of the materials, there will be a better knowledge of the materials in the building site and a higher reuse and recycling rate, with a positive effect associated to the decrease of materials and products sent to landfill. It will also enable a better knowledge about the production of construction and demolition waste (CDW).

Concerning the constraints, there were mainly technical constraints followed by economic ones. At the technical level there was great concern about the fact that it is difficult to quantify and characterize the materials, especially in older buildings, where it is unknown what materials / or products may exist due to lack of documentation, as well as the lack of laboratories accessible for the characterization of materials, including hazardous materials in the region.

Another constraint was the absence of municipal solutions for storage of products and materials and waste resulting from selective demolition. Another very important aspect at the technical level is that there is difficulty in finding skilled labour in the region. Thus, there is the risk that the auditor is not able to do the audit with exemption, total freedom, objective and without constraints from other stakeholders, since there may be close relationships between the actors linked to selective demolition.

In economic terms, the biggest constraint was the increase in costs, not only due to the increase in construction costs for the private and public developer (time, labour, and payment to the auditors), but also

the cost of storage and transport of products and materials, but also the availability (liquidity) of the municipality to hire an external auditor. The lack of speed and higher costs for products/materials resulting from deconstruction (combined with payment for the interventions necessary for their reuse) is critical for success and can lead to the purchase of new materials. New material is often cheaper.

On a legal level the concern was that the current stricter legislation limits the use of reused products in new buildings taken from older buildings (for example in the case of windows) and that there should be a clear definition of the responsibility of each municipality throughout the life cycle of the building. The question was also raised: who validates the integrity and the results of the audit?

From the point of view of the required competences, it was pointed out the need for training of the auditors, as there is difficulty in finding external auditors with experience in the municipalities and the need for training and awareness raising of the human resources of the municipalities.

Concerning the **conditions for success at the municipality level** it was indicated at the technical level the need to have interconnection with all the construction documents, including material passports and that the application of the pre-demolition audit guide in a public work should be exemplified. It was also indicated that a centre for collection, sorting and storage of materials/products should be created at municipal level, which could also bring cost reductions for the municipality, given that it belongs to the municipality itself and thus will not pay storage costs.

It was also pointed out in the economic part, that there should be incentives at municipal level regarding the reduction of urban planning fees, the license fee, or other fees for the owners of construction sites, for those who do a pre-demolition audit (if this is optional). The purchase of more efficient equipment with greater capacity: computers, for example, is also an expressed need to carry out the activities more efficiently, which is also important to reduce the costs with the time to fill out and develop the audit - and, therefore, with the reduction of the cost of labour. Another very important aspect was the need for training and awareness raising among the human resources of municipalities and politicians, to explain the benefits of its application and increase motivation for the application of the guide.

Regarding the **external conditions for success**, all categories were indicated. On a technical level it is very important to have storage space for the materials, for example on an inter-municipal level, if this is not possible to be municipal, and that the creation of storage space can be flexible, i.e., allow other functions. Another very important aspect mentioned was the need for validation and certification of the products/materials taken from selective demolition. There should be the possibility of using a certification company for that purpose.

The possibility to have compensatory tax incentives at central administration level: for example, in IMI, VAT, others, was indicated at economic level, as well as the need to establish a schedule of fees per area ranges for auditors.

At the legal level, the existence of a take-back policy for materials and products that come out of the selective demolition, the legal imposition (mandatory) for the application of the guide and the identification of who does the verification of the demolition project on site (site managers), were also aspects considered very important. Regarding the need to improve skills, it was highlighted the need for training and awareness of

auditors and contractors, architects, designers, i.e., all actors involved in the activities of selective demolition and implementation of the guide.

4. Recommendations and conclusions

This workshop revealed a clear added value for the further development of the WP3 and WP4 tools of the (De)Construct for Circular Economy project.

4.1. Materials passport

To conclude the development of the tool, the following conclusions were drawn from the workshop:

- The tool was considered by the municipalities as an important element in the valorisation of the construction sector, acting at the level of construction materials and products, thus promoting the improvement of the sustainability and circularity profile of buildings, both in their initial construction phase, by promoting more efficient materials and products, by raising awareness of the various actors for the adoption of a life cycle thinking, and by promoting the valorisation of these materials and products at the end of their life, promoting their reuse and a more efficient recycling;
- It is important that the information necessary for the implementation of the passport is related to information already existing in the design phase;
- Since the use of materials foreseen in the project is not always materialised in the construction work, the tool should foresee the filling in by the entities involved in both phases;
- In the identification of the materials, it is important to discriminate different types of metals, woods, etc.;
- It is necessary to somehow ensure that the information is available throughout the useful life of the buildings;
- To address the lack of technical capacity to fill in the tool (and the registration of composite materials was identified as a critical aspect), it is necessary that the guide is didactic enough to fill in that gap;
- The need to ensure compatibility and synergy between the materials passport and the pre-demolition audit guides was also confirmed.

As recommendations for complementary activities, namely at the level of the circularity strategy for construction in Baixo Alentejo:

- Municipalities have a key role in the implementation of the passports, both in promoting and raising awareness for their adoption by designers, builders and owners, as well as the interconnection with the remaining tools and procedures associated with the licensing and registration process.
- In a first phase, municipalities should play an active role in the promotion of passports, also acting as a demonstrator, applying the process in public buildings, thus demonstrating its viability and associated benefits;
- Having as a major goal to promote the reuse of materials and products in the medium/long term, it is necessary to create an integrated system that allows to enhance their use/reuse in the construction of new buildings or rehabilitation;
- Thus, the creation of centres for depositing materials for reuse and the availability of detailed information, demonstrating the benefits of their use, should be ensured, so that the passports are appealing;
- The training of the various actors involved in the implementation of the tool is essential, so training sessions should be promoted for designers, contractors, municipal technicians, waste management

bodies and other actors who, in some way, may be involved in the preparation of material passports or benefit from the information contained therein;
- It should be considered how to integrate this tool in the already existing procedures, namely in the municipal regulations of urbanization and building or, at least, its elaboration should be a recommendation;
- In a medium/long term perspective, it is important to create in the municipalities, a registration system of the passports and its availability to the actors who will benefit from this information in the future.

4.2. Pre-demolition audits

For the pre-demolition audits the following conclusions were drawn from the workshop:

- It was considered an excellent opportunity for a better identification, characterisation and quantification of the materials and a stimulus to increase the reuse and recycling rate, with a positive effect associated to the decrease of materials and products sent to landfill. It will thus enable a better knowledge of the materials on site and the production of construction and demolition waste (CDW), with obvious improvements in environmental terms;
- There is great concern about the fact that there is difficulty in quantifying and characterising materials, especially in older buildings, where it is unknown what materials / or products may exist due to lack of documentation, as well as the lack of accessible laboratories for the characterisation of materials, including hazardous materials in the region;
- The opportunity for interconnection with other documents was also pointed out, for example, with the Urban Rehabilitation Legal Regime (RJRU) and with the materials passport and aligned with the waste management plan;
- Cost is a major concern, both due to increased construction costs for the private and public developer (time, labour and payment to auditors), and due to the cost of storage and transportation of products and materials; this is compounded by the need for financial availability (liquidity) of the municipality, to hire an external auditor. The lack of speed and higher costs with products/materials resulting from deconstruction (combined with the payment of the interventions required for their reuse) is critical for success and can lead to the purchase of new materials. New material is often cheaper;
- Lack of storage sites and conditions for materials removed from selective demolition, was a very indicated constraint and may make the reuse of materials unviable.

As recommendations for complementary activities, namely at the level of the circularity strategy for construction in Baixo Alentejo:

- It is absolutely necessary to create storage sites at municipal or inter-municipal level in order to re-use the materials/products and that the creation of this storage space can be flexible, i.e., that it allows other functions in order to reduce costs. It should be taken into account that the reuse of products/materials may be reduced for spatial reasons and recycling in this case will be preferred;
- Consideration should be given to the possibility of reducing urban taxes, the license fee or other fees for the owners, for those who do a pre-demolition audit (if this is an optional instrument), and/or there are compensatory tax incentives at the level of central administration (for example, in IMI, VAT or others);

- Given the fact that it is difficult to quantify and characterise materials, especially in older buildings, where it is unknown what materials and/or products may exist due to lack of documentation, the possibility of mapping the type of construction and type of products/materials in buildings, by decades, at municipal or inter-municipal level, should be considered;
- The development of a pool of auditors for Alentejo region should be considered, since it is difficult to find external auditors with experience in municipalities;
- It is essential to promote information, awareness and training actions aimed at municipal staff, auditors, architects, contractors, building owners, and other actors who may somehow be involved in the implementation of the guide for pre-demolition audits, in the selective demolition activities of buildings or benefit from the information contained therein. It is absolutely fundamental that the auditors have training that allows them to have the knowledge to fill in the guide;
- The participants agree with the possible obligation at national level to implement the guide, with definition of the scale for application of the tool and with the requirement to apply the guide in all public works;
- It should be discussed and defined at municipal and/or national level who validates the integrity and results of the audit and who should validate and certify the products/materials removed from the construction site and going for reuse;
- It should also clearly define the responsibility of the municipality throughout the life cycle of the building and for both tools;
- There is also a need to have a national policy that captivates and promotes the reuse of materials taken from deconstruction, since new materials are still accessible in terms of cost and quantity on the market.

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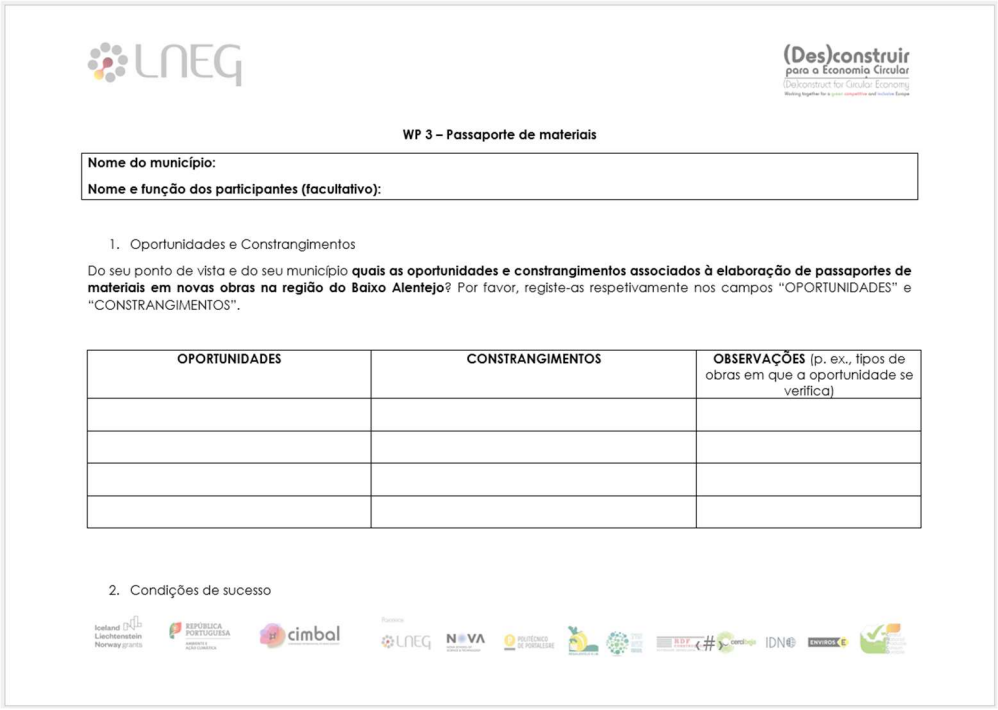
Acknowledgements

The project team would like to thank all the municipalities and their representatives for their active and constructive collaboration in the workshop and hopes that the tools presented here and the project in general will be useful for the development of their work, in line with the principles of circularity and sustainability in Baixo Alentejo region.

ANEX I – Collecting feedback in the working groups - Templates

Template for the materials passport



WP 3 – Passaporte de materiais

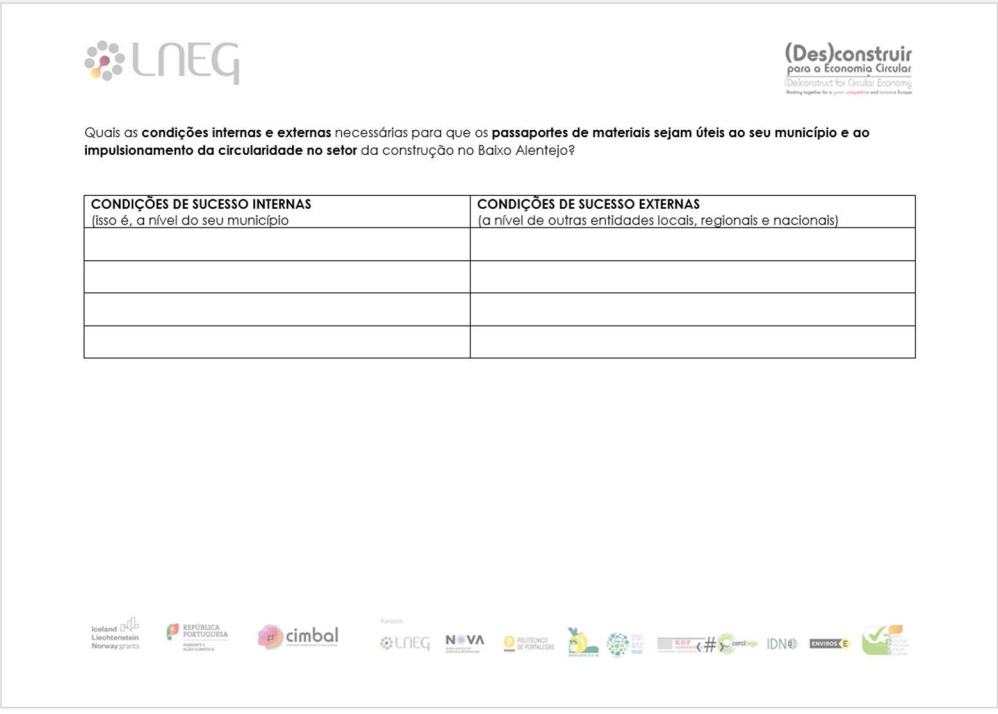
Nome do município:
Nome e função dos participantes (facultativo):

1. Oportunidades e Constrangimentos

Do seu ponto de vista e do seu município **quais as oportunidades e constrangimentos associados à elaboração de passaportes de materiais em novas obras na região do Baixo Alentejo**? Por favor, registe-as respetivamente nos campos "OPORTUNIDADES" e "CONSTRANGIMENTOS".

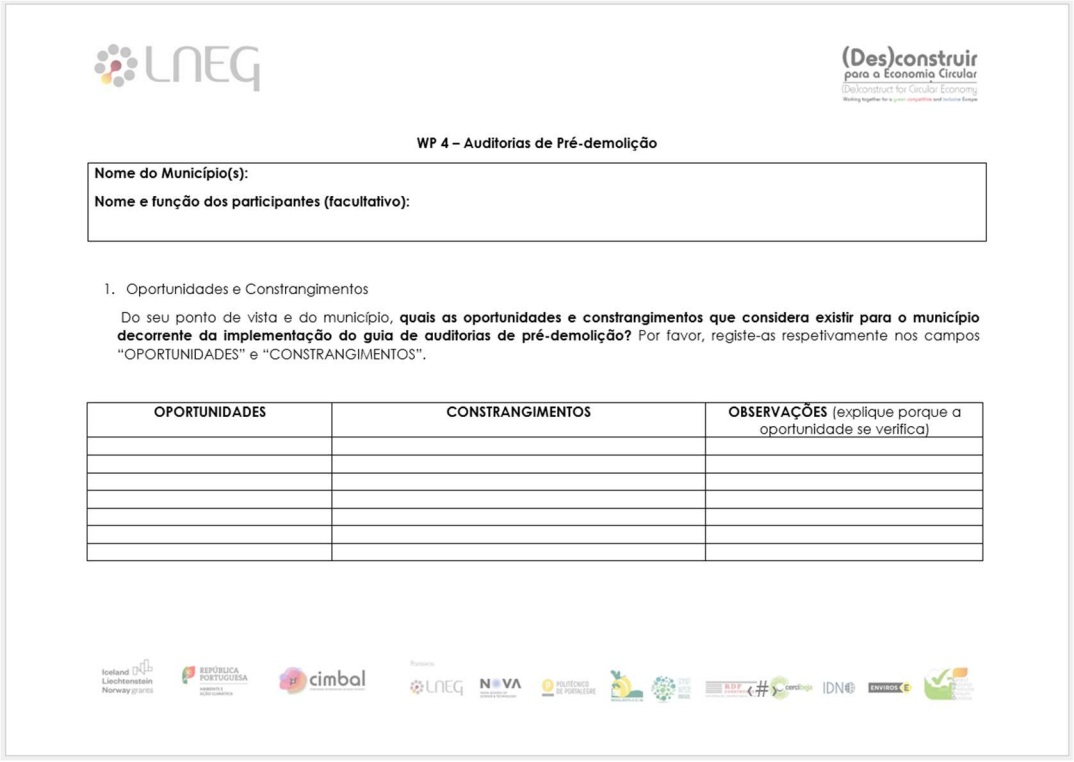
OPORTUNIDADES	**CONSTRANGIMENTOS**	**OBSERVAÇÕES** (p. ex., tipos de obras em que a oportunidade se verifica)

2. Condições de sucesso



Quais as **condições internas e externas** necessárias para que os **passaportes de materiais sejam úteis ao seu município e ao impulsionamento da circularidade no setor** da construção no Baixo Alentejo?

CONDIÇÕES DE SUCESSO INTERNAS (isso é, a nível do seu município	**CONDIÇÕES DE SUCESSO EXTERNAS** (a nível de outras entidades locais, regionais e nacionais)



WP 4 – Auditorias de Pré-demolição

Nome do Município(s):
Nome e função dos participantes (facultativo):

1. Oportunidades e Constrangimentos

Do seu ponto de vista e do município, **quais as oportunidades e constrangimentos que considera existir para o município decorrente da implementação do guia de auditorias de pré-demolição?** Por favor, registe-as respetivamente nos campos "OPORTUNIDADES" e "CONSTRANGIMENTOS".

OPORTUNIDADES	**CONSTRANGIMENTOS**	**OBSERVAÇÕES** (explique porque a oportunidade se verifica)

Quais as **condições internas e externas** necessárias para que os **passaportes de materiais sejam úteis ao seu município e ao impulsionamento da circularidade no setor** da construção no Baixo Alentejo?

CONDIÇÕES DE SUCESSO INTERNAS (isso é, a nível do seu município	**CONDIÇÕES DE SUCESSO EXTERNAS** (a nível de outras entidades locais, regionais e nacionais)

ANEX II – Session photos