LET'S GO CIRCULAR! Paving the way for a circular transition of cities

Thematic Article 2 By Dr Eleni Feleki, Lead Expert April 2024

MAINSTREAMING CIRCULAR ECONOMY CRITERIA IN PUBLIC PROCUREMENTS THE SUCCESSFUL CASE OF LISBON







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Mainstreaming circular economy criteria in public procurements: The successful case of Lisbon

Abstract

This thematic article delves into the transformative journey of Lisbon, towards establishing a sustainable, circular economy, framed within the broader context of the European Union's ambitious environmental initiatives, notably the European Green Deal and the Circular Economy Action Plan (CEAP). Lisbon, with its combination of rich cultural heritage, notable industrial activity and densely populated historical center, represents a compelling case study of how European cities can lead the transition towards sustainability through innovative governance, procurements, and use of digital tools.

The thematic article unfolds the approach of Lisbon to embrace a circular economy model by establishing a strategic focus on procurements system, acknowledged in 2022 in the frame of the Procura+ Conference. This system has fostered multidisciplinary collaboration and the adoption of a polycentric governance model, engaging a wide range of stakeholders in the pursuit of climate neutrality and resilience.

A number of initiatives are presented that exemplify the city's commitment to circularity, such as the food action plan and applications in the Hub Criativo do Beato and in food cantines, as well as application of digital tools, (piloting of Save as You Throw) for effective waste separation. All the initiatives are transversed by a strong commitment of the city to enhance social integration, inclusion and to boost entrepreneurship.

Background Information

Lisboa E-Nova Agency, is one of the partners of the "Let's Go Circular! Paving the way for a circular transition of cities" Action Planning Network that receives funding from URBACT IV. Lisboa E-Nova is an Energy and Environment Agency, a non-profit association, whose purpose is to promote the sustainable development of Lisbon and its metropolitan area.

Mobility/ transportation, air quality, high urban density and tourism flows, inadequate exploitation of solar energy, low exploitation of water and secondary materials, low exploitation of urban-rural synergies are among the biggest challenges in Lisbon, related to circular economy.

At national level, Portugal has a National Action Plan for Circular Economy that is being updated at this moment: <u>National Action Plan for Circular Economy</u>. At regional level, a wide range of studies and analysis were developed to support the strategy for the circular economy in the region: <u>Regional studies</u>. There is a regional agenda 2019, focused on productive cycle, agri-food sector, and on construction. At metropolitan level there is an initiative to link 18 municipalities working together to implement sustainability (exploitation of urban-rural synergies, focused on short supply chains and minimization of food waste). Within the scope of the national initiative "Cidades Circulares", the <u>Action</u> <u>Plan for the sustainability and circularity of Lisbon's food systems</u> has been put into force.

Although Lisbon does not have a formal Action Plan for the circular economy, the City has been investing in circular strategies in the areas of energy, mobility, water, and materials. All of them are fully aligned with the Climate Action Plan. The City is among the 100 Mission Cities that have signed to contract to become climate neutral by 2030.

According to the <u>Baseline Study</u> that has been developed in the frame of the ''Let's Go Circular!'' network, a sustainable Lisbon must pass through a renewed public space, through the reinforcement of the fruition of the green spaces, in the conformation of the centralities of the neighborhood and in the promotion of a universal accessibility. Lisbon must take the lead in local climate action and be an example in implementing broader measures and projects that accelerate the energy transition carbon neutrality, the sustainable expansion of renewable energies, climate adaptation, environmental protection, safeguarding natural capital and ecosystem services and the circularity of materials. The ambition of Lisbon in terms of circularity are:

- Formalization of a working group internal to municipal management and with all relevant organizations in which the municipality has an active participation
- Build a circular strategy for the city with all relevant actors by promoting their involvement in a participatory manner and in a spirit of co-creation
- Identify and work on circularity in all matters relevant to the sustainability of the territory and to meet the objectives set to achieve carbon neutrality, to which the city is committed



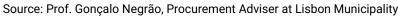
Procurements in Lisbon

Lisbon Municipality aims for more innovation and sustainability in Public Procurements. This is reflected through the "Lisbon Municipality Procurement Strategy 2021-2023". The Strategy is aligned to the ECO 360 – National Strategy for Green Public Procurements.

The strategic focus of procurements is on sustainability and the commitment is towards open innovation; Lisbon brings innovation in tenders, but this is done with extra care, in order to make sure that the companies will be capable to apply.

The aspect of procurements is cross-cutting every policy. The Strategy is based upon four axis, depicted in the following figure.





Currently, Lisbon is the only public entity in Portugal that has received an ISO 20400 certification, in the field of public procurements. ISO 24000 is a guiding standard that allows to organize the procurement function towards sustainability throughout the life cycle, with a positive impact on the SDGs and on the climate action. In addition, Lisbon applies the methodology "Circular public procurement: a framework for cities" in a procurement-project approach. Moreover, Lisbon committed in creating a benchmark for mitigating environmental, social, economic impact in public procurement with the direct involvement of suppliers.

The starting point, was to begin thinking out of the box and keep aside budget constraints, secure enough time and make knowledge available, among a multi-disciplinary team of public employees, coming from different Municipal departments.

Budget as a driver

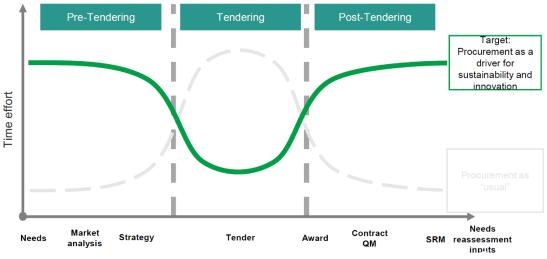
Lisbon has set budget, as a driver for procurement innovation.

Lisbon Municipality plans and sets savings to incentivize innovation and provides support at the pre-tendering phase. Through this approach, Lisbon has passed from traditional tenders, to tenders with innovation criteria and open innovation.

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Changing the effort focus from tendering to pre-tendering phase

While the tendering phase is quite complex, the pre-tendering phase is only focused on availability of budget.



Source: Prof. Gonçalo Negrão, Procurement Adviser at Lisbon Municipality

The pre-tendering platform is currently under development, while the Procurement Planning Platform is developed and aims to drive sustainability, circularity and innovation in Lisbon Municipality. The Procurement Planning Platform has received award in the frame of Procura+ Conference 2022.

What was also very effective, was the initiation of the Procurement Network Knowledge Portal that raises awareness, educates, disseminates knowledge and provide an open space for collaboration between the Municipal employees from different departments that are involved in procurements. Procurements higher than 75000€ are decentralized.

Capacity building – exploiting digital transition and developing new skills: The Public Procurement Platform (PPP)

The Lisbon Procurement Planning Platform for Innovation and Sustainability (Lx PPP-IS) was developed in 2021. Since the conception phase, the innovative approach involved users, designing and developing the Procurement Planning Platform, using a rapid development tool, cloud-based, and agile methods, which selects and supports a project-led approach for deploying new procurement strategies.

The Lisbon Procurement Planning Platform for Innovation and Sustainability (Lx PPP-IS) is the backbone for a modern strategic sourcing approach towards sustainability and innovation. The Lx PPP-IS supports needs' assessment, allowing medium-term forecast of goods, works and services needs and early identification of social, green and economic measures to consider in future tenders. It supports the city's budget planning and the Procurement Annual Planning, aligning with SDGs related to the public procurement initiatives and climate-neutrality targets.

It is an innovative approach to the Public Procurement Pre-tendering stage, turning the annual Planning into a strategic action plan to promote innovation. Finally, it creates an

annual public procurements plan and provides a baseline for monitoring outcomes and impacts. The development of Lx PPP-IS followed best practices of open data, using the OCDS standard, aiming to publish the annual procurement plan before the start of the upcoming year, which is not the practice in Portuguese Public Administration.

The innovation is also about the software used, a low-code rapid development tool from Outsystems, a Portuguese-born unicorn. Lisbon Municipality has established an internal Outsystems Factory, run by our IT Department. Lx PPP-IS team defined the functional requirements involving end-users and then, using an agile project management approach, aligned with the scrum methodologies.

The main pillars for developing the Procurement Planning Platform, among others, are:

- Developing climate action initiatives and assessing the supply chain carbon footprint of Public Procurement are drivers for Green Procurement policies that are wider than setting tender-led green criteria. Lisbon is one of the 100 participating cities which will receive the European Commission's support in achieving the goal of Climate-Neutral and Smart Cities by 2030
- Building an innovation ecosystem is at the core of Lisbon's DNA, though there is a low uptake of innovative solutions from startups and SMEs. Creating an attractive playground for nurturing innovation in public Procurement towards more effective sustainable solutions is mandatory
- Promoting transparency and engaging with the market by delivering more comprehensive open data related to Public Procurement. Integrating data from Public Procurement and infrastructures and assets-related data is crucial for sustainability and circularity
- Transitioning to a new generation of digital Procurement that goes beyond e-Procurement solutions. Implementing transformative technologies, such as rapid-development tools and data analytics, can leverage the Procurement function to address long-term challenges.

Lisbon Municipality is one of the TOP 5 public buyers in Portugal, Lx PPP-IS benefits several stakeholders, here are a few:

- City Government: by providing support to political objectives concerning: climate action, carbon neutrality, innovation ecosystem development, sustainability of supply chains (such as food supply)
- Central Purchasing Bodies: by providing Procurement needs data that allows strategic sourcing decision making;
- End-users: by involving them at early-stage in the challenge of adopting different approaches to fulfil needs and promoting a project-led approach to addressing public tenders (there are more than 500 users involved in End-users: by involving them at early-stage in the challenge of adopting different approaches to fulfil needs and promoting a project-led approach to addressing public tenders (there are more than 500 users involved in End-users: by involving them at early-stage in the challenge of adopting different approaches to fulfil needs and promoting a project-led approach to addressing public tenders (there are more than 500 users involved in Public Procurement);
- Innovation Unit: by involving startups and innovative SMEs in Open Innovation Challenges and promoting internal capacity building in innovation;
- Transparency Unit: by providing more upstream information on Procurement and by incentivizing a more open procurement.

Working with food suppliers for school cantines: Public Procurements serving for less food waste and circular economy

Lisbon is working with food suppliers for school cantines and has put circular economy and social criteria in the tenders for this public procurement. This initiative has a wider social impact as well, because indirectly, families are trained and potentially, they can change their dietary habits, while also decrease their food leftovers. The objective is to establish a healthier and more sustainable school food system.

The road was not easy. Challenges for the Municipality were:

- to plan menus and supply with more seasonal locally sourced products
- to use public procurement to promote local food, without breaching the EU legislation



• to promote food education in school community and families

Source: https://urbact.eu/networks/biocanteens

Legislation as a driver: The Parish of Olivais case

In the case of the parish of Olivais¹, which is a typical quarter of Lisbon that started in 2016 in cooperation with a cooperative of organic agriculture, different stakeholders were involved to promote quality of food in public schools' canteens. The project was awarded with the European Social Responsibility Label–CEEP-CSRO, a recognized European label awarded to organizations that provide sustainable public services. Over the past few

¹ S. Bizzaro and M.Ferreiro, Regional Science Policy & Practice, 2022

years, this project has enabled the improvement of the school menus, modernization of facilities, and local employment (e.g. long-term unemployed).

A commercial contract involved in the partnership between the parish, the school, and the <u>cooperative AgroBio</u> allowed the adjustment of farmers' production according to the needs of the schools. This introduced a more balanced market, with the increase of supply and the reduction in the prices of organic farming, improving negotiation conditions and the purchasing power of schools.

Currently, part of the schools' food provision contains organic products from short supply chains. The new food program ensures about 1660 daily meals (around 60% of organic products) to children aged 3 to 10 and a nursing home with more than 50 users. So far, schools cannot supply 100% organic food due to the unavailability of products in the market. This also demonstrates the limited scale of the organic market in a national context.

Therefore, there is space for growth in this area. This initiative also encompasses a strong investment in the training of food service staff and the coordination of tendering procedures in public offices, to monitor and respond to fluctuations. The management of schools' food service involves a continuous adaptation of the menus according to the availability of the products (seasonality), as well as a flexible management of the routines, supervision of the stocks, and logistics.

This case has a multidimensional nature and aims for the participation of the whole community in the promotion of food pedagogy (e.g., multicultural meals, vegan days) and environmental education (e.g., training on recycling and composting). Students also have the opportunity to perform activities in local vegetable gardens, learning how to produce and consume their own food.

This case study shows that the existing legal framework on public procurements allows the effective introduction of sustainable foods in public contracts. The increasing demand for quality required in food procurement tenders was accompanied by a robust pre-procurement process, strengthening engagement with local providers and, therefore, encouraging local economies and a positive response from the market. Furthermore, the tendering procedures are generally based on direct contracts and treated as separate lots, providing a better adjustment for planning of menus and better suits the response capacity of suppliers, overcoming possible constraints. This flexibility is crucial for the upscaling and maturation of these pioneering strategies, expanding the knowledge sharing, networks, and information exchange with other actors and territories

Lisbon food action plan

Overall, the City has a strong strategy for elimination of food waste and promotion of sustainability and circular economy in this secror. The objective of Lisbon's food action plan is to promote circular functional connections between urban and rural areas as levers of integrated territorial development and locally based sustainable collaborative processes.

The action plan consists of eight actions and several tasks, summarized below.

Action 1: measure to know

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- 1.1 Food Balance Hub Criativo do Beato
- 1.2 Scale application of measurement methodologies
- 1.3 School Meals Footprint measurement and creation of indicators
- Action 2: improve the consumption of short-chain
- 2.1 Production and Consumption: Shorten the chain
- 2.2 Short Chain Km. 0 awareness campaign
- 2.3 Promote the sale of short-chain products in a set of markets in the municipality
- Action 3: seasonal and national origin foods
- 3.1 Building a Roof Garden at Hub Criativo do Beato
- 3.2 Develop "Lisboa Comestível"
- 3.3 "Urban Farmers"
- 3.4 Scale up the Horticultural Parks Network in the City

Action 4: local production: kilometro zero

4.1 Mapping and exploring symbiosis between local partners in the Freguesia do Beato area

- 4.2 From Start to Table
- 4.3 Improve the efficiency of water consumption in city markets
- 4.4 "Clean Future" Acceleration Program
- 4.5 "Last mile deliveries"
- Action 5: innovation and entrepreneurship in the food
- 5.1 Market selling products produced locally by existing community gardens.
- 5.2 Short Chain Km. 0 awareness campaign

5.3 Intensify training activities on organic farming, natural pest control and composting in schools

5.4 "Hortas na Escola": Use of products by the school community or their sale to the surrounding community (with the sales profit being applied to measures to combat climate change)

5.5 Distribution of seed kits for home planting on balconies and/or small spaces

5.6 Promotion of the use of products from vegetable gardens in municipal cafeterias

- Action 6: Value chain
- 6.1 Collection of organic waste in the residential sector in Lisbon –2nd phase
- 6.2 "Lisboa a Compostar"

6.3 Selective Collection in Lisbon: "Green Gardens"

6.4 "SAYT" Project

Action 7: educate to empower

Action 8: bio waste: improving the end of the cycle

The Hub Criativo do Beato and its role in the delivery of the food action plan

The <u>Hub Criativo do Beato</u> is an innovation centre for creative and technological companies which is emerging in a complex of decommissioned factories, on the eastern riverside front of Lisbon. This former industrial area of the Portuguese Army, formerly known as the Manutenção Militar (Military Maintenance), was where flours, pasta, bread, biscuits and other cereal products were manufactured. Now it is getting ready to host over 3 thousand people from around the world who want to produce innovation.

The goals of the Hub Criativo to Beato are to: a) attract the most innovative ideas b) attract new players c) provoke interaction between different people and industries, d) create a community, e) add value to the city.



The Hub embraces and supports the following concepts:

- Smart energy community
- Sensing and charging
- Smart street lighting
- Urban agriculture
- Collection of food oils for biodiesel production and use in buses that serve the Hub
- Collection of used cooking oils in schools, production of biodiesel and use on the CARIS bus route serving the Hub area

- Circularity in the food chain and definition of better strategies for supply, production and final disposal
- Centralised information acquisition and management system for resource optimization, development of advanced analytics and monitoring of urban infrastructures
- Data laboratory
- Clean Tech acceleration programme

Urban garden Hub Criativo do Beato

At the top of the Hub Criativo do Beato, an organic urban garden is born, to demonstrate the contribution of local production for the sustainability of the Hub food system, as well as the benefits of this implantation in the energy consumption of the buildings.



The project is aimed simultaneously at entities based at Hub Criativo do Beato, such as <u>The Browers Company</u> and Praça restaurant, but also at the surrounding community, contributing to the approximation and social interaction between members of the local community and citizens who enjoy the space.

The Browers Company is producing hops (a climbing plant whose flower is used in beer production, and which gives it a characteristic aroma and slightly bitter taste), using it as an ingredient in beers to be produced and marketed in its space at HCB, the Brothers Beato.

The Praça will work on the production of aromatic herbs of different species, to be marketed and consumed in its market and restaurant space at HCB. The objective of the experiment is to investigate and demonstrate the feasibility of production in the HCB food chain, optimizing the process to the best sustainability parameters.

With these experiences, it is expected to investigate and demonstrate the feasibility of food production in the Greater Lisbon area and, due to the geographical proximity, eliminate the need for logistics and transport of goods by road, thus contributing to decarbonization.

Through Programa Hortas, promoted by the Lisbon City Council, the neighbors of Hub Criativo do Beato will be able to enjoy their own urban garden, take home the organic

related social

vegetables and fruits they have grown, and invest in healthy eating habits. The opening of Hub's urban garden to citizens aims to strengthen human relationships in the community and promote social inclusion.

Circular food system

Food systems in cities are actually not very resilient and self-sufficient, depending more and more on a system that tends to operate on a global scale. To reverse a set of weaknesses inherent to this lack of resilience, cities are promoting the implementation of production strategies that promote territorial proximity and the reduction of food waste through its circularity, reuse or recovery for energy purposes.

The food chain of Hub Criativo do Beato will be assessed in a systemic and life cycle approach, which will include the definition of strategies in terms of supply, production and final disposal, for the agents of the local restaurant and the surroundings of the Hub.

Pre-defined circularity strategies will be developed and applied, and the implementation of new strategies in the Hub will be explored that may have their genesis during the evolution of the Hub, evaluating alternative options at the same time.

A tool will also be developed to assess food flows associated with the catering system, which will produce performance indicators relating to the sustainability of the Hub food system.



Foodprojects in Lisbon: Cozinha Popular da Mouraria

Mouraria is one of the most culturally diverse neighborhoods in Lisbon. The former Moorish Quarter of the city (circa the 1300s) was, for centuries, the favored place for immigrants to settle down at and, nowadays, Mouraria is home to folks of at least fifty different nationalities.

Cozinha Popular da Mouraria translates as "Mouraria's popular kitchen" or, even more accurately, it presents itself as Mouraria's kitchen for the people. For its many diverse people!

This is a non-profit association that works towards promoting multiculturalism via a series of initiatives that involve the neighborhood's residents, visitors from elsewhere in the city and, quite often, even tourists. This popular kitchen is a meeting place for people to come to share, learn with one another and, at the end of the day, expand their horizons by getting closer to other cultures they might have been a little less familiar with. All of this, of course, via cooking and eating together. Those who want to get more actively involved with Cozinha Popular da Mouraria might be given the chance to organize a themed night of their country which sometimes goes beyond what's on the menu and may even include other cultural activities such as music or performance.



Let's Go Circular! partners had the opportunity to dine in the Cozinha Popular da Mouraria

In their own words, Cozinha Popular da Mouraria is "a space to exchange ideas and cultures, cook, share and so much more". Indeed, it seems like the volunteers at this non-profit seem tireless as they keep putting together themed events as well as new initiatives. For instance, they have a more recent project going on, under the name Projeto Receitas. Projeto Receitas involves the south Asian community living in Lisbon, through a series of events in which they share their own recipes, with focus on healthy and culturally sensitive meals. Another of Cozinha Popular da Mouraria's programs is Projeto Substância, which supports the growth of business ideas in the field of food production.

Managing waste in Lisbon

In Lisbon, having a population of approx. 550000 inhabitants, in an area of 100 km² dispersed in 24 parishes, approx. 230 waste collection vehicles operate, in 150 routes, collecting 900 tones/ day, in 11300 km/day.

Concerning stream of food, waste collection has started in April 2005 through special collection routes, serving 3000 enterprises of the HORECA sector. In 2019, the system expanded to door-to-door collection serving 41550 dwellings and finally, today there are also underground drop off points, serving 511 dwellings.

Dr Eleni Feleki, Lead Expert



Source: Food waste collection, Higiene Urbana

The green waste stream collection has started in 2018 with community composting. Community composters are installed in the city and domestic composting is also being held, through composters offered by the City. Door to door domestic collection covers 7500 dwellings, in 2023.



Source: Green waste collection, Higiene Urbana

In Lisbon there is a biowaste digestion and composting plant, in Valorsul.

Technological solutions for managing waste in Lisbon

New technological solutions can encourage lower household waste production and higher levels of waste separation. Darine et al² analysed the role of different behavioral factors. They investigated the role that empowerment and ecological behavior have on citizens' intention to use a novel household waste management and separation system and how these interact with the financial incentives typically applied in this area (i.e. Pay-As-you-Throw (PAYT) and Save As-you-Throw (SAYT).

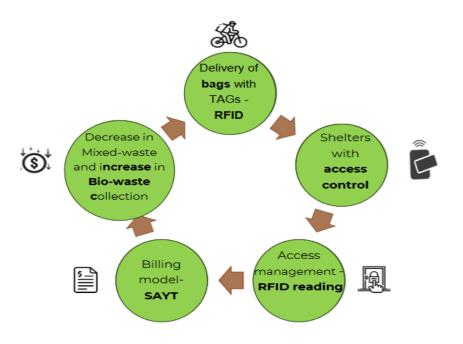
SAYT is a spin on the PAYT system, used by many municipalities across the country, where residents pay for refuse removal - often through a system where bags for trash cost money

² Journal of Cleaner Production, 2022, <u>https://doi.org/10.1016/j.jclepro.2022.132328</u>

but bags for recycling are free, therefore incentivizing people to recycle more. This is a tariff model that simulates the attribution of a bonus to the citizens for their contribution by diverting their waste from the unsorted category, to a selective collection of organic matter. In PAYT users are charged a rate based on how much waste they present for collection to the municipality or local authority. In SAYT, customers pay only for the waste they generate, just as they pay only for the electricity or water they use.

Darine et al., discovered that for people with low perceived ecological behavior, PAYT actually reduces the use of a new waste management system, while SAYT can increase the use of the system. They discovered that PAYT was proved to be pivotal for behavioral intention but not for system use. On the other hand, SAYT has no significant influence on consumers' behavioral intention, but it is a significant predictor of the use of waste management system.

Lisbon pilots SAYT, with a proximity collection system on public roads, using shelters with access control and delivery of bags with RFID tags, in order identify the waste producer. The bags also allow the shelters to be opened. This is piloted in Lisbon, in an area that covers 7000 dwellings. The project is based on the proposal to implement a tariff model that simulates the attribution of a bonus to the citizen for their contribution by diverting their waste from the unsorted category, to a selective collection of organic matter.



Source: SAYT, Higiene Urbana

Supporting entrepreneurship

Lisbon is supporting strongly entrepreneurship. Startup Lisboa, as an incubator and facilitator of innovation processes and activities for the city, implements every year an acceleration program at the Hub Criatovo do Beato Living Lab, dedicated to clean technologies, focusing on the priority areas: Energy, Buildings, Mobility, Circular Economy and Environment.

With the objective of stimulating sustainability practices in the creation and development of businesses, the program intends to reward innovative products and services that must, in part, be demonstrable in the context of the Hub, thus contributing to the constant evolution of the living laboratory and to the sustainable transformation of Lisbon.



Source: <u>https://hubcriativobeato.com/en/noticia/new-clean-tech-acceleration-program-seeks-solutions-to-improve-sustainability-of-cities/</u>

Startup Lisboa has promoted acceleration programs in several areas, from the restauration sector to the creative industries and, more recently, co-organized the Women4Climate mentoring program with the Lisbon City Council, within the framework of the C40 network of cities. Promoting a culture of entrepreneurship and attracting national and international talent is at the heart of Lisbon's and Hub Criativo do Beato's economic policy.

Clean Future is the name of the acceleration program, promoted by Unicorn Factory Lisboa and Startup Lisboa. There are €20,000 in prizes and applications run on the program's official website: www.cleanfuture.pt.

Closing remarks

The logic of cooperation and mutual benefits to the market and to the public procurer can drive substantial changes in the supply chain (e.g., improve management practices, optimize costs, reduce food waste) and creates significant opportunities to optimize innovation mechanisms in the procurement. To achieve this, Lisbon applies initiatives that facilitate rules and procedures, strengthens the training of teams and procurement managers, and avoids the administrative burden and potential financial constraints. The strong knowledge and experience of the City in the field of procurements as a driver of open innovation and sustainability, has been applied specifically in the field of public procurements for shools' cantines and is perfectly in line with the food action plan that has been adopted. Moreover, the City aplies a life cycle approach in managing biowaste, either food or green waste and for this reason, digital tools are piloted (i.e. Save As You Throw). Finally, the Hub Criativo do Biato, provides a perfect ground not only for testing innovative solutions, but also to promote entrepreneurship and clean technologies.

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External distinguished contributors that contributed to the transnational meeting from the city of Lisbon: Mr Diogo Moura, Economy and Innovation Deputy Mayor of the city of Lisbon, Gonçalo Negrão Serra, Procurement Adviser at Lisbon Municipality, Dean and Professor at Instituto Piaget and Professor Paulo Ferrão, distinguished Professor of Instituto Superior Técnico - University of Lisbon, President of IN+, Center for Innovation, Technology and Policy Research, very active in the area of waste management, previously coordinator of the National Circular Economy Strategy, of the National Waste Management Strategic Plan and Mrs Claudia Nunes, employee of the Municipal Waste Management Directorate of Lisbon, presented waste management.

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