4 Policy recommendations and actions for a circular economy in Granada, Spain

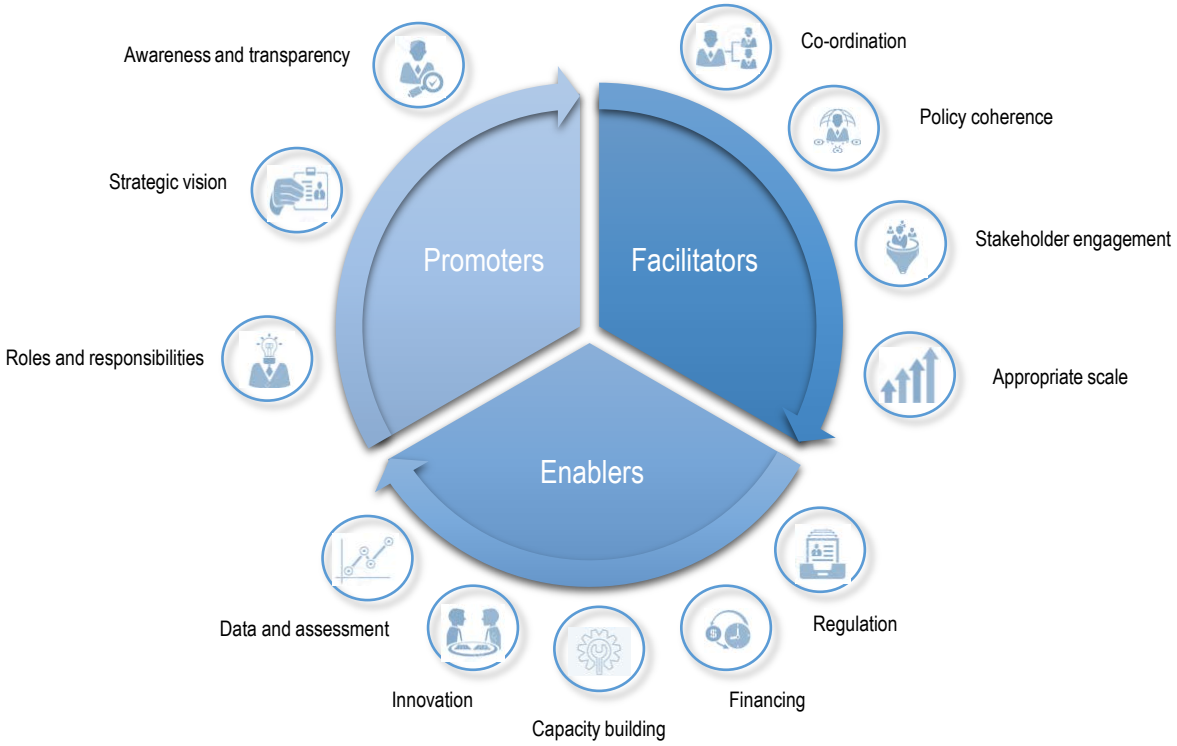
In response to the challenges identified in Chapter 3, this chapter suggests policy recommendations to implement the circular economy in the city of Granada, Spain. The city of Granada can act as: i) *promoter* of a circular economy culture and lead by example; ii) *facilitator*, for enhancing collaboration across stakeholders and levels of governments; and iii) *enabler*, for implementing the necessary regulatory and financial conditions, amongst others, in the transition from a linear to a circular economy.

The governance of the circular economy in cities and regions

According to the OECD, cities and regions can play a role as *promoter*, *facilitator* and *enabler* of the circular economy (Figure 4.1) (OECD, 2020[1]).

- *Promoters*: Cities can promote the circular economy, acting as a role model, providing clear information and establishing goals and targets, in particular through: defining who does what and leading by example (roles and responsibilities); developing a circular economy strategy with clear goals and actions (strategic vision); promoting a circular economy culture and enhancing trust (awareness and transparency).
- *Facilitators*: Cities and regions can facilitate connections and dialogue and provide soft and hard infrastructure for new circular businesses, in particular through: implementing effective multi-level governance (co-ordination); fostering system thinking (policy coherence); facilitating collaboration amongst public, not-for-profit actors and businesses (stakeholder engagement); and adopting a functional approach (appropriate scale).
- *Enablers*: Cities and regions create the enabling conditions for the transition to a circular economy to happen, for example: identify the regulatory instruments that need to be adapted to foster the transition to the circular economy (regulation); help mobilise financial resources and allocate them efficiently (financing); adapt human and technical resources to the challenges to be met (capacity building); support business development (innovation); and generate an information system and assess results (data and assessment).

Figure 4.1. The governance of the circular economy in cities and regions: A Checklist for Action



Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

This chapter suggests policy recommendations and related actions based on international practices and as a result of the interviews with more than 70 stakeholders (Figure 4.2), during the OECD mission on 25-28 March 2019 and a policy seminar on 23 October 2020 (Table 4.1). The 12 governance dimensions for each cluster (promoter, facilitator and enabler) build on the Checklist for Action for cities and regions transitioning to the circular economy (OECD, 2020[1]). These governance dimensions were inspired by the OECD Principles on Water Governance (OECD, 2018[2]; 2015[3]) and they are accompanied by the OECD Scoreboard on the Governance of the Circular Economy, developed thanks to the collective efforts from case studies on the circular economy in several cities (OECD, 2020[4]; 2020[5]; 2020[6]).

It is important to note that:

- **Actions are neither compulsory nor binding**: Identified actions address a variety of ways to implement and achieve objectives. However, they are neither compulsory nor binding. They represent suggestions, for which adequacy and feasibility should be carefully evaluated by the city of Granada in an inclusive manner, involving stakeholders as appropriate. In turn, the combination of more than one action can be explored, if necessary.
- **Prioritisation of actions should be considered**: Taking into account the unfeasibility of addressing all recommendations at the same time, prioritisation is key. As such, steps taken towards a circular transition should be progressive. Table 4.1 provides an indicative timetable for actions (short, medium and long term).
- **Resources for implementation should be assessed**: The implementation of actions will require human, technical and financial resources. When prioritising and assessing the adequacy and feasibility of the suggested actions, the resources needed to put them in practice should be carefully evaluated, as well as the role of stakeholders that can contribute to the implementation phase.
- **The proposed actions should be updated in the future**: New potential steps and objectives may emerge as actions start to be implemented.
- **Several stakeholders should contribute to their implementation**: Policy recommendations and related actions should be implemented as a shared responsibility across a wide range of actors. The stakeholder groups contributing to this report and the identification of the actions are represented in Figure 4.2. They have a key role as “do-ers” of the circular economy system in Granada, Spain, along with other stakeholders that will be engaged in the future. Table 4.1 provides an indicative, however not exhaustive, selection of actors that can contribute to each of the proposed actions.

Table 4.1. Policy recommendations and actions for the circular economy in Granada, Spain

Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
Promoter	Roles and responsibilities	Create a dedicated municipal coordinating structure for the circular economy, building on the experience of the Municipal Office of Innovation, Smart City and Funds for Transformation.	X			Municipal Office of the Circular Economy Municipal Department for the Environment Municipal Department for Public Works and Urban Development Municipal Department for Economy, Participated Companies, Treasury and Innovation Municipal Office of Innovation, Smart City and Funds for Transformation
		Identify who can do what within the municipal departments to apply circular economy principles in order to lead by example. Actions would include: • Prevent waste generation. • Promote the use of secondary materials and sustainable products. • Adopt business models shifting from ownership to services. • Adopt green public procurement (GPP), including circular economy principles.		X		Municipal Office of the Circular Economy All municipal departments of the municipality of Granada
	Strategic vision	Collaborate with universities for urban metabolism analysis.	X			Municipal Office of the Circular Economy University of Granada
		Map the existing circular economy-related initiatives in Granada.		X		Municipal Office of the Circular Economy Emasagra Inagra Municipalities within the Metropolitan Area of Granada OnGranada University of Granada Government of Andalusia Province of Andalusia Granada Health Technology Park Granada Convention Bureau

Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
						Provincial Federation of Hospitality and Tourism Companies of Granada Sustainable Construction Cluster of Andalusia
		Link the biofactory to the urban factory.			X	Emasagra Municipal Office of the Circular Economy
		Define clear and achievable goals, actions and expected outcomes linked to European Union (EU) and international frameworks.		X		Municipal Office of the Circular Economy (in consultation with stakeholders)
		Establish sector-specific goals, such as for the tourism sector.		X		Municipal Office of the Circular Economy Emasagra Inagra Granada Convention Bureau Provincial Federation of Hospitality and Tourism Companies of Granada Sustainable Construction Cluster of Andalusia
		Link the strategy to the local budget of the municipality of Granada.		X		Municipal Office of the Circular Economy Municipal Department for Economy, Participated Companies, Treasury and Innovation
		Engage stakeholders to develop a circular economy strategy.	X			Municipal Office of the Circular Economy Granada Chamber of Commerce and Industry Non-governmental organisations (NGOs) Representatives from the private sector: • Bioeconomy and agro-food • Built environment • Energy • Retail • Technology and science • Tourism, restaurants, hotels and events • Waste • Water
		Monitor regularly the progress made, evaluate the impacts and communicate the results to the public.			X	Municipal Office of the Circular Economy

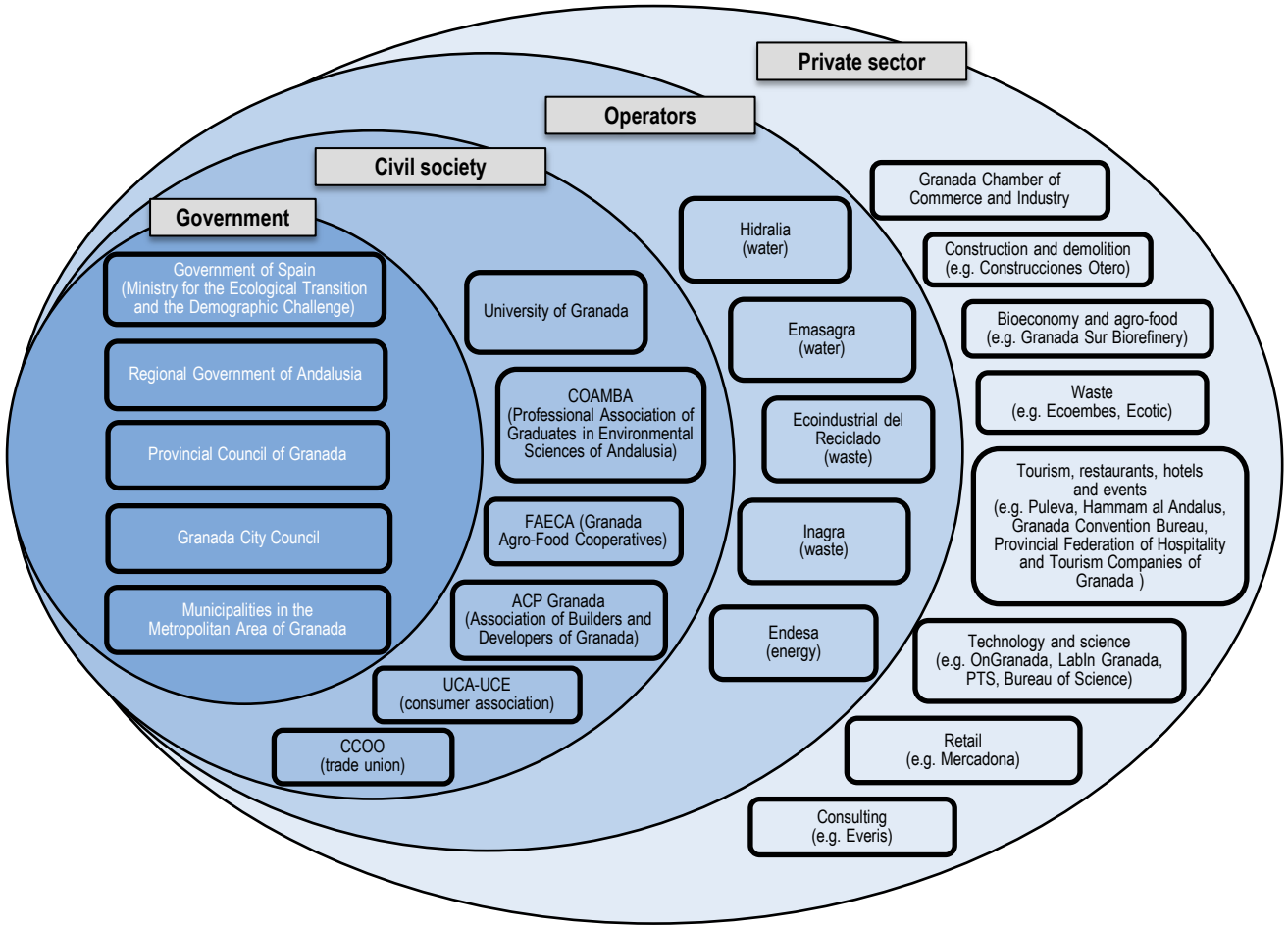
Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
	Awareness and transparency	Set up an online or offline platform to gather all the existing circular economy initiatives in the city and to share information and data.	X			Municipal Office of the Circular Economy University of Granada OnGranada Granada Health Technology Park
		Strengthen and expand the existing awareness raising and communication initiatives.		X		University of Granada Municipal Health, Education and Youth Department
Facilitator	Co-ordination	Explore options to strengthen horizontal and vertical co-ordination.	X			Horizontal level: Municipal departments Vertical level: Provincial Council of Granada, Autonomous Region of Andalucía and the Government of Spain
		Promote dialogue for co-operation on waste prevention and management; local food production and distribution, tourism and transport within the metropolitan area.		X		Municipal Office of the Circular Economy Municipalities within the Metropolitan Area of Granada, Granada Network of Municipalities for Sustainability (GRAMAS)
	Policy coherence	Identify synergies across existing and future climate change, smart cities, waste management initiatives in Granada.	X			Municipal Office of the Circular Economy All municipal departments
	Stakeholder engagement	Establish collaborations around the circular economy with relevant players (e.g. universities, sector-specific clusters, consumer associations and citizens).	X			Municipal Office of the Circular Economy All municipal departments of the municipality of Granada University of Granada OnGranada Granada Health Technology Park Sustainable Construction Cluster of Andalusia Representatives from the private sector: • Bioeconomy and agro-food • Built environment • Energy • Retail • Technology and science • Tourism, restaurants, hotels and events • Waste

Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
						Water Granada Chamber of Commerce and Industry
	Appropriate scale	Experiment with circular economy projects at small scales (e.g. neighbourhoods).		X		Municipal Office of the Circular Economy Municipal Office of Innovation, Smart City and Funds for Transformation University of Granada NGOs Associations
		Facilitate territorial linkages between the city of Granada and its surrounding rural areas.		X		Municipal Office of the Circular Economy GRAMAS Granada Agro-Food Cooperatives (FAECA)
Enabler	Regulation	Include circular economy principles in GPP.		X		Municipal Office of the Circular Economy Government of Andalusia Provincial Council of Granada
		Apply a life-cycle analysis approach.		X		Municipal Office of the Circular Economy University of Granada
	Financing	Explore funding options to accelerate the transition to the circular economy.	X			Municipal Office of the Circular Economy Government of Andalusia Provincial Council of Granada
		Explore participation in European calls as a source of funding for the circular economy.		X		Municipal Office of the Circular Economy Government of Andalusia Provincial Council of Granada
		Identify the economic instruments to foster the transition to the circular economy.	X			Municipal Office of the Circular Economy Government of Andalusia Provincial Council of Granada
	Capacity building	Review and analyse the required skills and capacities for carrying out all activities associated with designing, setting, implementing and monitoring the circular economy strategy. This could include the capacity to: • Design circular economy plans/programmes that are realistic, result-oriented, tailored and coherent with national and regional objectives.		X		Municipal Office of the Circular Economy Granada Chamber of Commerce and Industry Government of Andalusia Provincial Council of Granada

Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
		• Involve stakeholders in the planning of the circular economy strategy. • Ensure adequate financial resources by linking strategic plans to multi-annual budgets and to mobilise private sector financing. • Collect and analyse data, monitor progress and carry out evaluations.				
		Identify existing training and educational programmes at the university level to establish possible synergies and provide support if need be.		X		Municipal Office of the Circular Economy
		Collaborate with the University of Granada and other institutions to develop targeted capacity building programmes for public officials.			X	Municipal Office of the Circular Economy University of Granada
	Innovation	Create an incubator to promote circular economy projects.			X	OnGranada University of Granada Granada Chamber of Commerce and Industry
		Organise initiatives for the collaborative development of ideas for implementation in the most relevant sectors of the city (e.g. challenges).			X	Municipal Office of the Circular Economy Municipal Office of Innovation, Smart City and Funds for Transformation University of Granada OnGranada Granada Chamber of Commerce and Industry
		Facilitate the use of quick response (QR) codes to share information across the value chains, in particular on the quality and maintenance of a product and the creation of online platforms.			X	Municipal Office of the Circular Economy Municipal Office of Innovation, Smart City and Funds for Transformation Granada Health Technology Park University of Granada
		Create a single window for the circular economy for businesses.		X		Municipal Office of the Circular Economy
	Data and assessment	Generate an information, monitoring and evaluation system on the circular economy.		X		Municipal Office of the Circular Economy Municipal Office of Innovation, Smart City and Funds for Transformation

Role	Governance dimension	Action	Short-term	Medium-term	Long-term	Selected leading actors
						University of Granada
		Explore the innovative solutions that big data, the Internet of Things (IoT), machine learning and blockchain tools can provide to the circular economy (e.g. real-time information to make last-mile logistics more efficient).		X		Municipal Office of the Circular Economy Municipal Office of Innovation, Smart City and Funds for Transformation OnGranada Granada Health Technology Park University of Granada

Figure 4.2. Stakeholders map in Granada, Spain



Note: This is a map based on interviews with more than 70 stakeholders that took part in the OECD mission to the city of Granada on 25-28 March 2019 and in the virtual policy seminar on 30 October 2020. The institutional mapping builds on earlier OECD Water Governance Reviews (OECD, 2015[7]; 2019[8]).

Promoter

As promoter, the city of Granada can: i) create a dedicated municipal structure for the circular economy and lead by example; ii) develop a strategic vision on the circular economy; and iii) promote a circular economy culture.

Roles and responsibilities

Creating a dedicated municipal structure for the circular economy could help co-ordinate actions towards the circular economy transition across municipal departments. The circular economy is still an incipient concept for the city of Granada but the transition from a linear to a circular economy will require leadership, collaboration across stakeholders and co-ordination across municipal departments and levels of government. The dedicated office could help embed circular economy principles into municipal policies and practices, in order to lead by example. Actions would include:

- Prevent waste generation (e.g. plans to prevent waste production; reduce the use of paper or banning single-use plastics such as cups in municipal events and daily activities).
- Promote the use of secondary materials and sustainable products and the introduction of circular economy principles in the construction of roads and buildings.
- Adopt business models shifting from ownership to services (e.g. product-as-a-service model through public procurement: pay for a lighting service adapted to the municipality's needs rather than buying light bulbs and appliances; lease a furniture service instead of buying specific furniture, etc.).
- Adopt GPP, including circular economy principles (e.g. reuse, durability, reparability, purchase of second-hand or remanufactured products).

The Circular Economy Office could identify and create synergies across urban strategies. As an example, in the last 3 years, the city has put in place several initiatives for making the city "smarter", such as the Granada Smart City 2020, launched in 2018 by the Municipal Department for Economy, Finance and Smart City. Moreover, in 2021, the city of Granada created a Municipal Office of Innovation, Smart City and Funds for Transformation to move towards building a smart city and working towards greater effectiveness and efficiency in the delivery of municipal services. The office depends on the mayor's office and is transversal across municipal departments. The political willingness, the leadership and the technical competencies led to the achievement of the following results: installation of free WiFi hotspots throughout the city, the installation of sensors to monitor air quality and noise in the city and the development of training programmes on digital skills for municipal staff. The city could build on the experience of the Office of Innovation, Smart City and Funds for Transformation and create a dedicated structure to move forward the circular economy agenda. This structure should be characterised by a cross-departmental and transversal nature. The creation of the Andalusian Circular Economy Office as the administrative body in charge of the transition, planned in the draft Circular Economy Law of Andalusia, could be an interesting example to follow. The Circular Economy Office could coordinate actions also at metropolitan level, in agreement with neighbouring municipalities.

There are many practices at the international level, which can be inspiring for Granada. Several cities (e.g. Nantes Metropolitan Area, France; Rotterdam, the Netherlands) have set up specific dedicated circular economy offices within the municipal departments, taking the lead of circular economy-related initiatives, making sure that circular economy principles are included in local policies and that the municipality itself applies circular economy principles in daily activities and operational management: from waste management to replacing ownership with services, last-mile distribution practices, etc. Other cities carry out the same functions through innovation offices (e.g. Antwerp, Belgium; Sabadell, Spain),

environment agencies (e.g. Copenhagen, Denmark; Joensuu, Finland), economic development and co-operation offices (e.g. Dunedin, New Zealand; Kitakyushu, Japan), urban planning and sustainability offices (e.g. Milan, Italy; Oulu, Finland), waste management utility companies or agencies (e.g. Greater Porto Area, Portugal; Toronto, Canada), city council/municipal central administrations (e.g. Murcia, Spain; Prato, Italy) and public works (e.g. Phoenix, United States) (OECD, 2020[9]).

Strategic vision

The city of Granada could develop a strategic vision of the circular economy to clarify objectives and identify actions to achieve them, reduce fragmentation of policies and silos, and optimise costs and synergies across stakeholders. According to the OECD (2020[1]), there are various steps for developing and implementing a circular economy strategy: i) analyse stock and flows; ii) map the existing circular economy-related initiatives; iii) define clear and achievable goals, actions and expected outcomes; iv) allocate budget and resources to each of the actions; v) share and co-create the strategy with stakeholders to build consensus; vi) monitor regularly the progress made and evaluate the impacts.

The city of Granada, through the office in charge of setting and implementing the circular economy vision in co-ordination with municipal departments, could:

- *Collaborate with the universities to analyse stock and flows*, in order to identify the city's priorities based on the analysis of consumption and production trends and material flows, as well as identify key sectors potentially able to implement circular economy principles and practices. The University of Granada could lead the urban metabolism analysis. Results of the analysis should be disseminated and clearly communicated to all relevant stakeholders in Granada (Figure 4.2). The analysis should be replicated after a certain period of time (e.g. 2-3 years) to evaluate changing production and consumption paths and modify the priorities.
- *Map the existing circular economy-related initiatives in Granada*. The mapping can be carried out through an online platform to upload initiatives and projects in the field of the circular economy, or through offline platforms, gathering input from stakeholders through regular meetings, surveys, interviews and public consultations. For example, in 2021, the city of Umeå, Sweden, collaborated with the Circular Regions initiative to develop a platform (Circular Regions Platform) to map the existing circular initiatives in the city, identifying best practices by business model, impact and cycle phases, among others (Circular Regions, 2021[10]). The Regional Government of Catalonia (Spain) created a Circular Economy Observatory (*Observatorio de Economía Circular de Cataluña*) whose main objective is to map circular initiatives in Catalonia. For the case of Granada, it would be particularly relevant to execute the mapping at the metropolitan area level for building synergies at the right scale.
- *Link the biofactory to the urban factory*. The strategy could build on positive examples for the circular economy, such as the one provided by Emasagra concerning the water sector, through the biofactory, closing loops across water, energy and waste. For example, the biofactory should connect to the urban factory for sustainable food production and use waste streams or enhance innovation with the industrial symbiosis.
- *Define clear and achievable goals, actions and expected outcomes linked to EU and international frameworks*. Objectives could be linked to the 2030 Agenda for Sustainable Development. In particular, the circular economy strictly relates to United Nations Sustainable Development Goal (SDG) 12, pledging for more sustainable and responsible consumption and production patterns. Moreover, it is also relevant for the achievement of SDGs 6 (water), 7 (energy), 11 (sustainable cities and communities), 13 (climate action) and 15 (life on land). The European Green Deal and the New Action Plan for the Circular Economy (2020), which sets the objective of achieving climate neutrality, are key frameworks to consider for developing circular economy actions.

- *Establish sector-specific goals,* in relation to economic activities, such as tourism, that have strong impacts on the city in terms of economic growth and environmental consequences of related activities (e.g. transport, waste). Identify circular chains in the "culture" and "hospitality" sectors, which are key for the local economy (Box 4.1). Some areas of action could consist in:
  - Setting up a network of circular hotels. For example, the Circular Hotels Leaders Group (*Kloplopergroep*) was recently launched in Amsterdam. A total of 12 hotels have started co-operating among them and with actors along their different value chains. These actions can lead to new circular opportunities. Exchanging knowledge, joint purchasing and bundling of waste streams or working with suppliers within each value chain are part of the actions that can be put forward (e.g. collaborating with the textile sector's suppliers to find more sustainable uses of textiles in the hospitality sector and reduce the sector's carbon footprint) (CREM, 2018[11]). The city of Granada could explore setting up a similar initiative with the Provincial Federation of Hospitality and Tourism Companies of Granada.
  - Promoting sustainable mobility and last-mile logistics as a way to reduce carbon emissions by reducing traffic and the use of raw materials. Applying reverse logistics[1] could be one way of doing this, reducing logistic costs and increasing resource efficiency by connecting local demand and supply in real-time.
  - Promoting anti-food waste campaigns and actions across restaurants and bars.
  - Rewarding circular businesses in the cultural, touristic and hospitality sectors with certificates.

Box 4.1. Examples of circular economy practices in the culture sector from the city of Paris, France

In November 2018, the city of Paris adopted its Second Roadmap of the Local Circular Economy Plan. The strategy includes 15 new specific actions, including in the culture sector. The city of Paris further developed a practical guide aiming at "developing the circular economy in Parisian cultural spaces and institutions" which included the following recommendations:

- Commit to certification and standards relating to the circular economy, by encouraging event organisers to sign up for a Parisian environmentally responsible standard.
- Adapt cultural programmes to raise awareness and engage cultural actors in the circular economy by developing cultural programmes in relation to the circular economy (conferences, collections, residencies, etc.) and create space for dialogues with artists, curators and art directors on this topic. For example, each semester, the Canopée La Fontaine's media library organises talks with academics, writers or non-profit organisations specialised in sustainable development and the circular economy.
- Adjust contracts and public procurement processes by integrating performance targets and clauses in the procurement of frequently used products, promoting renting rather than buying and including circular and environmental criteria to the various consultations and tenders.
- Develop plans and build internal capacity on the circular economy in the cultural space. For example, the French Museum of Natural History in Paris recruits trainees who specialise in sustainable development and circular economy to work on the sustainable development area of the museum.
- Add environmental criteria to the catering contracts whether for general catering in restaurants and cafés or for specific events such as opening buffets. The city of Paris has developed a guide for organising environmentally friendly events.

- Improve waste management by equipping sites such as recycling bins, vermicomposting or outdoor composting.
- Support the adoption of eco-design and reuse practices by donating or reselling scenography materials and elements and creating a network of local partners for the redistribution of materials and elements. Adaptive reuse of cultural heritage sites (retrofitting, rehabilitation or redevelopment) also appears as a way to promote a circular economy in cultural cities. For example, the city of Paris signed a charter to develop "pop-up art" (temporary occupation of sites) in Paris, with about 15 public and private partners and the objective to rehabilitate the existing sites, make new experiments and rethink the urban space.

Source: City of Paris, (2018[12]), *Second Roadmap of the Circular Economy Plan for Paris*, https://www.apisite.paris.fr/paris/public/2019%2F1%2FVDP_PEC_2E_FEUILLE_DE_ROUTE_WEB.pdf; City of Paris (2020[13]), *Practical Guide: Developing the Circular Economy in Parisian Cultural Spaces and Institutions*; Foster, G. (2020[14]), "Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts", http://dx.doi.org/10.1016/j.resconrec.2019.104507.

- *Linking the strategy to the local budget of the municipality of Granada* in order to ensure adequate financial resources and ensure human resources are adequate for the implementation of the action.
- *Engaging stakeholders to develop a circular economy strategy*. The circular economy is a shared responsibility across stakeholders that need to be involved from the beginning of the process. Many international initiatives on the circular economy foresee stakeholder consultation (Box 4.2). Granada could engage stakeholders from different levels of government, civil society and the private sector. For the latter, in order to get the message across to a larger number of businesses, the municipality could collaborate with sectoral associations (e.g. ACP Granada, COAMBA, FAECA) and the Granada Chamber of Commerce and Industry to spread the message to the business sector. Building on the recommendations provided in the OECD Checklist for Stakeholder Engagement in Water Governance (OECD, 2015[15]), some steps to be followed by Granada might include:
  - Designing a participatory methodology to engage key stakeholders in the definition and co-creation of a shared circular economy strategy that reflects their concerns:
    - Map all stakeholders that have a stake in the outcome or are likely to be affected, as well as their responsibility, core motivations and interactions.
    - Define the ultimate line of decision-making, the objectives of stakeholder engagement and the expected use of input.
    - Use stakeholder engagement techniques, ensuring the effective representation of all stakeholders in the process.
    - Allocate proper financial and human resources and share needed information for result-oriented stakeholder engagement.
    - Regularly assess the process and outcomes of stakeholder engagement to learn, adjust and improve accordingly.
    - Embed engagement processes in clear legal and policy frameworks, organisational structures/principles and responsible authorities.
    - Customise the type and level of engagement to the needs and keeping the process flexible to changing circumstances.
    - Clarify how the inputs gathered from consulted stakeholders will be used.
  - Creating participation spaces for citizens and stakeholders throughout the different implementation phases of the circular economy strategy. Instruments that can be used to share the ownership of the circular economy transition with stakeholders include:

- Multi-stakeholder fora.
- Workshops.
- Breakfast meetings on the circular economy.
- Co-creation methodologies.
- Feedback loops.

Box 4.2. Select international examples of stakeholder engagement in circular economy initiatives

The role of bottom-up public consultation mechanisms is significant on the road to circularity, as a starting point to collect ideas and proposals from stakeholders. National and local governments have taken action in this regard. For example:

- In Italy, the Ministry of the Environment promoted a two-month online consultation on the national strategic document on the circular economy. About 3 900 people took part in the consultations and 300 organisations and institutions provided specific comments on the proposed text.
- A key step for the development of the Spanish Strategy on the Circular Economy was the "Pact for a circular economy", engaging the main economic and social stakeholders in Spain towards circular business models. By September 2019, a total of 347 stakeholders had adhered to the pact.
- The Circular Economy Strategy of Greater Paris, France, was developed by 240 stakeholders from over 120 different organisations. They were divided into working groups and defined 65 proposals.
- In Brussels, Belgium, consultations across stakeholder allowed the identification of priority areas for circular economy projects.

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

- *Regularly monitoring the progress made* (e.g. quantity of circular economy-related projects, number of circular building to be constructed, etc.), *evaluating the impacts and communicating the results to the public.* Table 4.2 suggests a number of indicators for setting and implementing a circular economy strategy (OECD, 2020[1]). Moreover, it is relevant for the city of Granada to follow up on the monitoring efforts in Andalusia, since the Andalusian Circular Bioeconomy Strategy plans to design a series of indicators. Due to the similarities in economic structures between the city of Granada and Andalusia mentioned in Chapter 1, the city of Granada could consider co-ordination with the region for measuring progress.

Table 4.2. Selected indicators for setting and implementing a circular economy strategy

Phase	Type of indicator	Indicators for the circular economy strategy: Input, process and output
Setting the strategy	Process	No. of public administrations/departments involved
	Process	No. of stakeholders involved
	Input/process	No. of actions identified to achieve the objectives
	Input/process	No. of projects to implement the actions
	Process	No. of projects financed by the city/regional government/Total number of projects

Phase	Type of indicator	Indicators for the circular economy strategy: Input, process and output
	Process	No. of projects financed by the private sector/Total number of projects
	Process	No. of staff employed for the circular economy initiative and implementation within the city/region/administration
Implementing the strategy	Environmental output	Waste diverted from landfill (t/inhabitant/year or %)
	Environmental output	CO_2 emission saved (t CO_2/capita or %)
	Environmental output	Raw material avoided (t/inhabitant/year or %)
	Environmental output	Use of recovered material (t/inhabitant/year or %)
	Environmental output	Energy savings (Kgoe/inhabitant/year or %)
	Environmental output	Water savings (ML/inhabitant/year or %)
	Socio-economic output	No. of new circular businesses (e.g. companies, start-up, etc.) created to implement the circular economy initiative
	Socio-economic output	No. of businesses (e.g. companies, start-ups, etc.) adopting circular economy principles
	Socio-economic output	Economic benefits (e.g. through additional revenue and costs saving) (EUR/year)
	Socio-economic output	No. of employees of new circular businesses
	Socio-economic output	No. of jobs created from circular activities
	Governance output	No. of companies coached by the city/region to adopt circular economy principles
	Governance output	No. of contracts awarded by the purchasing department of the city/region that include a circular economy criterion/Total number of contracts
	Governance output	City/region % of public investment dedicated to the circular economy initiative/Total public investment by the city/region

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

Awareness and transparency

The city of Granada could promote a *circular economy culture* among citizens, businesses and relevant actors and encourage sustainable production and consumption practices. There are many ways through which to increase awareness and share information of circular economy opportunities and practices. For example, the city of Valladolid, Spain, organises Circular Weekends, during which entrepreneurs connect with one another and join forces for circular projects. In Granada, it is important to move from the notion of the circular economy as synonymous with sustainable waste management and investigate upstream options for narrowing and slowing loops, based on eco-design and reuse. The city of Granada, in collaboration with the University of Granada, could consider introducing a label for local circular activities, for instance, related to food (e.g. restaurants), construction or other sectors (examples are provided in Box 4.3).

Moreover, the existing clusters (e.g. CSA, OnGranada), technological parks (e.g. Granada Health Technology Park [PTS]), research institutions (e.g. University of Granada), associations in the city (e.g. ACP Granada, COAMBA, FAECA, UCA-UCE, etc.) could promote the circular economy based on their own specialisation, whether technology, food or hospitality. Learning by example is important for followers of the circular economy transition. For example, the city of London, United Kingdom, recruited "circular economy ambassadors" in different companies and local authorities to share the benefits of the circular economy with specific information for each economic sector and to raise awareness at the workplace (London Waste and Recycling Board, 2017[16]).

The city, in cooperation with research centres, could strengthen and expand the existing educational initiatives in schools. The Circular Economy and Recycling: The Solution for the Environment programme designed by the Health, Education and Youth Department of the municipality of Granada for students from primary school, secondary school and higher education is a good practical example of raising awareness.

The city of Granada could adapt the content of the programme according to the age group and could also explore opportunities to address other topics related to the circular economy beyond recycling.

Finally, the city of Granada could create an online platform to gather all existing circular economy initiatives in the city and share information and data relating to the circular economy. This platform should be regularly updated and easily accessible. However, it is important to note that the lack of access to high-quality access to internet could be an issue for some municipalities of the province. There are several digital tools implemented in other cities that could be inspirational. For example, the Austin Materials Marketplace and Austin Reuse Directory is an online searchable directory to inform residents of nearby outlets to reuse items, such as drop-off locations, pick-up services and resale options. The city of Phoenix, United States, developed an online Recycle Right Wizard to provide recycling information to local residents and has also launched a digital educational website, Recycle+, which promotes a digital interaction with the residents on recycling best practices through activities, games, resource guides and educational videos.

In addition, a website and information shared through social media can reach a certain type of population, such as young people, and quickly inform about initiatives, projects and how to actively participate. However, as evidenced by the trend of the ageing population in Granada, many citizens lack the knowledge to use digital applications. Therefore, it is necessary to develop adequate training programmes and ensure connectivity in order to leave no one behind in the transition to the circular economy.

Box 4.3. Examples of labelled products for the circular economy

Certifications are developed to assure stakeholders and clients that products and services meet requirements linked to the circular economy. The private sector and national and subnational authorities are taking steps in this regard to develop and introduce labels for the circular economy. For example:

- The **Amsterdam Made Certificate** was developed upon request of Amsterdam City Council in the Netherlands to inform consumers about products that are made in the Amsterdam area while seeking to boost creativity, innovation, sustainability and craftsmanship.
- The French roadmap for the circular economy, **50 Measures for a 100% Circular Economy**, launched by the Ministry for an Ecological and Solidary Transition (*Ministère de la Transition Écologique et Solidaire*) in 2018, includes the deployment of voluntary environmental labelling in five pilot sectors (furnishing, textile, hotels, electronic products and food products).
- The **White Paper on the Circular Economy of Greater Paris** examines 65 proposals, including the design and use of circular economy labels. More precisely, it aims to provide higher visibility of existing environmental labels, such as the French NF Environment (a collective certification label for producers that comply with environmental quality specifications) and the European ecolabel, as well as the development of a quality label for second-hand products. The city of Paris is also making progress in the creation of the NF Habitat HQE certification, specific to the construction sector. The certification aims to define a "circular economy profile" adding new specific requirements. Besides meeting all mandatory requirements established in the NF HQE Base standards, construction projects should reach at least 40% of the criteria established in the "circular economy profile" to be considered circular (e.g. inclusion of a waste management plan, use of recycled materials, development of life analysis calculations, eco-certification of wood, considering deconstruction processes, establishing synergies with local actors in the surrounding areas, among others).

Source: French Government (2018[17]), *50 Measures for a 100% Circular Economy*, http://www.ecologique-solidaire.gouv.fr/sites/default/files/FREC%20-%20EN.pdf (accessed on 6 June 2019); Amsterdam Made (2019[18]), *Homepage*, http://www.amsterdammade.org/en/ (accessed on 6 June 2019); Paris City Council (2015[19]), *White Paper on the Circular Economy of Greater Paris*, https://api-site.paris.fr/images/77050 (accessed on 11 June 2019).

Facilitator

As facilitator, the city of Granada can: i) facilitate co-ordination across municipal departments and across other levels of governments; ii) link the circular economy with existing initiatives; iii) engage stakeholders for the circular economy; iv) explore spatial linkages across the urban and the rural area and experiment at various scales.

Co-ordination

At the horizontal level, co-ordination across municipal departments can help identify sector-related trade-offs and effectively implement a circular economy strategy. For example, the city of Toronto, Canada, created a Cross-Divisional Circular Economy Working Group, which is now comprised of 11 divisions to co-ordinate and increase the capacity of city divisions for implementing circular economy initiatives. The working group's mandate is to provide informed input, ideas and feedback during the development of the city's circular economy initiatives.

At the vertical level, the city of Granada, the Provincial Council of Granada, the Autonomous Region of Andalucía and the Government of Spain could benefit from mutual support to enhance synergies and achieve common goals, within the framework of a circular economy strategy. There are several initiatives that could be taken into account already and for which alignment of objectives could be taken into account. For example:

- The Andalusian Circular Bioeconomy Strategy identifies the generation of synergies and alliances between all actors in the different areas of activity of the bioeconomy, as a key factor in its implementation.
- The regional government's Strategy for Sustainable Development 2030 includes the objective of establishing inter-institutional co-ordination and co-operation mechanisms to facilitate a global framework for action.
- The Spanish National Circular Economy Strategy also highlights the importance of facilitating and promoting the creation of appropriate channels to facilitate the exchange of information and co-ordination with public administrations in order to create synergies that favour the transition.

Together with municipalities of the metropolitan area, the city of Granada could identify synergies, in order to apply circular economy principles to: reduce resource consumption and waste; preserve natural capital and ecosystem services; and design out negative externalities (economic, social and environmental) associated with resource waste, degradation of natural capital and ecosystem services. The city of Granada, the largest municipality amongst 34 municipalities[2] of the metropolitan area and the centre of the economic activities, could promote dialogue for co-operation on waste prevention and management, local food production and distribution. It could also co-ordinate activities in relation to tourists and transport to diversify the offer and reduce negative impacts due to mass tourism. Some cities have set up co-ordination mechanisms either with neighbouring municipalities or across levels of government, such as: dedicated horizontal working groups (e.g. Melbourne, Oulu and Toronto) and roundtables for the co-ordination of actions related to the circular economy in cities and metropolitan areas (e.g. Barcelona, Spain) (OECD, 2020[1]).

In addition, the city could explore opportunities for collaboration on the circular economy with the Granada Network of Municipalities for Sustainability (GRAMAS), promoted by the Environment Department of the Provincial Council of Granada and which includes 90 municipalities in the province, except the city of Granada. Its purpose is to provide the local entities of the province with a tool for co-operation and exchange, which allows the incorporation of the principles of sustainability and compliance with good environmental practices in order to achieve sustainable development in the management of the

municipalities of Granada. There are six thematic groups addressing water, energy, urban planning, biodiversity and environmental engagement.

Policy coherence

The city of Granada could identify linkages across existing and future initiatives in the city on climate change, smart cities, waste management, amongst others, and their respective targets that can be achieved through applying circular economy principles. For example, smart data can help with monitoring traffic and mobility to reduce CO_2 emissions. It can contribute to making waste collection more efficient by reducing the number of trips thanks to real-time data and improve waste sorting by providing feedback to users through mobile applications. Data platforms can also be of use in the built environment sector by providing information about the materials that have been used to construct buildings and that are potentially reusable in the future, at the end of life of the infrastructure.

There are several strategies, plans and actions led by the city of Granada that could be linked to the circular economy, such as:

- Granada's Smart City Strategic Plan 2020, which aims to turn Granada into one of Europe's intelligent cities through the implementation of new technologies in the management of municipal services and resources.
- The Air Quality Improvement Plan for 2017-20, which aims to improve the air quality of the city by focusing on four horizontal areas (capacity building; information; awareness-raising and collaboration; and management) and five sectors (industry; built environment; transport; agriculture and farming; and residential, commercial and institutional).
- The Green Ring Road (*Anillo verde*) project, a public-private collaboration for the cultivation of more than 200 000 trees by 2031.

A general overview of the existing plans that could be linked to the circular economy could foster coherence across all sectors and synergies across responsible departments.

Stakeholder engagement

Since the circular economy is a shared responsibility across stakeholders, the city of Granada could establish collaboration around the circular economy with relevant players, including the following:

- The University of Granada (UGR) is leading many initiatives linked to the circular economy, particularly focusing on technologies that can boost the circular transition, plastics, the role of the circular economy within the implementation of the SDGs and an inclusive project on waste collection. Furthermore, the Department of Urban Planning and Land Management, and the Area of Architectural Composition of the UGR promote the debate on how to achieve a green future for Granada through the platform "Debates of Granada".
- Granada's technological and other sector-specific clusters support innovation and circular business. For example, the OnGranada technological cluster works on projects related to reusing waste and increasing resource efficiency. The Granada Health Technology Park (PTS) provides teaching, research and business development services to companies working in the pharmaceutical, health sciences and healthcare sectors. Furthermore, construction companies that are members of the Sustainable Construction Cluster of Andalusia (CSA) are increasingly recovering materials from construction and demolition waste.
- Several associations representing the private sector and consumers have also been carrying out actions, mainly to raise awareness of the circular economy. Some of the actions completed or planned by these groups are: creating a platform for secondary products; granting certificates for

companies to evidence a level of commitment to sustainable development; designing environmental indicators; and workshops to build knowledge on the opportunities from recycling.

Collaborations can be established through sectoral and cross-sectoral networks for the circular economy (e.g. National Platform for Circular Manufacturing initiative 2020-22, CIRCULEIRE in Ireland and Sustainable Restaurants Network in Umeå, Sweden), incubators or innovation platforms (e.g. Paris & Co in Paris, France, and the Circular Economy Hub in Groningen, the Netherlands) and networking events (e.g. Circular Glasgow in Glasgow, United Kingdom) (Box 4.4). Finally, involving citizens in the circular transition of Granada is key to achieve willingness and commitment, as they make constant consumption choices and can influence production.

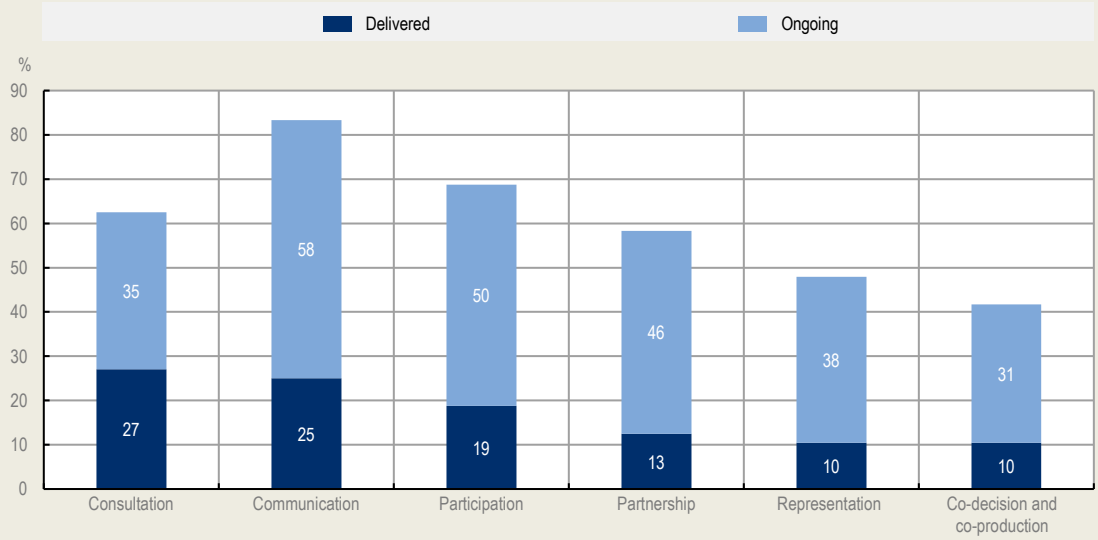
Box 4.4. Stakeholder engagement in cities and regions

Cities and regions apply different typologies of stakeholder engagement towards the circular transition but mainly stakeholders are engaged through consultation. The various types and levels of stakeholder engagement identified in the OECD *Stakeholder Engagement for Inclusive Water Governance* (2015[15]) are equally relevant for securing the social and political buy-in needed for the transition to a circular economy:

- *Communication*: Aims to make the targeted audience more knowledgeable and sensitive to a specific issue.
- *Consultation*: Aims at gathering stakeholders' comments, perceptions, information, advice, experiences and ideas.
- *Participation*: Allows stakeholders to take part in the decision-making process and in discussions and activities.
- *Representation*: Attempts to develop a collective choice by aggregating preferences from various stakeholders and often consists in having stakeholders' perspectives and interests officially represented in the management of a project or of an organisation.
- *Partnership*: Consists of an agreed-upon collaboration between institutions, organisations or citizen fora to combine resources and competencies in relation to a common project or challenge to solve.
- *Co-decision* and *co-production* are the ultimate levels of stakeholder engagement as they are characterised by a balanced share of power over the policy or project decision-making process.

From the 51 cities and regions surveyed in OECD (2020[1]), 27% had organised consultation activities, followed by communication (25%), participation (19%), partnership (13%), and only represent 10% for co-decision and co-production initiatives (Figure 4.3).

Figure 4.3. Type of stakeholder engagement for the circular economy in 51 surveyed cities and regions



Source: OECD (2020[11]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en; OECD (2015[15]), *Stakeholder Engagement for Inclusive Water Governance*, https://doi.org/10.1787/9789264231122-en.

Appropriate scale

The city of Granada could be a "circular lab" to experiment pilots in different neighbourhoods within the city, for example for smart waste collection. In terms of experimentation and pilots at the neighbourhood level, Valladolid, Spain, started a pilot project to meet the target of separate collection by 60% by 2030. Another example in the city of Amsterdam, the Netherlands, is the development of a circular neighbourhood, the Circular Buiksloterham. Once one of the most polluted areas in the city, it is now turning into a circular area through the development and construction of circular and sustainable buildings, receiving sustainable energy supply generated at the local level, the experimentation with smart grid solutions and the creation of parking spaces for bicycles and shared mobility options.

In the case of Granada, agriculture shows great potential for the connection of urban and rural areas within a circular economy approach. These sectors are of major relevance both in the economy and in the employment of the province of Granada, above the Spanish average. The city of Granada could explore opportunities to promote agreements with food suppliers of public canteens in the city of Granada based on nearby producers (e.g. from the Vega de Granada) or create circular loops in the agro-food and bioeconomy sector, use organic waste as fertiliser, last-mile type of food production and distribution, etc. There are several international experiences in urban-rural connections within a circular economy that could be inspirational for Granada. For example, Kitakyushu City, Japan, has established a food-recycling loop between rural-urban areas to use compost generated in urban areas as fertilisers in rural areas or as a source of energy for the city, while in Tampere, Finland, eco fellows are co-ordinating rural-urban partnerships related to biogas. They work as a hub that brings together different actors that have not been necessarily in contact before (farms, power plant operators, logistics etc.).

Enabler

As enabler, the city of Granada can: i) implement GPP; ii) identify fiscal and economic instruments for the circular economy; iii) foster capacity building for the circular economy; iv) support business development; v) develop an information and monitoring system.

Regulation

Circular economy principles could be included in GPP to promote eco-efficiency, eco-design and collaborative consumption. The guidelines for municipal procurement of the city of Granada incorporate some social and environmental policy objectives, such as: promoting the social and labour insertion of people with physical and/or intellectual disabilities; stability and quality in employment; improvement of occupational health and safety; corporate social responsibility; and criteria of fair trade, ethical public procurement and sustainable products. Environmental criteria for the award of contracts include the emission of noise, gases or other pollutants, energy consumption, disposal, decommissioning or recycling costs, etc. However, the evaluation criteria and the establishment of a minimum threshold are determined in each tender, making the value of the environmental criteria in the award of the contract unknown (Granada City Council, 2017[20]). Some international examples of cities including circular criteria into their purchasing process are available in Box 4.5. The city could apply a life-cycle analysis approach and develop criteria to evaluate the life cycle of the assets used by each municipal service to foster more sustainable solutions in municipal services.

Box 4.5. Green public procurement for the circular economy: Examples from cities

In OECD member countries, public procurement accounts for approximately 12% of gross domestic product (GDP) and subnational governments, including cities, are responsible for around 63% of public procurement. Almost all OECD countries have developed strategies or policies to support GPP. High-impact sectors are construction, food and catering, vehicles and energy-using products.

According to the European Commission, the impact of public procurement on the transition to a circular economy is worth around EUR 2 trillion in the EU, around 14% of GDP. There are several examples of GPP that includes circular criteria:

- Amsterdam, the Netherlands, has developed its *Roadmap for Circular Land Tendering* that includes 32 performance-based indicators for circular economy building developments.
- Zurich, Switzerland, took the decision to lease printing equipment rather than buying it outright, thus only paying per page printed and incentivising better printer performance and energy use.
- Bollnäs, Sweden, has applied what the local government calls “functional public procurement” (*funktionsupphandlingen*) to rent light as a service in municipal pre-schools and schools. The service is provided by a start-up that received support from Umeå’s BIC Factory business incubator.
- Flanders, Belgium, implemented the Green Deal Circular Procurement (GDCP) between 2017 and 2019. Inspired by the Dutch Green Deal on Circular Purchasing (launched in 2013), the joint project was signed by 162 participants (companies and organisations), the Flemish Minister of the Environment and its initiators Circular Flanders, The Shift, the Association of Flemish Cities and Municipalities (VVSG) and the Federation for a Better Environment (BBL). In total, 108 purchasing organisations, local authorities, companies, financial institutions and 54 facilitators have been involved. During the 2 years of the initiative, the signatories of the GDCP have conducted more than 100 circular procurement pilot experimentations, building

knowledge and experience and testing tools and methodologies and new forms of chain co-operation.

- Ljubljana, Slovenia, included environmental requirements in its tenders as part of the technical specifications, as a condition for determining the qualifications of the provider or as a criterion for selecting the most favourable bid.

Some of the obstacles identified in pursuing GPP include: the perception that green products and services may be more expensive than conventional ones; public officials' lack of technical knowledge on integrating environmental standards in the procurement process; and the absence of monitoring mechanisms to evaluate the achievements of goals.

Source: OECD (2015[21]), *OECD Recommendation of the Council on Public Procurement*, http://www.oecd.org/gov/ethics/OECDRecommendation-on-Public-Procurement.pdf (accessed on 6 June 2019); Municipality of Amsterdam (2017[22]), *Roadmap Circular Land Tendering*, https://amsterdamsmartcity.com/projects/roadmap-circular-land-tendering (accessed on 28 January 2020); EC (2017[23]), *Public Procurement for a Circular Economy: Good Practice and Guidance*, https://ec.europa.eu/environment/gpp/pdf/Public_procurement_circular_economy_brochure.pdf (accessed on 7 November 2019); Municipality of Bollnäs (2018[24]), "New light with many advantages", https://www.bollnas.se/index.php/88-aktuellt/2525-nytt-ljus-med-manga-foerdelar (accessed on 28 January 2020); The Shift (2019[25]), *Green Deal Circular Procurement in Flanders*, https://theshift.be/en/projects/greendeal-circular-procurement-in-flanders (accessed on 28 January 2020); OVAM (2020[26]), *Green Deal Circular Purchasing*, http://www.vlaanderen-circulair.be/nl/onze-projecten/detail/green-deal-circulair-aankopen (accessed on 5 February 2020); OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

Financing

The city of Granada could explore funding options to accelerate the transition to the circular economy, supporting businesses and community-based initiatives. For example, the city of Amsterdam, the Netherlands, through the Amsterdam Climate and Energy Fund (ACEF) and the Sustainability Fund invested in more than 65 projects related to climate, sustainability and air quality for a total of EUR 30 million. These are revolving funds, allowing to reinvest revenues within 15 years to fund additional sustainable energy production, energy efficiency or circular economy projects. Each of the funded projects must contribute to the aims of the sustainability agenda approved by the city council in 2015. Regarding the nature of the financing, the ACEF provides funding in the form of loans, warranties and/or share capital, subject to a maximum of EUR 5 million per project. The London Waste and Recycling Board (LWARB) supports circular business through the Circular Economy Business Support Programme. The venture capital fund supports circular economy small- and medium-sized enterprises (SMEs) in scaling up businesses that are already in the market. Moreover, the LWARB, through the Circularity European Growth Fund operated by Circularity Capital, seeks investment opportunities in circular businesses with proven cash flow and profit.

There are also European calls that could be explored as a source of funding for the circular economy, such as:

- Horizon Europe: The new 2021-27 EU funding programme for research and innovation has a budget of EUR 95.5 billion and includes an area of intervention on circular systems (EC, 2021[27]).
- Invest EU Programme: Focusing on investment, innovation and job creation in Europe over the period 2021-27, its scope is to support a sustainable recovery for a greener, more digital and more resilient European economy (EU, 2021[28]).
- The new LIFE programme: It is expected to include calls for project proposals on the circular economy (EC, 2021[29]).

The city of Granada could identify the economic instruments to foster the transition to the circular economy. Co-ordination with the national and regional government may be required. A range of economic instruments are used in cities to incentivise or disincentive individual behaviours, such as:

- Property tax according to the energy consumption of buildings.
- Corporate income tax (e.g. based on the waste generation level, water and energy consumption, use of recycled materials as raw materials).
- Value added tax (VAT) reduction on products labelled as circular (e.g. easy to recycle and reuse, proximity).
- Tax reductions on second-hand materials.
- Discount waste fees according to preselected criteria.
- Differentiated tariffs for waste separation and recycling (e.g. pay-as-you-throw approach).

Some international experiences include the following: the Dutch Government's DIFTAR system is a scheme based on differentiated tariffs in order to provide incentives to improve waste separation at source (pay-as-you-throw); VAT reductions for companies working on circular economy projects in Shanghai, China, and for reused items in Sweden; discounts on waste fees for businesses in Milan, Italy, and San Francisco, United States.

Capacity building

The city of Granada could foster capacity building for the circular economy to provide municipal staff with deeper knowledge and is taking its first steps in the transition towards the circular economy. Due to the incipient state of the circular transition in the city, it is necessary to develop capacities both in the municipality and the business environment. As such, the city can:

- Review and analyse the required skills and capacities for carrying out all the activities associated with designing, setting, implementing and monitoring the circular economy strategy. This could include the capacity to:
  - Design circular economy plans/programmes that are realistic, result-oriented, tailored and coherent with national and regional objectives.
  - Involve stakeholders in the planning of the circular economy strategy.
  - Ensure adequate financial resources by linking strategic plans to multi-annual budgets and mobilising private sector financing.
  - Collect and analyse data, monitor progress and carry out evaluations.
- Identify existing training and educational programmes at the university level to establish possible synergies and provide support if need be.
- Collaborate with the University of Granada and other institutions to develop targeted capacity building programmes for public officials.

Specific skills are needed for future circular economy jobs. The Amsterdam Metropolitan Area (AMA), the Netherlands, identified six groups of skills relevant to future circular jobs: basic skills (capacities that facilitate acquiring new knowledge); complex problem solving (abilities to solve new, complex problems in real-world settings); resource management skills (capacities for efficient resource allocation); social skills (abilities to work with people towards achieving common goals); system skills (capacities to understand, evaluate and enhance "sociotechnical systems"); and technical skills (competencies to design, arrange, use and repair machines and technological systems) (Circle Economy, 2020[30]).

Innovation

The city of Granada could create an incubator to promote circular economy projects. An incubator should support innovative projects related to the circular economy by: providing management and business assistance; promoting connections with strategic partners in the private, public and academic sectors; facilitating access to financial opportunities (investors, loans, public programmes); and providing a physical space for the projects to develop. For example, since 2016, the Prodock, the scale-up incubator of the port of Amsterdam, the Netherlands, has been helping growing business and established companies to co-create solutions in a shared working space on diverse topics that go from transforming wet waste into renewable gas to the production of sustainable bio-based chemicals, or recycling plastic and soap waste in the hospitality sector. It is important to create conditions in which universities and companies can connect and solve the needs of the municipality. At the same time, the municipality can be a launching customer for new projects and innovations that, if successful, can be scaled up.

The city could also organise initiatives for the collaborative development of ideas for implementation in the most relevant sectors of the city (e.g. hospitality and tourism). These initiatives could take the form of "challenges" involving academia, business and government. Some international examples could be inspirational for the implementation of this initiative. For instance, in Amsterdam, the Netherlands, the Startup in Residence programme connects start-ups and scale-ups with key social challenges in the city. The municipality shares problems with a start-up that will try to develop specific solutions that can be purchased by the city.

The city of Granada, in collaboration with technological centres, could facilitate the use of QR codes to share information across the value chains. For example, codes can be used for the quality and maintenance of a product. Moreover, the data obtained through the QR codes could be useful to run predictive models to facilitate decision-making processes (e.g. estimating the economic, social and environmental impacts of the introduction of a tax).

Finally, the city of Granada could also create a single window for the circular economy for businesses, in order to offer services, information and administrative support related to circular economy projects in the city. Having a single focal point could also be beneficial for the engagement of entrepreneurs and SMEs through the reduction of transaction costs. For example, the initiative Start-up Slovenia, established in 2014, mobilises a network of mentors from various backgrounds to provide entrepreneurs and young firms with tailored advice.

Data and assessment

Generating information and a monitoring and evaluation system would help the city of Granada reach a better understanding of what the circular economy is and improve policymaking and implementation. A wide range of data can support the monitoring and evaluation of policies, programmes and strategies, and improve policymaking and implementation, such as:

- Environmental data (e.g. resources, waste and circulation processes), flows (water, energy, products, food, transportation, information, people) and social data (circular jobs created).
- Data on empty buildings, materials used for construction and waste streams.

- Data on existing circular economy initiatives, as well as laws and regulations that can foster the transition from the linear to the circular economy.
- Data collected within the Granada's Smart City Strategic Plan 2020 taking place in the city by exploring opportunities to enable circular economy-related activities. Data collected by this initiative include real-time traffic and air quality, among others.

The city of Granada could explore the innovative solutions that big data, the IoT, machine learning and blockchain tools can provide to the circular economy (e.g. real-time information to make last-mile logistics more efficient) in Granada (Box 4.6). Digitalisation plays an important role in this case, as big data, the IoT and blockchain tools can provide real-time information, enable material traceability and foster reuse through online platforms and applications. By using available digital tools, the city of Granada can generate open data sources, make collected data publicly accessible, understandable and updated regularly. For example, the Circular City Data programme is a project promoting a collaboration between start-ups, city agencies and larger firms to collect, produce, access and exchange circular data aiming to build new and sustainable social, economic and environmental models in New York City, United States (New Lab City, 2019[31]).

Finally, the city of Granada could carry out a self-assessment of the current situation of the circular economy in Granada through the OECD Scoreboard on the Governance of the Circular Economy. This scoreboard is intended as a self-assessment tool based on the 12 key governance dimensions that would enable a circular economy system to take place (Box 4.7).

Box 4.6. Blockchain solutions for the circular economy

A blockchain is a distributed append-only database, which is capable of storing any type of data and is replicated across many locations operated jointly by all users. Once added to the blockchain, a record is encrypted and cannot be changed or deleted without the knowledge of all participants. This immutability feature of blockchains is what makes them strong and an alternative to traditional centralised databases.

For the circular economy transition, blockchain technologies offer several opportunities, such as to:

- Enhance information flows along the value chain
- Improve the transparency and traceability for producers, consumers and recyclers.
- Drive the uptake of new business models, for instance through monetising plastic waste or marketing collected plastic to recycling firms with transparent information about its origin.

Using blockchain solutions still require significant amounts of energy to make its environmental footprint significant. Moreover, some questions remain about data privacy, liability and competition.

Source: IFC (2017[32]), "Beyond fintech: Leveraging blockchain for more sustainable and inclusive supply chains", https://www.ifc.org/wps/wcm/connect/85fb81a9-632c-4c98-86fc-2a0619996562/; OECD (2019[33]), *Digitalisation and the Circular Economy*, OECD, Paris.

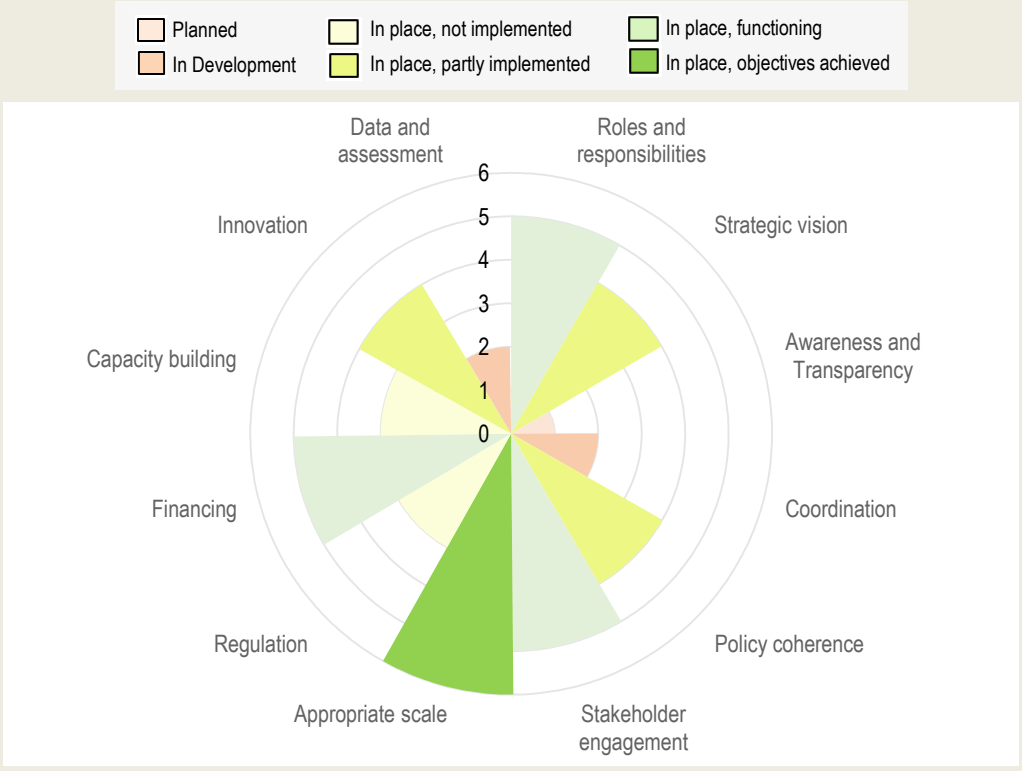
Box 4.7. The OECD Scoreboard on the Governance of the Circular Economy in cities and regions

The OECD Scoreboard on the Governance of the Circular Economy is a self-assessment tool of governance conditions to evaluate the level of advancement towards a circular economy in cities and regions. Its purpose is to accompany cities and regions in identifying gaps and assessing progress to

improve policies and self-assess the existence and level of implementation of enabling conditions. It is composed of 12 key dimensions, whose implementation governments and stakeholders can evaluate based on a scoreboard system, indicating the level of implementation of each dimension: Newcomer (Planned; In development), In progress (In place, not implemented; In place, partly implemented) and Advanced (In place, functioning; In place, objectives achieved). These dimensions include: 1) Roles and responsibilities; 2) Strategic vision; 3) Awareness and Transparency; 4) Co-ordination; 5) Policy coherence; 6) Stakeholder engagement; 7) Appropriate scale; 8) Regulation; 9) Financing; 10) Capacity building; 11) Innovation; 12) Data and assessment. The visualisations of the results (Figure 4.4) provide an overview of the level of circularity of a city or region for each of the 12 circular economy governance dimensions.

Figure 4.4. Visualisation of the OECD scoreboard results

A. Graph



B. Traffic light system

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

To carry out the self-assessment, the following procedure is recommended (Figure 4.5): i) clearly identify the lead team to co-ordinate the self-assessment; ii) set objectives and scope of the assessment in advance; iii) map stakeholders that will play a key role in a circular economy system: governmental departments, public, private and non-profit actors; iv) organise targeted workshops with key

stakeholders to share, compare and confront views and achieve consensus; and v) repeat the process once a year to verify changes and improvements and to keep stakeholders engaged.

Figure 4.5. A five-step self-assessment methodology

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

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Notes

[1] This is the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements.

[2] Albolote, Alfacar, Alhendín, Armilla, Atarfe, Cájar, Cenes de la Vega, Chauchina, Churriana de la Vega, Cijuela, Colomera, Cúllar Vega, Dílar, Fuente Vaqueros, Gójar, Granada, Güevéjar, Huétor Vega, Jun, La Zubia, Láchar, Las Gabias, Maracena, Monachil, Ogíjares, Peligros, Pinos Genil, Pinos Puente, Pulianas, Santa Fe, Valderrubio, Vegas del Genil, Villa de Otura and Víznar.