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## **"Prato Circular City": an integrated strategy to accelerate the circular urban transition through innovation, regeneration, cohesion**

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Case study of the City of Prato, Tuscany (Italy)

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### **Abstract**

Accelerating the transition towards a circular economy is an important challenge for institutions, cities, production clusters, organizations and citizens. Alongside the many virtuous initiatives that exist at a micro level, it is essential to encourage the development and affirmation of increasingly systemic and integrated circular models aimed at sustainability on a larger scale. Cities are the main drivers of economic development and the production districts introduce a bio-uniqueness principle among the urban and industrial dimension at a territorial level. The circular economy offers great opportunities for innovation and sustainability of cities and their production systems. Enabling organizations to identify these opportunities can help the transition acceleration. This also means enhancing all the initiatives developed by virtuous organizations at micro level translating them into a wider system, where that symbiotic phenomena are favoured. The development of more sustainable consumption patterns among citizens is an additional opportunity to move the economy to a circular direction. Cities are able to motivate and push their citizens in this direction.

At urban level, circular economy principles need to be managed in an integrated manner by policy makers and relevant stakeholders. In order to overcome barriers, our proposal to local policy makers is to approach to the circular economy taking into account innovation, regeneration, cohesion.

Innovation means rethinking production processes in a circular way considering the product's life cycle. A better legislation can facilitate the recovery and reuse of waste and by-products, better funding can help to adopt less impactful technologies, better knowledge can affect organizations on the one hand and citizens on the other to drive more informed consumption.

Regeneration means unused or underused spaces and buildings must be rethought and destined for new productive, recreational and social functions. Better legislation can help in temporary or permanent change of destination, better funding can contribute to the necessary adjustments, and better knowledge can push more aware citizens to reclaim "forgotten" spaces.

Cohesion, by promoting participatory processes and active citizenship within the cities, may contribute to improving the quality of life and collaboration at all levels.

This paper presents the integrated strategy promoted by the Municipality of Prato in order to accelerate the city's transition towards a circular economy. The so-called "Prato Circular City" is a local public strategy, supported by scientific supervision, able to involve public and private local stakeholders, also favouring connection with upper level of decision makers. The territory of Prato is strongly characterized by a homogeneous production district (e.g. textile and clothes production) which is a fertile ground for this transition. Prato Circular City explores four relevant vertical themes, and it defines an innovative model of governance of the circular economy transition at local level

This paper relates mainly to SDG 11, target 11.a. The health emergency due to Covid-19 forces the reconsideration of lifestyles and coexistence, the training system, the ways of using spaces, and our production processes. Pushing the transition to circular economy at urban level could contribute in accelerating progress towards SDGs.

**Keywords:** Circular economy, Urban policies, Innovation, Regeneration, Cohesion

## **1. Introduction**

A sustainable vision of the city gives rise to reflections on the need for a paradigm shift, involving the gradual abandonment of the linear use of resources in favour of one based on a circular logic, through innovative economies. In fact, in the so-called technosphere, what is processed, exchanged and consumed in production chains leaves waste and residues (Nebbia, 2002). The adoption of a circular approach in production process, as well as in the governance of a territory can offer opportunities for innovation within the local context and the sustainability of existing economic systems. This also means enhancing virtuous initiatives by transferring them into a wider system, capable of fostering symbiosis phenomena. In other words, it means for a municipality to incorporate the principles of a circular economy in all its functions, with local policies designed to be regenerative, accessible and with a sustainable use of resources (Ellen MacArthur Foundation, 2015). From the point of view of awareness, it is also necessary to direct citizens towards more sustainable consumption models. In addition, the concept of the circular city, as mentioned above, is linked to that of urban metabolism, in which the resources flowing within the city define complex networks of interconnected social and physical infrastructures (Ghisellini et al., 2016). Moreover, the urban dimension is one within which specific

policies and initiatives can influence both consumers and businesses (Kirchherr, 2017). Consequently, the adoption of a circular approach in cities should necessarily involve from administrators to productive activities, from associations to citizens (Borsacchi and Pinelli, 2019). It is desirable that this sharing of intentions translates into concrete actions to promote innovation, regeneration and cohesion as the accelerating factors of the transition into a circular city model.

The ecological transition and the circular economy are at the centre of recent European policies. Some European cities are experimenting model of urban governance of circular economy. Among them, in Berlin, the “Circular Berlin” program promotes the development of knowledges, strategies and projects to understand material flow, exploring their linkages and imagining innovative modalities of eco-design. The Berlin metabolism analysis aims to develop a local circular economy agenda and its implementation through research, community building and a participatory approach for the co-creation of urban strategies. More emphasis on organisations is given by the Brussels-Capital initiative “Be Circular Be.Brussels”, with the aim of providing support in the development of circular economy activities. A further dimension of the initiative is the promotion of a local economy to improve the quality of life. The “Circular Glasgow” project, promoted by the local Chamber of commerce, is focalized on organizations by accompanying programmes for the adoption of sustainable and circular practices, also encouraged by dedicated funds. Instead, the policy of Milan, called “Food Policy”, aims to orientate the food policies, in order to make the food system of Milano city more equitable and sustainable. Indeed, five priorities have been identified by participative processes, including the access to health food for all, the sustainability of the food system, the reduction of waste.

Since 2006, as part of the European Urban Agenda, cities, regions and Member States, together with European institutions, have started to discuss about regulatory issues, funding opportunities and increased awareness. Among the various partnerships is the one on Circular Economy, which started its activities in February 2017. The participating municipalities are Oslo (coordinating the work), The Hague, Prato, Porto, Kaunas, as well as the region of Flanders. Also involved are ministries (from Finland, Poland, Slovenia and Greece), representatives of Directorates-General of the European Commission and other European institutions (Borsacchi et al, 2020). The methodology used by the Partnership to enhance sharing and converge on shared proposals for the circular economy included the identification of a number of priority themes. The result was the definition of an action plan based on concrete actions for the acceleration of the transition towards the circular economy at urban level. This methodology provided the Partnership with the opportunity to enter into direct dialogue with the European Commission and the Parliament on relevant urban issues. The experience gained within the partnership, together with the building of a consolidated network of relations at European level, allowed all the parties involved to increase their awareness that is carried over into their strategies at local level. Based on this experience, some members of the Partnership have started to define and launch their own local circular economy strategies.

The Municipality of Prato, with its almost 200,000 inhabitants, is the second largest city in Tuscany and the third largest in central Italy by residents. Famous worldwide for its textile district, it has over 3,500 enterprises. Alongside the textile district, since the 1990s the fast fashion district has grown, with a sector of over 4,000 enterprises. In the last decades, Prato has been affected by strong migration processes of foreign citizens that have ended up characterising its social and productive structure in an important way. The coexistence of numerous cultures, including one of the largest Chinese communities in Europe, has led to the experimentation of coexistence and multicultural solutions. Over the years, it has become necessary to launch projects to promote a culture of integration and legality, as well as to raise awareness, disseminate knowledge and provide training. From the economic point, textile production in Prato has historically based its fortunes on the reuse of textile waste from manufacturing, and used clothing from all over the world. This activity was made possible in the past thanks to the support of the district's mechanical textile industry, which was able to design machinery to recycle the fractions that would otherwise have been considered waste. The application of circular economy principles to the textile chain has also created over the years virtuous symbiosis phenomena. A significant example in strategic and infrastructural terms was the construction in the early 1980s of a centralised treatment plant for industrial and urban wastewater. This is still the most important industrial plant in Europe, and it allows the reuse of treated water back to textile production, in a closed loop. More, the availability of empty industrial buildings no longer in use due to the relocation of business activities to more accessible locations, together with the progressive closure of enterprises, has led to public and private initiatives to recover and regenerate buildings and spaces.

The Municipality of Prato's approach to sustainability issues and the application of circular economy concepts goes beyond efficient waste management. In fact, circularity also includes issues such as building design; renewable energy systems; sustainable urban mobility; a balanced urban bio-economy; and production systems that minimise the use of new resources and are based on the recovery, recycling and reuse of materials and energy. Thus, the administration has made the strategic choice to place the circular economy at the centre of the city's innovation and development policies. This decision is part of an integrated short- to medium-term plan based on digital transition, ecological transition, local economic development and social policies. These conditions, together with Prato's experience in the above-mentioned European Partnership, the existence of policies at metropolitan level (Florence-Prato-Pistoia area), the administration's ability to involve the various local stakeholders, and the scientific-technical support provided on these issues by the local university research centre, led to the definition of the “Prato Circular City” (PCC) strategy and related methodology.

## **2. Methods**

Structured as a Living Lab, PCC operates to overcome the barriers that slow down the transition to the circular economy. For this reason, PCC focuses on better regulation, better funding and better

knowledge. Within the discussion on circular economy, actions of better regulation aim at the improvement of existing laws by comparing them with the regional, national and European level, especially in order to affect and address legislative review processes that are already underway. Better funding is geared towards tapping appropriate funding, including European structural and investment funds, as well as creating partnerships at city and district level. Better knowledge actions aim at increase awareness at all levels, including the creation of a sense of belonging to the systemic mechanism of the circular city.

The living labs work as follow: 1) Identification of relevant stakeholders, according the topics, and willingness to participate in meetings. 2) Organisation of thematic working tables in the identified areas and for specific topics. 3) Focusing on specific topics, chosen and validated by the participants. Discussion of the specific topics in working groups. 4) Presentation of the proposals for action to others outside the working group and collection of feedbacks. These defined actions are compiled in an operational plan containing implementation modalities and timing. However, not all actions are intended to be finalised. In order to limit failures around a specific topic, the first meetings are devoted to systematising useful information for the continuation of the activity. Group participants are invited to identify and share initiatives; good practices and existing networks (knowledge); relevant legislation (regulation); relevant funding calls (funding). This is an initial survey that highlights existing barriers. Based on the information gathered, a hypothesis of action is formulated, which is then evaluated through criteria and by decision tree. Only relevant and feasible ideas can continue in the process of defining the action, until to subsequent implementation. Working groups are set up and operate in three different ways. Based on the state of the art and existing initiatives at local and supra-local level, Operational working group (OWG) formulates a hypothesis of action to overcome at least one barrier. Thanks to the support of the action co-ordinator, OWG works on concrete and feasible proposals, with relevant impact on the transition whenever implemented. Cross-cutting working groups (CWG) are groups already operating prior to the launch of PCC. CWGs use the PCC platform to operate in an integrated manner on their interest topics but including in their discussion circular economy principals and approach. An Observatory (OSS) is a forum for discussion and the conduction of in-depth analysis of economic and social phenomena.

### **3. Results and Discussion**

Officially launched in July 2020, “Prato Circular City” (PCC), aims to promote and accelerate the transition of the city towards the circular economy. In fact, the strategy, willing to strength the image of Prato as «circular city» and promote shared, integrated and participatory actions. The result is the creation of a permanent forum that involve all local stakeholders to co-create and implement shared circular economy actions and act as the governance of circular city.

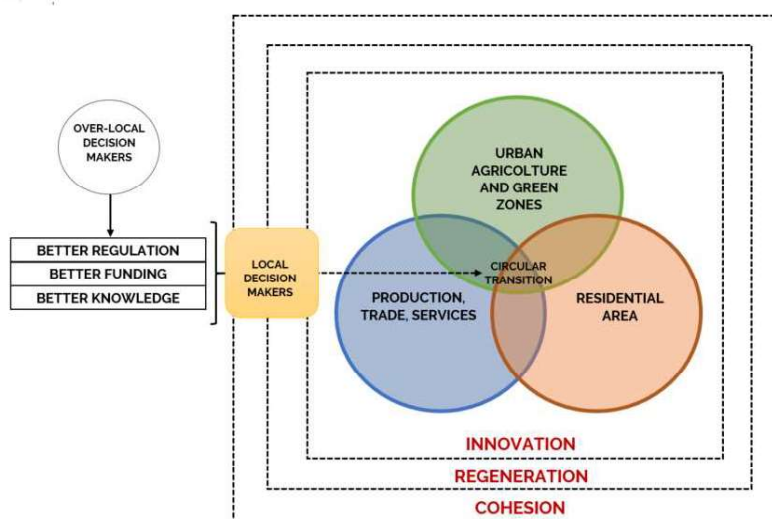
The promotion of innovation in production dynamics and citizens' behaviour, together with the adoption of urban regeneration policies, can make the urban system more sustainable and resilient. Likewise, by means of strengthening social cohesion, it contributes to the creation of an inclusive and solidarity-based community, based on the principle of sharing and creative reuse as a means of stimulating innovative driving forces for business activities, also with social purposes, within collaborative economy initiatives (Borsacchi et al., 2018). Thus, the approach followed by the Municipality of Prato in the adoption of circular economy principles within local policies and strategies takes into account innovation, regeneration, cohesion.

*Innovation:* For the textile district, the challenge of global markets requires a change in production processes towards more sustainable and innovative models, aimed at strengthening inter-district relations and increasing competitiveness, and considering the product's life cycle. A better legislation can facilitate the recovery and reuse of waste and by-products, better funding can help to adopt less impactful technologies, better knowledge can affect organizations on the one hand and citizens on the other to drive more informed consumption. The district must be able to benefit from adequate investment, both public and private, especially related to the processes of digital and ecological transition. This translates into focusing resources on supporting the diffusion of technologies and digital skills at companies, green transition, circular economy, energy transition. In addition, it will be necessary to define funding lines for supply chain projects aimed at the reorganization of relations between production activities, using technological solutions (i.e. blockchain). At the logistics level, the development of integrated strategies at the regional level is expected. More, the application of digital information technologies to cultural assets and activities must result in a more widespread knowledge of heritage and can, if extended to the tourism sector, further translate into increased attractiveness.

*Regeneration:* Increasing the competitiveness of businesses activities in the textile district also involves organizational reorganization in production chains. The development of circular economy projects will have to go hand in hand with the digitalization of enterprises. At city level, phenomena of uncontrolled urbanization in the past have caused fragmentation and unjustified land use, intensifying in marginalized areas the risk of exclusion. On this issue, also thanks to the participation in the European Partnership on Circular Economy, the Municipality of Prato has understood that circular reuse of unused buildings and spaces is an opportunity to re-think and change critical areas of the city, assigning them new functions and services (i.e. productive, recreational and social functions). Better legislation can help in temporary or permanent change of destination, better funding can contribute to the necessary adjustments, and better knowledge can push more aware citizens to reclaim "forgotten" spaces. Participatory processes and co-design with residents can increase the positive impact of the interventions. The social dimension of urban regeneration also includes the promotion of health and citizens wellbeing.



*Cohesion:* Strengthen responsible production chains, encouraging virtuous initiatives and symbiosis phenomena. The textile waste can be directed, for example, towards other production sectors such as construction, furniture and automotive thanks to dedicated funds for research on materials and certification of the obtained products. At city level, it is possible to motivate or push citizens towards more sustainable consumption patterns. In addition, the development of the territory passes through the creation of integrated paths of enhancement of agribusiness and tourism offer of the area. At the same time, the Public Administration intends to promote collaboration with neighbouring municipalities, by extending the sharing of data with other public and private entities. Finally, by promoting participatory processes and active citizenship, it is possible to obtain positive results in terms of quality of life and increase collaboration at all levels. The application of a circular approach in the urban area must translate into a commitment to promoting innovation, regeneration and cohesion as factors accelerating the transition process, which also provides for systematic governance. The actions developed by PCC intend to contribute to Sustainable Development Goals (SDGs) 3, 8, 9, 11, 12, 13 and 17. The approach of PCC strategy for accelerating the circular transition at the urban level is represented in Fig 1.

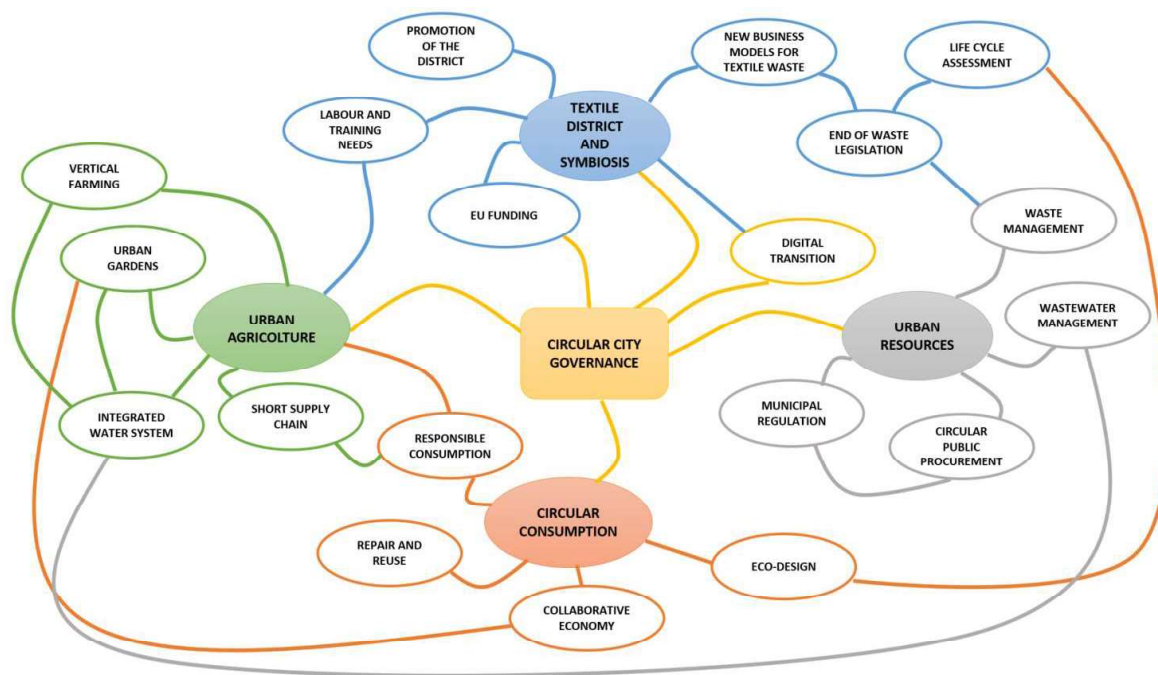


*Figure 1. The Prato Circular City strategy, by integration of innovation, regeneration and cohesion (source: Borsacchi et al, 2020)*

The governance model of PCC depicts the relations between governance, priority areas and interactions between the specific topics and takes into account the digital transition. The groups of stakeholders work on priority areas on specific topics as shown in the table 1. The complex system of interactions between priority areas and specific topics is depicted in Figure 2. It should be noted the dynamism of PCC. In fact, with the progress of the meetings, some working groups will progressively close (with the production or not of an output). At the same time the opening of new working groups, based on emerging needs, is expected. PCC will remain active through the three-year period 2020-2023.

**Table 1.** Prato Circular City, areas of discussion

Priority areas	Specific topics and related working groups
AREA 1 - TEXTILE / CLOTHING DISTRICT AND INDUSTRIAL SYMBIOSIS	OBS End of waste legislation OWG New business models for textile waste OWG EU funding OWG Promotion of the district OBS Labour and training needs CWG Digital transition CWG Life Cycle Assessment and decarbonisation
AREA 2 - MANAGEMENT OF URBAN RESOURCES	OWG on waste management OWG on waste water management OWG on circular public procurements CWG on municipal regulations
AREA 3 - CIRCULAR CONSUMPTION	OWG Eco-design OWG Responsible consumption OWG Repair and reuse OWG Collaborative economy
AREA 4 - SUSTAINABLE URBAN AGRICULTURE	OWG Integrated water system OWG Short supply chains OWG Urban gardens and common goods OWG Vertical farming



**Figure 2.** Prato Circular City, interactions between priority areas and specific topics (source: Authors)

In the first six months of Prato Circular City (September 2020 - February 2021) 14 working group meetings were organised. The working groups operated on six specific topics and have defined five actions that will continue in the subsequent implementation phases. Policymakers participated in all working groups, emphasizing strong commitment to the overall PCC strategy.

The evidence gathered during the first months allows us to highlight some positive and negative elements of the methodology used. Among the positive elements, there is the direct involvement of qualified stakeholders from the textile district and civil society thanks to the aforementioned attitude of the local administration to listening to the needs of the various local actors. Having the discussion converged on a single platform avoids duplicating meetings. While on the one hand this facilitates the possibility of creating synergies and partnerships for participation in funding calls, it also underlines the possibility of relating to supra-local levels with a single and shared position on certain priority issues. However, it should be noted the lack of involvement of citizens in the meetings in this first phase of the strategy (they will be involved in a later phase). These considerations are outlined in the following SWOT table 2:

**Table 2.** Prato Circular City, positive and negative elements about the used methodology

STRENGTHS	WEAKNESSES
Involvement of qualified stakeholders, both of the textile district and civil society Attitude of the local administration to listen to the needs of stakeholders Single discussion platform that avoids replicating meetings Integrated discussion between different project and policies Possible creation of synergies and partnerships for participation in calls for funding	Lack of citizen involvement at this stage of the strategy Possibility of overlaps among specific topics and working groups Different timing of working groups in defining actions
OPPORTUNITIES	THREATS
Development of a single and shared position on some priority issues facilitate the discussion with supra-local levels Improvement of the perception of Prato as circular city Circular economy as a pillar in the Recovery Plan	Widespread increase in awareness among cities about circular economy and consequent competitiveness in fundraising

The overall result is an improvement in the perception at local level of Prato as circular and sustainable city as well as an increase in awareness among stakeholders of circular economy as pillar in the green revolution and ecological transition indicated as missions of the National Recovery Plan. It should be noted that, meanwhile, other Italian cities are starting to launch strategies similar to PCC. This will competitiveness in fundraising among cities in the short-medium period.

#### 4. Conclusions

Cities need courageous urban agendas based on a renewed alliance between economic, social and cultural policies in which the issues of digital and circular transition, the social impact of economic systems, a return to short supply chains, and environmental transition, which in cities are translated into resilience strategies, urban forestation and sustainable mobility, are seen as major opportunities for generating sustainable local development. To these must be added the centrality of human health, through the adoption of new socio-economic models that look to the well-being of citizens, while respecting the planet we live on.

The capacity for integrated vision on circular economy policies on the part of the municipality of Prato is due to a number of factors concerning the history and evolution of the textile district. First, the presence of a homogeneous production district in which common interests and knowledge converge. This allows policies to be targeted. The textile sector is also a sector where innovative and sustainable production solutions can be introduced, some of which are already in place (*innovation*). Secondly, the relocation of numerous production activities from the previous dedicated area (close to the city centre). This emptied numerous buildings. By urban regeneration practices, the disused buildings can nowadays be rethought in terms of their functions and destinations (*regeneration*). Finally, the presence of a multicultural society on the territory represents a fertile ground for innovative solutions to strengthen social *cohesion*.

The methodological approach used by Prato Circular City is replicable in other urban contexts, regardless of size, with the appropriate adaptations related to the presence of prevalent productive sectors and previous initiatives and policies already in place. A 'circular city' strategy can act effectively on urban areas by contributing to and implementing effects of ecological transition, increased resilience and social sustainability of local economies, digitalisation, and innovation, and by contributing to placing territories and their specificities in the more general debate that promotes the centrality of urban policies in national ones.

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### **Disclaimer**

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