Inclusive Circular Economy

guide for cities and regions

MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE
IDEIA CIRCULAR

Federative Republic of Brazil

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Summary

*Replace *Your City* and *Your Circular City* with the actual name of your city or region.

Introduction

The concept of a circular economy (CE) has emerged over the past decades as a pivotal approach to achieving **sustainable consumption and production patterns**, decoupling **economic prosperity** and **human well-being** from environmental degradation and the extraction of new resources. Within this framework, **nature is regenerated**, and waste generation is either completely avoided or minimized through the **design of products and materials** for extended use periods, employing strategies such as reuse, redistribution, repair, remanufacturing, recycling, and recovery.

The proposal of an **inclusive circular economy** by the Brazilian G20 presidency in 2024 [1] represents a significant contribution to advancing this global paradigm shift, **highlighting social dimensions** that are often underrepresented in traditional CE approaches. By embedding inclusivity at the core of CE strategies, it becomes possible to design virtuous cycles that regenerate nature while simultaneously strengthening social fabrics, and ensuring that the benefits of the transition extend to all segments of society. In this sense, an inclusive CE gives human industry a renewed sense of purpose and social responsibility, aiming for a just and equitable transition for all.

Cities and regions play a crucial role in this transformation. Today, urban areas house 55% of the world's population [2], generate approximately 80% of global GDP [3], and are responsible for a similar share of energy consumption, resource use, carbon emissions, and solid waste production [4].

While circumstances vary globally, in most countries **waste management is closely tied to local and regional governments**. Currently, only 19% of global municipal solid waste (MSW) is recycled, while an average of 30% is landfilled, 13% is incinerated, and **38% is uncontrolled** - either uncollected, openly burned, or dumped in landfills or directly into ecosystems [5]. These figures vary widely across regions, with disparities that highlight the need for **localized solutions** tailored to the **specific challenges and capacities** of each city or region.

In addition to managing growing volumes of solid waste, cities and regions face additional interrelated challenges such as **climate change, public health** crises, and **social inclusion**. As major contributors to climate change, cities are also among the most vulnerable to its impacts. Waste mismanagement exacerbates greenhouse gas emissions, particularly methane from dumpsites and landfills, while resource-intensive production cycles strain natural ecosystems. Circular strategies that lead to reduced material consumption and organic waste cycling can help **mitigate emissions and build urban resilience to climate shocks**.

Additionally, the transition to an inclusive circular economy offers an opportunity to create **systems where all citizens benefit**, including vulnerable groups often excluded from formal labor markets. **Recognizing and honoring** the invaluable contributions of waste pickers is a critical part of this approach for many cities and regions. Circular initiatives such as repair services, reuse systems, material recovery, composting, and local food production can also create **dignified work and income opportunities** for vulnerable communities, while delivering social and environmental co-benefits and reducing adverse health impacts associated with open dumpsites and hazardous waste.

By addressing these **intertwined challenges**, cities can unlock significant opportunities for innovation, **economic growth**, and **sustainability**. With their spatial and functional interconnectivity, cities are uniquely positioned to close material loops and become **active drivers of the circular transition**.

About this guide

This guide was prepared by Ideia Circular and the Ministry of the Environment and Climate Change, which coordinates the Resilient Green Cities Program, in partnership with the Ministry of Cities and the Ministry of Science, Technology, and Innovation. It is the result of discussions held within the Waste and Circular Economy axis of the Environmental and Climate Sustainability Working Group during Brazil's presidency of the G20 in 2024 [1]. Its objective is to provide local governments with insights on the **benefits of understanding and applying the principles of an inclusive circular economy**. By turning waste into resources and promoting social inclusion and equity, this approach improves quality of life while driving innovation and regenerating urban ecosystems. It is recommended that each municipality or region adapt these guidelines to their specific **local needs and circumstances** to promote their journey toward circularity.

The first chapter establishes the conceptual foundations of the publication, addressing 3 key questions: Why Circular? Why Inclusive? Why in Cities and Regions?

The second chapter offers practical action guidelines for *Your City*'s transition towards inclusive circularity. It outlines initial steps in waste management and material flows, highlights additional opportunities in critical areas such as construction, water, energy, and mobility, and emphasizes the importance of community engagement, innovation, and collaboration. It also discusses policy levers available to local governments, including policies and frameworks, tax incentives, and public procurement strategies.

The third chapter provides guidance for developing *Your City*'s Circular Roadmap, with practical exercises to help map your starting points, define a vision for *Your Circular City**, identify priority areas and actions, and organize implementation.

*The expression *Your Circular City* was intentionally designed to be adaptable — cities are encouraged to replace it with their own name to personalize the journey (e.g., "Circular Salvador" or "Circular Nairobi").

1. Why?

1a. Why circular?

The idea of a circular economy represents a **new way of thinking about our future** and how we relate to the planet, decoupling economic prosperity and human well-being from environmental degradation. CE approaches aim to maintain materials at their highest value for as long as possible, by fundamentally rethinking how we design, make, use and dispose of products [7].

In a circular economy, materials flow through integrated and intentionally regenerative systems, retaining their value across multiple use cycles through strategies such as reuse, repair, redistribution, remanufacturing and recycling, or returning value in ways that are beneficial to natural ecosystems, such as composting and biodigestion.

In cities and regions, this perspective can extend beyond materials to encompass energy, water, and human mobility, promoting a holistic view of regeneration that also addresses land use and social relationships. This **integrated and positive approach to urban planning** can effectively mobilize and coordinate efforts toward achieving the Sustainable Development Goals outlined in the 2030 Agenda.

Challenging the linear model

A circular economy model stands in contrast to the traditional linear production systems, where resources are extracted, transformed into raw materials, and used to manufacture products that are distributed, used or consumed, and ultimately discarded.

While some of this waste is occasionally reused or recycled, this is rarely a priority in the design of materials, products and systems. Consequently, the linear model results in **pollution, contamination** of natural ecosystems, and vast amounts of unused waste that can be harmful to both humans and nature.

Figure 1. Linear Economy.

Source: Ideia Circular.

Beyond the visible issue of waste accumulation, there is also a critical and less-discussed risk of raw material depletion. The linear system's dependence on finite resources, many of which are nearing supply limits or becoming increasingly costly to extract, creates long-term instability and uncertainty.

Circular economy approaches offer a pathway to address and overcome these challenges, guiding us towards **more intelligent and beneficial ways of inhabiting this planet – and our cities and regions** [6].

Prioritizing prevention

CE strategies align closely with the **Waste Management Hierarchy**, a fundamental principle embedded in many waste legislations worldwide. According to this hierarchy, the highest priority is to (a) **prevent** waste generation; (b) **minimize** waste to the greatest extent possible; (c) promote the **direct reuse** of materials with little or no processing; (d) **recycle or compost** waste; (e) recover energy from waste; and (f) ensure that any remaining waste is safely disposed of in **landfills** when no other options remain.

By designing products and systems that **prevent waste**, while also encouraging the reuse, recycling, or composting of materials, CE approaches can significantly promote the **upper, more desirable levels** of the waste hierarchy over the lower ones [8].

However, CE challenges us to go beyond waste reduction and management. Redesigning current linear systems from a **circular approach** allows waste to stop being a problem to be solved and become **nutrients for new processes**, promoting prosperity, health and environmental regeneration.

Thinking in cycles

For waste to become a resource for new industrial processes, materials, products, and systems must be intentionally designed to **retain or enhance** their value through multiple use cycles. A key circular design strategy involves differentiating materials that are optimized for two distinct cycles: the **technical cycle** (technosphere) and the **biological cycle** (biosphere).

Technosphere-optimized materials are designed to **circulate continuously** within industrial cycles, maintaining their value as **technical nutrients**. In contrast, biosphere-optimized materials are sourced from renewable resources and are designed to safely **return their value** to natural systems as **biological nutrients** [9,10].

Next, you will explore strategies that can be used in the intentional design of systems for the technical and biological cycles, aimed at optimizing circulation and preserving the value of products, materials, and components.

Keeping value in circulation

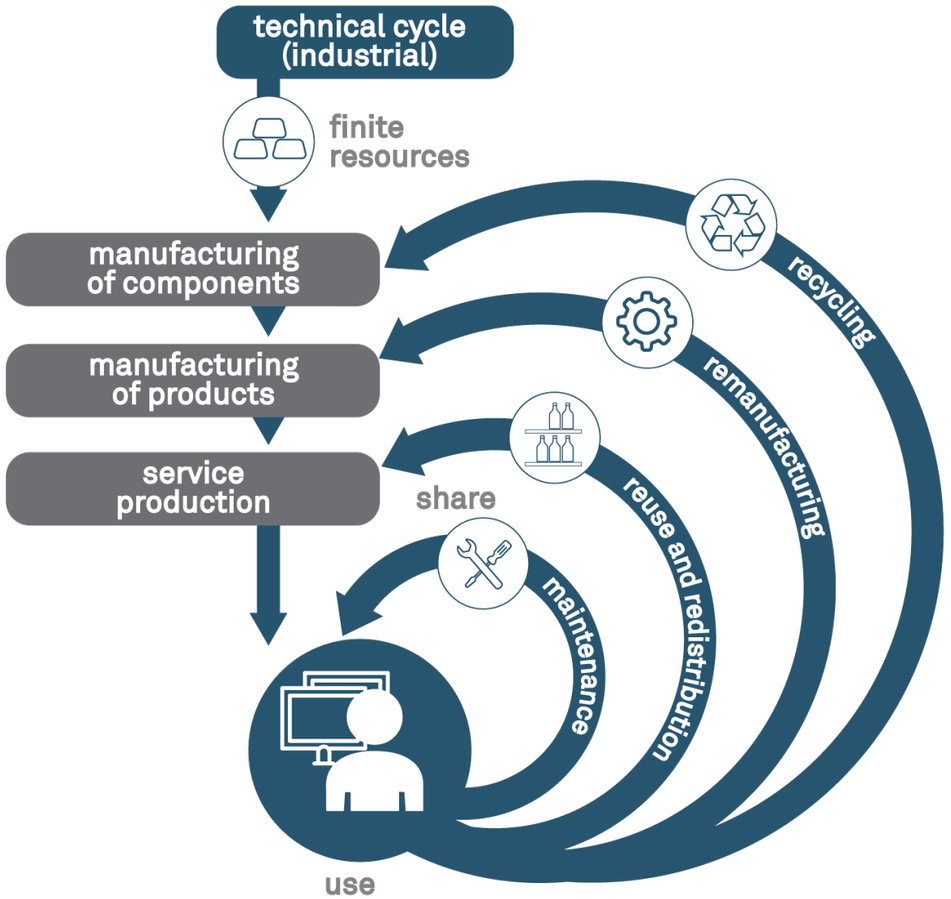
When considering the technical cycle, it is understood that, in most cases, we are dealing with products that are used rather than consumed.

In this context, there is an opportunity to encourage systems that promote **reuse, maintenance, sharing, and redistribution**, all of which help maintain higher value by keeping products in circulation, thus preserving the resources invested in their production.

Additionally, promoting **remanufacturing** systems leverages components to repair or redesign products. Finally, there is **recycling**, which breaks down products and/or components into their basic materials, allowing them to be transformed and reintroduced into the production chain.

Due to its high logistical and energy costs, as well as the **likely loss of material value** throughout the process, recycling is viewed as a last resort in a circular system, to be used when reuse or remanufacturing is not feasible.

Figure 2. Technical Cycles.



Source: Ideia Circular, adapted from the original diagram created by the Ellen MacArthur Foundation, MBDC and McKinsey.

Regenerating value

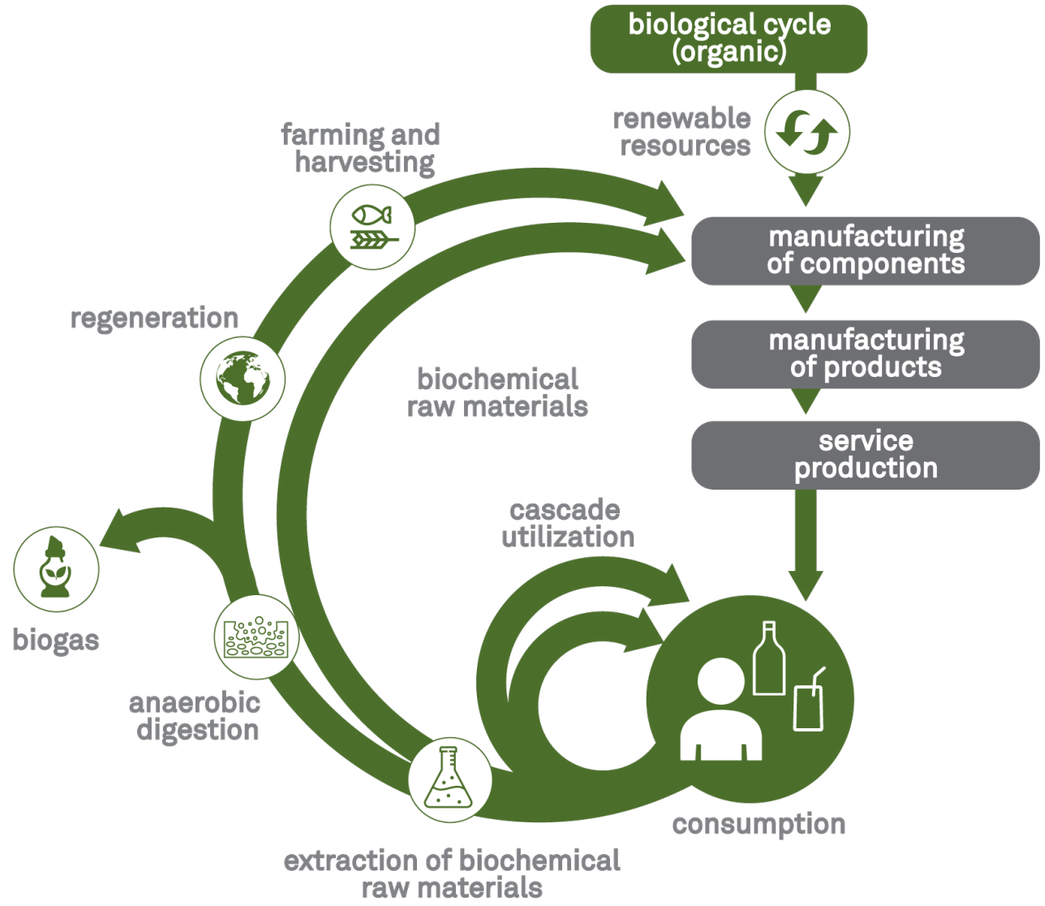
The biological cycle presents various possibilities for **beneficial interaction with natural systems**, harnessing and returning nutrients in ways that are **healthy and prosperous** in the long term. One can consider, for example, **cascading** use or the extraction of valuable **biochemical raw materials**, maximizing the value of biological waste to generate new products [6].

Even when it no longer has apparent economic value, organic waste returns its value to the biosphere, helping to restore soil health and fertility through simple and effective technologies such as **aerobic or anaerobic decomposition**, including composting and biodigestion.

Moreover, local biodiversity can be strengthened by increasing green areas, promoting local food production, and implementing nature-based solutions, all of which sequester carbon and enhance the population's quality of life.

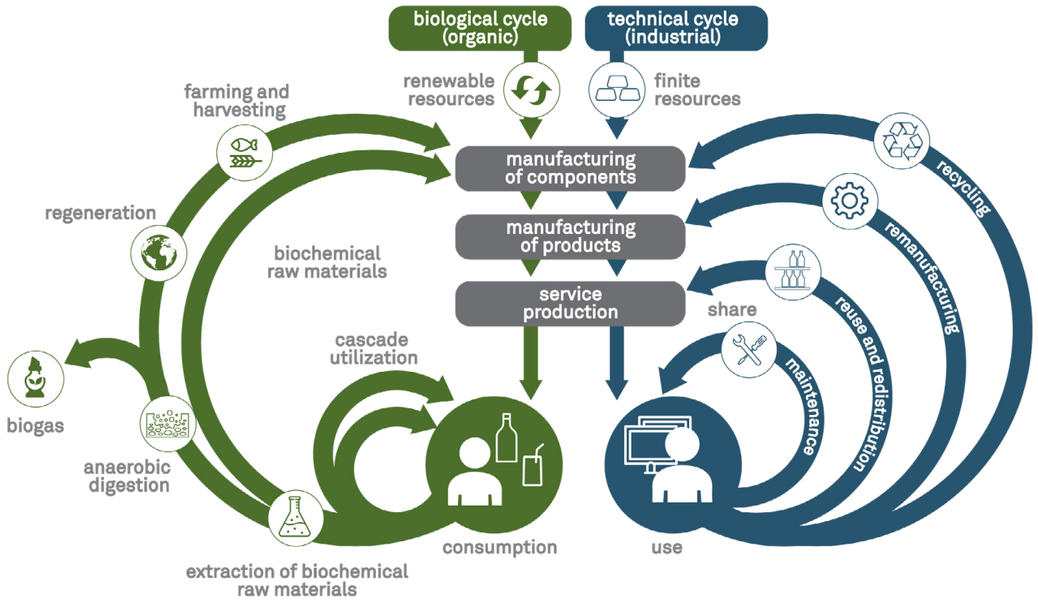
These solutions contribute to ecological and human health by promoting biodiversity, carbon fixation, and improved air and water quality. The central idea in all these possibilities is to replace degrading and wasteful practices with intentional processes that foster the **regeneration** of the natural systems we depend on.

Figure 3. Biological Cycle.



Source: Ideia Circular, adapted from the original diagram created by the Ellen MacArthur Foundation, MBDC and McKinsey.

Figure 4. Butterfly Diagram.



Source: Ideia Circular, adapted from the original diagram created by the Ellen MacArthur Foundation, MBDC and McKinsey.

Creating virtuous cycles

Regeneration involves continually enhancing resources by integrating natural processes, community initiatives, and human behaviors [10].

In a time when the negative impacts of human activity are clearer and more alarming than ever, circular economy approaches bring us the welcome challenge of rethinking our consumption and production patterns – not only to minimize harm, but also to **create positive effects**.

This is evident in the principle of **regenerating nature and living systems**, and can be extended to social systems, influencing **how humans think about and relate to one another**.

Through intentional design and action, it is possible to create virtuous cycles that regenerate nature while simultaneously **healing social** fabrics, and giving **human industry** a renewed **meaning and purpose** [11]. This is linked to the idea of an inclusive circular economy, as explored in the following section.

1b. Why inclusive?

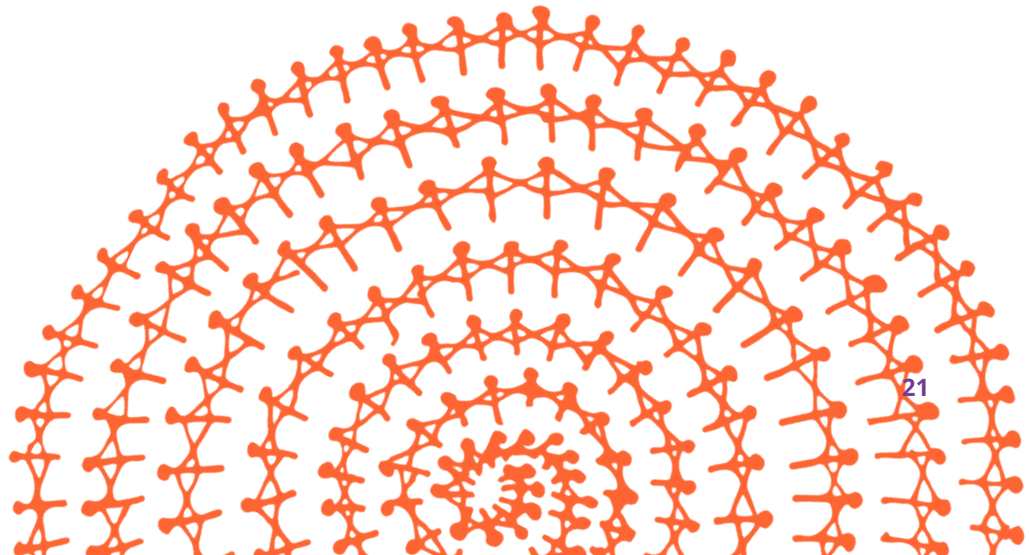
Sharing value

While environmental and economic performance are central to most CE approaches, the social dimensions of circularity are not always explicitly emphasized and prioritized. The proposal of an **inclusive circular economy** urges us to play close attention to this perspective, ensuring that the **benefits of circularity reach all segments of society**, particularly vulnerable populations such as waste pickers, low-income communities, and informal workers. These groups are often directly affected by current linear economic models but stand to gain significantly from CE practices that promote job creation, resource access, and improved living conditions.

An inclusive approach seeks to ensure that circular economy policies and initiatives do not exacerbate existing inequalities but instead serve as a **tool for collective well-being and economic equity**. Ensuring inclusivity and fairness will be crucial for achieving sustainable and equitable progress towards a more circular economy, both globally and locally, in cities, regions and countries.

To further promote a worldwide transition towards an inclusive CE, the **Brazilian G20 Presidency** has proposed the following concept [1]:

> An inclusive circular economy, as a contribution to achieving sustainable consumption and production patterns, is one that aims to keep products and materials in circulation at their highest value, decoupling economic prosperity and human well-being from environmental degradation, while integrating social equity and inclusion across all sectors to ensure that benefits are shared equitably among all stakeholders – including waste pickers, informal workers, women, youth, marginalized and vulnerable communities, Indigenous Peoples and small businesses – and is developed globally through international cooperation and solidarity to help reduce development gaps within and between nations.



To advance the adoption of this concept, the Presidency has also proposed a set of principles **that address the most relevant aspects of an inclusive circular economy**, drawing from key references [13, 14, 15, 16, 17]:

- **Social Equity, Inclusion and Justice**, to ensure that the benefits of CE approaches are accessible to all and shared equitably, including just treatment and meaningful involvement of all members of society, with a special focus on populations in situations of vulnerability;

- **Environmental Equity**, to ensure that everyone has access to healthy ecosystems;

- **Decent and Just Work**, to ensure safe and dignified working conditions, and fair wages;

- **Community Recognition and Engagement**, to recognize the value of traditional knowledge and skills, particularly those of Indigenous Peoples and local communities, actively engaging them in participatory decision-making and project implementation to ensure that their perspectives, knowledge, and priorities are considered;

- **Health Protection**, ensure that CE practices do not harm ecosystems or human health;

- **Access to Funding**, including access to technologies, financing, and adequate infrastructure;

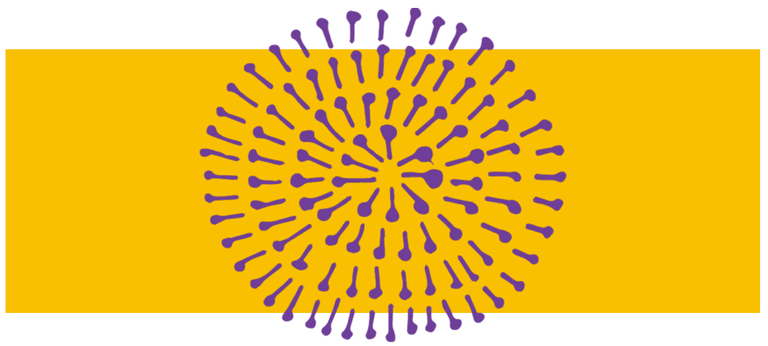
- **Inclusive Design**, to consider the needs and preferences of diverse user groups, including people with disabilities and different cultural backgrounds;

- **Education and Awareness** on sustainability and CE among diverse stakeholders;

- **Innovation and Technology** in social and technological arrangements related to product design, materials science, recycling and other recovering technologies, and circular business models;

- **Collaboration and Partnerships** among stakeholders such as governments at all levels, businesses, civil society, academia, and communities to co-create and implement solutions; and

- **International Cooperation** to reduce regional and global inequalities, within and among nations.



1c. Why in cities and regions?

While national frameworks, strategies and policies play a fundamental role in guiding and supporting the transition towards inclusive circular economy approaches, cities and regions play a very important part in this process. Cities and regions **connect** people, environments, and flows, and each locality has its own potentials and specificities to be taken into account. Human beings have lived in cities for many centuries, and they are centers of development of **culture, innovation, and knowledge exchange**.

Cities hold significant economic importance, contributing substantially to the global GDP. Currently, a major portion of the world's population lives in urban areas, which occupy a small fraction of the Earth's surface, but are responsible for a large share of global greenhouse gas emissions, as well as consuming a significant amount of resources and generating a substantial amount of waste [2, 3, 4].

Thus, our choices on urban issues such as transportation, food production, building materials, sanitation, and energy directly impact **ecosystem services and climate**. This also reflects on **social and economic attributes**, as the poorest areas are usually the most vulnerable and have the least access to ecological and urban services and infrastructure.

If cities are designed, built and managed for a circular economy, we can create **healthy, inclusive, resilient and regenerative** urban spaces.

Linear vs circular urban metabolism

The concept of **urban metabolism** arises from understanding urban areas and the regions on which they depend as ecosystems, with inputs and outputs of interconnected resource flows [18]. And like the economy, the metabolism of traditional cities works within a linear model, based on ***cradle to grave*** flows [19].

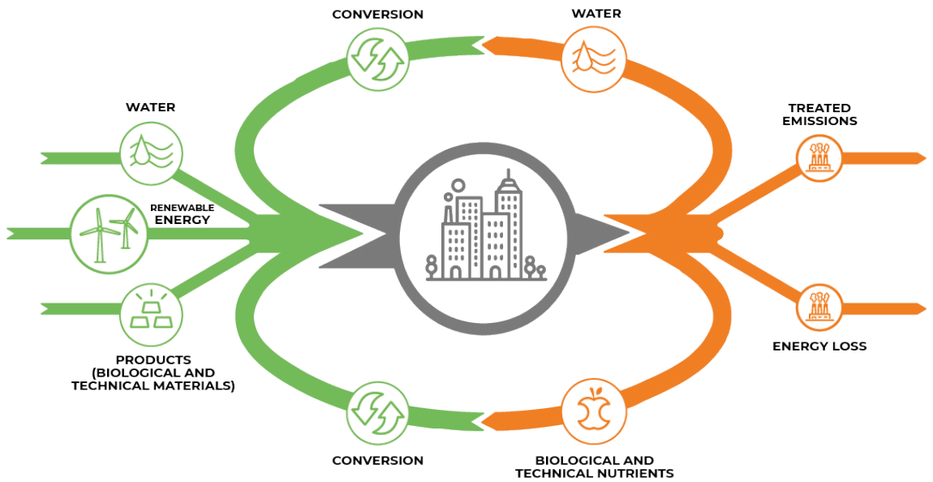
In this **linear metabolism**, industries mainly manufacture products for **single-use consumption and quick disposal**. Water and technical and biological nutrients are not cycled effectively, and energy networks often run in inefficient systems. This results in resource depletion, accumulation of waste and pollution of water bodies, air and land. As a consequence, the **nutrients taken from the earth as food are not replenished**, organic and inorganic waste **accumulates in landfills and open dumps**, the **air is contaminated** by factories and vehicles' emissions, and **the water returns polluted to** the water system.

Figure 5. Linear urban metabolism.

Source: Ideia Circular.

To change this scenario, urban infrastructure can be designed and built for the **effective use of resources**. Urban areas can be designed to decelerate and narrow resource consumption and to close cycles in value chains, through the circulation of the flows of their metabolism. This implies a **systemic change in urban planning and development**, which is a key element in the transition to a circular economy [6].

Figure 6. Circular urban metabolism.



Source: Ideia Circular.

Thus, transitioning from linear to circular urban economies requires **maximizing the value** extracted from 'waste' streams. For cities, this requires adopting new strategies for **managing resource movement**, encompassing both **stocks** like building materials and the **flows that sustain urban life**, such as water. The new urbanism will be characterized by concepts like 'urban mining,' 'resource cascading,' 'industrial symbiosis,' and other circular economy approaches.

Sanitation and solid waste systems will need to evolve from merely collecting pollutants for disposal to becoming **sources of water, energy, materials, nutrients, and employment**, creating jobs in resource recovery, recycling, and sustainable infrastructure [18].

To ensure a **continuous, high-quality cycle** of these resources, it is necessary to develop **effective strategies for transitioning from a linear to a circular urban metabolism**. This includes understanding the inflows and outflows of resources, setting clear objectives for continuous optimization, seeking maximum process efficiency, prioritizing local and renewable materials. Additionally, it involves **recirculating resources** and **enhancing positive impacts** by considering the flows of energy, water, biological and technical nutrients, and construction materials, alongside aspects of land use, local biodiversity, and societal factors, to foster **strong, healthy, and equitable communities**.

What is a circular city or region?

A circular city or region is one that promotes a transition to circularity across the urban space, through multiple city sectors and activities, promoting a **reduction of inputs and outputs through a valorization of internal resource cycles**, which implies **changes in land use and public regulation**. Its functions are **planned to be regenerative**, through the maximum capture of local resources, retention of the value of materials and products, recovery of nutrients for new production cycles, and improvement of the conditions of natural resources and biodiversity [6, 20].

Cities and regions can reframe the way they deal with their waste, seeing its **high economic potential, as well as the potential for income generation and social inclusion**. This translates into the reduction of waste destined to landfills and the adoption of new ways of valuing materials, such as composting yards, technology parks, biodigestion stations, recycling plants and cooperatives, as well as local solutions adapted to communities and neighborhoods. Circular principles and approaches also enable carbon sequestration through regeneration of biological systems, emissions reduction through the use of clean and renewable energy, maintaining water courses, protecting local biodiversity, and increasing food security and urban resilience in the face of climate change.

The next chapter takes a closer look at each of these opportunities, along with suggested directions and practical actions to consider in *Your City**'s journey towards circularity.

***Please replace "Your City" and "Your Circular City" with the actual name of your city or region** (e.g., Circular Nairobi, Circular Toronto), and adapt suggestions as needed to reflect your local context, needs, and opportunities.

2. *Your Circular City*

2a. A new perspective on waste

Most cities begin to understand and plan their circularity strategies with a focus on **waste**, aiming to increase recycling rates or find alternatives to dumping and landfilling. And it makes sense that this should be so, since waste collection and management are usually the **responsibility of local governments** - and current practices are highly linear, ineffective and harmful.

It estimated that only 19% of global municipal solid waste (MSW) is recycled, while an average of 30% is landfilled, 13% is incinerated, and **38% is uncontrolled** - either uncollected, openly burned, or dumped in landfills or directly into ecosystems. These figures vary widely across regions: landfilling ranges from 9% to 61%, incineration from 0% to 42%, recycling from 4% to 56%, and uncontrolled disposal from 10% to 87% [5].

This linear waste management model generates **significant direct costs for cities**, which typically pay transport and landfill fees based on the volume or weight of waste. It also represents a major **loss for economic systems**, amounting to billions of dollars in unused materials. Furthermore, it imposes severe **environmental, social, and health costs**, especially in the case of uncontrolled dumps and landfills, which contaminate soil, water, and air, and expose local populations and ecosystems to harm [6]. In the Global South alone, between 400,000 and 1 million people die each year from diseases related to mismanaged waste, such as diarrhea, malaria, cancer, and heart conditions [21].

Globally, MSW is predominantly composed of organic matter (around 50%, including food and garden waste), followed by recyclable materials (around 40%, such as paper, cardboard, plastic, metals, and glass), with other materials accounting for less than 10% [5]. This means that up to 90% of global MSW **could potentially be redirected into value** for biological and technical cycles, while only 10% can even be classified as waste - and that figure could be gradually reduced through circular design approaches.

In this context, adopting a new perspective on waste as a resource, aligned with circular economy principles, presents cities with a significant opportunity to transform this burden into a source of value creation, leading to substantial economic, environmental, and social benefits.

Think biological: towards an urban bioeconomy

Even though most current efforts are focused on recycling, the **biological cycle** can be a very promising starting point for many cities.

A compelling reason to start with organic waste is that it constitutes approximately 50% of global MSW. Unlike dry or technical waste, which requires complex separation processes and specialized recycling technologies, organic materials can often be managed with **simpler, less expensive and well--established methods** like composting and biodigestion. Additionally, separating organic waste at the source **prevents contamination of the dry fraction**, facilitating the efficient management and recycling of other materials.

Another good reason to begin with the biological cycle is that organic waste is a prime nutrient source. Instead of rotting in dumps and landfills, becoming a vector for contamination and diseases, or requiring costly and high-impact chemical treatments in sewage facilities, nutrients in the organic fraction of municipal solid waste and wastewater streams can **return their value to the soil** as organic fertilizer for both urban and rural agriculture. This practice reduces the need for mineral fertilizers, lowers costs for producers, enhances agricultural resilience, and improves food security for the population, creating an effective and beneficial urban bioeconomy [22]. Additionally, a local strategy should be developed to prevent or reduce food waste in the first place, including public-private partnerships and targeted actions in the retail, food service and household levels, to help achieve SDG target 12.3 of halving food waste by 2030 [23].

Furthermore, circular economy approaches can bring **significant benefits** to soil, water, green areas, local biodiversity, and the restoration of degraded areas, while also strengthening exchanges and community sense. **Local food production** can be intensified through nutrient recycling, reducing dependence on external inputs and promoting local financial gains. By maintaining high-quality soil and water, the health of the population and ecosystems is enhanced. Green infrastructure can be integrated to improve air quality, manage stormwater, and increase urban biodiversity. Additionally, the restoration of degraded areas can be facilitated through contaminated soil treatment, contributing to the creation of more resilient and healthier cities and regions.

Stimulate reuse, repair and upcycling: local value loops

Stimulating reuse, repair, and upcycling in urban areas is a vital strategy within the framework of a circular economy. While most producers of goods and packaging are not based in cities, **urban areas are home to the majority of consumers**, making them ripe with **opportunities for circular practices**. These include **circular business models** such as sharing models, reuse systems, product-as--a-service models, redistribution and repair services, which cities are uniquely positioned to support [24], as well as the implementation of local extended producer responsibility (EPR) schemes.

A circular economy also opens doors to the concept of "urban mining," which involves **recovering valuable materials** from urban waste, such as electronics and construction debris. This process **reduces the demand for virgin raw materials** and **creates new economic and employment opportunities in urban areas**. Upcycling, which transforms waste into new, higher-value products, can be encouraged through design and innovation programs, contributing to a **more circular and creative economy**.

The idea behind all these initiatives is to stimulate production systems that encourage the creation of '**local value loops**'. This means more local production and increased and more diverse exchanges of value in local economies [22]. This way, **cities can become hubs for material regeneration**, contributing to a more resilient economy that is less dependent on finite natural resources.

Recognize and involve waste pickers

In many cities and regions there is a robust network of **informal** waste sector **activities**, primarily focused on the collection, sorting, and recovery of recyclables. This occurs particularly when formal MSW systems are lacking or insufficient, or when there are not enough dignified opportunities or social programs for vulnerable and marginalized populations. **Women are particularly affected** by the burdens of informal work, due to the overlap with child rearing and homecare work, and a lack of health protections and policy support.

Conservative estimates suggest that 15 to 20 million people worldwide are engaged in the informal waste sector [25], and that they are responsible for collecting around 58% of all the post-consumer plastic waste collected for recycling globally. In some developing countries, this figure **exceeds 80% of all recovered waste** [26], making **waste pickers** the backbone of the recycling supply chain.

To promote a just transition towards an inclusive CE, it is crucial to formalize, empower, and support both autonomous waste pickers and those organized in associations or cooperatives, integrating them into formal MSW systems with **fair wages and safe working conditions**. This integration creates opportunities for waste pickers and cooperatives to be contracted by local governments, private companies, large waste generators, and EPR systems—thereby providing **social recognition and financial stability**. In addition to the collection and sorting of recyclable materials, for which

their work is already indispensable, waste pickers can - and should - be included in the composting, reuse and redistribution strategies described above, providing new opportunities for work and income generation.

Thus, waste pickers can be **invaluable allies** in *Your City*'s transition towards a circular economy. They can help *Your City* significantly boost recycling rates, reduce landfill waste, and lower environmental impact. In addition to environmental benefits, empowering waste pickers through proper training and support can create new job opportunities, improve social inclusion, and enhance the overall economic resilience of the city. Their role in collecting, sorting, and redirecting waste materials helps transform urban areas into more sustainable and resource-efficient ecosystems.

Divert from "final destination": don't dump it, burn it, or bury it!

Don't dump it!

If *Your City* has a dumpsite, your top priority must be **safely closing or converting it**. Dumpsites differ from landfills as they create far more serious **environmental impacts**, including air, soil, and water pollution, greenhouse gas emissions, and public health risks. In many regions, waste pickers collect recyclables or even food from dumpsites, further endangering their health.

Before closing a dumpsite, it's essential to identify **opportunities to divert as much waste as possible from final disposal** through circular economy approaches and material recovery. This reduces environmental pressure on new landfills, extends their lifespan, and creates opportunities for retaining or adding value to materials. **Composting facilities** are an excellent option for *Your City*, as they can typically be installed at low cost and have the potential to divert up to 50% of MSW [5] - more on that to follow. You will also need to identify new or existing infrastructure for the controlled disposal of unrecoverable waste, and plan necessary interventions in the affected area to ensure that legacy pollutants are properly managed.

Don't burn it!

To reduce dumpsite and landfill rates in the short term, some cities consider investing in **waste incineration** plants, under the concept of waste-to-energy.

While waste-to-energy is considered a 'controlled' method of disposing of MSW, it ranks low on the waste management hierarchy because materials that are burned are permanently removed from the resource cycle, preventing their reuse in new processes. Therefore, **it cannot be considered a circular solution** and, if set as a standard, will inhibit efforts for material cycles and create a counter-incentive to pursue more circular alternatives for MSW [27].

Additionally, waste-to-energy is neither an effective nor desirable option for energy generation in the transition to clean and renewable sources. It is not clean, as most materials were not designed for safe incineration, resulting in toxic waste that must be filtered and disposed of. Nor is it renewable, if our vision is to eliminate waste and pollution through circular economy approaches, progressively reducing 'unusable' waste that could, in theory, be incinerated.

Don't bury it!

Landfills, while often considered a more controlled method of waste management compared to open dumpsites, still fall short of being a circular solution. Although modern landfills are designed to minimize immediate environmental harm through containment measures like liners and methane capture, they **fail to contribute to the fundamental goal of a circular economy: keeping materials in circulation**.

When waste is buried in landfills, it locks away valuable resources that could have been recovered, reused, or recycled, making landfills a **linear endpoint for materials**. These facilities also occupy valuable land that could be used more productively.

In a circular economy, the goal is to eliminate waste and pollution, and recover the value embedded in products and materials at the end of their use cycles. As we still operate within largely linear systems, landfilling remains a feasible and necessary solution in the short and medium term. Yet, in **the long term**, landfills inherently contradict the principles of a circular economy by treating waste as an inevitable undesirable by-product rather than a resource. While they may provide a temporary solution for managing waste, landfills should not be considered a viable strategy for the long term in a circular economy framework.

These were some guidelines to help foster a new perspective on waste within *Your City*'s urban planning. But as we saw in the previous chapter, the circular economy goes **far beyond waste management** – it promotes the **redesign of systems** so that materials become nutrients for new processes.

This approach opens up **significant opportunities** in other areas of *Your City* beyond waste, including building systems and the management of water, energy and urban mobility. **In the next section** you will explore some of these diverse opportunities on **the path toward *Your Circular City***.

2b. Multiples opportunities

Circularity in construction

The construction sector plays a crucial role in the transition to a circular economy in cities due to its significant environmental impact under the current linear model and the **vast regenerative possibilities** it offers. The buildings and construction sector is the **leading contributor to greenhouse gas emissions**, responsible for an impressive 37% of emissions worldwide. The manufacturing and utilization of materials like cement, steel, and aluminum have a substantial carbon footprint [28].

Circular construction promotes the **maintenance and reuse of existing building stock**, as well as the **dismantling** of systems, components, and materials for future use cycles. By adopting these principles, it is possible to significantly reduce resource waste and minimize the need for new raw material extraction.

To make this approach feasible, architects and urban planners must design buildings with the premise that **their materials and components can be reused** in subsequent cycles. This involves "designing for disassembly" and employing **modular construction techniques** that allow for the selective deconstruction of buildings. By using adaptable systems, components can be reused in new projects, preventing premature material disposal. This extends the lifespan of resources while supporting the long-term maintenance and flexibility of buildings [28].

Moreover, it is essential to maximize the use of the existing building stock, promoting renovations and adaptations that enhance functionality and extend the life of structures [27]. Instead of demolishing old buildings, a circular economy encourages the **renovation and requalification** of these structures, preserving the value of the materials already incorporated and reducing the demand for new construction. This strategy decreases the carbon footprint associated with construction and contributes to **urban regeneration** and culture valorization by preserving **local sociocultural heritage**.

Urban revitalization and biodiversity enhancement: circularity in water, energy and mobility

Promoting circularity in sectors such as water, energy, and mobility is essential for creating more sustainable and resilient cities [28]. The adoption of **practices that close local cycles**, such as rainwater harvesting, effluent treatment, and the use of renewable energy, helps **reduce dependence on external resources** and minimizes environmental impacts. Additionally, the implementation of low-carbon vehicles and efficient **urban mobility** planning helps reduce greenhouse gas emissions, improving air quality and promoting a healthier urban life.

Circularity is also directly linked to the **revitalization of soil** and the improvement of **biodiversity** in cities. The use of **nature-based solutions**, such as the recovery of degraded areas and the restoration of the hydrological functionality of the urban landscape, creates a more favorable environment

for local fauna and flora. These actions help **mitigate** the effects of climate change while promoting the **resilience** of cities, making them **more adaptable to extreme weather events**, such as floods and droughts [29].

Finally, adopting circular practices in water, energy, and mobility directly impacts the **quality of life of the urban population**. By ensuring a healthy water cycle, preventing contamination, and promoting its reuse, cities can secure access to this essential resource. Similarly, the recovery of green areas and the promotion of biodiversity create more pleasant urban spaces that encourage leisure and the well-being of citizens. In this way, a circular economy can contribute to **environmental regeneration** while also fostering the development of **healthier and more vibrant cities**.

Local food production

Local food production plays a strategic role in the transition to more circular and resilient cities. In addition to **reducing dependence on long and crisis-prone supply chains**, local food systems help **minimize transport-related emissions**, increase food security, and strengthen local economies. Models such as urban and peri-urban agriculture, community gardens and agroforestry systems **integrate food production into urban planning**, while technologies like hydroponics and aquaponics optimize water and space use, enabling **cultivation in densely urbanized areas**.

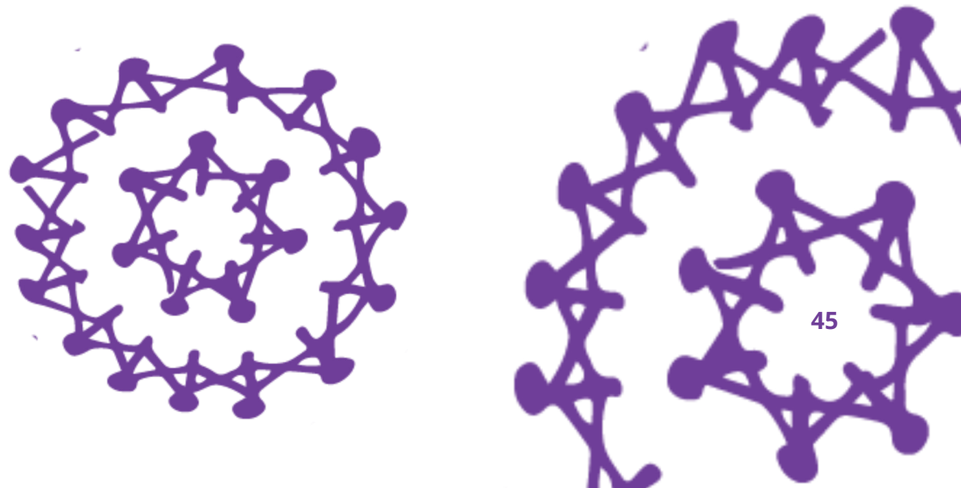
By embedding circularity into food production, cities **can regenerate urban ecosystems** and promote practices that improve soil health, capture carbon and reduce reliance on chemical inputs. Composting and biodigestion of organic waste are key to **closing nutrient cycles**, transforming food scraps and urban green waste into **valuable inputs** for local agricultural production.

Beyond environmental benefits, strengthening local food production generates **economic and social opportunities**, generating green jobs and fostering business models rooted in **cooperation** and the **solidarity economy**. Farmer's markets, direct delivery systems and digital platforms that connect urban farmers with consumers can expand **access to fresh and healthy food**, promote environmental and food education, and strengthen the **bond between citizens and the urban ecosystem**.

Human well-being, safety, and inclusion

Promoting inclusive circular economy approaches in cities and regions can bring a wide range of benefits for human well-being, safety, and inclusion. **Residents' quality of life** can be enhanced by reducing pollution, regenerating natural systems, increasing food security, and fostering urban biodiversity, which also deepens their **connection with the city**.

In some cities, especially in the developing world, there are irregularities in legal and territorial relations that **generate significant differences in access to urban services** such as housing, sanitation, employment, transport, contact with nature and climate resilience. In this context of uneven development, inclusive circular economy approaches can help address the socio-environmental inequalities reproduced in cities, ensuring adaptive and resilient spaces, improving the urban quality of informal areas and providing them with basic services such as **access to sanitation, green areas, public transportation, and housing** [6].



Circular culture: engaging citizens, schools, and communities

Promoting a circular culture requires the **active engagement of citizens and local communities**, making them **key players** in the transition to a more sustainable way of living. Awareness is the first step, ensuring that people understand the importance of changing consumption habits to prevent waste generation from the outset. Communication strategies must be clear and accessible, helping communities understand how their daily habits impact the environment and how they can **promote local transformation**. Participatory processes, such as community meetings and workshops, can foster **collective decision-making**, while incentives like tax reductions or rewards for circular behaviors can **motivate individuals to take action**. Additionally, promoting education on circular economy approaches in schools, universities, and community programs is essential to ensure that future generations are prepared to adopt circular practices from an early age.

Involving communities in **source segregation** is also essential to ensure that household waste can be properly recovered and cycled. By encouraging citizens to separate their waste at the source, we can increase recycling and composting rates and reduce the amount of waste sent to landfills. Through these collective efforts, and with the support of continuous education on circular economy approaches, communities can play a crucial role in **building local systems** where wastes become nutrients for new processes, and resources are continuously reused.

Governance and cooperation: involving stakeholders from all sectors

The shift to circularity requires **systemic transformations** that can only be achieved through **cooperation among various stakeholders**, fostering dialogues and encouraging cross-sectoral participation and collaboration. Clear and effective communication of ambitions is crucial to enable the productive sector, commerce, industries, universities, community organizations, and citizens to actively contribute to the development of the city's circular economy strategy [6].

Cooperation can be fostered through the formation of **sectoral or multisectoral networks** to deal with a particular material flow – such as plastics, building materials, electronics, textiles, and food – or by publicly and collaboratively involving actors in **participatory calls** or targeted actions such as retrofit, urban regeneration or neighborhood redesign.

It is vital to establish **concrete projects** in which several sectors can work together to advance circular economy approaches. Such projects build trust among the various actors, identify skill sets, empower stakeholders, and promote **active participation in the transition toward circularity**. Robust governance plays a key role in this process, translating intentions into actionable practices.

Governance structures should promote **democratic participation**, ensuring that all voices are heard in decision-making processes. Additionally, equitable resource distribution and adherence to the principles of **equality and justice** are essential for ensuring that the benefits of circularity are shared by all segments of society.

Innovation for circularity

Innovation is essential for implementing a circular economy in cities, where challenges related to resource management, waste reduction, and product lifecycle extension are amplified by population density and the **complexity of urban infrastructure**. Emerging technologies, such as advanced recycling, bioconversion, and modular product design, can be applied in urban environments to ensure that materials are reused, repurposed, and recycled efficiently. Moreover, the creation of new business models based on the **sharing of goods and services**, such as collaborative economy platforms, can reduce the need for new products, alleviating pressure on natural resources.

Digital innovation also plays a crucial role in implementing a circular economy in cities. Technologies such as artificial intelligence and blockchain can be used to optimize the logistics of waste collection and processing, improve the efficiency of supply chains, and ensure the **traceability of materials** throughout their lifecycle. This allows cities to monitor resource flows more effectively, ensuring that waste is minimized and materials are redirected for new uses.

Additionally, **digital platforms can foster collaboration** between different sectors of society, from governments and businesses to citizens, promoting more active and democratic participation in the development of circular solutions.

As detailed in the following section, an effective way for city governments to stimulate innovation is through regulatory frameworks, tax incentives and public procurement criteria, creating **significant financial incentives** for actors in the private sector to invest in innovative materials, products and services [6].

Next is an overview of strategic opportunities for *Your Circular City* across each of the key areas explored in this chapter.

Opportunities across key areas

Biological Cycles

- Promotion of urban agriculture and local food production.
- Reduction of food waste.
- Returning the organic fraction of municipal solid waste (MSW) to the soil as compost.
- Treatment and processing of residential effluents as fertilizers for agricultural use.

Technical Cycles

- Innovation and new business opportunities by rethinking systems for reuse, sharing, repair, redistribution, remanufacturing, repurposing, and recycling.
- Encouragement of product design with longer life cycles and easier recyclability.

Social Cycles

- Creation of new jobs and income generation.
- Stimulus for innovation and a creative economy.
- Increased awareness and education for sustainability.
- Social and economic inclusion.
- Reduction of socio-environmental inequalities.

Construction Cyles

- Maintenance and reuse of existing building stock.
- Dismantling of building systems, components, and materials designed for future cycles.
- Reduction of the volume of waste sent to landfills.

Water, Energy and Mobility

- Reduction of greenhouse gas (GHG) emissions.
- Water and soil regeneration.
- Ensuring clean water and air.
- Improvement of urban accessibility.
- Enhancement of biodiversity and climate adaptation.
- Improvement of quality of life.

Innovation

- Development of new technologies and solutions.
- Transparency and efficiency in supply chains.
- Optimization of material use and waste reduction.
- Application of digital technologies for traceability and efficiency in material flows.

Circular Culture

- Education of more conscious citizens, better prepared for the transition to a circular economy and climate adaptation.
- Increase in recycling rates and significant reduction in the volume of waste sent to landfills.
- Greater acceptance and success of circular initiatives.
- Creation of local jobs and strengthening of the social fabric.
- Democratic participation of all sectors of society.

2c. Policy levers for local governments

In this section you will explore some policy levers within the legislative and administrative activities of municipal and regional governments that can set the enabling conditions for circular economy transitions [6, 30].

Public policies and frameworks: balancing regulations to promote circularity

The **creation of public policies and regulatory frameworks** that mandate or incentivize circular practices is an essential mechanism by which cities and regions can lead the transition toward a circular economy.

In many cities, **initiatives** are already in place **to ban** single-use plastics or implement waste management policies aimed at reducing materials sent to landfills, or prohibiting their disposal in open dumps and uncontrolled sites. It is crucial that these restrictions are accompanied by dialogue and support for viable **alternatives**, encouraging innovation to replace outdated products, processes, and services.

However, regulatory frameworks can go further by fostering innovation **at the very beginning of the production chain**, encouraging the **design of circular products and processes**. One approach is the implementation of **Extended Producer Responsibility (EPR)** laws, which motivate manufacturers to redesign their products and processes, taking into account their responsibility for managing the product's lifecycle after its initial use.

Tax incentives: Correcting injustices and stimulating innovation

Rethinking the **taxation structure** of industries, products, and services is one of the key ways to shift production systems towards a circular economy [31].

In some cases, tax structures are determined by **federal laws**, which can be adjusted over time based on government efforts to support this transition. In other cases, taxes are set and administered locally providing opportunities to **promote inclusive and regenerative circular models** over those that contribute to pollution and environmental degradation.

Cities and regions can offer fiscal incentives to **encourage local businesses** or **services** that extend the use cycle of products and keep them in circulation, such as **repair, redistribution, and remanufacturing** services. Additionally, local governments can reward companies that increase their use of **secondary materials** or invest in the development of new circular **business models** and sustainable materials.

Green property tax discounts can also be a powerful tool for local governments to promote a circular economy and urban regeneration within the building stock. By offering tax discounts to property owners who adopt sustainable solutions such as rainwater harvesting systems, solar energy, urban farming, green roofs, and efficient waste management, green property tax discounts encourage the effective use of local resources and waste minimization. Moreover, by improving green infrastructure and energy efficiency, these measures contribute to urban regeneration, revitalizing degraded areas, increasing biodiversity, and enhancing the quality of life for residents.

On the flip side, cities can **remove incentives** or increase taxes on **polluting or extractive** practices, reflecting the negative externalities of these activities. At the local level, it is also possible to implement differentiated taxation for waste generation and management aligning with the waste hierarchy that prioritizes reduction, reuse, composting, and recycling over landfill disposal.

Although this fiscal restructuring may face resistance from sectors benefiting under the current linear model, it remains one of the most effective financial mechanisms to stimulate innovation and drive the transition towards a circular economy.

Public procurement: It all starts at home

Public procurement, the process by which governments purchase goods and services from external suppliers, is a powerful tool that most cities can leverage to support the development of a local circular economy. It constitutes **15-20% of the global GDP**, and subnational governments are responsible for nearly half of these procurement decisions. This positions city governments as key players in shaping local circular economies [32].

By incorporating circular economy **criteria** into public purchasing—whether for building materials, food, energy supply, or contracted services—local governments can help create more sustainable systems for managing material flows. This includes **qualifying suppliers** and fostering an **internal culture** around circular practices.

Since not all suppliers currently adopt circular economy principles, cities may choose to provide an **adaptation period** for them to meet the minimum requirements and begin transitioning their production and service delivery methods. Alternatively, new suppliers can be sought or developed, **rewarding** companies already investing in circular models and encouraging their **growth at scale**.

To implement these changes, it is crucial to understand the existing procurement criteria and processes in Your City. For example, if procurement decisions are solely based on cost, it can be challenging to include suppliers using innovative processes and materials, as they often lack the scale or cost advantages of traditional (linear) suppliers. Therefore, it is important to **identify opportunities within each department or sector** to adopt circularity criteria, clearly communicating the benefits of these practices when developing procurement policies and public tenders (requests for bids from suppliers).

These were some general guidelines on the opportunities and policy levers to support *Your City*'s transition to a circular economy. In the next chapter, you'll find guidance for developing a specific Roadmap to help steer your city through this journey.

3. Guidance for creating *Your City*'s Circular Economy Roadmap

A Circular Economy Roadmap is a strategic plan that outlines a long-term vision and identifies the key initiatives necessary for transitioning to circular models. It is a public policy instrument that has been adopted by many countries and regions globally [33], and can be highly beneficial for cities aiming to advance this transition locally. Your Circular City's Roadmap will help establish a shared vision to guide other public policy instruments and engage different actors from the public, private and civil sector in this transformation.

In this section you will find guidance for developing this process, starting with **understanding Your City** and its circularity potentials, followed by the creation of a vision for ***Your Circular City***, which will then be detailed and broken down in ***Your City's C*ircular Economy Roadmap** into specific intentions, goals, targets, timelines and indicators. We will also discuss creating a governance framework to oversee and evaluate its implementation.

Throughout this chapter, we suggest you replace "*Your Circular City*" with the actual name of your city or region to personalize this journey – for example, Circular Bogotá or Circular Toronto.

Who should participate?

The Circular Economy Roadmap should be proposed by the entire city government to develop a **unified position** across the various entities working on policies related to the circular economy transition. This process can include multiple secretariats, agencies, and municipal departments, and must be validated externally through the participation of civil society, with representation from companies, associations, communities, and universities. This can be achieved via **open sessions, dialogue tables, and public consultations**. The goal is to establish **shared governance** among different government sectors and with other stakeholders, creating a **joint vision for the transition to circularity** [6].

Multi-stakeholder involvement in visioning is essential to engage and empower the various actors and guide the structuring of the Roadmap and its future implementation. Given the need for **multisectoral efforts, collaboration** becomes a critical factor. Integrating multiple stakeholders during the planning phase increases the likelihood of successful implementation and **adherence** to the ideas and the project as a whole.

A good strategy is to start the Vision and Roadmap exercises with a smaller and more aligned team, and later involve other departments and external actors to co-create the final version. Additionally, experts or consultants can be brought in to support this process.

3a. Understanding *Your City*

Before implementing a broader strategy, it is crucial to **investigate and assess the current conditions** in *Your City*, as well as identify the main **potentials, challenges, and opportunities** related to circular economy approaches. By conducting this analysis, the city will have the necessary insights to proceed through the next steps of planning and implementing circular strategies [6].

For an initial diagnosis, you can begin by identifying challenges or areas of concern related to waste management in *Your City,* such as:

- Is there an established system for **selective waste collection**, and what is the current recycling rate?
- Does a **municipal waste management plan** exist, and how effectively is it being implemented?
- Are there **dumpsites** in *Your City*? Are there **landfills**? What are their conditions? What strategies can be employed to divert waste from these sites?
- Are **composting facilities** available, as well as opportunities to enhance **local food production**?
- Lastly, are there **waste pickers cooperatives**, or do independent waste pickers operate in the area? What are their work conditions?

Going beyond this initial diagnosis, you can also map the key potentials and existing projects in *Your City*. Some guiding questions for this process include:

- What are the **assets or strengths** for developing a circular economy in *Your City*?
- Are there more **suitable sectors** for advancing a circular economy locally? Is there a particular kind of industry or sector specific to *Your City* or region?
- Are there **projects already underway involving circular economy approaches**, both within city hall and in other sectors? In local industries? In local universities and research centers? In citizen-led/community initiatives?
- Who are the **key actors** involved in these projects?
- What additional actors should be included, and how can they be trained in CE approaches?

3b. Vision for *Your Circular City*

Defining a vision for *Your Circular City* is an opportunity to imagine where the city wants to be by a specific point in the future, applying circular economy principles to local realities and the areas of interest identified in the initial diagnosis. This can include setting a medium or long-term milestone (e.g., 20, 30, or 50 years) to express the desired future.

While the vision may include data or targets, it is primarily an aspirational and **qualitative exercise** – one that imagines **the best possible version of *Your City***. It should stimulate creativity and inspire a future vision that is **abundant, prosperous, and inclusive** based on circular economy principles, adapted to local realities. Rather than focusing solely on waste reduction, recycling, or efficiency, the vision should reflect a regenerative approach to city flows.

On the next page, you'll find a series of guiding questions to support this visioning exercise. They are organized around the general opportunity areas discussed earlier, but they can — and should — be adapted and expanded according to ***Your City*'s specific needs and realities.**

Tip: As mentioned before, you can replace "*Your Circular City*" with the name of your own city or region when drafting this vision – for example, Circular Salvador, or Circular Nairobi. This will help make the exercise more concrete and engaging.

Guiding questions to create a vision for *Your Circular City*

- How do biological nutrients circulate through *Your Circular City* and return value to the soil?
- How does *Your Circular City* foster local biodiversity and strengthen connections with nature?
- How is food produced, distributed, and consumed in *Your Circular City*?
- How do industrial systems operate in *Your Circular City*?
- How are goods and products shared, repaired, or redistributed in *Your Circular City*?
- How do technical nutrients circulate through *Your Circular City* and return value to new production cycles?
- In what ways have residents' lives improved with the adoption of circular practices in *Your Circular City*?
- How does *Your Circular City* create new job opportunities and support income generation?
- Is the vision inclusive? Does it reflect the social diversity of *Your City*?

- How does *Your Circular City* include waste pickers and vulnerable populations in its circular transition?

- How are new buildings designed and constructed in *Your Circular City*? What materials and processes are used?

- How does *Your Circular City* optimize the use of existing buildings and infrastructure?

- How do people interact with the built environment in *Your Circular City*?

- How does water circulate through *Your Circular City*? How is it supplied and treated? How does *Your Circular City* care for and interact with urban water bodies?

- What are *Your Circular City*'s energy sources? How is energy produced and distributed?

- How do people move around *Your Circular City*? How do mobility systems connect and support daily life?

3c. Roadmap for *Your Circular City*

Now it's time to create the roadmap for *Your Circular City*, which will help guide and structure the efforts needed to **turn the vision into reality**. This roadmap should outline intentions, goals, targets and indicators within a defined timeframe.

The idea is to reflect on the actions, initiatives, and steps needed to achieve *Your Circular City*'s **desired vision**. This phase helps ensure that *Your City*'s commitment to the circular economy transition is maintained, even in the face of changes in government or administration.

Intentions, goals, targets, and indicartors

The Roadmap begins by defining **intentions and goals**, aligned with *Your Circular City*'s vision, followed by the development of a **plan for continuous improvement** that includes **indicators, targets**, and **timelines** for *Your City* to meet its established intentions.

It's important to distinguish between **intentions** and **goals**: Intentions focus on **quality** – something not necessarily measurable. In contrast, **goals** focus on **quantity** and are measurable through specific indicators. **Targets** serve as intermediate milestones, guiding progress toward the full achievement of each goal.

The following questions can help guide the development of qualitative intentions and quantitative goals:

- What actions should *Your City* take to realize its vision for a circular future?
- What are the intentions for each key area in *Your City*?
- What positive aspects can *Your City* amplify? What negative aspects can it minimize?
- How can *Your City* achieve its intentions? How can they be translated into quantifiable goals?

Continuous Improvement Plan

Once intentions and goals are set, the next step is to define **how** they will be achieved — including how progress will be monitored and measured over time. Use these guiding questions to shape the plan:

- What concrete actions and interim targets are needed to reach each goal?
- What indicators and milestones can help monitor progress toward each target or goal?
- What is the timeline for achieving these milestones?
- Which stakeholders and actors need to be involved in each action?

Define governance for implementation and monitoring

Governance and collaboration are just as essential for implementing and monitoring the Roadmap as they were during its development.

You can establish a **governance group** that includes some of the same actors who helped create the Roadmap, along with others who became involved along the process. This group can operate at both political and technical levels to support implementation.

Involving **public servants**, as well as representatives from the **private sector** and **civil society**, will be important to leverage and sustain the Roadmap's implementation over time, across different governments and administrations.

Communicate and celebrate!

Be sure to define how you will **communicate and celebrate the progress** *Your City* makes.

Communication is key to engaging other actors and organizations, expanding the actions defined in the Roadmap, and to **making the benefits clear** to all residents and stakeholders.

Conclusion

The implementation of an inclusive circular economy in cities may seem like a complex challenge, given the number of transformations required in various sectors. However, this process should be approached **step by step**, with **structured planning tailored to local realities**.

One of the first steps is **eliminating open dumps**, which represent a major obstacle to sustainability. Simultaneously, **reducing food waste** and creating **composting systems** for the organic fraction of MSW are important short-term actions that can drastically reduce the volume of waste going to landfills or dumps, while generating compost for **local food production**. This, in turn, is a key element of a circular economy, as it decreases dependence on long supply chains and promotes the local economy and a sense of community.

Promoting circularity in sectors such as water, energy, and mobility, along with soil revitalization and biodiversity improvement, is also crucial for more sustainable and resilient cities. This includes **local water harvesting and recycling**, transitioning to **renewable energy sources**, and encouraging **public and non-motorized transportation**. **Soil revitalization** and increased **biodiversity** strengthen ecosystems, improve air quality, and support urban agriculture, contributing to a better **quality of life** and greater **resilience and adaptability** to future challenges.

Encouraging innovation and practices such as **reuse, repair, and upcycling** is also a strategy that can be gradually implemented, creating **local value loops** and fostering **circular business models** that cities are uniquely positioned to support.

Local governments can employ **policy levers** to establish the enabling conditions for circular economy transitions. Among the most impactful are public policies and **regulatory frameworks, tax incentives and circular public procurement**.

Another important aspect is recognizing and integrating **cooperatives and waste pickers**. These actors already play a **fundamental role** in waste collection and recycling, and with proper support, they can be a driving force in the transition to a circular economy. In addition, **engaging communities**, promoting **circular culture, addressing socio-environmental inequalities** and adopting a **stakeholder**-centered approach help facilitate the transition, by prioritizing actions considered most important or with greatest potential for positive impact according to local needs. This approach helps ensure broader acceptance and engagement—crucial for long-term success in advancing circularity in cities and regions.

Ideia Circular and the Ministry of the Environment and Climate Change, which coordinates the Resilient Green Cities Program, in partnership with the Ministry of Cities and the Ministry of Science, Technology, and Innovation, encourage **cities and regions** to adapt this document to their **local needs and circumstances**, fostering cooperation and multi-level governance.

References

[1] MMA - Ministry of the Environment and Climate Change (2024). **Waste and the circular economy: advancing a global agenda towards an inclusive circular economy**. Environment and Climate Sustainability: technical papers on adaptation finance, oceans, payment for ecosystem services and waste and circular economy – Brasília: MMA, 2024. https://www.gov.br/mma/pt-br/composicao/secex/g20/materiais-para-download/documentos-publicacoes-e-midias-g20/midias/copy_of_PublicaofsicaPTG2020241.pdf.

[2] UNITED NATIONS. (2019). **World Urbanization Prospects**. 2018: Highlights (ST/ESA/SER.A/421). https://population.un.org/wup/assets/WUP2018-Report.pdf.

[3] MCKINSEY GLOBAL INSTITUTE (2012). **Urban world: Cities and the rise of the consuming class**. https://www.mckinsey.com/featured-insights/urbanization/urban-world-cities-and-the-rise-of-the-consuming-class

[4] UN-HABITAT. (2013). **Cities and climate change**. https://doi.org/10.4324/9780203077207.

[5] UNEP - PROGRAMA AMBIENTAL DAS NAÇÕES UNIDAS (2024). **Global Waste Management Outlook 2024: Beyond an age of waste- Turning rubbish into a resource**. Nairobi: UNEP. https://doi.org/10.59117/20.500.11822/44939

[6] IDEIA CIRCULAR and UCCI. **Circular Economy Handbook for Ibero-American Cities**. São Paulo, 2022. https://ideiacircular.com/circular-economy-handbook-for-cities/

[7] UNEP - UNITED NATIONS ENVIRONMENTAL PROGRAMME (2024). **Understanding circularity**. UNEP Circularity Platform. https://buildingcircularity.org/

[8] GACERE - GLOBAL ALLIANCE ON CIRCULAR ECONOMY AND RESOURCE EFFICIENCY (2024). **Circular Economy and Solid Waste - Working Paper**. https://www.unido.org/sites/default/files/unido-publications/2024-06/Working_Paper_Circular_Economy_and_Solid_Waste.pdf

[9] McDonough, W., Braungart, M. (2002). **Cradle to Cradle: Remaking the Way We Make Things**. Nova York: North Point Press.

[10] ELLEN MACARTHUR FOUNDATION (2014). **Towards the circular economy Vol. 1: an economic and business rationale for an accelerated transition**. https://emf.thirdlight.com/file/24/xTyQj3oxiYNMO1xTFs9xT5LF3C/Towards%20the%20circular%20economy%20Vol%201%3A%20an%20economic%20and%20business%20rationale%20for%20an%20accelerated%20transition.pdf

[11] Girardet, H. (2014). **Creating Regenerative Cities**. (1ª ed.). Routledge. https://doi.org/10.4324/9781315764375. ISBN 1317654102, 9781317654100.

[12] Schröder, P., Lemille, A., Desmond, P. (2020). **Making the circular economy work for human development**. Resources, Conservation and Recycling, Volume 156, 2020, 104686, ISSN 0921-3449 https://doi.org/10.1016/j.resconrec.2020.104686

[13] Wilson, D. (2023). **Learning from the past to plan for the future: An historical review of the evolution of waste and resource management 1970-2020 and reflections on priorities 2020-2030 - The perspective of an involved witness**. Waste Management & Research, V. 41(12), pp. 1754-1813. https://doi.org/10.1177/0734242X231178025

[14] ILO – INTERNATIONAL LABOR ORGANIZATION (2022). **Green Jobs, Green Economy, and Just Transition Concepts and Definitions: The UN-ILO perspective**. 1st meeting of the G7 ETF under German Presidency. Berlin: ILO/ G7 Germany.. https://www.ilo.org/media/280921/download

[15] UN-HABITAT - UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME / NIVA - NORWEGIAN INSTITUTE FOR WATER RESEARCH. **Leaving no one behind**. https://unhabitat.org/sites/default/files/2022/11/un-habitat_niva_report_leaving_no_one_behind_1.pdf

[16] Preston, F., Lehne, J., Wellesley, L. (2019). **An Inclusive Circular Economy- Priorities for Developing Countries**. Chatham House. Londres. https://www.chathamhouse.org/sites/default/files/publications/research/2019-05-22-Circular%20Economy.pdf

[17] UNEP - UNITED NATIONS ENVIRONMENTAL PROGRAMME (2023). **Topic Sheet: Just Transition**. Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/42231/just_transition_sheet.pdf?sequence=3&isAllowed=y

[18] Swilling, M. et al. (2018) **The weight of cities: resource requirements of future urbanization**. UN Environment and International Resource Panel. ISBN: 978-92-807-3699-1. https://www.resourcepanel.org/reports/weight-cities

[19] Braungart, M.; McDonough, W.; Bollinger, A. (2007). **Cradle-to-cradle design: creating healthy emissions - a strategy for eco-effective product and system design**. Journal of Cleaner Production, 15(13-14), 1337-1348. https://doi.org/10.1016/j.jclepro.2006.08.003

[20] Novak, M. et al. (2021). **Circular City Actions Framework**. ICLEI- Local Governments for Sustainability. https://circulars.iclei.org/action-framework/

[21] UNEP - UNITED NATIONS ENVIRONMENTAL PROGRAMME (2024). **Waste Pollution: A primer on how unsustainable production and consumption habits have escalated the waste pollution crisis**. https://www.unep.org/interactives/beat=-waste-pollution/#:~:text-These%20pollutants%20bioaccumulate%20in%20the,diseases%20related%20to%20mismanaged%20waste

[22] Dhawan, P., & Beckmann, J. (2018). **Circular Economy Guidebook for Cities**. https://circulareconomy.europa.eu/platform/sites/default/files/circular_cities_publication.pdf

[23] UNITED NATIONS ENVIRONMENTAL PROGRAMME (2024). **Food Waste Index Report 2024**. https://www.unep.org/resources/publication/food-waste-index-report-2024

[24] ELLEN MACARTHUR FOUNDATION (n.d.). **Circular cities: thriving, liveable, resilient**. https://ellenmacarthurfoundation.org/topics/cities/overview

[25] ILO – International Labor Organization (2020). **Reducing Waste Towards a Just Transition: Work, Labour and Value in the Informal Recycling Chain**. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/@gjp/documents/publication/wcms_905814.pdf

[26] UNEP - UNITED NATIONS ENVIRONMENTAL PROGRAMME (2021). **Roadmap for the progressive closure of dumpsites in Latin America and the Caribbean**. Coalition for the closure of dumpsites at Latin America and the Caribbean. https://wedocs.unep.org/bitstream/handle/20.500.11822/34919/Roadmap_EN.pdf?sequence=7&isAllowed=y

[27] Scheelhaase, T., Braungart, M., Mulhall, D., Qian, H., Siegmund, T. (2010). **Cradle to Cradle: Transitioning from Waste Incineration to Beneficial Materials**. CATALYST - Creative Enterprise Leadership Action Learning Network https://catalystreview.net/cradle-to-cradle--transitioning-from-waste-incineration-to-beneficial-materials/

[28] UNEP - UNITED NATIONS ENVIRONMENTAL PROGRAMME (2023). **Building Materials and the Climate: Constructing a New Future.** Nairobi. ISBN: 978-92-807-4064-6. https://wedocs.unep.org/handle/20.500.11822/43293

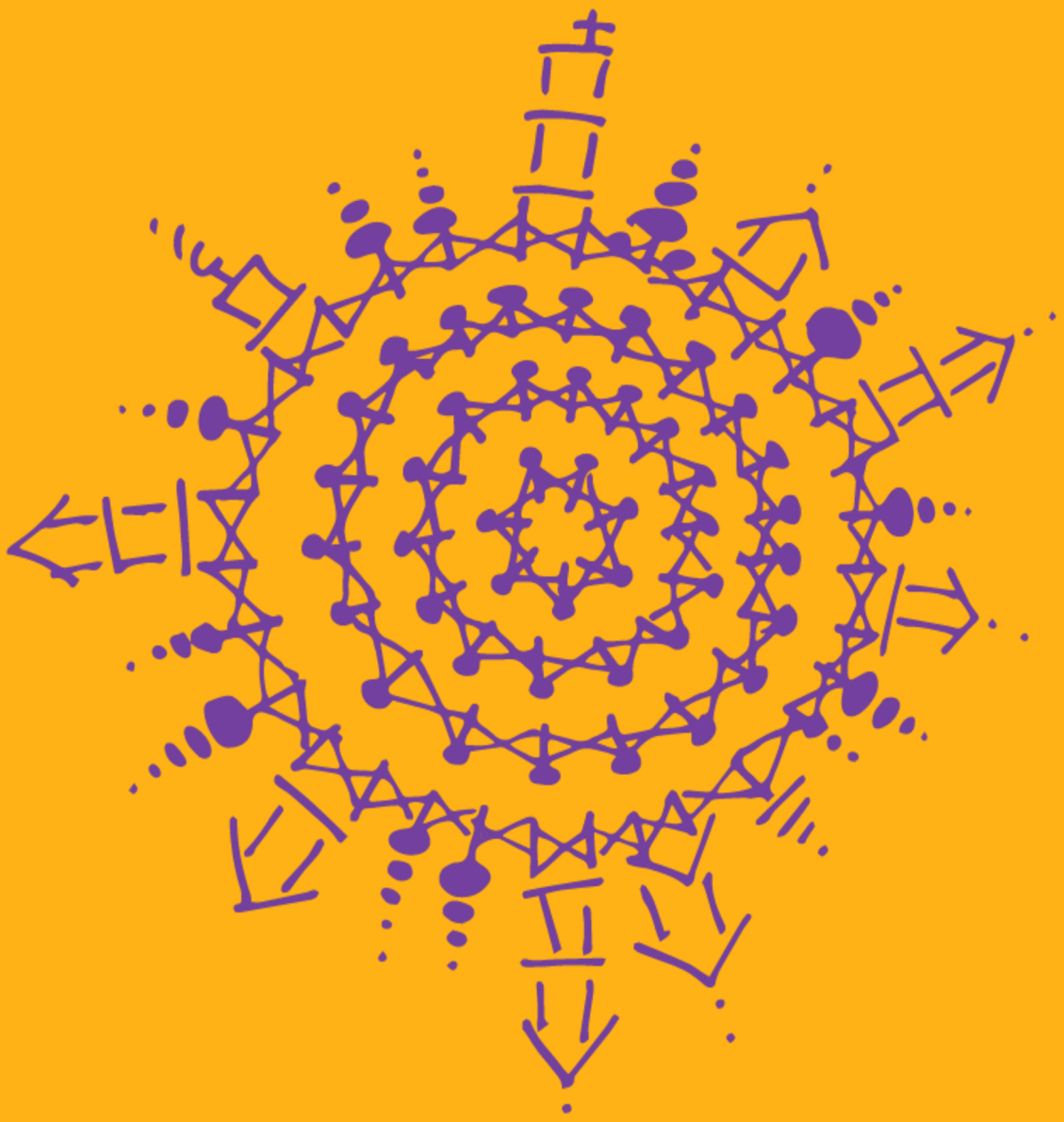
[29] GACERE (2022). **Circular Economy and Biodiversity - Working paper**. https://www.unido.org/sites/default/files/unido--publications/2023-11/GACERE%20Working%20Paper%20on%20Circular%20Economy%20and%20Biodiversity_March%202022.pdf

[30] ELLEN MACARTHUR FOUNDATION e ARUP. (2019). **City Governments and Their Role in Enabling a Circular Economy Transition: An Overview of Urban Policy Levers**. https://ellenmacarthurfoundation.org/policy-levers

[31] Milios, L. (2021). **Towards a Circular Economy Taxation Framework: Expectations and Challenges of Implementation**. Circular Economy and Sustainability, 1(2), 477-498. https://doi.org/10.1007/s43615-020-00002-z

[32] ELLEN MACARTHUR FOUNDATION (n.d.) **Circular public procurement: a framework for cities**. https://emf.gitbook.io/circular-procurement-for-cities

[33] Järvinen, L., & Sinervo, R. (2020). **How to Create a National Circular Economy Road Map: a Guide To Making the Change Happen**. https://www.sitra.fi/app/uploads/2020/09/how-to-create-a--national-circular-economy-road-map.pdf



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