



European Union
European Regional
Development Fund

ACTION PLAN

for Lazio Region, Italy

**Construction & demolition waste management
policies for improved resource efficiency**



**REGIONE
LAZIO**

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1. General information

Project:	CONDEREFF
Partner organisation:	LAZIO REGION
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2. Background

2.1. Introduction to CONDEREFF project

Construction and demolition waste (CDW) are the most voluminous waste streams generated in the EU. The European Commission's initiatives in the field of the circular economy, together with the European Union's protocol on waste management in construction and demolition (C&D), have triggered some European regions to improve their waste management policies for more sustainable growth. "CONDEREFF - Construction waste management and demolition policies to improve resource efficiency" project was born in this context with the support of Interreg Europe.

This action plan document is part of the activities of CONDEREFF project, which aims to accelerate policy work on construction waste management and demolition (CDW) and improve resource efficiency in the partners countries through the exchange of experiences, different studies on C&D waste, transferring lessons learned and the implementation of an action plan. The CONDEREFF project brings together 8 partners from 7 countries for the exchange of experiences:

Country	Partner
	Polytechnic University of Valencia (UPV)
	Region of Thessaly (RoT)
	Auvergne-Rhône-Alpes Energy Environnement Agency (AURA-EE)
	The Regional Development Agency of the Pardubice Region (RRAPK)
	Italian National Agency for New Technologies, Energy and Sustainable Economic Development Lazio Region (Lazio)
	Styrian Provincial Government – Department 14 – Water management, Resources and Sustainability (STYRIA)

2.2. Justification of the action plan activities

The Condereff project has been granted in the framework of the Interreg Europe Programme 2014 – 2020, Category 4. Environment and resource efficiency, Specific objective 4.2. Improving resource-efficient economy policies.

In fact, it pursues the overall objective to accelerate the European regions' policies for the efficient management of the resources present on their territory and it contributes to such goal by focusing on the improvement of the existing policies on the sustainable management of waste from Construction and Demolition, following the indications of the EU Protocol on the management of C&D waste¹. The project thus intends to support the integration of the EU protocol's provisions into the territorial policies to **strengthen the transition to the circular economy** by increasing the efficient use of these resources.

To allow a region to implement policies that increase the use of this waste, it is necessary **to increase its "circularity" by facilitating a market that, in addition to strengthening the existing reuse sectors, finds new production outlets.**

In order to increase the reuse of C&D aggregates in the market, the EU Protocol indicates that two main objectives must be achieved to increase:

- I. **Confidence in the C&D waste management process and**
- II. **Confidence in the quality of C&D recycled materials.**

Only by reaching these two goals can we hope that C&D recycled products can find significant commercial outlets.

To increase confidence in the C&D waste management process and in the quality of the materials recycled, the EU protocol proposes **to improve the quality of 5 essential areas that involve all the supply chain's players:**

- I. Identification of waste, source separation and collection;
- II. Waste logistics;
- III. Waste treatment;
- IV. Quality management;
- V. Policies and regulations.

The regional application of the existing best practices at European level in these areas would allow to create the necessary confidence in the market to launch recycled products from C&D waste.

¹ [Protocollo UE per la gestione dei rifiuti da costruzione e demolizione](#). September 2016

C&D Waste in Italy

At National scale, according to the data elaborated by ISPRA (National Institute for Environmental Protection and Research) on the separate collection of the main commodity fractions, the volume of municipal waste from C&D between 2015 and 2019 increased in line with other types of special and non-special waste, passing from 350,000 t. in 2016 to 429,000 t in 2019². Such waste is mostly identified as "inert" with codes 170107 and 170904 (non-hazardous mixtures of cement, bricks, tiles and ceramics and non-hazardous mixed waste from construction and demolition).

As of 2018, 65.5% of the total construction and demolition waste (not only urban) is disposed of in landfills for inert waste, 32.3% in those for non-hazardous waste and the remaining 2.2% in landfills for Hazardous waste³.

In 2018, at national level, the total number of operational landfills for the disposal of aggregates according to the classification provided for by Legislative Decree 36/2003, consisted of a plant park of 149 landfills (48.1% of the total operating plants), a number gradually decreasing in the three-year period 2016 - 2018⁴, which disposed of 4.2 million tons.

Most of these plants are concentrated in Northern Italy (98) while in Central Italy they are present only in the Lazio Region (11).

The state of the art in Lazio Region.

In the Lazio Region in 2018 - according to the Ispra⁵ Report - 441,171 tons of C&D waste, the largest regional dimension nationally - were disposed of in the appropriate landfills, divided as follows:

- 422,093 t in landfills for aggregates
- 19,078 t in landfills for non-hazardous waste
- 0 t in landfills for hazardous waste

The **Waste Plan of the Lazio Region**, recently approved by **Regional Law in August 2020**, identifies the "crushing" as the critical phase of the entire process to obtain a good quality product from the recycling of C&D waste, which is structured as follows⁶:

- Quality control of the incoming material;
- Preliminary separation of the fine fraction, which is not used for crushing;
- Particle size reduction (crushing);
- Separation of metals;
- Refining;
- Removal of the light fraction.

² [Rapporto Rifiuti Urbani. Edizione 2020](#) ISPRA pagina 37

³ [Rapporto Rifiuti Speciali. Edizione 2020](#) ISPRA pagina 122

⁴ Ibid. pagina 154

⁵ Ibid. pagina 155

⁶ Regional Waste Management Plan of the Lazio Region page 305.

According to the plan, by recycling construction and demolition waste it is possible to produce a material that can replace:

- road foundations that is the part underneath the road pavement, which must be protected from the action of water and frost;
- foundations for industrial buildings;
- road superstructure and aprons;
- environmental recovery that is for the restitution of degraded areas for productive or social uses through morphological remodeling;

In addition to these main uses, the Plan also provides for the possibility of using C&D waste in the environmental restoration of mining activities and recycled aggregates for the morphological restoration of quarries in Lazio, for the continuation of the activity, as well as within the mining basins.

However, the Plan also underlines that, at present (2020), **the C&D materials recovery sector intercepts only 9%** while the consolidation of a virtuous system that allows 70% of the C&D waste to be recycled and reused at the same prices of natural aggregates would lead to a reduction in the costs of conferring waste from C&D.

Basically, the Lazio Region Waste Plan identifies the impossibility of obtaining a quality product from the recycling of C&D waste mainly in a technical problem (crushing) and in the scarcity of reuse sectors the difficulty in increasing the market for recycled products.

This second aspect would be confirmed by the fact that in Lazio Region a substantial part of C&D waste is stored due to the crisis in the recycled aggregates market linked to that of construction.

Among the other obstacles identified so far at national level that put a brake on the development of the circular economy of C&D waste, as well as for other types of waste, there is the failure to issue **Ministerial Decrees on the End of waste**, inherent to the legal regulations concerning the cessation of the qualification of waste at the end of a process that allows it to return to play a useful role as a product⁷.

In February 2020, the draft of the **Ministerial Decree for 'the End of Waste of C&D waste'** was sent to the Council of State. The next steps for its approval will be the opinion of the Legal Affairs Department and finally the evaluation of the Court of Auditors, which will be followed by publication in the Official Gazette⁸.

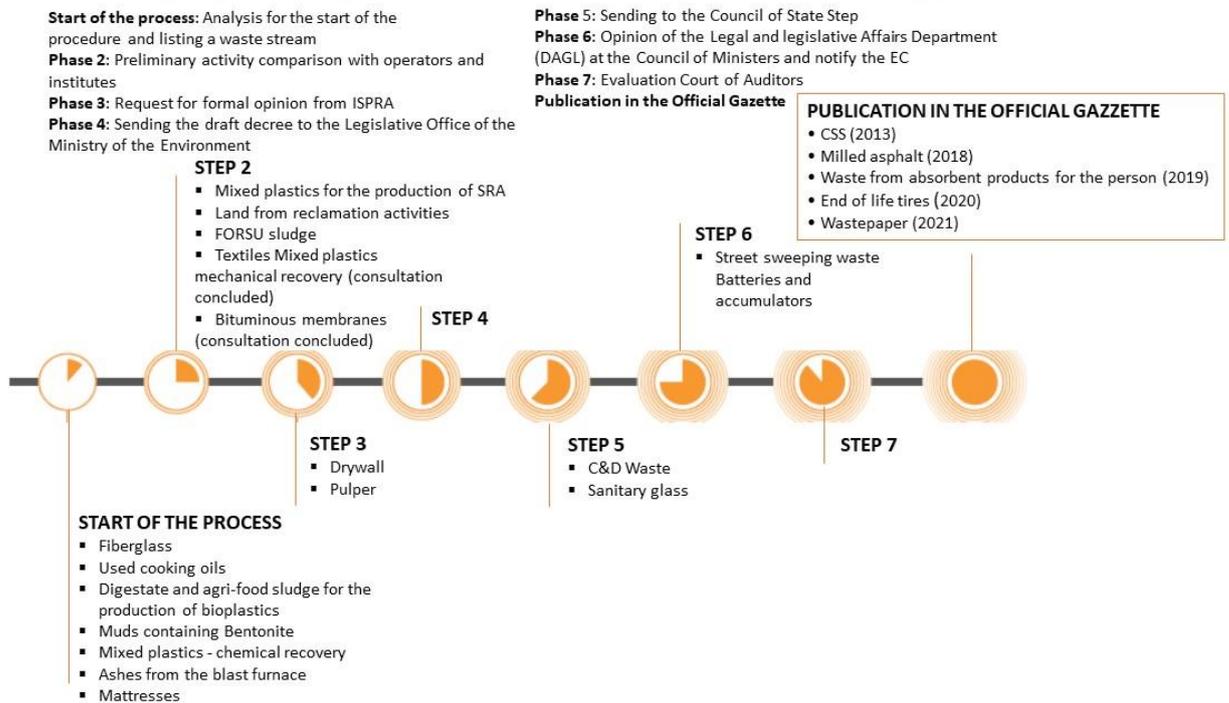
On the other hand, in 2020, two Ministerial Decrees for the End of Waste, highly anticipated measures regarding end-of-life tires and wastepaper, were finally approved.

The Figure below, taken from the 3rd Report on the Circular Economy in Italy, indicates the progress of the process of the End of waste decrees in Italy in February 2021 which shows that C&D waste is just missing two phases before publication in the Official Gazzetta for being recognized as not waste.

⁷ [3° Rapporto sull'Economia Circolare in Italia 2021](#). Circular Economy Network. Pagina 70

⁸ Ibid. pagina 71

Table 1. Steps of the End of Wastes Decrees and state of the art at February 2021



As noted in the "2020 Recycling Report"⁹, despite the recycling of C&D waste presents a series of undoubted advantages for all the players in the supply chain involved and for the environmental sustainability, there are still bottlenecks that do not allow the development potential of the sector. Among these, the Report lists:

- **Distrust in the use of products derived from waste**
- Lack of reliable data on the production of C&D waste
- Lack of updated technical tools (Tender Specifications)
- **Poor source separation of waste and use of selective demolition practices**
- Lack of taxation of mining
- Lack of prohibition or obligation to contribute for landfilling of C&D waste
- Transfer test provided for in Annex 3 of Ministerial Decree 186/06
- Obligation to carry out analyzes for waste sent for recovery / recycling
- Adoption of the End of Waste criteria
- CE marking
- GPP

Much of these bottlenecks preventing the potential development of C&DW management have been addressed by the Condereff project which, starting from the 5 areas indicated in the EU Protocol to be improved in order to achieve the dual objective of increasing confidence in the C&D waste management process and in the quality of C&D recycled materials, **proposes Good successful Practices for European regional administrations.**

⁹ [Rapporto del Riciclo 2020](#). Fondazione per lo Sviluppo Sostenibile. Pagine 168-172

The participative process of Phase 1

Following the Methodology and the Integrated Approach of the project's Phase 1, Interregional learning sessions were organized in presence both in the Lazio Region and in Valencia while the following two in Czech Republic and Austria were organized by remote due to the Covid 19 pandemic that struck since early 2020 when Phase 1 was still ongoing. All these sessions were introduced by Input Papers with the goal to delineate the policy, economic and technical context of the main thematic dealt with by the workshops.

The **first meeting was the International workshop** organized in **Valencia** by the Universitat Politècnica de València on the following thematic: CDW demolition audits supervision and documentation. The thematic focus was dealt with by the presentation of different Legal and regulatory framework levels of maturity across the EU taking into account the existing cultural barriers and the role of the Green Public Procurement in Circular Economy in each project partner country: Germany, Spain, Austria and Italy.

The main conclusions of this session comprised:

1. **Mainly lack of regulations concerning the waste management.**
2. **The Administration's involvement is essential for the right functioning of the Circular Economy.** Is essential to increase the interest of the administration to regulate the situation of the illegal uncontrolled landfills. For this purpose, civil service must demand technical documents (study of waste management in licenses) that guarantee a correct waste management in construction sites and demolitions.

The Session was an opportunity for the project partners and their stakeholders to introduce some experiences and good practices such as the **Pre-demolition audits as a tool for an eco-effective management of CDW.**

The second Meeting was the Interregional Learning session organized in the Lazio Region in September 2019. The input paper drafted by the ENEA introduced the Meeting focus on "Using public procurement as a driver for resource efficient C&D waste management".

The main conclusions of this Meeting were:

1. The legislation on sustainable waste management has consistently developed in recent years in each partner countries of the Condereff project, both at national and regional level. **The principles of EU directives on waste management and those contained in the circular economy package have been transposed in each country legislative framework.** However, **the application of these principles are rather difficult as detailed specification concerning the terms and experience of real case are still missing.**
2. The potential of the public procurement as driver for efficient reuse in C&DW management is very high considering its rate in the national GDP in most European countries. To effectively impact as leverage for the spread and up-to-market of C&DW materials, **the tendering needs to include all the necessary criteria of sustainability and better define the qualitative terms used.**
3. **The use of a Guide to reuse and recovery waste**, as in the case of the Saxony-Anhalt's for the mineral waste **may help to face the challenges set by the public procurement** to reduce the existing barriers to the establishment of recycled building materials in the market as much as possible in order to create the same marketing opportunities for recycled building materials.

Concerning the Lazio Region's state of the art, emerged that it **adopted the green procurement with materials recovery to the earthquake of 2016 in Amatrice and Accumoli (Lazio Region), following the provision of the concerned EU Directives and in view of the Circular Economy package.** By the way, In Italy there is a national coordination on the public procurement contracts and the GPP, led by the Consip as contracting authority and market maker. The minimum environmental criteria have been introduced in the public procurement for all the categories of goods and services in the electronic market by the CONSIP. However, **in the case of CDW management, there are not yet sufficient and detailed criteria introduced.**

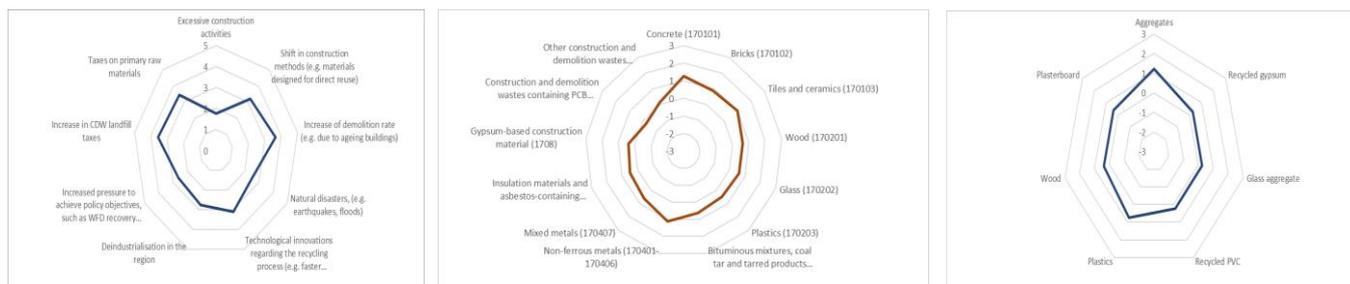
However, at regional level in Italy the autonomous decision taken by any single regional authority for the timing to release the authorizations to the private companies, represent an obstacle to the use of GPP and a bottleneck to the market uptake of recycled materials, since there is no certainty for the enterprise to invest. Therefore, **an up-to-date Regional Guide for the Management of C&DW that considers all these needs emerged would produce a potential positive impact on the regional economy.**

As Condereff project aims at strengthening the public administration of the partner countries involved, taking into consideration the principles of the EU protocol on CDW management to encourage the transition towards the circular economy, the exchange of a Good Practice on Regional Guide for the Management of C&DW, **would represent a positive impact for the Lazio Region waste policy.**

During the III Steering Committee Lyon 15 October 2019 the AURA-EE presented the "Analysis of the available and required C&D recycling capacity in the project territories" (A 1.3), aims to **survey the existing CDW recycling capacity and future CDW recycling requirements** that could emerge from present construction and relevant economic activities. The analysis enables to delineate **policy changes regarding regulations, infrastructure development, stakeholder involvement, and awareness-raising actions relevant to CDW recycling capacity.**

The **outlook of Lazio region** contained in the study presented the following data:

- 6 million of inhabitants, 27Mt of CDW generated in the AuRA region in 2016 (8,9t/hab), level of confidence medium
- The category "Other" weighs around 40% of total, while the three main categories namely "Other", "Soil", and "Bituminous" weigh 71,4% total
- Lazio region exports 8kt and imports 2,4Mt of CDW from other regions for treatment
- The total CDW treatment capacity is of 81,7Mt per year, and boils down to 30Mt if we consider exclusively CDW plants, no data is provided regarding the number of plants
- The recycling rate is 76,2% in 2016 and includes backfilling operations
- **Neither specific legislation fostering the use of recycled aggregates nor incentives for recycled aggregates or taxes for CDW landfilling are in force**, the implementation of environmental criteria in the call for bids is quite low
- Awareness campaigns are in preparation



The Key Learnings of the Analysis were:

- Difficult to get reliable data, challenges of classification and data reporting, difficulties to determine the volume of wastes generated per category in the sense of the EU codes
- CDW recycling capacity varies between countries, the region of Valencia is far below the need, while Lazio and Styria exceed. For others, no data is provided on the capacity, only the number of plants
- The main drivers in the future quantity and composition of CDW are the increase of demolition rate (ageing buildings) and the increase of construction activities and landfill taxes (to a lesser extent, technological innovations, improvement of recycling processes and taxes on primary raw materials)
- **The future demand for recycled materials is expected to increase slightly**
- The shyness of stakeholders to express on future trends vouches for the high level of complexity and uncertainty that the C&D sector is experiencing, a global lack of visibility
- All countries have adopted a waste framework policy, a landfill legislation, and a secondary raw material legislation either at national or local level, **now the topic is about their implementation**

In November 2020 a Workshop on the best practices for the regulatory framework's enforcement was organized in Styria (A 3.3) with the focus on the Exchange of Good Practice to implement the legal framework in the field of C&D activities, as it was titled the Input paper prepared by the Austrian partner.

The paper introduced the State of the Art in Europe on Regulations, Laws and ordinances regarding the C&DW Management and the best experiences to implement them at National, Regional, and local level. Moving from the EU Protocol, existing sectorial guides were dealt with in the Paper, with a particular emphasis on those from Styria. A very interesting one for the Lazio Region was the "Austrian government's "Guide to determining the end-of-waste status in the preparation for reuse", filling the gap left by the EU Waste Framework Directive (WFD) on the vague procedure to define the end of the legal waste status of products after having gone through the waste treatment process of preparation for reuse. In fact, the **Guide contains general rules, criteria, and principles as well as detailed checklists for certain product groups, mainly electric appliances, furniture and similar products for household use.** It is widely accepted and used by local and regional waste authorities as well as reuse enterprises. Unfortunately, specific checklists for construction elements and materials do not yet exist but

could and are planned to be added within the existing structural framework of the guideline in the future as soon as funding is available.

Good practices on C&D W management presented during the workshop by the Styrian Government were those directly involving the Public sector, such as:

Public bodies as incubators: Moving from the fact that public bodies in Austria own or manage a huge number of buildings, they are also responsible for a huge share of the total procurement budget and therefore represent a target groups in different roles and various options. The Austrian Government has been implementing target actions as an incubator of innovation regarding the sustainable management of C&DW:

- Efficient use of materials within their buildings that can potentially serve as secondary raw materials and/or reuse elements.
- Laying the structures to define criteria for procured products
- Using Public procurement as an incubator for new markets, new services, and new approaches to identify innovative, more resource efficient ways to fulfil requirements in the building sector.
- Incorporating the issue of environmentally friendly construction in their strategic planning and documents

Social Urban Mining: Urban mining is a widely used technical term to describe the use of resources that are not taken from natural sources but out of built (usually urban) environments during demolition processes. Circular Economy aims at making this type of resource mining the predominant one. One of the most important objectives of circular economy is the highest value retention of products and components for as long as possible. If these products or components cannot be kept within their original place or context of use, this **requires careful manipulation of every single piece or component** and usually cannot be done mechanically and this requires **human expertise and manual labor on-site**.

To balance the high labor costs with the revenues is usually very difficult under present given market conditions. Therefore, it is helpful **to generate extra added value to the process**. This can be done if the **manual work is combined with social integration of people that are disadvantaged on the first labor market**. In many countries this integration procedure is conducted by **specialized social enterprises offering not only integration and training in a real-time job environment, usually with common market wages for the workers, but also training on the job as well as special attention and support for solving individual social problems of various kinds thus helping people to regain confidence and self-esteem and finding their way back to regular employment and a life in dignity**. Of course, such people are normally less productive than average workers, but this is usually compensated by state subsidies to still guarantee standard wages, depending on the level of social problems in every case.

On the assumption above, the Austrian Government cofounded the project named **BauKarussell** the first Social Urban Miner. This intervention bases on:

- The economic values of deconstruction buildings
- Influencing the planning of the deconstruction phase
- Realizing recovery-oriented demolition
- Results in reuse of building materials and high value recycling

- Supporting Austrian building owners in fulfilling their legal obligations defined in Recycling material ordinance & standard ON B 3151
- Integration of social businesses in operational activities

The strengths of the project are also given by the: 1) opportunity of selling reuse building parts in an online application (licensed German bauteilnetz); 2) Education/Train the trainer lectures services provided for target vulnerable groups.

Finally, in February 2021 a Policy and Industry Symposium on Promoting and Incentivizing Reuse of C&D Waste was organized by the Czech partner RRAPK on a virtual Meeting in Pardubice. In the Input paper drafted by the Regional Development Agency of the Pardubice Region, interesting recommendations were indicated to the target subjects as policy and industry actors to overcome the barriers identified by the project as preventing the sustainable management of C&D W to flourish.

Three thematic sessions were organized to deal with the main single bottlenecks identified. The discussions focused on how to enable the value chain actors to overcome the main obstacles encountered to foster the management of C&DW in a sustainable way and stimulate an enabling environment for CDW reuse, recycling, and recovery.

A very interesting presentation was made by the **Green – Tech Cyrkl**, a Central European leader in the field of Circular Waste Management. This firm created **Cyrkl.com**, which is one of the biggest waste trading Marketplace in CEE and presented the **Rebetong project**, a secondary product by a High recycled content from C&D, reused for new innovative construction. Rebetong is produced based on joint research by Skanska, **Skanska Transbeton** and **ERC-TECH** according to **patent No. 307 741**.

Rebetong, Czech patent has the potential to revolutionize the construction industry globally. The material has similar properties to concrete but uses natural rubble instead of natural aggregate. All this thanks to **joint research and nano – technology**. Rebetong can help to solve the huge problem with construction and demolition waste that normally ended up on landfills. This patent helps the environment with CO2 production, for example by extracting raw materials and transporting raw materials. Furthermore, you can save money by using construction waste as a secondary material in Rebetong instead of expensive raw materials. Rebetong also saves money considerably due to the material's characteristics because it has a **lower conductivity coefficient and thus low energy consumption**.

Currently company has **certificates and standards for transport concrete and prefabricated walls, on the basis which Rebetong officially produce**. Material is ready to become a full-fledged part of construction of houses, foundation structures or even the underlying road layers.

A new national standard must be developed to enable concrete to be used up to 100% recycles and to promote wider use. This is being continuously worked on in cooperation with the Ministry of the Environment and Industry and Trade.

This is indeed a Good Practice for Lazio Region as Legislative and Planning Authority for the waste management as **it suggests at the legislative level the reuse of first second materials in new market sectors and on the other hand the opportunity to plan the financing for the realization of new patents for second materials derived from C&D W in the light of the future approval of the End of Waste Decree for C&DW**.

Stakeholders Meetings and political Feed-back

During the Project's Phase 1, 5 stakeholders' meetings were organized plus a political meeting hosted by the Regional Commission on Waste organized by the Commission President, the Regional Councilor Mr. Marco Cacciatore, to focus on Condereff's potential impacts on the Lazio Region policy on waste management.

The first Stakeholder Meeting was organized in the premises of Lazio Region to present the Condereff project objectives, methodology and future outputs. The meeting was widely participated by the Lazio Region staff from more Departments concerned in the project focus and future results, such as: Waste Dep., Economic Programming Dep. Productive Activity Dep. Among the several stakeholders who took part in the first meeting, there were the most important companies present in our region working in the C&DW sector; Associations of firms operating in the management sector of C&DW; University Departments working on the waste management and consumers' associations.

After the first meeting dedicated to the project's goals dissemination, a second meeting with the stakeholders was organized, in which the regional policies on waste, the fulfillment of European directives such as the Waste Directory and the Circular Economy Package were exposed by the technical staff of Lazio Region. Finally, the results of the first interregional meeting held in Valencia were reported by the staff who participated to that session. **Important feedbacks from the participants were discussed during the meeting and collected to be reported in the future Project's Meetings. Topics dealt with were the national policies on GPP, on the End of Waste Decrees and the future Waste Plan of Lazio Region.**

The third Stakeholders' Meeting was organized to expose in detail to the stakeholders the EU protocol on C&DW management and the potentials to integrate its principles in the Lazio Region policy on waste. The fourth and fifth SMs were organized mainly to report to the stakeholders the findings and outputs from the virtual workshop on best practices for the enforcement of the regulatory framework organized in Styria and the Policy and Industry Symposium on Promoting and Incentivizing Re-use of C&D Waste organized by the Czech partner RRAPK.

Finally, a session of the Regional council committee on waste was organized in May by the President of the Commission "Waste" of the Lazio Region Council to face the Condereff results reached and how to integrate them into the Regional Policy on waste. A selection of the Good Practices collected during the Phase 1 of the project from the project partners were introduced to be discussed among the participants, composed by the stakeholders (companies, associations of target firms and consumers' associations representatives) and politicians. The list of good practices taken into consideration and discussed during the session were necessarily shortlisted by the collection of all the GPs presented by the project partners in the A 4.1 official document since many of them were not considered potentially transferable in the Lazio region context or difficult to implement in the project's Second Phase.

The session of the Regional council committee concluded with the expressed need to update the participants in a future meeting. The companies' representatives mainly claimed the need to update some regulations such as the regional tariff system for the transfer of aggregates to landfills. However, what emerged among the priorities for the Lazio Region was the need to update the existing Regional guidelines for the management of C&DW, dated to 2011, with the integration of EU recommendations and possibly with toolkit to facilitate their fulfillment by the actors of the value chain.

All these meetings were very useful for the regional staff involved in the project to understand what orientation CONDEREFF could have in order to impact the regional policy on C&D waste management. For example, for the last meeting organized at the Regional Council, an input

paper was prepared in which the aims of the project, the principles of the Protocol and how these could be integrated into the recently approved waste plan were briefly described. Although no clear indications emerged from the participants to the meetings regarding a specific good practice from the project partners to be transferred to Lazio Region, it emerged unequivocally that our region lacks updated guidelines regarding the management of C&D waste and that this lack could be filled by taking a cue from some good practices presented by Condereff partners who instead produced very detailed guidelines on this waste sector.

Providing clear indications to all the players in the supply chain at the regional level helps to increase trust both in recycled products and in the recycling process. Furthermore, **to fill the gap of lacking clear updated references both within the regional waste plan and within the existing guidelines approved ten years ago, represents a priority for a region that intends to face the circular economy challenge.**

Now, we are going to present the process through which Lazio Region has analyzed and shortlisted the Good Practices selected by the project partners to submit them to the stakeholders and the Regional politicians to have a feed-back for their potential transferability into the regional policy.

Short survey of other partner’s best practices eligible for Lazio Region

To be selected, a best practice should hence meet most, if not all, the identified evaluation criteria that had been clearly stated during our project’s phases. It should also meet other general criteria such as relevance, community participation, stakeholder collaboration, ethical soundness, replicability, effectiveness, efficiency, and sustainability.

Sustainability in Buildings and Construction



Coupled with that, we, at Lazio Region, after being grateful to foreign partners for the help in locating this unavoidable and classical pattern for the managing of CDW, had been particularly impressed by those many real-life examples and success stories, among others, as we’ll subsequently underline, above all by those using various digital tools for the managing of CDW projects as described in quite a few of the submitted best practices. Taking into account the

above-mentioned framework, the following best practices had been valued to decide if applicable or inappropriate for our Region's needs:

The free online application designed by Comunidad Valenciana to assess ex ante the amount of waste generated by waste production in C&D projects and to provide guidance on how to manage it.

The application stems from the practical need to manage and evaluate deconstruction processes upstream in the province of Valencia. This demand, especially from entrepreneurs, represented a true green development in C&D waste management processes, given the growing urbanisation process (Valencia capital being, as concern CDW amounts generated, the third most important city after Madrid and Barcelona). Brussels's demands for innovation were met, in the past, same as in the Lazio Region, by fragmented institutional communication or, at best, dated one. Against this background, the IVE (*Instituto Valenciano de la Edificación*), a publicly co-funded research body, with thirty years of history in working for the sustainable development of buildings in the Valencia region, has developed an opensource digital tool for waste management by C&D, structured broadly as follows:

Once a personal account has been registered and created, you will activate 'my project', which will ask data to be entered such as: Draft, Type and quantity of CDW generated, conservation arrangements, utilization forecasts, budget. In turn, one of these tables will show more detailed sub-entries. For example, under the heading "Project" there will be other spaces to be completed such as "volume in m³ of excavated or moved soil", "nature of demolition: residential building or industrial building, etc." "if new construction is carried out", "building plot", etc.

At the end of the simulation by inserting all or part of the parameters, the system will generate a 'waste table' for each operation in tonnes per m² (NB: *Tonelada* in Spain is equivalent to 1 334.269 kg). Of course, other parameters such as storage and transport should also be included. Other additional features are quite interesting: The first is that the application does not take into account waste considered 'non-inert' for which only the Director of Works will be responsible and, given the sensitivity of compliance, of its isolation, reporting and inclusion in the special documentation required by the legislation in force. Additional indicative tags guiding the user in the management of CDW are also provided. For example, for the "differentiation" phase, the system will automatically choose the lock-in option "in situ", while for directly recyclable materials, the system indication will be "transport to the specialised facility". According to our simulations, the system also offers a useful geolocation of treatment plants available in the vicinity of our yard with appropriate much digital mapping. The result of the simulation will be a rough estimate with an overall table of costs which will take account of the costs of separation and storage at the site, transport to authorised firms and storage at the latter. Finally, the application will allow us to download a final document, in friendly docx World format, which will be our project feasibility study.

In our view, the interest of this Spanish application, as an overlapping best practice, lies in the simplicity of use and its basic design, which, in practice is intended not only to help the designer/director and, consequently, also the contractor/constructor to comply with the regulatory requirements, but above all contribute to reach a broad a market view related to the production of waste resulting from his deconstruction work. The final price generated by the application, which will include also sub-costs such as separation, transport and storage combined with the specific characteristics of the materials, will make it possible to calculate the actual value per tonne of our production, which will then have to be compared to the market

value of similar products, but also to the market value of virgin products which, up to today, represent the most striking comparator value.

The application that was presented in various specialised workshops and fairs such as the Valencia international 'CERISAMA' application for ceramics and bathroom architecture manufacturers (an important production sector also in our Region), etc. has been defined as 'essential' by various professionals. This practical contribution, or part of it, offered by our Valencian project's partner could certainly find use in similar projects that are in the planning state here in Lazio.

Styria's Guide on Construction and Demolition Waste

In 2015, Austria adopted specific and advanced legislation for the management of C&D waste, which includes, among its main objectives, the re-utilisation of inert products from a market perspective as well as assuring a guarantee of the quality of materials. The Waste Management Framework Act dates back to 2002, whereas since 2016 federal legislation has been equipped with a quality control and management tool, the Austrian ÖNORM B 3151 standard to be followed for each deconstruction project. At first sight, the legislation and implementing guidelines appear to be in the same way as those of neighbouring Germany, which are rather centralised. In order to harmonise all regulatory and procedural outputs of the Federal Government, in 2020 the Land of Styria published its own Waste Management Guide (www.baurestmassen.steiermark.at) with a broad title that does not restrict its use to those working in the sector. In contrast to the French examples, this is not an interactive portal with hyperlinks for simulation or localisation, but rather a series of suggestions, guides and management examples. Despite its static nature, Styria's online CWD guide is intuitive, concise and, despite the multiplicity of arguments, there is no risk of having a maze effect from one tag to another. Furthermore, all regulatory requirements and operational strategies have been explained, including examples and simulations of various situations (sizes, locations, etc.). A form and advice for a business plan draft is also provided.

As regards advice on the development of a new "Public Procurement Code", which is requested from UE, and often highlighted in the documentation and formalised, as we recall, in CONDEREF's institutional participants' intentions, the contribution of this guide is not particularly innovative if compared, for example, with the French partner's suggested guide from l'Orée. Contractual obligations still seem to be evolving. For example, the Guide suggests the use of specialised institutes as an alternative to direct control by the local authority of the PA of any polluting elements. That will be certainly more difficult to transpose, at least for the near future, in our Lazio Region.

At first glance, we are certainly dealing with of a customer-friendly approach, which, despite technical and regulatory suggestions, seeks to drive the designer, the director or the entrepreneur towards not only an environmentally friendly mentality, but also towards a practical and sound management. A number of points have been addressed again and in a more simplified way, giving an overview of the requirements useful also to non-professionals. Given the rather good general situation in Styria and the constantly updated legislation, it is possible to consider this guide, also in view of its clear exhibition, as another source from which, after a comparative analysis, some useful insights in the management of C&DW can be drawn for our territory as well. However, the sectoral legislation of both the Republic of Austria and Styria appears to be rather rigid, albeit very advanced, compared with those resulting from the Italian procedures. For these two reasons in particular, this excellent Austrian contribution would be quite difficult and, above all, very long to be applied in our territory.

CYRKL digital second hand products and waste market from the Czech Republic

This is certainly a useful and conspicuous best practice. In simple words Cyrkl (www.cyrkl.cz) is a sort of eBay or VINTED marketplace reserved for the waste market and, in short, a direct sell resource for companies or individuals who want to buy or sell their own waste or surplus production from construction or deconstruction projects. Cyrkl, also sponsored by the local Circular Economy Institute was born as start-up of young entrepreneurs whose CEO is the visionary, Cyril Klepek, who presented her company to us during the web meeting organised by our Czech partner on 25/02/2021. This brand-new mode of selling and purchasing waste is already widely used in Central Europe. The system is not limited to matching supply and demand but monitors and analyses the waste generation of the potential seller in terms not only of commercial value but also of potential savings for the future buyer or user, with an environmental impact (CO₂ emissions, etc.). The dedicated portal also provides good case studies of companies that have, through Cyrkl, not only met the circular economy criteria but also earned money from their C&D wastes.

The graphic design and functions of the sales portal are those used for buying or exchanging between private individuals, from eBay to Chinese giants such as Ali Baba or Ali Express with product categories, photos of the product, quantity and cost associated with possible transport modes with a brief description. Everything is viewable in open source and through a search engine by location, range of prices, etc. The offer is free, except usual registration costs and makes it possible to publish announcement for all categories of waste, co-products, recycled materials and surplus building material. Obviously, in the case of non-inertia, the offer and acquisition are allowed only between authorised operators.

Through some short simulations we have been able to check that the prices of products/waste are rather competitive. Among the most common offers, plastics followed by paper and wood. We have, for example, followed the offer from a local firm which placed and therefore successfully reintroduced into the circular system some 90 tonnes of scrap metal, at very competitive price. So far, the portal has brought together 4,680 customers from 60 countries, most recently showing that the initiative is likely to be well received, including some countries outside the original central European market, such as China, the United States and Great Britain. According to the platform, such 're-entry' of products/waste in the circular economy has saved more than 221,000 tonnes of carbon dioxide.

The context in which the sales portal was created is that of a small country, which enjoys some rather advanced laws and shows concrete results such as, for example, the almost complete disappearance of the use of landfills. According to the creator of the portal, the aim is "to make companies aware above all of the economic benefits given that, although the concept of the circular economy is now acquired, there is still a lack of market attractiveness to be associated with this choice".

Without any doubts, the above-mentioned venture could be considered as fascinating one and as real innovative asset but, according to the recent interviews we made, including those aimed at acquiring the valuable opinion of Lazio stakeholders, and above all those with sector entrepreneurs, this best practice doesn't totally fit, at least in the short period, the needs of our Region. According to local stakeholders, the products from C&D waste are still very difficult to sell and the actual or potential market is, in Lazio Region, from a geographical point of view, a very limited one. The entrepreneurs that were interviewed stressed the fact that actual market conditions for those products still do not coincide, here in Lazio, with the propensity to buy from very local customers.

The innovative Rebetong Czech patent for a 100 % degree of recycling material created by Skanska in collaboration with local ERC-TEC

This is another contribution offered, as a best practice, by our central European partner. Skanska, a Swedish multinational construction company operating on a global market and engaged in major works in the Czech Republic, together with the local AG Chemi GROUP, needed, in a recent past, to employ approximately 490.000 tonnes of mining material for a maintenance and repair contract for the main motorways in the Czech Republic, with obvious difficulties, not only of supply, but above connected with the protection of the environment. Other challenges were connected to the difficulty of finding undertakings producing recycling materials at a reasonable cost and the general lack of information on the origin of these materials. The problem was the lack of reliable data on the possible waste from C&D to be reused once the demolition stages had been completed without any help from a waste register. The Rebetong idea is based on these preconditions and increased awareness of circular economics on the part of society and institutions. **The pool of researchers from the two companies developed and patented a nano technology capable of creating cement and concrete made up of 100 % from demolition debris while retaining its original properties.** Considering that this is the solution to use the largest and most expensive part of C&D output (stockpiling, transport, etc.), the idea seems a very good one also given the foreseeable economic savings and impact on the environment. In the United States and in some Scandinavian countries, projects have already been carried out, the supply of which used Rebetong because of the information we gather not only with a brilliant “futuristic” idea, but rather with an optimal and practical application of a circular economy.

While bearing in mind the legal and commercial nature of the patent already in place, the Rebetong example is a good practice that should be carefully assessed for our territory, perhaps by promoting ad hoc research calls based on the same starting needs as the Rebetong concrete. During the last CONDEREFF 5th Stakeholder’s web meeting, held in May, between stakeholders and representatives of Lazio Region institutions, our proposal to fund patents for innovative materials has been welcomed by the entrepreneurs. The Lazio Region representatives also pointed out that, in addition to the funding lines already in place, how the coming Recovery Fund, could provide additional funding for similar patents and start-ups in the context of green economy’s actions.

The French guide “How we can better deconstruct and recycle construction and public works waste

This is the last best practice that we analyse because, as we shall see below, the work from Orée has caught our attention in view of possible future implementations in our territory. It will be considered as a source of ideas for the action plan concerning CDW management for the Lazio Region.

The guide created by Orée, a reference basis for C&D waste management professionals in France, is the result of the participation of various national and local stakeholders, both as financiers and as project supporters. This multi-sectoral guide, a compendium of virtuous case studies, refers, as well, to operators in the sector from a legal, commercial, environmental, and political point of view. The management of C&DW is addressed at 360 degrees also thanks to those who supported the project being this guide such as, for example, the SNCF; DS Avocats, Bouyques etc... In general, it can be inferred from the above initiatives, that private individuals and firms are required to provide know-how and advice as they are involved and listened to by the public authorities, but the final management is always rather centralised. The need for such a comprehensive work, backed by National Institutions, arose also by the fact that the quantity

of C&DW produced in France is very similar to the Italian one, i.e., 70 % of the total wastes. Many points therefore overlap with the needs of our country.

Furthermore, with a view to the full circular economy and the transposition of Community legislation adopted since 1998, the guide analyses the possibilities of legally, culturally and economically transforming the waste paradigm into a 'non-waste' one. France is at the forefront of the implementation of this concept. According to the studies and the subsequent suggestions made by the French stakeholders, a legal frame should be reached according to which, once it has been established that the waste is treated, possibly on site, the site or treatment plant will then be regarded as a production unit to all intents and purposes, thereby negating, de facto, the static concept of 'waste' or 'waste' in favour of the evolving and commercially encouraging 'product'. The International Bar Board, DS Avocats, analyses the rather delicate legal implications of the concept, the development of which would be greatly facilitated by the relaxation and subsequent consolidation of the administrative tasks associated with this well needed novation of the status of waste. This legal innovation strategy connected with the management of C&D waste in view or an access of the final product in the circular economy is certainly another topic to be addressed for further developments to Lazio Region stakeholders and institutions.

Considering the needs of Lazio Region, there is no doubt that the main interest of the guide lies in the management examples, especially in the field of digital innovation, created at a fast pace, supported by the public, and with an easy to use and straightforward approach. For example, the management of French public goods, for which Paris Institutions including neighbouring areas of Isle de France, set up, as early as 2014, a system for the full implementation of European legislation into public procurement contracts, particularly for the benefit of entrepreneurs who implement calls for tenders, have been completely dematerialised.

For the time being, this innovative system is also managed as a kind of kit to incorporate useful tools to help businesses aiming at the best possible use of C&D waste. Another interesting point provided by the guide relates to another need arising from the UE regulations, namely full traceability of C&D waste even during the handling phase.

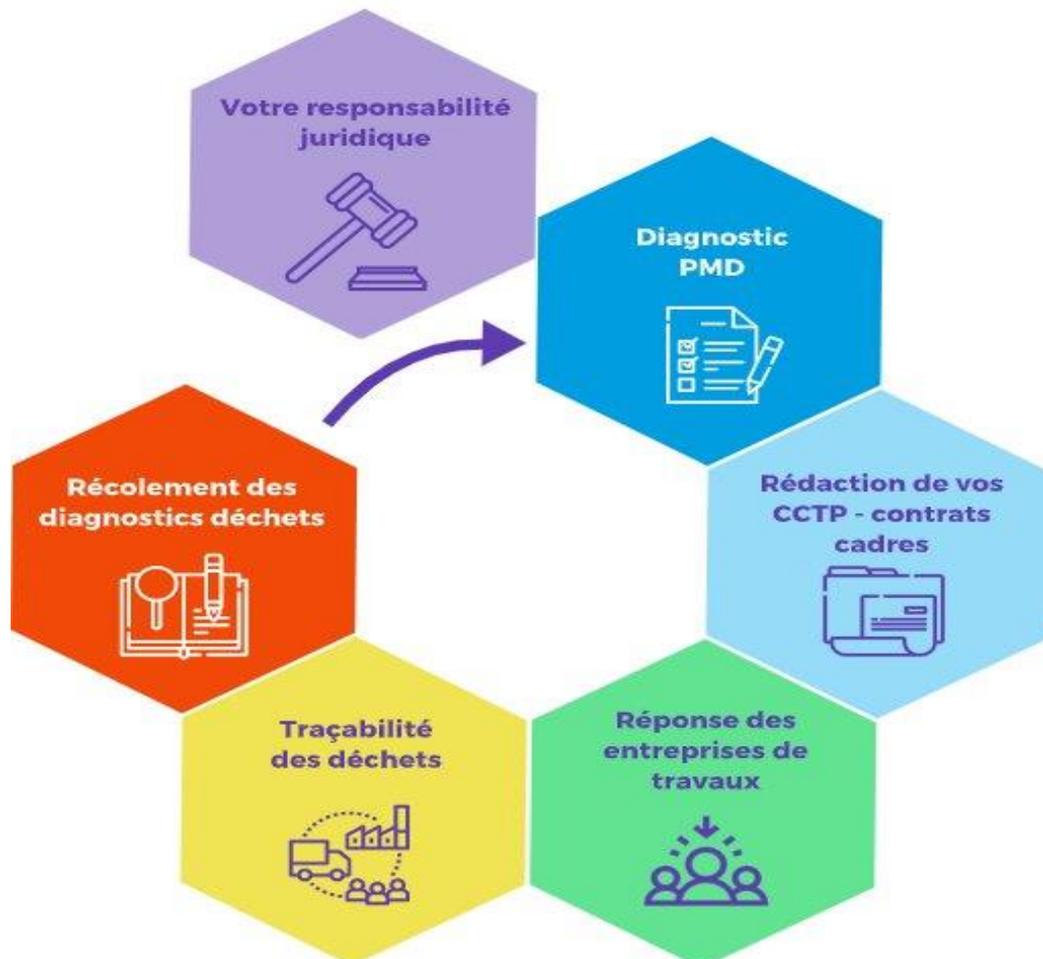
Among the great array of examples and tools included in the Orée Guide we have detected quite a few ones that could be included, almost such as they are, into Lazio Region proposals for an action plan:

Démoclés, a French traceability model for construction waste, whose methodology is being tested in France to be then disseminated abroad. Currently, in France and Europe' separate legislations, there is a real growing awareness among institutional and business stakeholders of the need to develop the concept of the traceability of waste from C & D and to quickly put it in practice. However, although requested by Brussels, this is not, unsurprisingly, yet considered essential by the insiders and this is due to:

- The project manager perception of that very task as a mere regulatory compliance
- The resulting estimates are not always adequate.
- Digital diagnostics specialists are also unlikely to be waste experts.

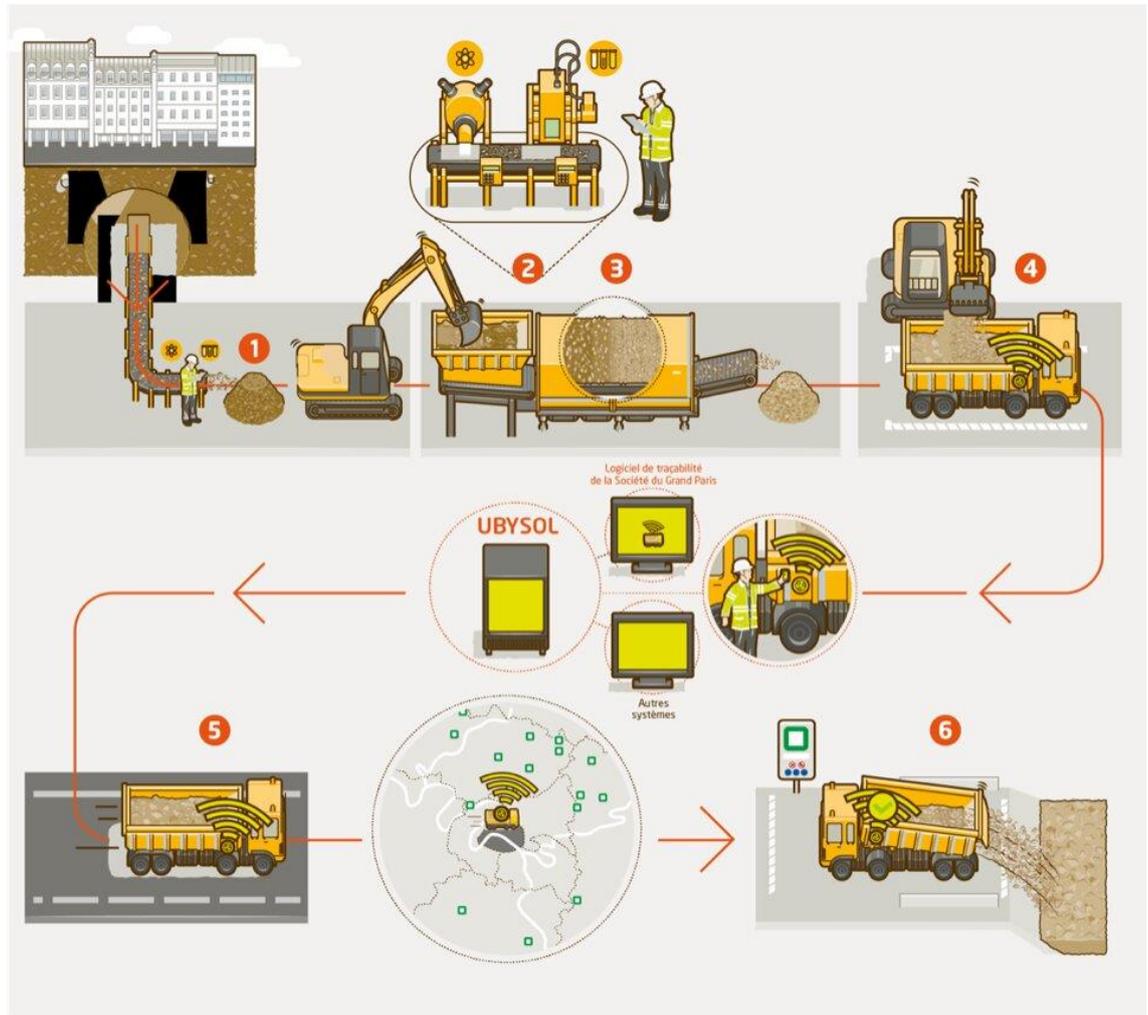
The platform, resulting from the Démoclés project, aims to remedy this 'disconnection' by providing, in addition to straightforward 'digital diagnostic' function, a whole range of IT aids capable of accompanying C&D projects until completion. The so-called "toolkit" included in

Démoclès includes a management guide, about a dozen short tutorials video and 20 Excel sheets making up the official inventory, recently included by Paris in the legislation in force, of the main equipment and materials. By way of example, videos, which are rather user-friendly, accompany the Director of Works, who is now also responsible for the diagnosis, from the preliminary study phase to the on-the-spot survey, the analysis of lighting and energy installations, etc. Finally, the legal, administrative, contractual and market spill-over aspects are also addressed.



Attention has also been focused on an interesting instrument created by Bouygues Travaux Publics SAS, a major industrial group based in the Paris region, active in the telecommunications and building sectors. We are talking about the Ubysol sensor with a tablet application and web interface, which has already been tested, albeit with other functions/purposes, during the building of a new line of the Paris metro with practical application to the transport of inert, hazardous materials and, in general, the totality of waste generated by the C&D.

The Ubysol sensor, once applied to the truck box transporting the waste, will record at the same time a digital accompanying bubble, every movement of the truck load and vehicle box showing and, if any, also unauthorised work and moving. A tool similar to Ubysol could certainly be devised, its compulsory use included in the waste transport regulation of our Region and his access provided through a multi-purpose GIF application which, as we will see in the next paragraphs, is currently being designed by Lazio Region experts.



In the face of budget cuts, increased tax burdens for landfill, and challenging targets to improve recycling, local authorities, all over Europe, are installing or increasing (as is the case of examples offered by the l'Orée Guide which is under study here at Lazio Region) the using of mapping technology to improve the quality and cost of waste collection services, achieve better procurement, and to develop more efficient service partnerships. The amount of waste to be managed, and the speed with which this increase, have implications for the environment and for the costs of managing waste. Example of mapping technology and geo-tracking which, according to the Orée Guide, are used in France by both local authorities and private firms, to analyse and assess property and to plan routes to enable more efficient collection service, and that could be easily reproduced in Italy are for example:

- *Déchets de Chantier* (<https://www.dechets-chantier.ffbatiment.fr/>) aimed, as title said at C&D waste during private housing projects
- *MATERRIO* more aimed at public housing and construction and, as consequence, fit for Lazio Region needs. (<http://materrio.construction/cartographie/index/start.html>)

- *Materiaux Anciens FR* an interesting geolocation service to allow to dispose or collect supposed to be “waste” which is fact is still a real quality product ready to back again in the green economy loop. (<http://bit.ly/21R52e1>).

3. Policy instrument

General Description of the Policy Instrument	
The Action Plan aims to have an impact on:	<p>Lazio Region Start Ups and Industry Patterns future Region’s budget headings.</p> <p>POR FESR Programme (eventually)</p> <p>Recovery Fund</p> <p>Regional and City funds</p>
Name of the policy instrument addressed:	<p>As of 16 December, 25 EU countries and the UK have requested 239 amendments to their existing Cohesion Policy programmes using the flexibilities offered by CRII and CRII Plus. The Commission has modified its internal procedures to allow for a swift treatment of all requests under lighter, faster procedures. The administrative burden has been alleviated through extension of deadlines, enlargement of project. The above-mentioned contributions converge in identifying resource flexibility as a necessary ingredient of the policy responses aimed at mitigating the hurdles and strains imposed by the COVID-19 crisis. These measures had risen sharply after February 2020. Those same measures had an indirect impact in the founding of our programme therefore the impact of CONDEREFF on the policy instrument selected had to be reduced.</p> <p>The regulation framework in which our action plan would fit is:</p> <ul style="list-style-type: none"> - Piano regionale di gestione dei rifiuti della Regione Lazio, Deliberaz. C.R. Lazio 05/08/2020, B.U.R Lazio Supp. 22/09/2020 n.1 - Linee Guida ENEA Raccolta dei Rifiuti - “End of Wastes” Ordinances from Italian Gov.t from the very dated D.M 05/02/98 up to the last of the sectorial Decree at the end of march 2020. Lawmaking not included in recovery measures had, obviously, been slowed down. - Lazio Region expected deliberation

	<p>“End Of Waste” Decrees in Italy as far as February 2021.</p> <p><i>Table 1. Steps of the End of Wastes Decrees and state of the art at February 2021</i></p> <p>START OF THE PROCESS</p> <ul style="list-style-type: none"> Fiberglass Used cooking oils Digestate and agri-food sludge for the production of bioplastics Muds containing Bentonite Mixed plastics - chemical recovery Ashes from the blast furnace Mattresses <p>STEP 2</p> <ul style="list-style-type: none"> Mixed plastics for the production of SRA Land from reclamation activities FORSU sludge Textiles Mixed plastics mechanical recovery (consultation concluded) Bituminous membranes (consultation concluded) <p>STEP 3</p> <ul style="list-style-type: none"> Drywall Pulper <p>STEP 4</p> <p>STEP 5</p> <ul style="list-style-type: none"> C&D Waste Sanitary glass <p>STEP 6</p> <ul style="list-style-type: none"> Street sweeping waste Batteries and accumulators <p>STEP 7</p> <p>PUBLICATION IN THE OFFICIAL GAZETTE</p> <ul style="list-style-type: none"> CSS (2013) Milled asphalt (2018) Waste from absorbent products for the person (2019) End of life tires (2020) Wastepaper (2021)
<p>Geographical coverage of the policy instrument:</p>	<p>Lazio Region</p>
<p>Policy Instrument Responsible:</p>	<p>The Director of the Regional Direction of Economic Development, Productive Activities and Research.</p>
<p>Main features of the policy instrument:</p>	<p>The Policy Instrument characterizes itself as a Legislative Act novating the management of the recycling, recovery, and disposal chain of inert waste in the Lazio Region with an Annex dedicated to specific Guidelines for all the value chain actors. To date, the policy instrument exists but is dated to 2012. It was approved by the Regional Council¹⁰ to provide sectorial legal frameworks at national and regional encompassing the following domains:</p> <ul style="list-style-type: none"> ➤ Waste management in construction and demolition sites, ➤ Construction and management of recycling/recovery plants of inert waste ➤ Construction and management of environmental recovery with the use of inert waste ➤ Construction and management of landfills for inert. <p>Furthermore, the Guidelines was enriched by 7 Annexes providing specific indications on existing procedures regarding the C&DW, such as:</p> <ol style="list-style-type: none"> 1. ACCEPTANCE OF INERT WASTE IN PLANTS OF RECYCLING / RECOVERY 2. ACCEPTANCE OF INERT WASTE IN ENVIRONMENTAL RECOVERY 3. ACCEPTANCE OF INERT WASTE IN LANDFILL 4. DELIVERY OF INERT WASTE FROM PRIVATE CITIZENS <p>Plus...</p> <ol style="list-style-type: none"> 5. FORM FOR THE BASIC CHARACTERIZATION OF THE WASTE TO BE FILLED IN BY THE MANUFACTURER OF THE WASTE 6. INSTRUCTIONS FOR THE DRAFTING OF THE WASTE MANAGEMENT PLAN FOR AN INTERVENTION THAT ALSO INVOLVES EARTH MOVEMENTS 7. WASTE SAMPLING REPORT MODEL

	<p>The above mentioned “Guidelines” being not only an integral part but also the main technical feature of our policy instrument, will be enriched and, occasionally, amended by selected suggestions from l’Orée Guide that could fit our country’s peculiarities and need. Following that old regional political instrument which approved and included the so called “ guidelines”, during last year, the same political body approved, with a resolution, the “4th Regional Plan for the managing of waste in the Lazio Region”.¹¹ The plan, overdue since 2014, will be further developed and will be operative until 2025. However, even if submitted to the Italian and Lazio’s political and industrial stakeholders during the very last two Condereff meetings, that legal instrument of about more than 1000 pages, deal with general context of wastes and it’s associated to a rigorous framework of regulations from our public authorities. In that way we could see some similarities with what has been shown trough the French Guide from l’Orée in which public action is clearly underlined. This last political act is very important, nevertheless is of a somewhat less technical nature if compared with the already mentioned “ENEA Guidelines”¹² of 2012. Furthermore, the “ENEA Guidelines” deal, specifically, with the C&D waste management and so could be easily integrated with ideas inspired by some of those included in the French guide as for example the already mentioned traceability system. That’s the main reason why “ENEA Guidelines”, annex and integral feature of the 2012 resolution (DGR), will be the chosen policy instrument we want to customise according to what we learn from Condereff and from the Orée Guide.</p> <p>¹⁰ Delibera di Giunta Regionale del Lazio (D.G.R) n. 34/2012</p> <p>¹¹ D.G.R n. 4/2020</p> <p>¹² “Linee guida per la gestione della filiera di riciclaggio”, recupero e smaltimento dei rifiuti inerti nella Regione Lazio, pag. 38, Roma 2011</p>
Other relevant information:	

4. Actions

4.1. List of actions

Action 1	<i>Introduction of new CDW Traceability system for comprising Legal and Green Economy aspect in the Regional Guidelines for the sustainable Management of C&DW.</i>
Sub-Action 1.1	
Sub-Action 1.2	
Action 2	

4.2. Detailed actions

ACTION 1	
Action name	<i>Introduction of new CDW Traceability system for comprising Legal and Green Economy aspect in the Regional Guidelines for the sustainable Management of C&DW.</i>
Relevance to the project	<p>The Guide has been chosen because it's a sort of kit and quite a few of the proposals (Geolocation, traceability open-source tools notably) are easy to share and could complement what we are already doing (GIS for CDW Management) here in Lazio.</p> <p>Although our Action Plan draft focus on the traceability and geolocation simply because we still do not have anything similar here in Lazio as compared to French examples and case studies related in the L'Orée Guide, we have also considered some other kind of suggestions included in the guide, both of a legal and commercial value. Our policy instrument is, obviously, also a legal one so we cannot fail to transpose the regulatory development work to turn the waste status into a commercial product that is being developed in France. What ADEME (The French National Agency for Ecological Transition) is doing in this context is another interesting contribution that we became aware thanks to l'Orée. Here in Lazio, we basically have a positive attitude towards new developments in this field as being mentioned both in the new Waste Regional Plan and our "ENEA Guidelines" Policy Instrument but being, in practice, something quite difficult to achieve in the short period we are also interested in following France's legislative path according to the sources that have been available thanks to l'Orée. By decree of 1 April 2021, the French Ministry of Ecological Transition and the Ministry of Agriculture and Food supplemented the regulatory conditions for leaving the status of waste. The procedure has been extended to any producer or holder of waste. France's course, which is certainly optimal, does not diverge too much from the Italian 'End Of waste' decrees (see former section). Therefore, cooperation and study of this topic included in the best practice could be further inspiration for the amendments to our regional regulatory instrument.</p>

	<p>In the best tradition of French satire, the “Moniteur” published in 2019 this fun cartoon which explain us that, in view of the “end of waste”, even waste types are starting to envy each other.</p>
<p>Nature of the action</p>	<p>The Integration of digital technologies into existing systems to exchange information among all construction and CDW contributors, the improve of planning and then business of procedures with the aim of smoother exchange of data and information and the control of products are features that we think are necessary for the managing of the C&D waste also in our Region.</p> <p>We are also aware that a lot still has to be done for the implementation of really efficient IT standards as concern managing of CDW in our Region. According also to the recent UE Call for the Horizon Programme, “Automated tools for the valorisation of construction waste (RIA)”, projects were, among others, expected to contribute to the following outcomes:</p> <ul style="list-style-type: none"> • KSO C, ‘Making Europe the first digitally led circular, climate-neutral and sustainable economy through the

	<p>transformation of its mobility, energy, construction and production systems.’</p> <ul style="list-style-type: none"> • KSO A, ‘Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.’¹⁰ <p>¹⁰ HORIZON-CL4-2021-Twin-Transition-01-11</p> <p>We think, here in Lazio Region, that local and private authorities should be licensed to use all available mapping data together with all other possible information available from service departments. In view of that, and just a few months before we discovered and deeply studied the IT tools reported in the Guide from l’Orée, we had already envisaged and began to plan a similar, multifunction application tool which will probably pave the way, here in Italy, for such a long overdue digital asset for the C&D overall sector</p> <p>In shorts terms, Lazio Region, is currently working within his traceability/GIS project on:</p> <ul style="list-style-type: none"> • Optimising the use of survey mapping datasets and other available data • Capability to analyse geographical and mapping data easily and digitally • Creating an online mapping functionality of all waste collection rounds ☐ Reviewing collection routes in relation to the changes to waste transfer stations <ul style="list-style-type: none"> • Digitally insert and update, if deemed necessary, all the all-available sector regulations in the same application • Inserting and tracking of different thematic layers that could be related with waste management and, in particular, CDW. • Inserting data of waste facilities according to what they do, what they get etc. <p>What we have just related belonged, since a couple of years, to our “wish list” but, once we began to study the examples and links furnished by the French Orée Guide introduced by the Rhones Alpes partner we clearly saw some potential ways to put them into practice also trough reading our selected policy instrument, the “ENEA Guidelines”. Let’s see some examples of regulatory novation, as concern traceability, that could be driven by our policy instrument:</p> <ul style="list-style-type: none"> - As early as 2012, Lazio Public Authority asked the waste disposal companies , trough our ENEA Guide to set up
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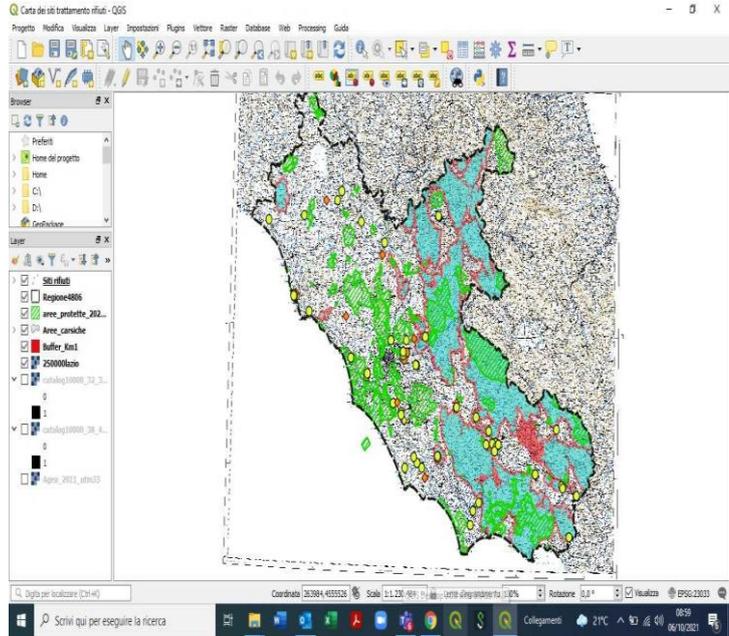
temporary or mobile C&D sites but required, among other precautions aiming at limiting production of airborne particle material:

*Provision must be made for planning the movement of heavy goods vehicles from/to the construction site. We stress the need to minimise the impact on the areas crossed, including bands, interference with existing roads, as well as routes affecting the least possible inhabited areas. The characteristics of heavy goods vehicles in use at the installations must comply with the requirements laid down in existing regulations or local provisions. As a general rule, when carrying out the activity, the operator will have to take the necessary measures to the containment of diffuse and non-diffuse emissions, **in line with best available technologies**.* Such a passage clearly calls for the designing, as we are already developing here at Lazio Region , of a GIS, open source, traceability tool that could be very useful for every company involved in the C&D waste management. Suggestions and already successful examples to this way are clearly shown in the French guide that we would like to choose as a compendium of best practices.

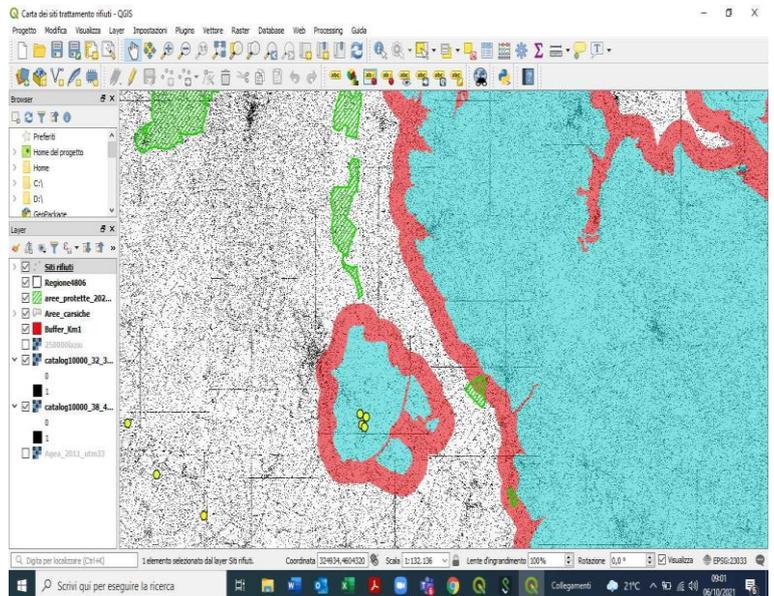
As a further example taken from l'Orée Guide that could also be a secondary but interesting add-on if adopted as a good practice is, as said before, the French Ubysol, a modern and real-time tracing tool instrumental in putting to practice collective initiatives that guarantee the health and safety of everyone, irreproachable ethical behaviour and protection of the environment. A draft regulation to be included in our "ENEA Guidelines" could require vehicles involved in the transport of CDW to be fitted with a tool similar to Ubysol attached to truck box and acting as a sort of oscillometer. Such a simple and reliable technological precaution is sufficient to minimize the possibility of unintentional maneuvers and could help to meet another requirement asked by our guidelines:

the maintaining, if possible, automatically, during the dumping of waste, of an adequate height of drop and lowest speed technically achievable

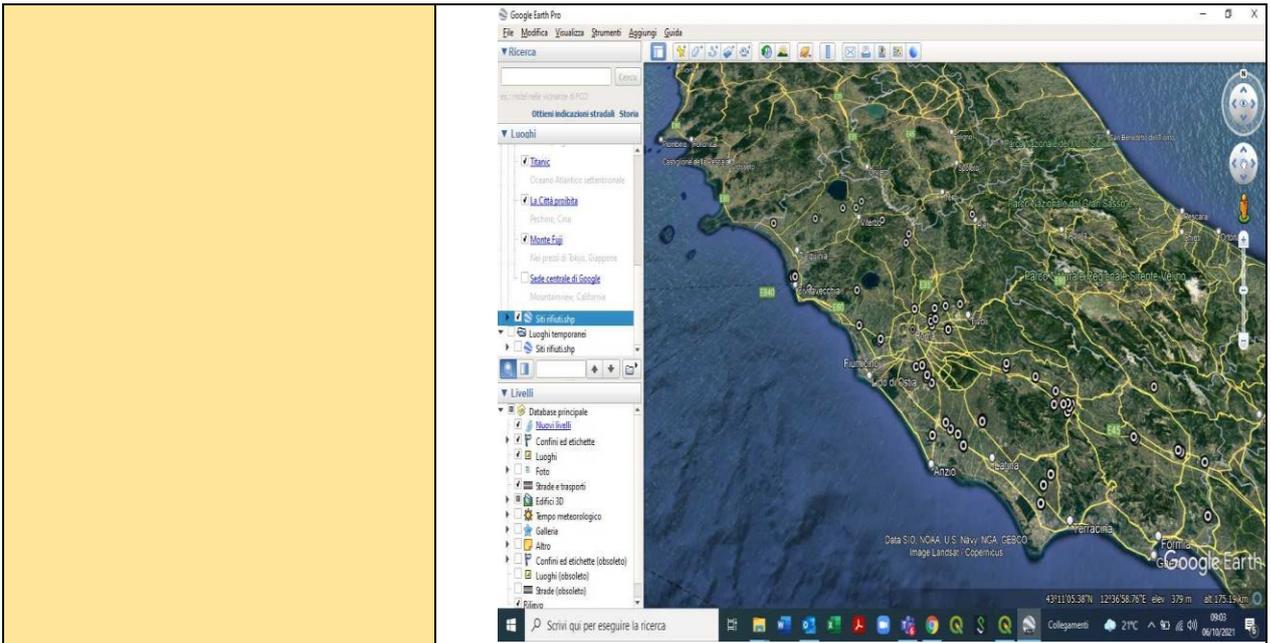
This is what we are doing: a traceability tool inspired by the French, Belgian, etc. as detailed in the Orée Guide: We hope that it will serve as a technical basis to which our political and regulatory instrument will refer. In a nutshell by making available and mandatory for insiders and professionals to adopt a GIS tool with the following data :



Tab.1 Facilities locations and main layers.



Tab. 2 Layers details as concern C&D waste facilities.



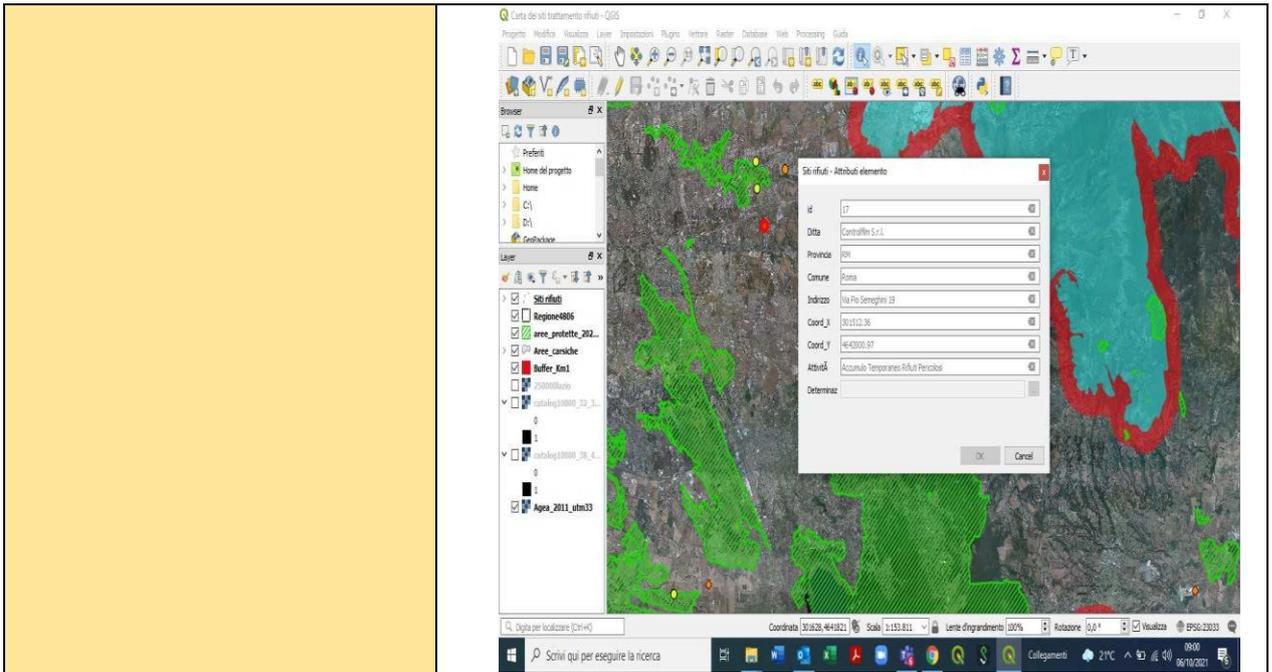
Tab. 3 Routes and facilities.

Carta dei siti trattamento rifiuti - QGIS

Siti rifiuti - Totale degli elementi: 66, Filtrati: 0, Selezionati: 0

id	Ditta	Provincia	Comune	Indirizzo	Coord_X	Coord_Y	Attività	Determinaz
1	ACEA Ambiente S.r.l. (ex Klydos)	LT	Aprilia	Via Ferriere	312073.34	4599404.87	Trattamento Rifiuti	
2	Astra Ecologica srl	FR	Alvito	Via Spinele	395111.77	4614378.57	Trattamento Rifiuti	
3	11. Berg S.p.a.	FR	Frosinone	Via As4	357746.77	4609270.35	Trattamento Rifiuti	
4	Bracciano Ambiente S.p.a.	RM	Bracciano	Via Settevene palo	265712.38	4659175.63	Discarica	
5	C.S.A. - Centro Servizi Ambientali	LT	Castelforte	Via Viano	403068.85	4572088.69	Trattamento Rifiuti	
6	14. Centro Rottamaz...	LT	Pontinia	Via San Carlo	347186.98	4585669.92	Trattamento Rifiuti	
7	15. Centro Rottami s.r.l.	LT	Cisterna di Latina	Via Grotte di Notola 7	321986.45	4603579.93	Trattamento Rifiuti	
8	16. Consorzio per lo ...	RI	Rieti	Via Campo Sano	322480.74	4698362.47	Trattamento Rifiuti	
9	17. Controlfin S.r.l.	RM	Roma	Via Pio Semeghini 19	301512.36	4642000.97	Accumulo Tempo...	
10	18. E. Giovi S.r.l. - TMB Malagrotta 1 e 2	RM	Roma	Via di Malagrotta 257	278604.39	4636642.13	Trattamento Rifiuti	
11	19. Eco Italia 87 S.r.l.	RM	Guidonia Montecelio	Loc. Inviolata 18	307755.03	4650408.17	Discarica	
12	2. ACEA Ambiente S.r.l. (ex Solenne)	LT	Sibaudia	Via Lungo Sisto, 61 Loc. Borgo Vidocce	342151.98	4577052.51	Trattamento Rifiuti	
13	20. Ecoambiente s.r.l.	LT	Latina	Via Montefiore Borgo Montello	314085.84	4595568.13	Discarica	
14	21. Ecofer Ambiente s.r.l.	RM	Roma	Via Ardeatina km 15, 300	297315.05	4625171.54	Discarica	
15	22. Ecologia Viterbo ...	VT	Viterbo	Località Le Fornaci	253508.01	4704525.32	Discarica	
16	23. Ecologia Viterbo ...	VT	Viterbo	S.P. 5 Teverina km 7,6	263088.97	4708374.14	Trattamento Rifiuti	
17	24. Ecosantagata S.r.l.	VT	Civita Castellana	Via flaminia km 48+200	288097.96	4683029.70	Discarica	
18	25. Ep Sistemi S.P.A.	RM	Colleferro	Via Vittorio Emanuele snc	333304.03	4623301.28	Trattamento Rifiuti	
19	26. Fiotech Srl	RM	Cassino	Via Cerro Antico 48	399457.59	4591708.74	Trattamento Rifiuti	
20	27. Francesca Moroni Srl	RM	Civitavecchia	Via Braccianese Claudia snc	234858.75	4667213.68	Trattamento Rifiuti	
21	28. Fratelli Lupoli Srl	LT	Cisterna di Latina	Via Appia Km 87, ann	322274.12	4603940.65	Trattamento Rifiuti	

Tab. 4 Facilities table



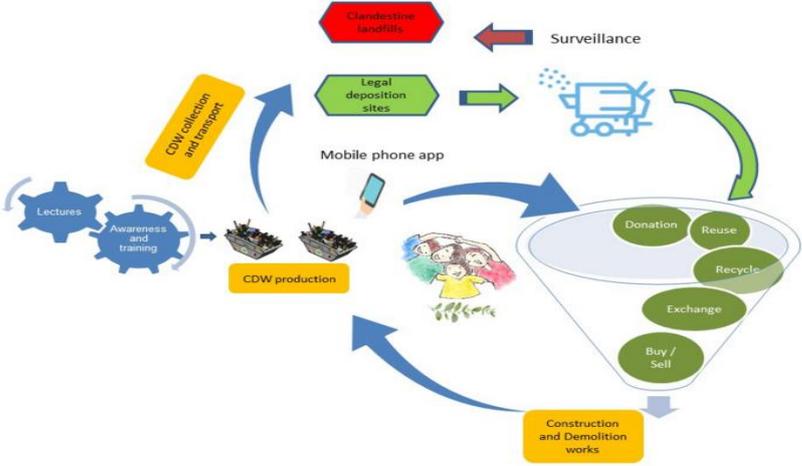
Tab.5 A secure “temporary landfill” for hazardous waste.

Those tools, partially inspired by those from l’Orée guide, once adopted could certainly enhance the potential of the application we are developing through allowing :

- Determining truck’s fleet capacity reserved to C&D mobility and improve their productivity, security and, from our point of view, compliance with road regulations.
- Improve Lazio Region’s percentage recycling performance.
- Improve Lazio Region’s compliance with the law as concern, in general CDW.
- Reduce carbon emission.

The expected customer, entrepreneurs and C&D actor’s benefits would be:

- Routes, locations and times would be simple to understand, so it’ll be easier to recycle
- Minimise operational costs (fuel savings).
- Tracking vehicles to monitor performance and, in some cases, defend insurance claims.
- Capability to model and predict any requirement to change route design to optimise.
- Better Productivity and Quality of service.
- Improved planning capabilities for health and safety purposes.

	<ul style="list-style-type: none"> • Raise of the profile of secondary products once people become aware of where to send and maybe earn money from. <p>In a nut, what we hope to achieve, through the sharing of the French best practice and customisation with what we need and are doing here in Lazio Region is the mandatory:</p> <ul style="list-style-type: none"> • obtaining a system of GIF tools with visualisation on a maps backgrounds and within very short downloading times, of the locations of the collection points located close to the selected address. • obtaining a personalised summary sheet of all the CDW collection solutions put in place in the sector surveyed with routes and disposal/recycling sites. • valorisation of investments dedicated to that very establishment of a Geographic Information System (GIS) by extending and extending access to this geographical information to the public. • A real-time vital traceability digital control device/system with immediate benefits for both users and institutions. 
<p>Stakeholders involved</p>	<p>ENEA, Lazio Region, Sector 's Lazio entrepreneurs (SEIPA and others)</p>
<p>Timeframe</p>	<p>01/01/2022 – 31/05/2023</p>
<p>Indicative costs</p>	<p>The costs will be those of the internal staff of Lazio Region working in the amending the Policy Instrument described plus an external cost for an expert supervising the technical feasibility of the proposal. The overall cost will be that of the internal staff (6.000 €) and the external expert (10.000 €) for an amount of 16.000 €.</p>
<p>Indicative funding sources</p>	<p>Interreg Europe – Condereff Project plus Regional Fund (ERDF)</p>

<p>Dissemination communication</p>	<p>and</p> <p>A detailed communication towards the project stakeholders and wider public will be arranged by the Lazio Region staff already involved in Condereff project. Obviously the French Guide sections that could be interesting for us will be fully translated and the links and examples studied in detail. A Franco-Italian meeting to be held, here in Rome, to l'Orée booklet could also sound good. We are also very interested to listen to experiences and let us describe the tools boxes from the French experts that are behind the successful examples shown in the guide.</p>
<p>Monitoring the action</p>	<p>The implementation of the Action will be monitored by the technical staff of the Lazio Region involved in Condereff, whereas Director of Unit and fonctionnaires will be checking the correct application of the good practice transfer. It'll be very important to have technicians and lawyers working together simply because we aim to change a 2012 regulation document in view of brand new and, in general, very technical requirements. The driving idea and also a real challenge will be to implement something that has to become mandatory and, at the same time, be perceived as a customer friendly and also appealing and which, in our humble opinion, will be the only way to expect the people, here in Italy, to go along with those substantial changes. We envisage and will also suggest, even after the end of Condereff Project, the setting-up of a sort of semi-permanent control room, here in Rome, which will be supposed to stay in touch, for the coming years, with willing Rhone-Alpes Condereff partner experts and other French ones possibly from entities mentioned in the l'Orée Guide. Along with the internal staff, we are going to use an external professional, an Engineering with a specific expertise in C&DW management and traceability. He or She will be in charge with:</p> <ol style="list-style-type: none"> 1) Combining field, technical, and legal inputs and already existing work into a well-balanced feedback in support of both our political advisor and IT expert. 2) Assuring a professional performance and effective communication with the internal IT expert, political advisor, and Lazio Region lawmakers to Improve the transport, management, and description of C&DW by reforming existing regulations 3) Giving technical advice to strengthen intelligence sharing and engagement to tackle illegal activity by reforming, from a technological (traceability) point of view the existing regime, mandate the digital recording of waste movements, subject to consultation. 4) Supplying technical and legal advice to improve the transport, management, and description of C&D waste by reforming existing regulations, strengthen intelligence sharing and engagement to tackle illegal activity. Help to point out the best

	ways to prevent illegal activity being hidden through lack of digital traceability by reforming the existing regime.
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5. Declaration of responsibility

Date	
Name of the organisation	
Signature of representative of the relevant organisation	