

Regional Action Plan for Circular Construction and Rehabilitation of Housing in the Valencian Community



Comunitat Valenciana 2021-2023

REDUCES – Rethinking Sustainable Development in European Regions by Using Circular Economy Business Models

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1. General information

Project: REDUCES – Rethinking Sustainable Development in European Regions by Using Circular Economy Business Models

Partner organisation: Valencia Institute of Building (IVE)

Other partner organisations involved (if relevant): Polytechnic University of Valencia (UPV)

Country: Spain **NUTS2 region:** Comunitat Valenciana

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2. Policy context

- The Action Plan aims to impact:
- Investment for Growth and Jobs programme
 - European Territorial Cooperation programme
 - Other regional development policy instrument

2.1. Name of the policy instrument(s) addressed:

Policy instrument 1 (PI1): DECREE 151/2009, of October 2, of the Consell, by which the basic requirements of design and quality in housing and accommodation buildings are approved (DECRETO 151/2009, de 2 de octubre, del Consell, por el que se aprueban las exigencias básicas de diseño y calidad en edificios de vivienda y alojamiento)

policy instrument 2 (PI2): Grants program for the energy renovation of social housing and residential buildings within the frame of the Spain's Recovery, Transformation and Resilience Plan.

2.2. Further details on the policy context:

The policy instrument addressed from the beginning by REDUCES project in Valencia Region was Decree 151/2009, on basic design and quality requirements for residential buildings. This regulation is the responsibility of the Ministry with housing competencies, currently the Second Vice Presidency and Ministry of Housing and Bioclimatic Architecture. It is of the regional scope and mandatory compliance by technicians who design projects and carry out renovation or new construction works on residential buildings located in the Valencian Community.

This regulation sets the design and quality conditions that new or refurbished buildings intended for housing and residential use must meet. It regulates functional aspects of the dwellings and the buildings: such as the minimum surface of the spaces (living room, kitchen, bedroom, etc.), the relationship between the different spaces or enclosures, the conditions that the circulation spaces (horizontal and vertical: corridors, stairs, halls, foyers) must fulfil within the dwellings and buildings, minimum and / or mandatory equipment that a dwelling and building must have, also regulates certain aspects of habitability such as lighting and ventilation conditions, the specific conditions that an adapted dwelling must meet (for people with functional diversity/disability) or accommodation buildings (consisting of spaces for private use, in the form of accommodation units, and common services for collective use).

The [Regional Circular Economy Status Quo report](#) analysed this policy instrument as well as its relationship with other complementary and related regulations, programmes and initiatives

(developed/supported by the Regional Ministry of Housing) that converge with the objectives and interests foreseen in the REDUCES project, as for example, the White Paper on Housing, the Strategic Plan “Habitat 2030”, and the Observatory of Habitat and Urban Segregation.

However, during the development of the project, the opportunity to influence other new and priority policy instruments has arisen. This is the case of the Grants program for the energy renovation of social housing and residential buildings within the frame of the Spain’s Recovery, Transformation and Resilience Plan.

Royal Decree 853/2021, of 5 October, regulates the grant programmes for residential renovation and social housing under Spain’s Recovery, Transformation and Resilience Plan.

This Royal Decree articulates and regulates the following aid programmes that are specifically included in two of the investments of component 2 “Implementation of the Spanish Urban Agenda: Urban regeneration and rehabilitation plan”, investment C02.I01 “Rehabilitation programme for economic and social recovery in residential areas” (programmes 1 to 5) and investment C02.I02 “Programme for the construction of social rental housing in energy-efficient buildings” (programme 6):

1. Programme of aid for rehabilitation actions at neighbourhood level.
2. Support programme for rehabilitation offices.
3. Programme of support for renovation actions at building level.
4. Programme of aid for actions to improve energy efficiency in dwellings.
5. Programme of aid for the preparation of the existing building book for refurbishment and the drafting of refurbishment projects.
6. Programme of aid for the construction of social rental housing in energy-efficient buildings.

However, for the aid programmes relating to rehabilitation actions at building level (programme 3), to improving the energy efficiency of housing (programme 4) and to the preparation of the existing building book for rehabilitation and the drafting of rehabilitation projects (programme 5), the Autonomous Communities and the autonomous cities of Ceuta and Melilla, as direct beneficiaries, will make calls for aid for these programmes, which must be published in the National Subsidies Database. These calls for applications will serve as mechanisms for granting the aid to the final beneficiaries.

So, in this context, the Second Vice Presidency and Ministry of Housing and Bioclimatic Architecture from Valencia Regional Government is about to publish the Order that regulates the grants for the rehabilitation of buildings and dwellings in the framework of the European Spain’s Recovery, Transformation and Resilience Plan and Next Generation Funds.

3. Regional Action plan:

The main objective of the present action plan is to increase the number of dwellings built and renovated under circular economy principles in order to decrease the environmental impact of the building sector, increase the quality of life of citizens while creating new circular economy business models that promote a fairer and sustainable economic growth.

With regard to Decree 151/2009, on basic design and quality requirements for residential buildings (hereinafter DC-09), the implementation of the present action plan will enable to introduce changes in the policy instrument, integrating the lessons learnt from the cooperation, that promote the construction and renovation of more circular residential buildings and dwellings, while at the same time promoting the development of CE business models in the construction sector in the region, either by eliminating the existing hampering conditions in this regulation that current CE businesses are facing, or by introducing new conditions that drive forward CE business models that do not yet exist in the market.

Concerning the Grants program for the energy renovation of residential buildings and dwellings. Royal Decree 853/2021, of 5 October, regulates the aid programmes for the rehabilitation of residential

and social housing under the Recovery, Transformation and Resilience Plan. Article 11 of this regulation sets out the requirements that buildings subject to rehabilitation must meet. Among these requirements, it is established that building designs and construction techniques will support circularity and demonstrate the disassembly or adaptability of buildings, how are they designed to be more efficient in the use of resources, adaptable, flexible, and dismountable, to allow reuse and recycling.

However, it is not established how this requirement must be met, that is, the specific conditions that a building must meet to be considered flexible, adaptable, etc. The absence of a clear methodology that enables to justify adequately and objectively the compliance with this requirement leads to great uncertainty among technicians (mainly architects) who are not clear how the adequacy of their proposal (project) to this requirement will be assessed and, on the other hand, makes it difficult for the public administration to control and manage the compliance with this requirement. The implementation of the action plan will enable to improve the governance of this policy instrument.

The development of this action plan is based on the interregional cooperation between partners of the REDUCES project as well as the participation of regional stakeholders (public administration, businesses, and other entities) involved in the implementation and development of the circular economy in the construction sector in the Valencia Region.

Five different main themes for CE business models (product life extension, product as a service, sharing platforms, renewability and resource efficiency and recycling) are covered throughout the and structure the exchange and learning activities.

Activities conducted under the principle of interregional cooperation are:

- 1) Interregional learning events, held in Turku (Finland, 19th-20th November 2019), Valencia (Spain, 10th-11th March 2020, Product life-extension), online meeting organised by Utrecht (Netherlands, 17th-18th September 2020, Renewability and Product as a Service), online meeting organised by Bulgaria (10th-11th December 2020, Sharing platforms) and online meeting organised by Maramures (Romania, 20th-21th April 2021, Resource efficiency and recycling), and have comprised presentations of regional initiatives and good practices related to the policy instruments addressed and CE business models operating in the region.
- 2) Good practice examples and evaluation, where each partner presents the cases of business models or initiatives, operating in its territory, related to the thematic addressed at that time. The cases are subsequently evaluated through a peer review, following the common evaluative framework created by the project, and conclusions and main learnings are shared after with all the partnership. After the identification of these good practices, they have been submitted and published on the Policy Learning Platform of the Interreg Europe's programme website.

Besides interregional cooperation, a major role in sharing knowledge and experience played the representatives of regional stakeholder group, which includes different entities of the public administration, universities, technological institutes, business and professional associations, and companies linked to the application of circular economy principles in the construction sector.

The development of the actions proposed in this action plan has been influenced by multiple good practices presented by partners from different regions. Good practices related to a greater or lesser extent to the construction sector have been particularly relevant, but we have also been able to identify inspiration in good practices related to other sectors.

Within the Valencia Action Plan 2 actions have been defined:

Action 1: Incorporating circular economy perspective in the construction and rehabilitation of Housing in Valencian Community

Action 2: Standardise the assessment of housing renovation projects in compliance with circular requirements (in the frame of Next Generation funds)

Action 1 is linked to *Decree 151/2009, on basic design and quality requirements for residential buildings (DC-09)*, and action 2 is linked to Grants program for the energy renovation of residential buildings and dwellings.

3.1. Action 1: Encourage circular economy perspective in the construction and rehabilitation of housing in the Valencian Community.

Background and objective

The construction sector is a great consumer of resources in Europe. It uses about half of all the materials extracted, almost half of all the energy consumed and a third of all the water that is used and generates a third of the total waste.

If we refer to the housing stock in the Valencian Community, 50% of the buildings were built before 1980 (when there was no obligation to insulate buildings) and 81% of buildings are rated E, F and G in terms of CO₂ emissions in Energy Performance Certificate. Therefore, the housing stock is highly energy inefficient.

On the other hand, the ecological footprint of this housing stock, which is not ready for dismantling, must be considered. So far, the building sector has not been able to take advantage of the economic benefits of implementing selective demolition, which hinders the reuse of components and turns most of the materials that make up a building into waste at the end of its use. So, the non-rehabilitation of this housing stock would entail an energy and material cost associated with its demolition that would be unaffordable under current conditions, as the level of reuse of this type of construction is very low. Furthermore, the replacement of these buildings with new ones would further increase the ecological footprint associated to them.

All these factors point to the need for structural change in the construction sector, with a special emphasis on building renovation. In this context, in which green transition, the decarbonisation of the building stock and energy efficiency are also priority issues, the development of public policies that support the transition to a circular model in the architectural and the built environment is essential.

The objective of this action is to ensure that the lessons learned in the project are transposed into the regulation in the form of requirements and recommendations that support the implementation of a circular perspective in the construction and renovation of residential buildings and dwellings in the Valencia Region. Once the text of the new regulation is approved, an information campaign (knowledge transfer) addressing public and private sector technicians will be implemented to assure a correct and effective implementation of the changes introduced in the standard, promoting CE principles and businesses.

Link to REDUCES project

The good practices presented by other regions partners that attracted our attention and have served as inspiration for the definition of the first action are:

Werkspoorkwartier: Circular renovation of buildings in Werkspoorkwartier area (Utrecht, Netherlands).

The overall aim of the project is to regenerate the inner industrial area Werkspoorkwartier in Utrecht by promoting circular economy and strategies. Building renovation is already considered a circular strategy, which contributes to extending the life of buildings by avoiding their demolition, thus avoiding the extraction and production of new materials and waste.

Different principles of circularity and sustainability have been considered in the design and use of materials:

- Re-use of the existing structure and partly existing skin
- Modular interior, box-in-box system, creating small spaces inside a large container, which allows to dismount and change walls, so inner spaces can be moved, merge, downsized or grow.
- All building elements are labelled including their size, so they can be easily replaced elsewhere.
- Use of renewable/biobased materials (wood) which are also biodegradable.
- Wall construction with interlock systems that do not require fixing parts (screws, adhesives, etc.)

This good practice allowed us to identify some circular strategies with great potential to be incorporated in the new regulation, to promote circularity in housing, as:

- Reuse of structure/envelope (urban mining)
- Design of systems/structures with reversible and/or demountable joints
- Design of systems/structures with handy, independent, and detachable elements
- Design of independent and accessible installations

- Design of modular, versatile, and flexible spaces
- Information on building materials, components, and products (Building passport)

Insert: Online marketplace for reused building materials and plants (Utrecht, Netherlands).

The objective from Insert is to create a network that enables repurposing resources and materials from demolition projects. The core of Insert's proposition is an online marketplace (marktplaats.insert.nl) for materials and resources. On this online marketplace companies can post or look for available resources and materials from a wide range of categories, such as trees, heating installations and ceiling systems.

This good practice caught our attention and made us reflect on the need to consider and introduce requirements related to the use of reused materials, components and products in the design, construction and renovation of buildings. The building and demolition industry is one of the major consumers of raw (virgin) materials, making better use of resources contributes to reducing the extraction of new materials and the number of materials going to landfill.

TAPARO: New Generation Materials - recyclable composite materials from natural fibres (Maramures, Romania).

Taparo, a furniture company, has developed and produced new recyclable composite materials from natural fibres (hemp/linen). The composite materials can be obtained from a wide range of cheap raw materials produced locally (linen, hemp, jute, willow/poplar, coir, textile waste, etc) which contribute to reduce the use of wood, saving forest and protecting the environment (natural fibres can be harvest every year, trees are good for harvest only after 100 years). In addition, the composite materials are recyclable (waste and scraps resulting from the manufacture process can be recycled). The final products are more sustainable: better resistance and high durability, lighter in weight, 100% reusable, low cost of raw materials, less formaldehyde and contamination risk, production flow automatized, shorter and quickly.

It was especially interesting for us to see how in other sectors, even those related to construction, the use of recycled, recyclable and bio-based materials is valued and promoted, and it seems logical to promote this type of material also in the design and construction of homes, since that can be directly applied to coatings, furniture and home equipment, etc.

Sustainable structural solutions from hemp (SW-Finland, Finland).

The project aimed to bring a sustainable and new hemp material for the construction industry to use. The long-term goal was to develop resource efficiency and carbon neutrality, as well as to make hemp construction an alternative at the raw material level. The Hemp Construction project tested domestic hemp and domestic lime in practice. Various mixtures and tests were performed together with various stakeholders, and it was found that the domestic material worked in construction. Important aspect was to highlight the circular economy, especially the recyclability aspect of hemp material.

This good practice allowed us to reflect on the need to promote the use of renewable and bio-based materials, since they are materials rarely used in construction, especially in housing buildings.

Architectural Studio PAM Consult: Industrial symbiosis - reuse of old shipping containers in construction (Bulgaria).

Buildings construction from shipping containers are used for social student houses and restaurants in Sofia and other cities in Bulgaria.

Recycled shipping containers were chosen for number of projects to keep costs low and allow off-site prefabrication (over 80% of the construction is prefabricated in the factory), while re-using existing structures would have an environmental benefit. The environmental benefits include: good insulation, which keep emissions low; reduced waste during the construction process; use of recycled material. The modular design makes shipping containers a good choice for structures that need to be quick and cheap to assemble but also dismantled and reused elsewhere without negative consequences for the environment.

Main learnings coming from this good practice were two. The need to promote and make it possible innovative solutions, taking profit of reused elements from other industries/sectors. On the other hand, to enhance prefabricated construction in the sector.

Oldham Community Power: A model for community owned renewable energy (Manchester, United Kingdom).

This project seeks to provide affordable, sustainable, and low carbon energy by using both council owned and community-based buildings for solar installations. The scheme is primarily funded through a community share scheme, with secondary support through grants and loans provided by the local council. Set up as a social enterprise; the directors are volunteers, representing the community shareholders. The initiative contributes to reducing CO2 emissions and promotes responsible consumption patterns. Financial support and supportive policies are key to the success of such initiatives.

From this initiative, we found interesting the perspective of promoting the integration of renewable energies in buildings, but not only as an infrastructure or installation to be included in buildings, but with the idea of promoting the integral rehabilitation of buildings and neighbourhoods through the creation of Local Energy Communities.

City mobility with SPARK (Bulgaria).

Spark is the first car and sharing company fully equipped with electric vehicles. Mobile application allows the consumers to find and rent an electric vehicle no matter if it is for 15 minutes or a few days. After using the service, the car is left in one of the designated Spark areas in Sofia, including in the central part of the city, which is free for electric cars. The aim is to promote zero-emission transport solutions and contribute to responsible consumption.

This initiative made us reflect on how sustainable means of transport could be promoted through the design and equipment of residential buildings.

Finally, Valencia Region is a pioneer in some of the matters that circular economy considers, especially the treatment and reuse of wastewater. In the framework of the regional stakeholders' meetings, we identified and later shared with other regions two good practices related with water drainage systems: **E2stormed** and **CERSUDS**, both pilot actions implemented in two international projects. However, the requirement to include greywater treatment systems inside buildings and homes has not been addressed. This will be another aspect to consider in the modification of the regulations.

Implementation of activities and timetable (January 2021 – December 2022)

The proposed activities under action 1 are two. The steps foreseen for its implementation and their corresponding estimated timeframe are defined below.

Activity 1.1: Adaptation and transposition of the lessons learned in the project into the articles/text of the regulation

January 2021- November 2021. Creation of a Commission of Experts to review Decree 151/2009, on basic design and quality requirements for residential buildings (DC-09). REDUCES partners participate by providing their expertise on CE-related issues.

On 28 January 2021, the Regional Ministry of Housing convened and presented the Commission for the review of the regional regulations on habitability (DC-09). The aim of this committee, participated by technical experts from different disciplines, is to review the regulation with the purpose of adapting it to the new approaches set out in international agendas, promoting the rehabilitation of urban centres, facing green and digital transition, addressing the new needs and ways of life of people, and reinforcing the quality of the spaces we inhabit. The involvement of the REDUCES project partners in this commission has allowed, and will allow, the lessons learned in the project to be adapted and transferred to concrete improvements in regulations. The result of this phase is a first draft of the standard that will be later reviewed by the main stakeholders, organized in sectoral tables.

December 2021 – March 2022. Holding of the participatory process for the review of the first draft of the standard. The REDUCES project partners will be represented at the sectoral innovation table, in which CE aspects of the law will be addressed.

On December 9, 2021, a participatory process begins to review the first draft of the modified standard (DC_09). Sectoral tables are constituted aspects to be addressed (social inclusion, innovation, ...) and main stakeholders (Universities and R&D centres, Professionals: associations, Construction companies associations, Neighbourhood and citizens associations, Trade union associations, etc..) are invited to

participate in. During the process different meetings will take place and it is expected to last around 4 months. The result of this phase is a draft standard validated by all actors in the sector.

April 2022 – September 2022. Procedure for approval by the Regional Ministry of Housing.

Subsequently, the proposal must follow the usual procedural steps of the Regional Government, which includes submitting the text to a public hearing of the affected sectors and verifying conformity with the Legal Advisory Council of the Valencian Community. The beginning and end of this process is estimated and may be extended depending on the claims that may arise. This activity is the exclusive competence of the regional government and the REDUCES project partners are not involved.

Activity 1.2: Training/information campaigns (knowledge transfer) to professionals and technicians for the correct and effective implementation of the standard

October 2022 – December 2022. Conducting an information campaign (knowledge transfer) addressing public and private sector technicians. Once the text of the new regulation is approved and until its entry into force, an information campaign (knowledge transfer) addressing public and private sector technicians will be implemented to assure a correct and effective implementation of the changes introduced in the standard, promoting CE principles and businesses.

The Regional Ministry of Housing will organise, with the support of the IVE, information sessions/conferences for technicians in the sector (professionals, other affected public administrations, construction companies, developers, etc.). The professional associations (associations of architects, quantity surveyors and engineers) will collaborate especially in the dissemination of the sessions. The number of sessions will be sufficient to reach all the interested target audience. The format of the sessions (face-to-face/online) will depend on sanitary circumstances. Hybrid formats are also possible.

Key stakeholders

- Regional Ministry of Housing and Bioclimatic Architecture. Policy owner. Responsible for the implementation of the present action plan.
The Regional Ministry of Housing will be responsible for creating and organising the committee of experts for the review of the regulations, as well as the sectoral roundtables for the review of the first draft that emerged from the committee. Once the participatory process for the review of the regulation has concluded, it will initiate the process for its approval.
When the new text of the regulation has been approved, it will organise information sessions on the new changes introduced, dealing, among other issues, with the circularity criteria introduced in the regulation.
- Valencia Institute of Building (IVE). REDUCES project partner. IVE is a foundation promoted by the Regional Ministry of Housing. It brings together the stakeholders and professionals involved in the building and urban planning process: the public administration, professional associations, manufacturers' associations, developers, builders, users, and educational and technological centres.
IVE will participate in the expert commission and in the sectoral tables for the revision of the regulations, representing the REDUCES project partners, when the active participation of all partners in the sessions is not possible. It will collaborate with the Regional Ministry of Housing in the organisation, management, and dissemination of events/sessions (expert commission, sectoral tables, information campaigns, or others that may arise), when necessary.
- Polytechnic University of Valencia. REDUCES project partner. UPV is the leading technological University in Spain with the biggest transfer of technology share mostly connected to collaboration with SME's.
UPV will participate in the committee of experts and in the sectoral tables for the revision of the regulations, when the active participation of all the REDUCES partners in the sessions is not possible, they will be represented by the IVE. They will collaborate in the dissemination of information campaigns for technicians, taking advantage of its connection with the academic and business world (the transfer of regulatory changes to schools linked to the construction sector is especially relevant).
- Official Association of Architects of the Valencian Community (COACV). It represents and defends the interests of all Architects in the Valencian Community. It ensures that the technical,

competence and intellectual property standards that must be respected in the practice of Architecture are complied with and offers professional support and continuous training to its members to guarantee the quality of their services as professionals. Collaborators in the implementation of activity 1.2. They will collaborate in disseminating the conference/s to their associated technicians.

- Council of Official Associations of Surveyors, Technical Architects and Building Engineers of the Valencian Community (CCOATVVCV). It integrates the professional associations of Alicante, Castellón and Valencia and their members. Organises the professional activity of its members, monitors the exercise of the profession ensuring an adequate level of quality of the services provided by its members, defends the interests of its associates and provides services to them (e.g. training). Collaborators in the implementation of activity 1.2. They will collaborate in disseminating the conference/s to their associated technicians.

Costs and funding

Activity 1.1:

Fixed staff costs from the institutions involved (GVA / IVE / UPV). All staff costs are covered by each involved entity, from their internal resources (budget).

Activity 1.2:

Fixed staff costs from the institutions involved (GVA / IVE / UPV / COACV / CCOATVVCV). All staff costs are covered by each involved entity, from their internal resources (budget).

Some external subcontracting (Venue hire, coffee, recording services, live streaming services, others) ≈ 5.000 €. This Costs will be covered by IVE own budget.

3.2. Action 2: Standardise the assessment of housing renovation projects in compliance with circular requirements (in the frame of Next Generation funds).

Background and objective

Component 2 "Housing rehabilitation and urban regeneration plan" of the Spanish Recovery, Transformation and Resilience Plan will mobilise 6.82 billion euros, including a programme, CO2.I01, for the rehabilitation of Spain's housing stock, with a budget of 3.42 billion euros.

In turn, this programme is broken down into 6 sub-programmes, including programmes 3 and 4, relating to rehabilitation actions at building level (programme 3), and to improving the energy efficiency of housing (programme 4). In relation to these programmes, the Valencian Community has set very specific objectives, which are that by 2023 more than 17,000 dwellings should have been rehabilitated, but by 2026 more than 38,000 dwellings should have been reached.

If we analyse the experience of the Regional Ministry of Housing in the management of rehabilitation aid programmes in the Valencian Community, during the last years 2017-2020, we are talking about aid for amounts of 12, 19, 26 and 24 million euros, and 833, 883, 898 and 666 applications for aid processed, to carry out measures related to the state of preservation of the building, improve accessibility and to a lesser extent improve energy efficiency.

The targets committed under the current aid programme involve the management of around 20, 100 and 100 million over the next 3 years. This means quadrupling the amounts granted and managed by the Regional Ministry of Housing over the last few years. This is a great challenge for this administration.

On the other hand, the current call for proposals requests the incorporation of circular requirements in building renovation projects, which is a novelty compared to previous calls for proposals. It is therefore necessary to establish a transparent methodology that allows designers to know which actions they are obliged to implement in order to access the aid funds. At the same time, it is also necessary to introduce agile and objective tools that facilitate the management of the files for the administration's technicians.

The objective of this action is to develop a tool that will be used to evaluate how the projects support the circularity and demonstrate/evaluate the disassemblability or adaptability of buildings, how they are designed to

be more resource efficient, adaptable, flexible, and demountable to enable reuse and recycling. At the same time, the tool will be used to speed up the processing of dossiers and to evaluate them in a more efficient way.

In this context, the lessons learned during phase 1 of the REDUCES project, especially those related to the good practices presented by other regions participating in the project, and the evaluation framework elaborated to analyse their quality, environmental impact, transferability and scalability, will be incorporated in the elaboration of this tool.

Link to REDUCES project

The good practices presented by other regions partners that attracted our attention and have served as inspiration for the definition of the first action are:

Werkspoorkwartier: Circular renovation of buildings in Werkspoorkwartier area, (Utrecht, Netherlands).

The overall aim of the project is to regenerate the inner industrial area Werkspoorkwartier in Utrecht by promoting circular economy and strategies. Building renovation is already considered a circular strategy, which contributes to extending the life of buildings by avoiding their demolition, thus avoiding the extraction and production of new materials and waste.

Different principles of circularity and sustainability have been considered in the design and use of materials:

- Re-use of the existing structure and partly existing skin
- Modular interior, box-in-box system, creating small spaces inside a large container, which allows to dismount and change walls, so inner spaces can be moved, merge, downsized or grow.
- All building elements are labelled including their size, so they can be easily replaced elsewhere.
- Use of renewable/biobased materials (wood) which are also biodegradable.
- Wall construction with interlock systems that do not require fixing parts (screws, adhesives, etc.)

This good practice addressed some of the specific aspects and criteria that need to be incorporated and assessed in housing rehabilitation projects that are to receive funding. Particularly relevant was the process of evaluating the practice with the Utrecht partners and assessing which circularity indicators were offered to evaluate the success of the practice, as well as other potential indicators, which although not available, would have allowed to evaluate the good practice in all its dimensions.

Insert: Online marketplace for reused building materials and plants (Utrecht, Netherlands).

The objective from Insert is to create a network that enables repurposing resources and materials from demolition projects. The core of Insert's proposition is an online marketplace (marktplaats.insert.nl) for materials and resources. On this online marketplace companies can post or look for available resources and materials from a wide range of categories, such as trees, heating installations and ceiling systems.

This good practice caught our attention because one of the objectives to be achieved with the housing and residential building rehabilitation grants is to collaborate in the development of the market for the reuse, renovation, remanufacturing and recycling of materials and products. The initiative already gave some clues about the difficulties of public administrations to access this market (the tool presents different interfaces and functionalities for the public administration and for the companies operating in the private sphere).

Furthermore, the **assessment tool created by the REDUCES consortium** has also contributed to this action. The methodology developed allows the assessment of good practices on the basis of pre-established indicators, but also on the inclusion of additional indicators that are tailored to the specificities of each good practice, so that the impact can be better assessed. On the other hand, the evaluation of the potential for scalability and replicability favours the identification of the difficulties and challenges to be addressed in each of the regions to implement similar initiatives and businesses.

For the development of this action, one of the keynotes presented in the **second interregional meeting** of REDUCES project was especially relevant. Manuel Cerdá, professor at the UPV, gave a presentation on "Flexibility and adaptability as a building durability strategy", introducing an innovative approach developed on the modular architecture. This paper has provided key knowledge when it comes to being able to evaluate aspects such as adaptability and flexibility, in the rehabilitation of buildings.

Implementation of activities and timetable (October 2021 – July 2023)

The proposed activities under action 2 are three. The steps foreseen for its implementation and their corresponding estimated timeframe are defined below.

Activity 2.1: Development of the methodology and associated tool to assess the adequacy of building renovation projects to the circular economy requirements.

October 2021-January 2022. A methodology and tool are developed to verify and evaluate to what extent residential building rehabilitation projects meet the requirement set on article 11 of the Royal Decree 853/2021 which sets that "building designs and construction techniques will support circularity and demonstrate the disassembly or adaptability of buildings, how are they designed to be more efficient in the use of resources, adaptable, flexible, and dismountable, to allow reuse and recycling." The application has been promoted and developed under the agreement signed between the Second Vice Presidency and the Ministry of Housing and Bioclimatic Architecture and the Valencian Institute of Building.

Activity 2.2: Regional event to present the tool developed.

February 2022. On the 9th February 2022, the Regional Ministry of Housing (GVA) together with the IVE organizes a regional event to present the call for grants (Next Generation Funds) and the complementary tools developed, including the tool that will allow verification of compliance with the circularity requirement requested of technical projects for the application of aid within the framework of European funds.

Activity 2.3: Evaluation of the circularity criterion compliance of projects applying for grants with the developed tool.

April 2022 – July 2023. From the moment the aid order is approved, and the grant application period opens, GVA's internal staff will begin the process of verifying the requirements demanded of the projects, including support for circularity. During this process, operating errors may be identified that make it necessary to modify or correct the tool.

Key stakeholders

- Regional Ministry of Housing and Bioclimatic Architecture (GVA). Policy owner. Responsible for the implementation of the present action plan. GVA is responsible for publishing the order that regulates the grants programme for the energy rehabilitation of residential buildings and dwellings in the Valencian Community, providing the developed tools to professionals, and carrying out the management of the grants, including verification of the circularity criteria requested to the projects.
- Valencia Institute of Building (IVE). REDUCES project partner. IVE will develop the methodology and tool to evaluate the compliance of projects with circularity requirements, will co-organise the regional event and will support the Regional Ministry of Housing in relation to any unforeseen event that may arise in relation to the developed tool.

Costs and funding

Activity 2.1 is performed by own staff from the institutions involved (GVA / IVE). All staff costs are covered by each involved entity, from their internal resources (budget).

For activity 2.2, regional event, costs associated with the organization and management of the event are covered by the GVA and IVE staff. Some possible external costs could be incurred (Venue hire, coffee, recording services, live streaming services, others), they are estimated ≈ 2.500 €. In case they occur will be covered by IVE own budget.

Activity 2.3 is performed by GVA own staff.

4. Monitoring and risk assessment:

Nº	Activity	Indicators of verification and monitoring	Sources of verification (tbc)
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1.1	Adaptation and transposition of the lessons learned into policy instrument text	Number of meetings attended by REDUCES partners during participatory process	Minutes of the meetings (GVA) and/or Lists of registered and attendees. (GVA)
1.2	Information campaign	Number of SMEs/professionals aware of or engaging with CE business models	Lists of registered and attendees. (GVA/IVE)
	ACTION 1	Number of building/homes' endorsements/licenses emitted under the framework of the new policy instrument.	Visa statistics of Construction Management (Building Works statistics) (INE - National Statistics Institute)
2.1	Development of assessment methodology and tool	Follow-up meetings on the developments Beta versions of the tool	GVA-IVE email exchange IVE file server
2.2	Regional event	Number of professionals aware of or engaging with CE principles	Lists of registered and attendees. (GVA/IVE)
2.3	Evaluation of CE compliance of projects	Number of projects evaluated/assessed Amount of funds released under the use of the tool	Data collected by GVA

5. Risk factors

Type of risk	Low	Medium	High	Prevention measures
Loss of political interest in updating the political instrument (because other more urgent things arise and are prioritized)	X			Convince decision-makers of the need to update the policy instrument, highlighting the benefits of incorporating circularity criteria that promote sustainable productive development in the region.
Lobbying by some stakeholder involved in the participatory process (action 1) to not include requirements linked to circular economy principles		X		Technically justify the benefits of the circular economy principles and its need for implementation. Look for compromise solutions.
Political changes (directorship, ministry, secretary, head of the department, etc. or organizational or competency changes) that delay its implementation		X		Inform and update the new people/department responsible for the political instrument about REDUCES project aim. Involve new decision-makers in project development/action plan implementation

Loss of interest of involved stakeholders to participate and contribute to the action plan (due to excessive time dedication required, responsibilities required, possible changes in responsibility positions, or other).	X			Seek regional stakeholders with a similar role who can cover their absence, considering, if necessary, collaboration with entities and bodies at national level.
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Endorsement

Encourage circular economy in the construction sector in the Valencian Community

The construction sector is a great consumer of resources in Europe. It uses about half of all the materials extracted, almost half of all the energy consumed and a third of all the water that is used and generates a third of the total waste.

If we refer to the housing stock in the Valencian Community, 50% of the buildings were built before 1980 (when there was no obligation to insulate buildings) and 81% of buildings are rated E, F and G in terms of CO2 emissions in Energy Performance Certificate. Therefore, the housing stock is highly energy inefficient. On the other hand, the ecological footprint of this housing stock, which is not ready for dismantling, must be considered.

All these factors point to the need for structural change in the construction sector, with a special emphasis on building renovation. In this context, in which green transition, the decarbonisation of the building stock and energy efficiency are also priority issues, the development of public policies that support the transition to a circular model in the architectural and the built environment is essential.

One of the commitments of the Regional Ministry of Housing and Bioclimatic Architecture is to promote the ecological transition and the decarbonisation of the housing sector, and implementing circular strategies is essential to achieving desired decarbonisation.

During the last three years we had the opportunity to learned from and get inspired by the different partners within the REDUCES Interreg Europe project. Together with our regional partners we will increase our efforts in encouraging circular economy perspective in Valencia Construction Sector

GVA is happy in their role, the responsibilities, and the support within the REDUCES project Action Plan. Our ambition is to introduce, in the policy instruments of our competence, requirements and recommendations that encourage the construction and renovation of more circular housing, promoting more sustainable, less material- and energy-intensive modes of construction with a life-cycle approach throughout the value chain.

In this sense, the Second Vice-Presidency and Regional Ministry of Housing and Bioclimatic Architecture is already working, as detailed in this Action Plan, on the incorporation of circular economy criteria in the regulations for the Design and Quality of Housing and in the grants' programmes for Housing Renovation.

As responsible of the innovation committee that is assessing the incorporation of circular economy criteria in the regulations for the Design and Quality of Housing and in the grants' programmes for Housing Renovation, and representing the Second Vice-Presidency and Regional Ministry of Housing and Bioclimatic Architecture, I do hereby endorse this letter of commitment.

Date and place: 16.06.2022, València

Signature: Firmado por Nuria Matarredona Desantes el
23/06/2022 14:41:52
Cargo: Directora General d'Innovació
Ecològica en la Construcció

Nuria Matarredona Desantes,
General Director of Ecological Innovation in Construction.
Second Vice-presidency and Regional Ministry of Housing and Bioclimatic
Architecture