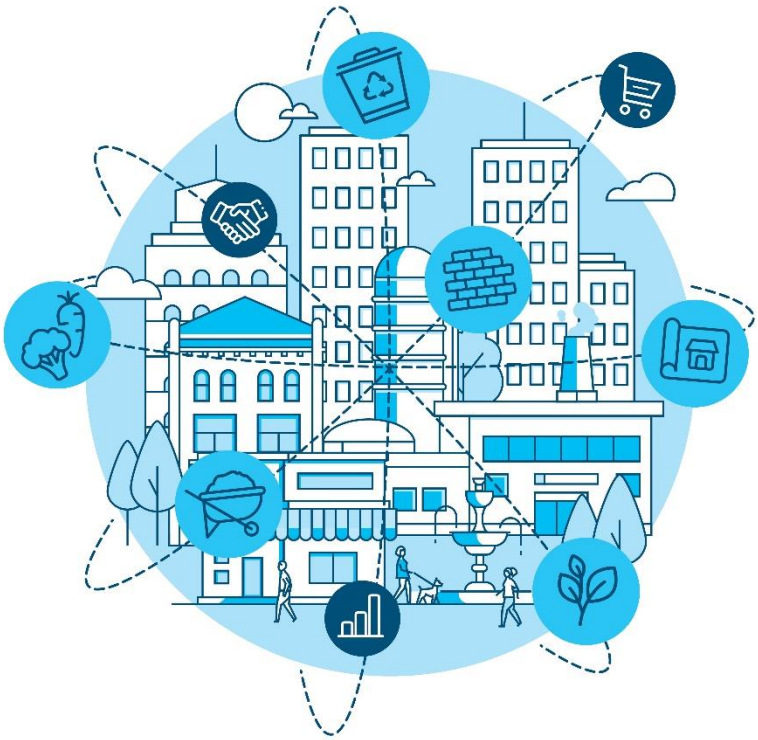
PORTO

Optimised Implementation Plan – Biowaste

2GO OUT Consulting, LIPOR, Municipality of Porto, Porto Ambiente



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Abstract	This Optimised Implementation Plan explains how the Porto will implement the tools and processes developed in the project preparation phase in its demonstration actions, and how relevant local stakeholders and CityLoops project partners will be involved.
Keywords	Demonstration; implementation; plan
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1. Biowaste selective collection and local treatment model

1.1. Short description

The City of Porto seeks to improve its biowaste collection practices to effectively separate, more specifically food waste. To do so, 120 containers for food waste separation will be integrated in the surface bin network of the city of Porto. These containers will be complemented with a Smart Collection System tool based on a mathematical model that will integrate data from the newly installed set of smart sensor containers with the transportation trucks. With the implementation of this technology, it will be possible to identify and locate every container.
During the CityLoops project, the aim is to implement this model and start to collect organic waste and information on the quantity of waste produced in each location, together with data on usage patterns of the bins, and maintenance operations. This way, we will use this information to optimize the bio-waste collection from the smart waste collection bins, through developing better bio-waste collection routes and promoting interaction with users.

The goal in the long term is to expand the network of organic waste collection points and make this data publicly available for businesses and for the public to enable other potential applications, involving the users and potential stakeholders.

At the same time, and as a complement to the bio-waste selective collection we will implement two community composting islands in two neighbourhoods together with food cultivation beds.

Both, bio-waste selective collection and community composting island be supported with the implementation of the awareness campaigns to engage the citizens of Porto City.

1.2. Activities

Activity	Timeline	Responsible partner
Installation of BW smart containers	From April to December 2021	Porto Ambiente
Awareness Campaign for Biowaste separate collection	From April to December 2021	Porto Ambiente
Installation 2 Community Composting Islands	From April to June 2021	LIPOR
Awareness/Engagement Campaign for Composting Islands	From April to December 2021	LIPOR
Deployment of BW collection optimization	From December 2021 to December 2022	Porto Ambiente
Monitoring	From May 2021 to October 2023	Porto Ambiente / LIPOR
Evaluation of the Demo Actions	Set/Oct 2022 (1st evaluation) Jul/Aug 2023 (2nd evaluation)	Porto Ambiente / LIPOR / 2GO OUT

1.3. CityLoops activities

Installation of biowaste containers

120 surface biowaste collection containers with smart sensors will be installed in high-rise residential areas, connected with the SCS tool (see below). These containers will be placed at strategic points of the city and will reach around 15,000 residences. To improve the separation of BW, 15,000 small 7L containers will be distributed for the kitchens of the residences in the area.

Smart Collection System tool (SCS)

A Smart Collection System (SCS) tool has been developed to collect data from the newly installed set of smart sensors biowaste collection containers, via the collection trucks. The system collects information on the quantity of waste collected, together with data on usage patterns of the bins, maintenance operations and real-time location. This will be employed in the demonstration.

This tool will be used by Porto Ambiente, the municipal company responsible for waste collection in the demonstration action to create more effective routes of biowaste collection.

Porto is planning to also make this data publicly available for businesses and for the general public, via its Urban Services Platform, to enable other potential applications.

Awareness raising/capacity building

An awareness raising campaign will be launched on the circular management of BW in the social economy and tourism sectors, and to encourage citizens in high-rise buildings to appropriately use the new separate BW collection system. Awareness teams will be mobilized for the places of residence covered by the project and major commercial areas, in order to introduce and explain the project, and to raise the population's awareness of participation in this project.

This campaign will be supported by a series of communication materials, such as:

- Start-up announcement
- Brochures (triptychs)
- Gifts (vertical gardens and backpacks)
- Hangings
- Information panels
- Physical and temporary structures for awareness actions (counter, roll-up, flag);
- Statements by public figures (in the areas of culture, sport, music, gastronomy, entertainment, television, businessmen)
- Partnerships (with food retail surfaces)
- Mascot
- Digital communication (management of social networks, animations, microsite, videos, photographic record)

Community composting

At the same time, and as a complement to biowaste selective collection, we will implement community composting islands, supported by a local awareness campaign to engage citizens of the surrounding areas. This campaign will be extended to associations and other entities with head offices located close to the composting islands, assuring the integration of composting into the social dynamics of the community and increasing user's number.

For this a series of communication materials will be at our dispose:

- Start-up announcement
- Brochures
- Door-to-door announcement to the local community
- Information panels
- Partnerships (with local associations and other entities)

- Digital communication (management of social networks, animations, videos, photographic record)

BW circularity model: focus on high-rise residential properties

High-rise residential districts represent the main focus of activities in this demonstration action. The activities presented above collectively represent a biowaste circularity model for such districts, providing a combination of biowaste collection points and community composting, with a strong communication and awareness campaign, aimed at stimulating the separation and local treatment of bio-waste in a challenging scenario.

We identified an area with two types of building, a high-rise residential area and a neighbourhood of small houses nearby. This gave us the opportunity to test the implementation of two solutions: a selective collection system for high rise residential buildings and the implementation of a community composting on an area (small houses neighbourhood).

All CityLoops biowaste tools and reports can be found here: *CityLoops - Biowaste*

1.4. Expected outcomes & evaluation

- Involve about 10% of the population of the city of Porto in the separation of biowaste collection
- Collect 1,500 t/year biowaste;
- 1 t/year/composting bin unit of local biowaste treatment (15 in total);
- 210.17 Kg of avoided CO_2 eq. emissions for 1 ton of biowaste treated on composting islands.

Evaluation

The evaluation of the Demo Action will analyse the material for composting, the increase of city population served by regular bio-waste separate collection and the environmental impact (GHG emissions) of this new bio-waste management model, that will allow to decrease the unsorted waste collection.

It will also analyse the costs reduced due to improved circularity, once more related with the decrease of the unsorted waste collection, as well the creation of CE-based employment.

The knowledge building and communication measures and its impacts will also be evaluated, as well as the impact of the stakeholder involvement. The implementation of this Demo Action will test new tools for better mapping of resources and their location that must be evaluated too.

Further information on Porto's demonstrations can be seen at: https://cityloops.eu/cities/porto

1.5. Risks

Potential risk	Mitigation approach
Low data collection for the system, enhanced by the difficulty in implementing selective bio-waste collection and the low adherence to community composting.	Design appealing communication and awareness-raising strategies and reinforce them in several periods during through the years.
Limitations on direct delivery of containers to citizens, given the restrictions imposed by COVID-19.	Design a strategy for the delivery of kitchen containers to citizens assuring social distancing. Possible need to postpone the deadlines for delivery of kitchen containers to citizens.
Impossibility of carrying out awareness-raising actions among the population for the correct separation of bio-waste and the use of community composting equipment.	Design communication and awareness raising strategies that minimise social contact without harming the effectiveness of the action (e.g. telephone contact, videos by WhatsApp and information by email/messenger). Possible need to postpone the deadlines for implementation of awareness raising actions according to the constraints imposed by the pandemic.
Scarcity of separate bio-waste collection capacity and reduced collection frequency, given the increased production of bio-waste in the household sector, resulting from short-term lockdown and medium/long-term changes in work patterns, leading to more people working from home.	Planning the circuits and collection frequency in the domestic sector bearing in mind the new reality and possible trends.
Difficulty in achieving the expected results from the composting islands, due to limited training, monitoring and on-site control of the activity developed in the community composting islands.	Reinforce training sessions with video demonstrations that allow citizens to see the whole composting process. Create a communication and clarification channel that allows citizens to clarity their doubts after the training.

2. Bio-waste Circularity Models, new CP practices and training courses

2.1. Short description

This demonstration action will guide a pilot hotel and private social solidarity institution (IPSS) through the implementation of a circularity model. This model is designed to significantly reduce food waste in both the tourism (hotels and restaurants) and social economy sectors (canteens). These sectors are big local producers of food waste, but are at the same time a source underexplored opportunity for waste reduction and prevention.

BW circularity models (Figure 1) were developed in preparation phase for both tourism and social economy sectors with the aim of supporting the implementation of several actions that will promote a change in citizen behaviour towards bio-waste while reducing its production, and closing the loop of organic matter from farm to fork.

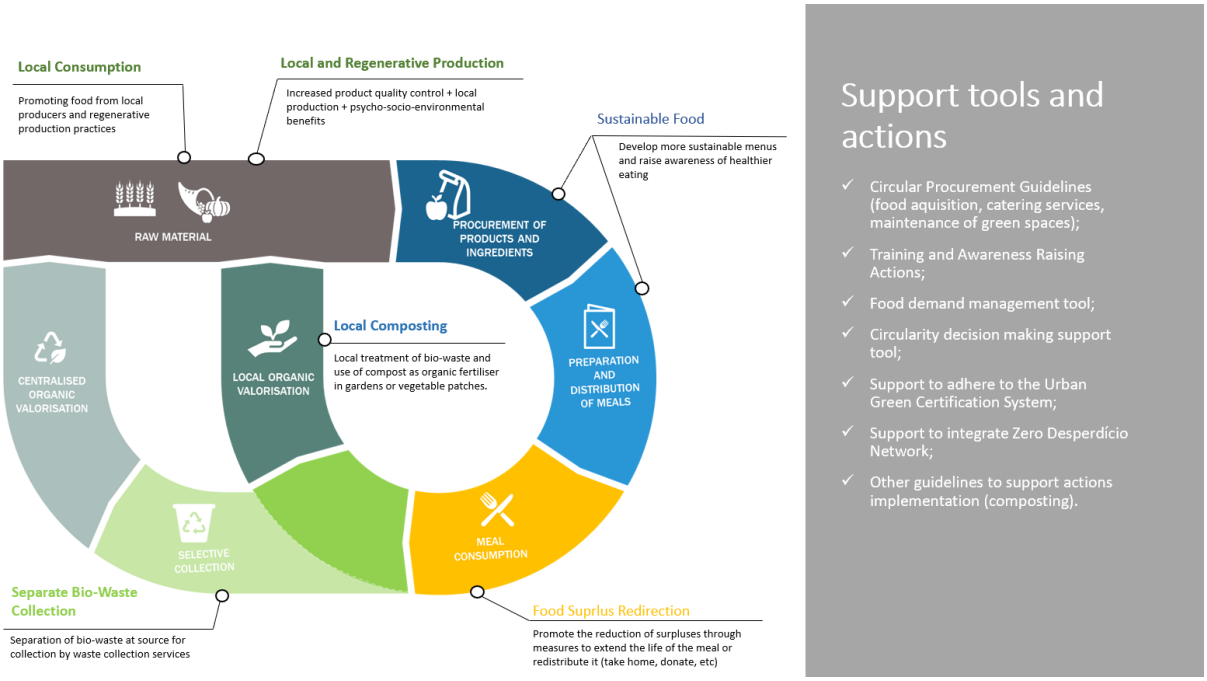

Figure 1. Circularity Models to Tourism and Social Economy Sectors

The models outline a set of measures to be implemented along the bio-waste life cycle. Most of the proposed measures are the result of the experience of the entities involved in waste management in the city of Porto (LIPOR and Porto Ambiente). Action goals and concept models are described in the table below.

Table 1. Goal of the actions

BIO-WASTE LIFE CYCLE	HOTEL	IPSS
Local Food Production	Growbed kits - *Encourage the use of space for the creation of new vegetable garden models and local food production for self-consumption.*	
Sustainable Food	'Dose Certa' - *Promoting sustainable and balanced food, fighting food waste by measuring food waste and designing an action plan.*	
Surplus Food Redirection	'EMBRULHA' - *Doggy bag scheme for selected restaurants allowing customers to take back home unfinished meals.*	*N.A.*
Bio-waste Local Treatment	Local Composting - *Provide institutions with local compost solutions allowing local bio-waste treatment in pilots.*	

Selective Collection and Bio-waste Treatment in Organic Valorisation Facility	Selective BW Containers - *Encourage the separation of bio-waste at source for collection by the waste management services, forwarding to centralised treatment at the Organic Valorisation LIPOR facility.*

The implementation of the BW circularity models will follow a methodology that will allow working directly with the hotels/restaurants and social economy entities in the identification of an action plan prioritising the actions to be implemented in accordance with their initial characterization.

Circularity models implementation will be supported by guidelines and training courses on circular economy to reduce bio-waste from these institutions. The guidelines are focused on canteen and catering services, as well as for maintenance of urban green spaces.

To promote circular procurement within Porto Municipality a tool with guidelines to prepare tenders with circular criteria will be developed.

Food demand management and decision-making support tools developed during the preparation phase, will also be tested within this Demo Action.

2.2. Tasks

Action	Timeline	Responsible partner
Implementation of Circularity Model: Social Economy and Tourism Sector	May 2021 to Oct 2022	LIPOR and 2GO OUT
Initial Characterisation of the hotel/IPSS	May 2021	LIPOR and 2GO OUT
Action Plan Definition	May to Jun 2021	LIPOR and 2GO OUT
Capacity building for the pilots	Jun 2021	LIPOR
Implementation of actions, technical support and monitoring	Jun 2021 to Oct 2022	LIPOR and Porto Ambiente
CP Training courses for technical staff of LPR, CMP and PA	May 2021	LIPOR
CP Training courses for other entities (tourism and social economy sector)	October 2021	LIPOR
Evaluation of Demo Action	Set/Oct 2022 (1st evaluation) Jul/Aug 2023 (2nd evaluation)	LIPOR Porto Ambiente / Porto Municipality / 2GO OUT

2.3. Preparation

A series of tools and guidelines have been developed for to support this demonstration action

- Decision making support tool - This tool is designed to assist social institutions, hotels, restaurants, citizens, and tourists in assessing the circularity impacts of their catering decisions. The tool offers clear guidance for users towards the most circular catering choice, based on a scoring system, on what to do each time organic material is used, bought, eaten, or discarded, with priority based on the hierarchy of the Lansink Ladder.
- Food demand management tool - In the City of Porto, the social economy sector and the tourism sector are major producers of avoidable food waste. To provide them with better tools to reduce food waste, a mathematical model was developed to predict food waste in the social economy and tourism sectors. The model is based on historical data on food served, providing information on expected food demand depending on a set of explanatory variables, namely the menu offered, day of the week, and others. The use of the tool will help stakeholders in these sectors in the daily management of food demand and supply fluctuations. With this information, procurers are able to adjust procedures to the needs of the market based on the forecast provided.
- Circular Procurement Guidelines for the Social Economy and Tourism Sector - Circular procurement guidelines were developed to improve public and tourism and social economy sector procurement. The set of guidelines focuses on canteen and catering services on one side, and the maintenance of urban green spaces, on the other side - meaning that this tool is intended to support green spaces management by Porto Municipality and by social institutions and the tourism sector, which will also develop the Sustainable Green Space certification system that will be rolled out during the demonstration phase (see below). The Porto Circular Procurement Guidelines are based on an integrated vision for Circular Economy for school meal & catering services and green spaces maintenance (macro vision), helping public authorities to identify possible gaps and consequently the need for new products and services. On the micro level, the tool includes information on how to define and develop criteria along the stages of the procurement procedure guidelines which constitutes a comprehensive set of example criteria to implement circular procurement in these sectors.

All CityLoops biowaste tools and reports can be found here: *CityLoops - Biowaste*

2.4. Planned activities

Implementing the circularity model for the tourism and social economy sectors

The demonstration action will consist of a series of activities designed to building the capacities and promote behavioural change in the tourism and social economy sectors to reduce food waste and improve separate biowaste collection. This approach will follow the biowaste circularity model presented above.

Based on an initial characterisation of one hotel/restaurants and one social economy entity involved, a specific action plan (see Table 1) will be prepared for each organisation. The implementation of these action plans will be supported by training on circular procurement (see below), and continuous technical support.

Circular procurement capacity building

Two training seminars will be delivered, focusing on circular management and circular procurement for biowaste:

- Training for technical staff of LIPOR, Porto Ambiente and the Municipality of Porto – focusing on circular procurement, and presenting the guidelines developed.
- Training for hotel, restaurant and canteen workers who want to learn how to apply circular procurement to its internal procedures.

2.5. Expected outcomes & evaluation

Prevent bio-waste production through the applied good practices.

- Local vegetable production of around 3 kg per month with a growbed kit;
- Food waste avoided ~30 % in the pilot;
- Reuse of ~300 grams per Embrulha. package.

Disseminate bio-waste circular models' knowledge on the community highlining its social, environmental, and economic impact.

Improve bio-waste management practices by all stakeholders (citizens, institutions, municipality, and waste managers) and promoting local biowaste treatment by composting.

- Increase separate bio-waste collection by 50 tonns per pilot (Porto AMBIENTE)
- Increase local treatment by 400 kg/year of bio-waste per compost bin (300L capacity)

Evaluation

The evaluation of the Demo Action will take in consideration the environmental impact (material for composting and GHG emissions) promoted by the implementation of the new measures on the pilots (tourism and social economy sectors) and the reduced costs due to improve circularity. The knowledge building and communication measures and its impact will also be evaluated.

The stakeholder's involvement and its impact as well as the new procurement practices implemented in both pilots and city will be analysed.

Further information on Porto's demonstrations can be seen at: https://cityloops.eu/cities/porto

2.6. Risks

Potential risk	Mitigation approach
Impossibility of face-to-face training due COVID-19	The training actions are being planned in both formats (face-to-face and e-learning) to be adapted according to the government restrictions imposed at the time of implementation.
Difficulty in obtaining commitment from the pilots (hotel and IPSS) due to current priorities focused on resolving safety issues of spreading COVID-19 (both sector). As well as opening the establishments in sustainable conditions to retain staff, in case of Hotels.	The circularity models were developed with focus on the valorisation of the food value chain and less focus on the selective bio-waste collection.
Ignore the importance of food circularity actions, due the current priorities of these sectors focused on solving safety problems of spreading COVID-19, as well as opening establishments in sustainable conditions to retain staff.	Development of a communication strategy focused on the opportunities that may arise from the implementation of circularity measures in the food sector: cost reduction, minimisation of food waste, increased brand awareness by favouring sustainable solutions (local production and local composting).
Difficulty in achieving the proposed results in terms of selective bio-waste collection due to the reduction in waste production that occurred during the pandemic.	Review the results and objectives expected. Assess the relevance of carrying out separate bio-waste collection in hotel sector, mainly.
Increase in the number of needy families who will seek social support for food because of the increase in unemployment and economic difficulties of families.	Anticipate the actions related to the donation of food (Demo Action 5), contributing to the support of social economy entities that support these needy families.

3. Launch of Green Space Certification System

3.1. Short description

A certification system guideline for Urban Green Spaces will be launched and implemented in the City of Porto during the demonstration phase. This system seeks to increase the sustainable management of green spaces, promote biodiversity and recognize the spaces already working on these issues, so that citizens can identify and enjoy safe and environmentally well-managed green areas.

The certification system will specifically encourage dedicated gardening practices to promote and reuse the compost produced at LIPOR's composting plant – in order to highlight the importance of returning bio-waste to soil in the form of compost and the sustainable management of green spaces.

Once the urban green spaces to be certified are identified and selected, their current gardening practices will be analysed through filling in a checklist. Based on this, we will produce an action plan to make these gardening practices more sustainable.

Once the action plan has been successfully implemented, the Urban Green Space certification will be awarded.

All CityLoops biowaste tools and reports can be found here: *CityLoops - Biowaste*

3.2. Tasks

Action	Timeline	Responsible partner
Design a certification system[1]	January 2021 to March 2021	LIPOR
Identify one urban green space for the use of compost and testing the certification system	April 2021 to July 2021	Porto Municipality and Lipor

[1] Currently awaiting council approval

Implement certification on urban green spaces in Porto	July 2021 to March 2022	LIPOR and Porto Municipality
Evaluation of the Demo Action	Sep/Oct 2022 (1st evaluation) Jul/Aug 2023 (2nd evaluation)	LIPOR / Porto Municipality / 2GO OUT

3.3. Expected outcomes & evaluation

- Reuse nutrients present in compost on Porto city green spaces
- Reduction of garden waste production and maintenance costs by the city
- Quantity of material for composting (local or centralised option)

Evaluation

The evaluation of this Demo Action will take in consideration the increment on the area of the green spaces certified in relation to the total area of the green spaces existing in the city of Porto. The management practices that will be promoted with the implementation of this Demo Action will impact on the quantity and quality of material for composting that will be evaluated.

Also, the communication measures and knowledge building campaigns and its impact will also be analyzed.

Further information on Porto's demonstrations can be seen at: https://cityloops.eu/cities/porto

3.4. Risks

Potential risk	Mitigation approach
Difficulty to implement the action plan	The action plan could be adapted and written with the management team
Requires changes to the current green spaces' management action plan (sustainable management practices already in place) and consequently, requires a concerted articulation with the green spaces department of the Municipality of Porto	Involvement of the green spaces team in the process

4. Circular Entrepreneurship Initiatives

4.1. Short description

A Contest for Circular Ideas, designed during the preparation phase, will be implemented in the city, during the demonstration phase, in order to promote the circular transition in biowaste and more broadly in the food system. This follows Porto's environmental strategy and Porto's Roadmap for Circular Economy to become circular by 2030, which aims to encourage, support and empower entrepreneurs to turn environmental and social challenges into circular business opportunities and to bring together key players to co-create responses to the challenges and raise awareness of best practices.

The contest is directed not only at local entrepreneurs or companies but also at citizens and social institutions in order to create synergies between new ideas and established organizations with the purpose of upscaling environmental, social and economic positive impacts at the city, and contributing to a more healthy and sustainable food system, applying the principles of circular economy. The contest will look to award ideas that:

- encourage the creation of synergies between several sectors and actors, mainly the social and tourism sectors,
- promote and support innovative food waste management ideas,
- improve food donation circuits,
- satisfy the nutritional needs of vulnerable communities and at the same time reduce food waste,
- promote local/regional agri-food circuits and
- strengthen multi-sector and multi-actor collaboration to raise awareness and fight against food waste.

During the implementation of the contest, 20 of the submitted ideas/teams will go through a bootcamp in order to improve and optimise ideas and business plan. The 5 winning ideas, after the evaluation of bootcamp results, will receive 6 months of high-quality mentorship from a

multiple range of specialists, according to the needs of each idea/project. By the end of the contest, the objective is that each team is able to gather the necessary resources (financial, space, actors' links, human resources, etc) to implement it and make it sustainable and viable.

4.2. Tasks

Action	Timeline	Responsible partner
Design of the contest and elaboration of its Program	2020/2021	Porto Municipality
Launch of the Contest and evaluation of the submitted ideas/teams	May-August 2021	Porto Municipality
Bootcamp to improve the 20 ideas/teams	October 2021	Porto Municipality and external partner
Winners' announcement (5 final winners' ideas/teams)	December 2021	Porto Municipality
Mentorship and capacity building	January-July 2022	Porto Municipality and external partner
Evaluation of the demo action	Sep/Oct 2022 (1st evaluation) Jul/Aug 2023 (2nd evaluation)	Porto Municipality / 2GO OUT

4.3. Preparation

Research on circular entrepreneurship initiatives

During the preparation phase, research into innovative ideas' contests with social, economic and / or environmental impact was conducted, and various internal and external stakeholders were involved in order to recognize the best practices already in place and create a contest model that would add value to the participants and the city. The knowledge and experience of organizing contest for innovative social ideas and projects already implemented in the city, by social cohesion municipal services, were also considered in the process of designing the circular contest.

Crossing the ambitions of accelerating the transition to a circular city with those of promoting innovation, entrepreneurship and a local resilient economy, a *team*, a *concept* and a *program* for the circular contest on circular entrepreneurship initiatives were defined with the ambition to catalyse synergies between the various local actors, from public and private economic to social agents, to raise awareness of environmental and social challenges and encourage their transformation into business opportunities based on circularity principles.

A bootcamp and a mentoring program are being prepared to reach the objectives. The bootcamp will include a local challenges diagnosis to connect the stakeholders to the current city challenges; adaptation or deepening of the innovative and entrepreneurship solutions based on collaboration; training, capacity building and knowledge sharing on circular, social and sustainable principles, sustainable business models and impact measurement so that they can be evaluated and their impact know; identification and localization of resources to the implementation of the ideas/projects; and a speech to the jury. The mentoring program (including masterclasses on specific topics) will be adapted to the technical needs of each winner idea/project so that each team make the project sustainable and viable and meet conditions to implement the project in the city.

All CityLoops biowaste tools and reports can be found here: *CityLoops - Biowaste*

4.4. Expected outcomes & evaluation

At the end of this demonstration, it is expected that the participating teams are able to understand circular economy principles and to transform their challenges into opportunities through the design and implementation of circular business models. The final goal is that the winning ideas can find the necessary resources in order to implement their projects and make it sustainable and viable, contributing to the overall circularity of the food system in Porto Municipality.

Winning ideas will have a holistic approach to a specific problem and will have the tools needed to solve it, whether these tools are funding opportunities, contacts, synergies and/or cooperations.

It is expected that will be generated 20 new business project/ideas of which 5 are winners.

The evaluation of this Demo Action will evaluate the number of new CE business models/cases and its potential environmental impact (GHG emissions). The communication measures and knowledge campaigns and its impacts will also be evaluated as well as the stakeholder's involvement.

Further information on Porto's demonstrations can be seen at: https://cityloops.eu/cities/porto

4.5. Risks

Potential risk	Mitigation approach
Due to the current pandemic situation, the communication and dissemination of the contest will be mainly through digital resources and channels which cannot reach all interested people.	Implementation of a communication and dissemination plan that consider the less social contact to not compromise the purpose of the action (through mailing list, information and short videos shared by e-mail, messages channels/platforms, etc)
The current pandemic context increases the risk of reducing number of applications because citizens and organizations, specially from tourism and social sectors, can be focused on resolving safety issues of spreading COVID-19 (both sector), not being interested or having availability to dedicate attention to new ideas/solutions and ignore the importance of food circularity actions	Communication plan focused on the opportunities that may arise from the implementation of circularity measures in the food sector (turn environmental and social challenges into circular business opportunities and bring together key players to cocreate responses to the challenges and raise awareness of best practices
The contest motivates teams of multi-sectors and multi-actors, which can increase the complexity of the ideas, greater effort to articulate with different stakeholders and discourage contestants	Communication and dissemination plan oriented to promote synergies between stakeholders and raise awareness of their benefits on implementing circularity measures to solve actual challenges in the food sector that are their one challenges too, as they are part of
Potential positive risk: Presentation of creative and innovative ideas that enhance the food value chain and its circularity in contexts similar to COVID-19	Not applicable
Impossibility of implement bootcamp and mentorship in person due COVID-19	The actions are being planned in both formats (face-to-face and e-learning) to be adapted according to the government restrictions imposed at the time of implementation

5. Reducing food waste by a donation Network

5.1. Short description

This will support and expand the food donation network, already occurring in the city, which connects food distribution and social economy sectors to support citizens with low income and social needs in the city of Porto. This action will also allow food waste reduction in the city.

Partnerships with Zero Desperdício will be promoted to expand the network, not only near Porto Municipality (involving municipal services related to social and school canteens and to events promoted by the municipality) but also near small, medium and large companies as food donors that are concerned with their ecological and social responsibility, such as: restaurants and similar, hotels and companies in the wholesale and retail sector; and social organizations as receivers, so that they can redistribute food with quality to citizens in unfavourable living conditions.

All the donation network already in place is supported by an online dashboard that belongs to Zero Desperdício ©. This dashboard (Power BI) presents the various indicators monitored by Zero Desperdício, namely amount of prevented food waste and CO2 emissions, food donors and receivers, type of food collected and the number of equivalent meals distributed, number of beneficiaries and number of families reached until now, and will support the promotion of the network near the potential new partners.

5.2. Tasks

Action	Timeline	Responsible partner
Collaboration protocol between Zero Desperdício and Porto Municipality	April 2021 to October 2023	LIPOR and Porto Municipality
Identification of potential donors and receivers partners	May 2021 to May 2023	Porto Municipality, Lipor, Porto Ambiente and external partner
Definition of the partnerships	September 2021 to May 2023	External partner and Porto Municipality

Food safety and Food security training for new partners	September 2021 to May 2023	External Partner
Evaluation of the Demo Action	Sep/Oct 2022 (1st evaluation) Jul/Aug 2023 (2nd evaluation)	Porto Municipality / LIPOR / 2GO OUT

5.3. Expected outcomes & evaluation

Data related to the donation network with key indicators:

- Food donation network increment (number of donators and receivers);
- Assure the distribution of food surplus through the food donation network (food waste avoided – tonnes and the correspondent avoided CO_2 emissions);
- Increment of the number of supported families.

The stakeholders' involvement is central to this Demo Action, since the main goal is to expand the food donation network, so stakeholders involvement and its impact will be evaluated. The reduced costs of food waste management due to improved circularity will also be evaluated in order to understand the savings related with the decrease of the food waste sent to waste bins that will be then collected for treatment.

Further information on Porto's demonstrations can be seen at: https://cityloops.eu/cities/porto

5.4. Risks

Potential risk	Mitigation approach
The protocol with Zero Desperdício requires a concerted articulation between the various departments of the Municipality of Porto and its actions, which can be a lengthy process	Anticipate the actions related with this Demo Action that do not depend on the signing of the protocol, such as making the network reach potential donor and potential receivers' organizations that are not yet part of the network of Zero Desperdício
Increase of the number of families in need and that will search for social support mainly for food. That is because of the increase on unemployment and economic problems of the families.	Anticipate the actions related with this Demo Action, helping to boost the food donation network, contributing to the support of social economy entities that support these needy families.
Reduction in the number of donor due the pandemic which closed down many establishments, like restaurants.	Optimise the relation between donors and receivers of the Porto Municipality.

CITYLOOPS

CityLoops is an EU-funded project focusing on construction and demolition waste (CDW), including soil, and organic waste (OW), where seven European cities are piloting solutions to be more circular.

Høje-Taastrup and Roskilde (Denmark), Mikkeli (Finland), Apeldoorn (the Netherlands), Bodø (Norway), Porto (Portugal) and Seville (Spain) are the seven cities implementing a series of demonstration actions on CDW and OW, and developing and testing over 30 new tools and processes.

Alongside these, a sector-wide circularity assessment and an urban circularity assessment are to be carried out in each of the cities. The former, to optimise the demonstration activities, whereas the latter to enable cities to effectively integrate circularity into planning and decision making. Another two key aspect of CityLoops are stakeholder engagement and circular procurement.

CityLoops runs from October 2019 until September 2023.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821033.