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The Circular Economy in Berlin, Germany

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This document was approved by the Regional Development Policy Committee on 4 November 2024 and prepared for publication by the OECD Secretariat.

This paper was authorised for publication by Lamia Kamal-Chaoui, Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD.

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The OECD Programme on the Circular Economy in Cities and Regions and the European Commission's Circular Cities and Regions Initiative (CCRI) provide support to selected European cities and regions to: i) build new knowledge and evidence at local and regional levels on the state of the art of the circular economy; ii) identify new solutions and innovative governance options for the transition to a circular economy; iii) deepen knowledge on the transition to a circular economy at regional level, especially in terms of value chain coordination; and iv) provide cities and regions with action plans to move from a linear to a circular economy.

Definition of circular economy

The circular economy is a system where the value of products, materials and resources is retained in the economy for as long as possible by returning them to the product cycle at the end of their use, thus minimising the generation of waste (EC, 2015[1]). In cities and regions, the circular economy should ensure that: *services* (e.g. ranging from water to waste and energy) are provided while preventing waste generation, making efficient use of natural resources as primary materials, optimising their reuse and allowing synergies across sectors; *economic activities* are planned and executed in a way to close, slow and narrow loops across value chains; and *infrastructure* is designed and built to avoid linear lock-in, which uses resources intensively and inefficiently (OECD, 2020[2]).

Acknowledgements

This scan was prepared by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) led by Lamia Kamal-Chaoui, Director, as part of the collaboration between the OECD Programme on the Circular Economy in Cities and Regions and the European Commission (EC)'s Circular Cities and Regions Initiative (CCRI), Directorate-General for Research and Innovation (DG RTD), led by Marc Lemaitre, Director-General. The scan is part of the Programme of Work and Budget of the OECD Regional Development Policy Committee (RDPC). It is the result of a policy dialogue with more than 50 stakeholders from public, private and non-profit sectors (list in Annex A).

The scan was drafted by a team composed of Oriana Romano, Head of Unit, Ander Eizaguirre, Policy Analyst, Water Governance, Blue and Circular Economy Unit, and Felipe Bucci Ancapi, Researcher at the Delft University of Technology (The Netherlands), under the supervision of Aziza Akhmouch, Head of the Cities, Urban Policies and Sustainable Development Division in the CFE. Nadim Ahmad, Deputy Director of the CFE, provided comments on the draft.

Special thanks are conveyed to the local team in the city of Berlin (Germany) led by Amélie Bonarius, Benjamin Bongardt, Tamara Fischer and Albrecht Fritze, Senate Department for Urban Mobility, Transport, Climate Action and the Environment (SenMVKU), city of Berlin (Germany), for the excellent collaboration throughout the policy dialogue; to Jacqueline Cramer, Emeritus Professor in Sustainable Innovation, at Utrecht University (the Netherlands), and former Minister of Housing, Spatial Planning and the Environment of the Netherlands for participating as a peer reviewer; and to Lucie Blondel and Marta Andreoni, Policy Officers (DG RTD, European Commission) for commenting on earlier drafts of the scan.

Thanks are extended to Jack Waters in the CFE for preparing the scan for publication. María Ferrer Estévez, Policy Analyst (CFE), designed the document's visual structure.

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Executive summary

Key findings

Berlin has experienced considerable population growth in recent years (+10% between 2013 and 2023, compared with +4% in Germany and +5% in the OECD) and is projected to reach 4 million by 2040. This is placing pressures on demand for housing, services and infrastructure and, in turn, on resource consumption. Although the city has made progress in reducing municipal waste generation over that period (-21% between 2013 and 2023: from 1.5 to 1.2 Mt), recycling rates lag the national average (56% in Berlin compared to 68% at the national level in 2020). Moreover, the average Berliner's Domestic Material Consumption (DMC) increased from 4 to 5 tonnes per capita between 2016 and 2020 (a 20% increase, faster than the national rate of 9% for the same period) and is expected to reach 7 tonnes per capita by 2030 (+28% between 2020 and 2030). Of DMC, mineral raw materials are expected to continue to be the most important component in 2030, in large part reflecting on going demand for new buildings. These pressures, including the imperative of driving sustainable growth, have helped increase political momentum to support a circular economy transition in Berlin.

In addition, Berlin hosts a dynamic start-up ecosystem (concentrating almost half of all capital investment in Germany), as well as a young population (56% of Berliners are below 45 years old, vs. 50% in Germany), which is highly educated (45% of 25+ year old citizens have completed tertiary education, compared to 32% in Germany), making it well-positioned to become a leader in circular innovation to drive economic growth and green jobs. Moreover, the potential for job creation in this transition provides an opportunity to address unemployment, which remains significantly above the national average (9.2% in Berlin versus 3.1% in Germany in 2023).

Berlin's journey towards a circular economy is at an early stage and can be divided into two main phases: the "waste reduction and recycling phase", which is based on the concept of sustainable waste management that shifted the treatment of municipal waste from disposal to incineration and recycling between the 1990s and the 2020s; and the "zero waste and circular economy inception" phase, which has led to the gradual incorporation of circular economy principles into waste policies, prompting, in turn, resource efficiency beyond waste management. The city has progressively rolled out waste prevention policies and established a Coordination Office for Circular Economy, Energy Efficiency and Climate Protection in Companies (KEK) in 2022. In 2023, it created a Zero Waste Agency and commissioned a study to analyse the potential of the circular economy in Berlin's industrial sector.

However, the self-assessment of the Senate Department for Urban Mobility, Transport, Climate Action and the Environment, based on the OECD Scoreboard on the Governance of the Circular Economy in Cities and Regions points to three main governance challenges: the lack of a common understanding of the circular economy in Berlin, which is mostly perceived as a synonym of sustainable waste management (i.e. zero waste) rather than resource conservation

and management; limited collaboration on policies related to the circular economy across the city administration and with the 12 districts of Berlin, mostly due to human and financial resource constraints; and difficulties in enforcing laws and regulations (e.g. on single-use plastics, commercial waste and food packaging).

Key recommendations

Based on the OECD's 3Ps framework (people and firms, policies, and places), the city of Berlin could take the following actions:

- *People and firms:* Being the city a national and international centre for innovation, driven by its 2020 digitalisation strategy (*Gemeinsam Digital*) and given its young, educated population, Berlin is well positioned to **boost circular innovation by leveraging on talents**. Berlin could set up innovative business models (e.g. product as a service, sharing models, reuse and repurpose, etc.) for example by: fostering collaborations with startup incubators (e.g. Impact Hub, Berlin Partner); mainstreaming the circular economy into the implementation of innovation programmes, such as the Startup Agenda 2022-2026; making the Senate Department for Urban Mobility, Transport, Climate Action, and the Environment (SenMVKU) and the Senate Department for Economic Affairs, Energy and Public Enterprises (SenWEB) collaborate to mobilise talents for circular economy related initiatives in sustainable production, consumption and services. The city could support SMEs by establishing policy tools to stimulate circular economy innovation (e.g. economic incentives such as subsidies, tax breaks, grants, simplified regulations, standards, and guidelines) and set clear circular procurement criteria (e.g. eco-design, minimum recycled content in products, adoption of circular business models and dedicated procurement programmes for SMEs). While the city of Berlin is already using digital tools for the circular economy, such as the digital marketplace that is part of the Urban Mining Hub under the city's Re-Use initiative, they could be applied to other sectors beyond construction, such as textiles, food, transport, consumer goods and services.
- *Policies:* The circular economy could contribute to **achieving Berlin's priority policy objectives** and agendas, such as the Berlin Energy and Climate Programme 2030, aiming to reach carbon neutrality by 2045. This could be done by: identifying strategic value chains (e.g. concrete, wood, steel, bio-resources, food) that have environmental impacts, from extraction to end of life; mapping game changer actors and working with facilitators (e.g. transition brokers) to help align interests and goals on resource use across supply chains, from producers, to retailers and consumers. The city could establish a circular economy roundtable to facilitate a formal and regular discussion between public and private sector stakeholders on matters related to the circular economy, including sector-specific challenges as well as data access and availability to monitor resource use and waste reduction targets (e.g. tonnes of waste avoided through re-use and repair), but also eco-design in products and services (e.g. design for disassembly, modularity, repairability). Finally, the city could appoint circular ambassadors providing positive and concrete examples of successful circular initiatives (i.e. "walk the talk").
- *Places:* Berlin's robust service-based economy is in an advantageous position to ensure accessibility and proximity to citizens. Circular services, including repair centres, sharing transport, renting, can promote resource sustainability by extending product lifecycles, reducing waste, and enabling resource reuse and regeneration. **A city of circular services**, which presents a significant opportunity for the dematerialisation of the economy, could be boosted by creating experimentation areas (e.g. circular districts) that would allow for the

implementation and enforcement of local regulations, including for land use and the ban of single use plastics and food packaging, while leveraging on different existing initiatives (e.g. reuse centres, repair bonus, pop-up or temporary stores, library through which sharing or lending items, packaging initiatives in restaurants and sport facilities). The city could also explore ways to make the circular economy attractive to investors and ensure its long-term economic sustainability, leveraging Berlin Partner in their role as business development supporter. The city should then regularly communicate about the impacts of such initiatives, for example in terms of energy savings, climate impacts, or cost savings due to circular initiatives.

1 Snapshot of Berlin

The transition from a linear to a circular economy in Berlin is driven by environmental and socio-economic considerations. First, the city's rapidly increasing population (+10% between 2013 and 2023) and is projected to reach 4 million by 2040. This is placing pressures on demand for housing, services, and infrastructure and, in turn, on resource consumption, underscoring the unsustainability of the current linear economic model. Although the city has made notable progress in renewable energy adoption, its reliance on waste incineration remains high, and recycling rates lag behind national averages. A shift to a circular economy, which emphasises resource efficiency and sustainable consumption, would help reduce material consumption, minimise waste, and mitigate environmental degradation. Additionally, Berlin has a dynamic start-up ecosystem (concentration almost half of all capital investment in Germany), a young population (56% of Berliners are below 45 years old), which is highly educated (45% of 25+ years old citizens completed tertiary education), making it well-positioned to become a leader in circular innovation to drive economic growth, environmental resilience and green jobs. This shift could also help address the unemployment level of Berlin, which remains significantly above the national average (9.2% in Berlin versus 3.1% in Germany in 2023).

Berlin hosts a young, highly educated, and growing population that is expected to reach 4 million by 2040. In 2023, 56% of Berliners were younger than 45 years old (+3% compared to 2013) (Amt für Statistik Berlin-Brandenburg, 2024[3]). In 2022, 45% of Berliners over 25 years old had completed tertiary education (above the 33% national average over 25 years old) (OECD, 2024[4]). Between 2013 and 2023, the population of Berlin increased by 10% (from 3.5 to 3.8 million), exceeding the national growth average of 4% (from 80.6 to 83.7 million) over the same period (OECD, 2024[5]). The German capital will reach 4 million inhabitants by 2040 (Berlin, 2022[6]). With 56% of households being composed by one-person, Berlin can expect increasing demand for services, housing, energy, infrastructure. On the other hand, greater environmental awareness is noticeable in the country, with 73% of German citizens considering adaptation to climate crisis necessary in 2022.

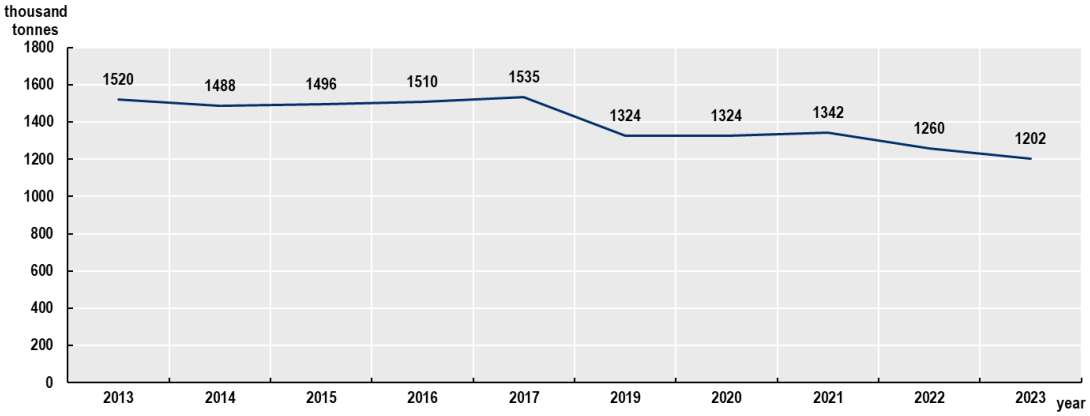
Berlin's economy has grown steadily over the past decade, driven by a strong services sector and a dynamic business and start-up environment that attracted almost half of total capital investment in Germany. Within the last ten years (2011-2021), Berlin's Gross Domestic Product (GDP) grew markedly by 53%, reaching EUR 165 million. During the same period, GDP per capita in Berlin increased by 39%, reaching EUR 43 839, similar to the national trend, which increased by 30% (from EUR 33 554 to EUR 43 480 in the same period) (Statistik Berlin Brandenburg, 2022[7]) (Eurostat, 2024[8]). In 2020, approximately 86% of the gross value added (EUR 139 854 million) was generated by the services sector (33% public services; 31% financial services; 22% trade, hospitality, information, and communication services), while manufacturing industries represented the remaining 14% (IHK Berlin, 2023[9]). Berlin co-led the creation of start-ups[1] in Germany in 2022 with 26 start-ups per 10 000 inhabitants, alongside Bremen and ahead of Hamburg (with 24 start-ups per 10 000 inhabitants). The city's start-up ecosystem benefited from significant public investment, with almost EUR 5 billion directed to

Berlin-based start-ups in 2022, representing nearly half of the nationwide capital investment (State of Berlin, 2023[10]).

The city of Berlin is facing pressing social issues, particularly in relation to unemployment and the well-being of vulnerable groups. Despite the sustained economic activity, the city is facing a significant unemployment rates (99.2% in Berlin versus 3.1% in Germany in 2023) (Statistische Ämter des Bundes un der Länder, 2024[11]) (Statistik der Bundesagentur für Arbeit, 2024[12]). In 2023, 20% of the population of Berlin was at risk of poverty[2], ranking second among all the German states after Bremen (28.8%) (Sozialpolitik aktuell, 2024[13]). In the past decade recipients of subsistence payments increased by 20% (from 17 928 to 21 520 between 2009 and 2017). (Statistik Berlin Brandenburg, 2018[14]). In addition, the city of Berlin conducted the first survey on homeless people in 2020 estimating in approximately 2 000 the number of people living on the streets of Berlin (State of Berlin, 2020[15]).

From an environmental standpoint, Berlin has made progress towards renewable energy and reduced waste generation. Nevertheless, incineration with energy recovery is the main waste treatment method, while material consumption has increased. The share of renewable energy moved from 10% in 2005 to 52% in 2023. This means that Berlin exceeded its renewable energy target of 35% by 2020, reaching 46% for this year, and is moving consistently towards its target of 80% renewable energy by 2030. Berlin's figures are well above the national and OECD averages of 12% and 8% respectively in 2020 (OECD, 2024[16]). Berlin has made progress in reducing municipal waste generation over the last decade (21% reduction in municipal waste between 2013 and 2023: from 1.5 to 1.2 Mt) (Figure 1.1), but when it comes to waste treatment (Figure 1.2) incineration with energy recovery is higher than the national average, while recycling is lower: respectively 44% and 56% compared to 30% and 68% in 2020. Finally, material consumption has increased in Berlin but remains well below national and OECD averages (OECD, 2020[17]). The average Berlin citizen's Domestic Material Consumption[3] (DMC) increased from 4 to 5 tonnes per capita between 2016 and 2020 (Institut für Energie-und Umweltforschung Heidelberg, 2020[18]). Meanwhile, the national average in 2019 was approximately 14.4 tonnes per capita, below the OECD average of 17.5 tonnes per capita, according to the latest comparable data (OECD, 2024[19]).

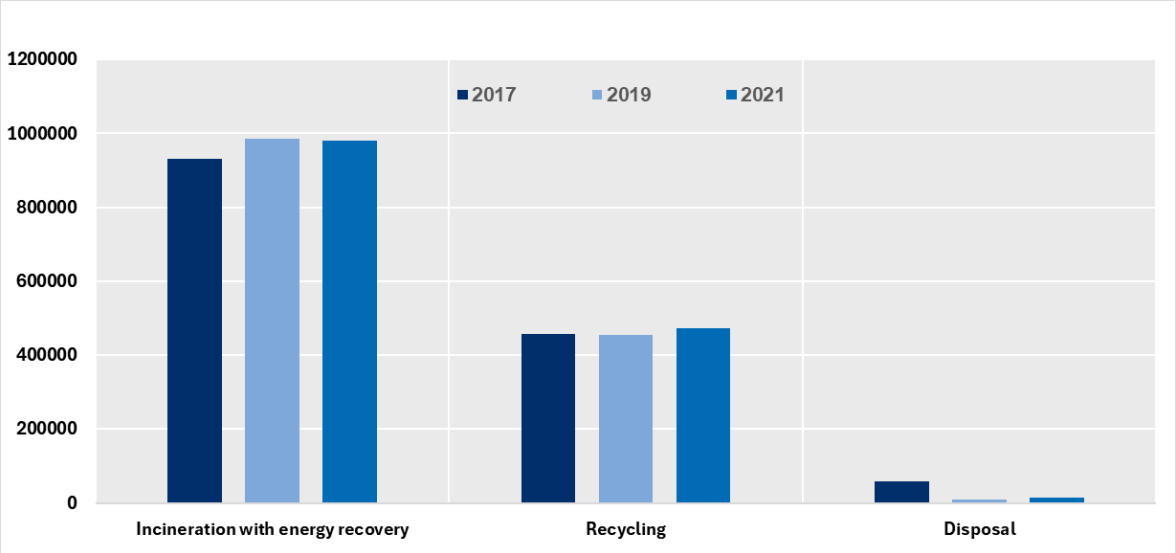
Figure 1.1. Municipal waste generation in Berlin, 2013-2023



Source: State of Berlin (State of Berlin, 2021[20]), Berliner Zero Waste Strategie 2030, https://www.berlin.de/sen/uvk/umwelt/kreislaufwirtschaft/strategien/abfallwirtschaftskonzepte/abfallwirtschaftskonzept-2020-bis-2030/

Note: In 2023, Berlin Waste Management[4] (*Berliner Standtreinigungsbetriebe*) managed 1.2 Mt of municipal waste[5] of which 89% corresponded to household waste[6] (including commercial waste from small businesses), 10% to other municipal waste and 1% to pollutants such as heavy metals, pesticides and solvents.

Figure 1.2. Treatment of municipal waste in Berlin, 2017-2021



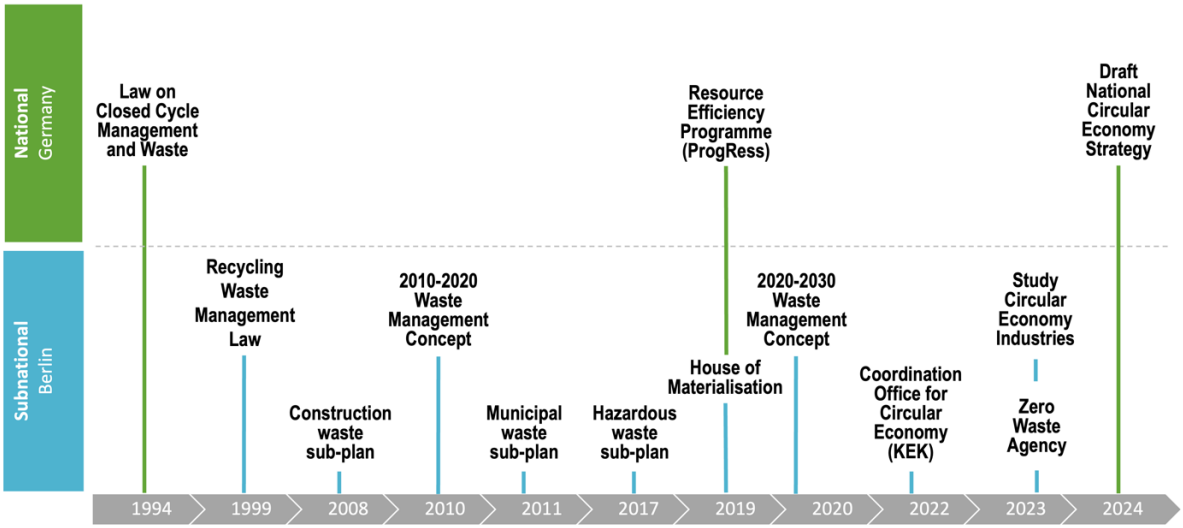
Source: Berliner Standtreinigungsbetriebe (2024[21]), Entsorgungsbilanz, https://www.bsr.de/entsorgungsbilanz-23297.php

2 Berlin's circular journey

A circular economy, as one leading to decouple environmental pressures from economic activities, is yet to be set in Berlin. The city has heavily focused on waste prevention policies and progressively set up the basis for a circular economy. It has established the Coordination Office for Circular Economy, Energy Efficiency and Climate Protection in Companies (KEK) in 2022 and the Zero Waste Agency in 2023. It also commissioned a study to analyse the potential of the circular economy in Berlin's industrial sector in 2023. Yet, in Berlin the circular economy is often perceived as synonymous with sustainable waste management. This is also reflected in the semantic distinction between *Kreislaufwirtschaft*, the concept used by most actors during the OECD dialogue in Berlin to describe a recycling economy and used as synonym of the circular economy, and *Zirkuläre Wirtschaft*, which refers to resource efficiency and conservation.

Berlin's journey towards the circular economy can be divided into two main phases: the first one "waste reduction and recycling phase" is based on the concept of sustainable waste management, which shifted the treatment of municipal waste from disposal to incineration and recycling between the 1990s and the 2020s; the second one "zero waste and circular economy inception" led the city to start incorporate circular economy principles into waste policies and prompt resource efficiency, beyond waste management (Figure 2.1). According to the OECD (2024[22]) Survey, the main drivers for a circular economy in Berlin include: tackling climate change, European Union, national, and local legal frameworks and strategies (Box 2.1), changes in natural resources availability, and the search for innovation.

Figure 2.1. Timeline of Berlin's progress from waste management to a circular economy



Source: Authors' elaboration.

Box 2.1. National Circular Economy legislation and planning in Germany

The **Law on Closed Cycle Management and Waste** (*Kreislaufwirtschaftsgesetz* - KrWG), effective since 1994, aims to conserve natural resources and safeguard people and the environment during waste production and management. It also introduced measures like Extended Producer Responsibility (EPR), mandating the preservation of product usability and using disposal as a last resort. The KrWG strengthens separate waste collection obligations and requires federal agencies to prioritise resource-friendly, low-waste, repairable, low-pollutant, and recyclable products in their purchases. The amendment to the KrWG in 2020 implemented the updated European Waste Framework Directive and the European Single Use Plastics Directive.

The German Federal Government launched in 2023 a document titled "Basics for a transition process towards a circular economy", as a basis for a **National Circular Economy Strategy** (*Nationale Kreislaufwirtschaftsstrategie* - NKWS) expected in 2024 and aiming to conserve resources for as long as possible and recycle them to become less dependent on raw material imports and to strengthen the resilience of the German economy. All German states were invited to comment on the draft through a public consultation process involving business, associations, civil society, science and administration. The NKWS is expected to consolidate existing raw material policies and other initiatives around eight fields of action, namely: i) circular production processes; ii) digitalisation, iii) clothing & textiles; construction; iv) ICT & electronic devices; v) metals; vi) plastics; vii) public procurement; and viii) vehicles & batteries.

First launched in 2010 and updated in 2019 as part of the **German Resource Efficiency Programme (ProgRess)**, the **German Raw Material Strategy** seeks to secure a sustainable supply of non-energy mineral raw materials for the country by setting measures to achieve this goal. Major challenges in securing raw material supply as result of international crises and supply shortages, motivated the German government to update the Raw Material Strategy

putting emphasis on the need to take advantage of domestic, recycled raw material streams. Twelve of the 17 measures included in the strategy, mention the circular economy as a means for material recovery and recycling in domestic value chains. The strategy foresees the implementation of innovative design concepts and new business models to extend the use of products and raw materials, but does not specify when nor how.

Sources: (Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz, 2012[23]); (Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz, 2023[24]); (Federal Ministry for Economic Affairs and Climate Protection, 2019[25]).

First phase (1990-2020): waste reduction and recycling

In the late 1990s, Berlin prioritised the establishment of an effective waste management structure to integrate the various waste management systems developed during the Cold War. In 1999, Berlin approved the Berlin Recycling Waste Management Law (*Kreislaufwirtschafts- und Abfallgesetz Berlin*), promoting recycling and sustainable waste management practices (Berliner Stadtreinigung, 1999[26]). Berlin developed the first Waste Management Concept[7] (*Abfallwirtschaftskonzept*) in 2005, foreseen by law, in consultation with Berlin Waste Management Public Company (*Berliner Standtreinigungsbetriebe*), associations of waste producing and disposing industries, nature conservation associations, and the neighbouring federal State of Brandenburg. As a result, between 1996 and 2008, Berlin reduced its total municipal waste generation by 27% from 2.1 Mt to 1.5 Mt, while simultaneously increasing its recycling rate to from 30% to 40%. This was achieved by maximising the use of the city's existing installed recycling capacity, coupled with an increase in the recycling of bulky waste (State of Berlin, 2010[27]).

The new Waste Management Concept for 2010-2020 aimed to ensure that, following sorting and pre-treatment, the majority of waste available for recycling was re-injected into the economy and residual waste sent to incineration plants for energy recovery (with the exception of mineral secondary materials recycled from construction and demolition waste). The Waste Management Concept 2010-2020 was supplemented by three sub-plans: i) the 2008 Construction Waste Sub-Plan, which included forecasts on disposal capacity to advance waste prevention and recycling potential for construction waste (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2008[28]); ii) the 2011 Municipal Waste Sub-Plan to ensure the continuity of recycling efforts and to advance waste prevention and avoidance (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2012[29]); and iii) the 2017 Hazardous Waste Sub-Plan to ensure domestic disposal of hazardous waste, limit its exportation and to adopt the European waste hierarchy[8] for the treatment of hazardous waste. The Sub-Plan was developed in response to the consistent increase in hazardous construction waste (+14%) and excavated soil (+86%) between 2012 and 2016 (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2017[30]). Some initiatives also concerned reuse. The Re-Use Berlin initiative, launched by SenMVKU in 2018, incentivised Berliners to collect used goods (e.g. clothing, electronics, furniture, upcycled products, and household items) in good condition at local markets and recycling centres for resale in the Re-Use Superstore (a store established in 2020 where more than 20 actors could offer their used and upcycled products). The Berlin Waste Management Public Company opened the NochMALL in 2020 as a second-hand store for furniture and textiles, which are delivered directly from recycling centres (Nochmall, 2024[31]).

Second phase (2020 – ongoing): zero waste and circular economy inception

From the 2020s onwards, Berlin began to implement circular economy measures into the management of waste, alongside other German cities (Box 2.2). In 2021, the 2020-2030 Waste Management Concept, also known as the Zero Waste[9] Strategy 2030 (State of Berlin, 2021[32]) started a new approach to waste management towards circular economy by focusing on waste reduction, reuse, and recycling, in compliance with the Berlin Recycling Waste Management Law (State of Berlin, 2021[20]). The Zero Waste Strategy outlines 80 measures on waste reduction, reuse, and recycling, targeting the construction sector, household waste and sewage sludge wastewater (Table 2.1). It sets up targets to be met by 2030, such as achieving a 64% recycling rate of construction waste, a 20% reduction in residual waste from 2020 levels, the safe treatment and recovery of 2 600 tons of phosphorus and a yearly reduction of 250 000 tons of CO_2 emissions derived from the city's waste management operations (e.g. transportation and treatment). The implementation of these measures is expected to contribute to the city's goal to become climate-neutral by 2045 and to reduce environmental costs through infrastructural investments in biowaste recycling and additional recycling centres by up to EUR 46 million (Berlin, 2024[33]).

Table 2.1. Circular economy actions included in the 2020-2030 Waste Management Concept

Streams	Circular economy actions towards 2030
Construction waste	• Use renewable, recyclable building materials such as wood, recycled concrete and recycled insulation materials. • Use 400 000 tons of recycled concrete and recycled gypsum in building construction. • Re-use bricks and recycled materials in building construction. • Promote design for disassembly in building design among architectural firms. • Encourage the use of recycled plaster. • Set minimum resource conservation requirements for the construction of new cycle paths. • Develop a recycling strategy for flat glass waste.
Household waste	• Promote separate collection of bio-waste in multi-storey buildings. • Reduce food waste. • Produce biogas from biowaste as fuel for lorries and fermentation residues to make compost for agriculture. • Establish a network of quality repair companies. • Promote re-use centres in Berlin. • Use catering food waste for biogas and compost production. • Increase separate collection of packaging, small electrical appliances and glass. • Promote the avoidance of single-use plastics in food takeaways through pilots and campaigns.
Sewage sludge wastewater	• Convert 2 600 tons of recovered phosphorus from sewage sludge into nutrients for agriculture. • Increase phosphorus recovery by replacing co-incineration of sewage sludge for renewable energy with mono-incineration of sewage sludge.

Source: State of Berlin (2021[20]), Berliner Zero Waste Strategie 2030, https://www.berlin.de/sen/uvk/umwelt/kreislaufwirtschaft/strategien/abfallwirtschaftskonzepte/abfallwirtschaftskonzept-2020-bis-2030/

Berlin has also established new offices and agencies within the city administration and commissioned studies to support the transition to a circular economy. The **Coordination Office for Circular Economy, Energy Efficiency, and Climate Protection in Companies (KEK)** (*Koordinierungsstelle für Energieeffizienz und Klimaschutz im Betrieb*)[10], created in 2022, started with a focus on energy efficiency and climate protection and started providing advice

and support on the circular economy to companies in 2024. The office provides operational guidance to companies; advice on funding opportunities; in-depth consultations for SMEs and capacity building initiatives (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2024[34]). The **Zero Waste Agency** of Berlin (*Zero Waste Agentur*), founded in 2023 within the Berlin Waste Management public company (*Berliner Stadtreinigungsbetriebe*), collaborates with the 12 districts of Berlin on waste prevention (Zero Waste Agentur, 2024[35]). The **House of Materialisation**[11] conducts research on sustainable business and climate-friendly use of resources. Since 2021, it hosts the Centre for Climate-Friendly Resource Use, developed as part of Berlin's citywide Re-Use Initiative. Its goal is to document knowledge, build skills, and provide educational measures for circular economy initiatives. Additionally, in 2023 the Senate Department for Economy, Energy and Public Enterprises (SenWEB) of Berlin commissioned the study **"Requirements and potential analysis of the circular economy in Berlin's industrial sector"** (*Anforderungs- und Potenzial-analyse zur circular Economy im industriellen Sector Berlins*). The study identified legal requirements that the industrial sector needs to comply with to move towards a circular economy including i) compliance with recycling quotas, ii) bans on certain hazardous substances in production, iii) energy efficiency standards and (iv) the use of secondary materials. The study also identified requirements that the city of Berlin needs to meet to advance the circular economy in its industrial sector, namely the mandatory use of recycled materials and the use of digital product passports (SenWEB, 2023[36]).

Box 2.2. German cities' actions to move towards a circular economy

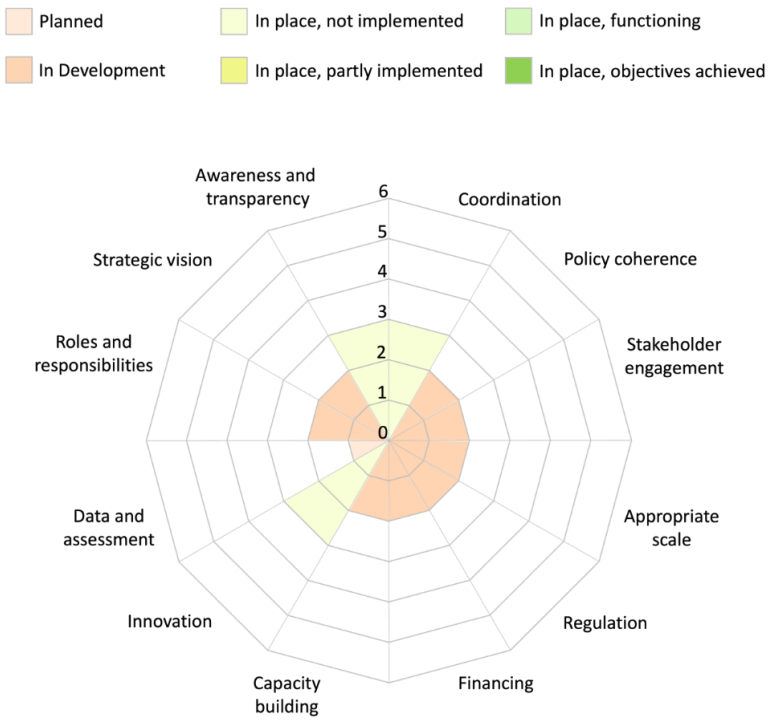
- In 2016, the city of **Freiburg** joined the EU-Interreg Alpine Space Project Greencycle to reduce CO_2 emissions and develop a holistic circular economy system. As part of the project, Freiburg identified 12 key principles for the transition to a circular economy, including the integration of circular economy principles into local policies, the pursuit of Sustainable Development Goals, the promotion of co-operation, education, sustainable consumption, innovation, infrastructure investment, and monitoring and measurement.
- The city of **Frankfurt** is moving towards a circular economy through an approach based on improving waste prevention and treatment. The city aims to become zero-waste by significantly increasing the share of waste that gets recycled (currently only 45%) and reducing the total waste generated, which is estimated at 280 000 tonnes per year. Initiatives include tackling food waste through participation in the "Cities against Food Waste" network and supporting the establishment of a Re-Use Network in the State of Hesse to improve co-operation between waste management entities, second-hand shops, and repair initiatives.
- The city of **Munich** adopted a resolution in 2020 to promote the implementation of a Circular Economy and a Zero Waste Strategy. The decision emphasises the importance of co-operation and networking among various stakeholders in the city and highlights the need to analyse the status and potential of material flows. Moreover, in 2016, the waste management corporation of Munich (*Abfallwirtschaftsbetrieb München, AWM*) launched the Halle 2 project to create synergies between waste collection and reuse by opening a second-hand store funded by waste collection fees.

Sources: OECD (2024[37]) Reaching Climate Neutrality for the Hamburg Economy by 2040, OECD Regional Development Studies, OECD Publishing, Paris, https://doi.org/10.1787/e1e44672-en.

3 Challenges and opportunities for Berlin's circular transition

The self-assessment carried out by the Senate Department for Urban Mobility, Transport, Climate Action and the Environment, based on the OECD Scoreboard on the Governance of the Circular Economy in Cities and Regions (Box 3.1) points out: the lack of a common understanding of the circular economy in Berlin, which is mostly perceived as a synonym of sustainable waste management (i.e. zero waste); limited collaboration across departments and the 12 districts of Berlin, mostly due to human and financial resource constrains; difficulties in terms of law enforcement (e.g. on single-use plastics, commercial waste and food packaging). Given that the circular economy transition is at an inception phase, most dimensions of the scoreboard indicate the status of Berlin as a newcomer to the circular economy, showing 'planned' and 'in development' levels of progress (OECD, 2020[38]) (Figure 3.1).

Figure 3.1. The OECD Scoreboard on the Governance of the Circular Economy in Berlin.



Box 3.1. The OECD Checklist for Action for the Circular Economy in Cities and Regions

The OECD Checklist for Action, based on 12 key governance dimensions, provides guidance to governments to promote, facilitate and enable the circular economy. Itis divided into three clusters that reflect the complementary roles of cities and regions in the circular economy:

- **Promoters:** Cities and regions can lead by example, communicate clearly and set goals and targets for the circular economy. They can do this by clarifying roles and responsibilities, developing a circular economy strategy, and promoting a circular economy culture and transparency.
- **Facilitators:** Cities and regions can support dialogue and collaboration and provide infrastructure and services for circular businesses. They can do this by implementing effective multi-level governance, fostering policy coherence, engaging stakeholders and adopting a functional approach.
- **Enablers:** Cities and regions can create the conditions for the circular economy to thrive, e.g.: adapting regulations, mobilising financing, building capacities, supporting innovation and generating data and assessment.

The Checklist is accompanied by the OECD Scoreboard on the Governance of the Circular Economy in Cities and Regions, a self-assessment tool for governments aiming to assess the advancement towards the implementation of each of the 12 governance dimensions. The potential scores that may be given for each governance dimension range from 1 to 6 or N/A, corresponding respectively to: Planned (1); In development (2); In place, not implemented (3); In place, partly implemented (4); In place, functioning (5); In place, objectives achieved (6).

The OECD Scoreboard offers to cities and regions undertaking the assessment:

1. An overview of the current situation concerning 12 governance dimensions to base decision-making processes on facts and clear objectives.
2. Guidance to improve policy areas needed to promote, facilitate, and enable the circular economy transition.

3. A tool for dialogue in multi-stakeholder processes for it provides information to improve policies and tools, to raise awareness about the opportunities of the circular economy, and to build consensus on the main challenges and potential ways forward.

Source: OECD (2020[2]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-e.

Table 3.1. Promoting a circular economy in Berlin, Germany

	Evaluation of governance dimensions through the OECD Scoreboard on the Governance of the Circular Economy	Ways forward based on the OECD Checklist for Action
	Roles and responsibilities: In development Berlin is the German capital and holds the double status of *city*, composed of 12 districts, and *state*, with implications on different levels of government and authorities being in charge of policy making, implementation and enforcement concerning circular economy related sectors. At state level, the Senate Department for Urban Mobility, Transport, Climate Action, and the Environment (SenMVKU) is the highest waste authority responsible for the enforcement of waste legislation, as well as for environmental, transport and climate protection. Additionally, SenMVKU is in charge for the development of waste management plans, waste policies and waste balances for the city of Berlin, and for monitoring their performance (State of Berlin, 2021[32]). The SenMVKU is responsible for supervising material flows throughout the waste disposal process, with a particular focus on hazardous waste. Responsibilities related to the transition to a circular economy are not clearly defined. To date, existing circular economy activities in Berlin have been primarily led by the SenMVKU. Through a joint commitment between the SenMVKU and the Senate Department for Economic Affairs, Energy and Public Enterprises (SenWEB), the Coordination Office for Circular Economy, Energy Efficiency, and Climate Protection in Business (KEK), has started to support companies in their transition to a circular economy in early 2024. In addition, the SenMVKU is actively trying to involve the Senate Department for Urban Development, Building and Housing (SenStadt) through invitations to participate in internal meetings on the circular economy, given the role of urbanisation and construction in the circular economy. In sum, in 2024 the responsibilities over the circular economy transitions lie in the SenMVKU and to a lesser extent with the SenWEB. Other Senate departments are not yet involved.	• Make sure that the leadership on the circular economy is shared across SenMVKU and the SenWEB to broaden the circular economy beyond waste management only.
	Strategic vision: In development The city has set up waste prevention policies, established the Coordination Office for Circular Economy, Energy Efficiency and Climate Protection in Companies (KEK) in 2022, created the Zero Waste Agency in 2023, and commissioned a study to analyse the potential of the circular economy in Berlin's industrial sector in 2023. The study identified requirements meet to advance the circular economy in its industrial sector, namely the use of	• Build the pre-conditions for a transversal circular economy strategy. To that effect, Berlin could i) conduct a stock and flow analysis; ii) promote shared understanding and co-creation/consultation with stakeholders to build consensus and vision iii) set clear and achievable goals, actions and expected

	recycled materials and the use of digital product passports, as well as opportunities (e.g. favourable framework conditions, digital progress, public procurement, lighthouse projects and urban mining) and threats (e.g. economic viability of recyclable materials, path-dependency of businesses, regulatory uncertainty, and labour shortages). The study concludes with several recommendations for action, divided in the following categories: i) visibility and agenda setting; ii) capacity building and information; iii) cooperation and networking; and iv) incentives for businesses. A circular economy, as one leading to decouple environmental pressures from economic activities, is yet to be set in Berlin.	outcomes; iv) set measurable and incremental targets; v) allocate a dedicated budget and resources to implement the strategy; vi) conduct robust monitoring and evaluation. • Select policy areas that can lead to successful results, such as built environment, tourism and events, food and water. Criteria for selection could include areas that: i) can substantially reduce environmental impact and have social and/or economic merit; ii) are in development but still scattered and need support to scale up; iii) are related to one of the main economic and governmental priorities; iv) involve non-governmental actors willing to join forces; v) can show positive preliminary results in 2-3 years. • Make strategy implementation a collaborative effort. For each selected theme, work with business, academia and civil society to decide how to orchestrate the process of change and who shall lead. In many cases this orchestration requires an independent intermediary (i.e. transition broker) to work in interaction with public, private, and civil actors in Berlin.
	Awareness and transparency: In place, not implemented To achieve the zero-waste objective of the 2020-2030 Waste Management Concept, the SenMVKU communicates specific measures through the "Re-Use Berlin" campaign launched in 2018 (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2023[39]). The campaign helped disseminate multiple projects and initiatives on reuse and disposal such as: BSR's NochMALL (Berlin's first second-hand mall); the Re-Use Super Stores (private shops offering second-hand products invited by the city of Berlin to increase visible of their business in various shopping centres of the city); ReMap Berlin (a website that enables users to identify environmentally-friendly methods for passing or disposing of items no longer required); and Re-use collection boxes (which serve as	• Support citizens and business in the understanding of the circular economy as being different from recycling, by highlighting economic and environmental benefits of a service- based economy, sharing, and reusing, for example. • Once a circular economy strategy is put in place, define a dissemination campaign targeting several categories of actors, including citizens, which would

	collection points for printer cartridges and shipping boxes, with the former collected by the city and the latter available to the public for reuse). The Re-Use Berlin campaign also included a practical guide for "Low-Waste Large Events", which provided information to event organisers on the waste management concept, how to plan waste quantities and how to prepare waste reports. In addition, Berlin Waste Management launched in July 2024 a repair network (*Repami*). The network includes commercial repair companies and voluntary repair initiatives as part of an online platform for georeference. Finally, the Zero Waste Agency of Berlin established in 2023, which is owned by the Berlin Waste Management (*Berliner Stadtreinigung* - BSR) and funded by the SenMVKU, raises the visibility of zero waste initiatives through a dedicated web portal that provides information on environmental centres and education, as well as search portals for relevant zero waste topics in the city. Despite these efforts, mainly related to waste prevention and reuse, there is little awareness on the circular economy as an economic system that goes beyond waste management. The lack of awareness of the public administration limits opportunities for urban development and environment in resource management given current lock-ins in waste management (i.e. recycling and energy recovery), as well as citizens and companies, which are not directly involved in existing public and private initiatives on the circular economy.	help change the narrative on the circular economy, as a system transformation that goes beyond adopting sustainable waste management and recycling practices. • Highlight successful business cases from companies supported by the KEK to exemplify positive results in awareness raising campaigns amongst businesses, investors and the Senate and attract more companies to develop their businesses in the circular economy transition.

Table 3.2. Facilitating a circular economy in Berlin, Germany

	Evaluation of governance dimensions through the OECD Scoreboard on the Governance of the Circular Economy	Ways forward based on the OECD Checklist for Action

	Co-ordination: In place, not implemented
	
	KEK is a publicly funded partnership launched in 2022 between SenMVKU and SenWEB (Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt, 2024[34]).
	
	The Federal/State Waste Working Group (*Bund/Länder-Arbeitsgemeinschaft Abfall – LAGA*) and the Resource Efficiency Working Group (*Länderoffenen Arbeitsgruppe Ressourceneffizienz – LAGRE*) aim to harmonise the enforcement of waste laws, facilitate inter-state discussions, exchange information between federal and state governments, engage with stakeholders, develop legislative proposals, represent state interests internationally, and publish guidelines for waste law enforcement (Bund/Länder-Arbeitsgemeinschaft Abfall, 2023[40]). In contrast to the LAGA, the LAGRE is not a permanent working group and its continuation is assessed every two years.
		• Strengthen Berlin's co-ordination with the Federal Government on circular economy policies by:
		  ○ Introducing circular economy as a topic in existing structures (i.e. LAGA, LAGRE).
		  ○ Advocating to make LAGRE a permanent working group for the States to formally and periodically discuss circular economy related topics.

	As in the case of the other 15 German states, Berlin was invited to comment on the draft National Circular Economy Strategy (NKWS) through a public consultation process involving business, associations, civil society, science and administration (*Nationale Kreislaufwirtschaftsstrategie NKWS*) (BMUV, 2024[41]). Although Berlin collaborates with actors from different levels of government for the circular economy, there is no structured nor institutionalised coordination between the federal government and the state of Berlin regarding circular economy policy.	
	Policy coherence: In development Most existing policy ambitions and strategies with the potential to incorporate circular economy principles operate in silos (e.g. 2021 Climate Protection and Energy Transition Act, 2020 Berlin Nutrition Strategy, 2020 *Gemeinsam Digital* and 2022-2026 Master Plan for Regional Industrial Development). Although there are several projects funded by SenMVKU on recycled concrete and low carbon emission buildings, there is not a coherent policy to align the circular economy with the management of the built environment. In addition, the KEK works on the circular economy and energy efficiency as standalone policies, while they could help achieve the latter. While companies that seek advice from the KEK may opt to explore energy efficiency and circular economy measures, these measures are not always pursued in a joint manner. The circular economy is perceived as a separate and isolated policy area rather than as a cross-cutting and strategic priority that can contribute to other long-term priorities of the city such as climate neutrality, nutrition, and industrial development.	• Identify areas of key strategies and plans where circularity can create synergies and contribute to resource efficiency. This could be facilitated through workshops with the departments responsible for each strategy to identify: i) areas where the circular economy can contribute to the achievement of these policies; and ii) actions to prioritise to drive the circular economy forward. • Set up interdepartmental coordination mechanisms, including in the form of regular meetings, to promote policy coherence.
	Stakeholder engagement: In development Berlin has implemented several initiatives to engage stakeholders. For example, regarding the built environment, SenMVKU hosted in 2022 an online dialogue on the use of recycled concrete in public building construction projects. The dialogue gathered 140+ participants, including designers, architects, developers, contractors, and concrete manufacturers, to explore alternatives and discuss the potential of recycled concrete in construction. Regarding manufacturing, the 2022-2026 Master Plan Industrial City (*Masterplan Industriestadt Berlin)* includes actions in relation to the circular economy, such as developing targeted networking spaces for industry-relevant players and collaborating with industrial actors from the State of Brandenburg. With a focus on waste management, the Zero Waste Agency (*Zero Waste Agentur*) organises annual multi-stakeholder conferences and regular Zero Waste stakeholder meetings. The objective is to identify shared	• Introduce the circular economy in existing stakeholder engagement initiatives on waste management (e.g. quarterly meetings organised by the Zero Waste Agency) to identify leading actors already working on the circular economy and those with the potential to do so. • Involve active actors committed to foster sustainability and move to a circular economy in ongoing initiatives such as industrial districts (*Berliner Zukunftsorte*) and startup incubators (Impact Hub, Berlin Partner) in a future circular

	priorities, uncover potential collaboration opportunities and facilitate knowledge exchange between stakeholders and projects. The agency has established two task forces to address waste reduction at events. The first, invites event organisers and environmental NGOs to participate in zero waste at events (e.g. Christopher Street Day), to share insights and best practices on reusable packaging at events and deliver a communication kit for event attendees on how to minimise their waste. The second, on coordination between Berlin's 12 districts, recognises that the districts have different needs and requires tailored actions to reduce waste. Regular Zero Waste stakeholder meetings are organised every quarter to discuss common topics, forthcoming events and activities, find synergies and cooperation opportunities, exchange needs and support options with each other, and share knowledge (Zero Waste Agentur, 2024[35]). The city of Berlin faces difficulties in engaging stakeholders in the transition to a circular economy. These challenges are attributed to an overall limited perception of the potential of the circular economy and the role of public and private stakeholders in the transition. With the exception of the built environment as a key supply chain for the circular economy in Berlin, where an initial group of companies have adopted circular economy principles and business models on their own, engaging with other stakeholders has resulted challenging.	economy strategy and in the next Berlin Innovation Strategy.
	Appropriate scale: In development Between 2020 and 2022, SenMVKU supported a project for the development and testing of recycled concrete, a secondary material made of rubble from demolished concrete structures, in collaboration with three construction companies. The project was divided into three phases. First, it developed the building material on a laboratory scale by producing recipes for recycled concrete with higher recycled material content and lower cement proportion. Second, it developed the technical requirements to scale up the production and use of recycled concrete in construction projects. In the third and final phase, 200 m3 of ready-mixed recycled concrete was used in the 2022 construction phase of the *Friedenauer Höhe* neighbourhood development in the Tempelhof-Schöneberg district (State of Berlin, 2023[42]). As part of Berlin's circular economy transition, the Urban Mining Hub is developed under the Re-Use Initiative by SenMVKU in partnership with two companies from the built environment and waste sectors. The Urban Mining Hub facilitates the efficient transfer of materials from dismantling for reuse in new buildings, emphasising planning, cost-effectiveness, and ecological impact assessment. The Urban Mining Hub works in collaboration with a digital market where reclaimed components, materials and furniture can be bought and building dismantling projects are offered to the market.	• Work with districts to identify areas of potential development, collaboration, and exchange in relation to the circular economy. This could be done through a series of workshops with representatives from the 12 districts of Berlin to identify businesses and citizen initiatives that could be part of urban symbiosis projects (i.e. where the waste of one business is a resource for another one) and create territorial networks for secondary material exchange.

	Berlin, where pilots and projects are restricted to micro and meso scales experiments in the built environment, does not yet have a functional circular economy that goes beyond the areas where the pilots are developed. This can be explained by the lack of circular economy related data (e.g. resource inputs and outputs, material productivity, domestic material consumption, share of circular businesses) and a thorough examination of potentialities for the circular economy at the district level.	

Table 3.3. Enabling a circular economy in Berlin, Germany

	Evaluation of governance dimensions through the OECD Scoreboard on the Governance of the Circular Economy	Ways forward based on the OECD Checklist for Action

	Regulation: In development
	
	As a city-state, Berlin has the authority to enact laws and regulations for its self-government. The 1999 Berlin Recycling Waste Management Law, enacted by the State of Berlin and its subsequent amendments up to 2022 provide a legal framework for waste management and recycling in the city.
	
	The Berlin Tendering and Procurement Act (BerlAVG) and the subsequent Administrative Regulation on Procurement and the Environment (VwVBU) of 2021 contain comprehensive measures for green procurement, including information on environmental requirements, design guidelines and a list of procurement restrictions, such as disposable beverage packaging, disposable cutlery and tableware, and cardboard packaging with less than 70% recycled content. In addition, the VwVBU incorporates a Life Cycle Cost Analysis (LCA) for electrical equipment, road vehicles, data centres and passenger and freight elevators. The LCA analysis takes into account energy consumption, carbon and other pollutant emissions. While the current regulation has the potential to further reduce waste generation, it is not necessarily conducive to more innovative circular business models in internal procurement processes; the current regulation does not include or favour circular business models in procurement.
	
	The implementation of circular economy regulations faces two main difficulties. First, the 1999 Berlin Recycling Waste Management Law (KrW/Abf) incorporates circular economy principles, with a focus on waste prevention before recycling and incineration or disposal. However, as the law has historically focused on safe waste management and disposal, it does not include obligations for re-use or other circular economy principles (e.g. reduce, re-think, and refuse). Similarly, the Berlin Tendering and Procurement Act includes principles for green public procurement with sustainability requirements and restrictions on the purchase of certain products (e.g. single-serve hot drink machines, disposable beverage packaging, disposable crockery and cutlery, and cardboard packaging with less than 70% recycled content). However, these conditions are limited criteria on waste
		• The SenMVKU and SenWEB can integrate circular economy criteria into the public procurement policies. They could:
		  ○ Explore the possibility of entering into agreements with suppliers to manage products and materials at the end of their life or contract period, ensuring that they are either reused or recovered in a responsible manner. These agreements could be facilitated through circular business models (i.e. circular supply, resource recovery, product life extension, sharing, product service system) and by working with circular service and product frontrunners to start with low-hanging fruits that could serve as inspiration for other suppliers and businesses to follow.
		  ○ Set requirements to promote the purchase of goods and services that include circular resources and collective purchasing to reduce resource consumption.
		  ○ Start with promising circular initiatives and assess which circular start-ups and scale-ups can be linked with circular procurement.

	management and sustainability and do not necessarily facilitate the implementation of circular economy models in tendering. Second, there is a limited level of implementation of the Commercial Waste Ordinance, which requires commercial producers, public institutions, and companies to separate waste fractions (e.g. paper, glass, plastics, metals, wood, textiles, biowaste, insulation materials, bitumen mixes, gypsum-based materials, concrete, bricks, and tiles). The problem of implementation is linked to a lack of enforcement caused by limited staff in the city administration. Finally, companies trying to implement circular business models based on replacing traditional material inputs with recovered ones, face challenges regarding the end-of-waste status. Regulation hinders the transformation of resources that have reached waste status into a secondary resource that could be reintroduced into the economy.	• Regarding the built environment, consider obligations to demolish in a circular manner to bring back into the cycle the products, materials and resources with the highest value as possible. This could be achieved by: requiring lifetime extension of a building or infrastructure; if not possible, separating as many concrete and steel elements as possible; and recycling with the highest value the remaining resource streams. These requirements could only work if supported by the Senate Department of Urban Development, Building and Housing (SenSBW) (frontrunners) as this department holds power over the management of Berlin's built environment policy. • Update the KrW/Abf to systemically incorporate circular economy strategies with impact in resource consumption, such as re-use, reduce, re-think, and refuse in the future updates of the Berlin Recycling Waste Management Law (KrW/Abf).

	Financing: In development
	
	The budget allocated to the circular economy in Berlin increased between 2021-2023, from EUR 3.7 M to EUR 6.2 M, excluding staff costs. This allocation was primarily funded by the Berlin Innovation Promotion Fund (*Innovationsförderfonds – IFF*), which was established in 2020 to co-finance federal programmes and state-level innovation projects. Between 2020 and 2023, Berlin allocated a total of EUR 750 M through the IFF, including EUR 2.5 M to establish the KEK and the Zero Waste Agency. In 2021, the SenMVKU allocated EUR 2 M to a three-year project through the IFF to explore the potential for reducing CO_2 emissions in the construction, use and end-of-life phases of buildings by using circular biomaterials such as wood and clay. Supported by a Life Cycle Assessment, the project aimed to reduce CO_2 emissions by 50% compared to conventional construction methods. Three new buildings of the city are part of the project. Furthermore, Berlin implemented a Repair Bonus (*Reparatur Bonus*) in September 2024 as an economic incentive to encourage the repair of household electric appliances in professional
		• Develop a long-term financial plan to ensure consistency and sustainability of circular economy projects in line with a long-term strategic vision:
		  ○ Include priority investments needed to support the long-term strategic vision (e.g. capacity, infrastructure, and projects).
		  ○ Identify areas where private investment may be required or desirable through Public-Private Partnerships.
		  ○ Set clear criteria and conduct regular evaluation and monitoring of circular economy projects that receive public funding to ensure the desired resource-saving effect.

	repair shops. The Repair Bonus will cover 50% of the total cost of repairs above EUR 75, with a maximum subsidy of EUR 200. The circular economy budget is expected to decrease in the city of Berlin once the IFF is terminated by the end of 2025. Without the IFF fund, Berlin will likely face challenges to allocate additional economic resources to the circular economy in the medium term, putting the continuation of the KEK and the Zero Waste Agency beyond 2025 at risk.	

	Capacity building: In place, not implemented
	
	KEK provides companies with tailored guidance on how to enhance energy efficiency and promote circular economy and climate protection. Furthermore, KEK conducts workshops tailored to individual companies, covering topics such as communications, greenhouse gas accounting, and the principles of the circular economy. These services are complemented by networking opportunities and knowledge-sharing events, where similar SMEs can participate in information sessions, roundtable discussions, and networks focused on energy efficiency and climate protection (State of Berlin, 2024[43]). The city of Berlin also counts with an Innovation Manager who, as part of Berlin Partner's innovation service, helps facilitating joint research and development projects between research centres and businesses in Berlin.
	
	The limited capacity within the city of Berlin's administration is a key obstacle to progress in the transition to a circular economy. SenMVKU has a limited number of employees dedicated to waste management, which led to perceive the circular economy as an additional task to carry out rather than as an opportunity to move the narrative from waste to resource and allow an economic system. This shortage of personnel has created difficulties in the areas of intergovernmental coordination, law enforcement, and stakeholder engagement.
		• Develop a training programme for the circular economy within the city of Berlin tailored to administrative staff needs in collaboration with actors already involved in the circular economy transition (e.g. Technical University of Berlin, Berlin Partner, Impact Hub):
		  ○ Identify the needs for a circular economy training for the administrative staff of the Berlin senate administration.
		  ○ Make the programme available to staff from all Senate Departments of Berlin, starting with the personnel of the SenMVKU.
		  ○ Provide theoretical and practical knowledge on: i) circular economy strategies (i.e. refuse, reduce, redesign, reuse, repair, refurbish, remanufacture, re-purpose, recycle, recover:); ii) circular business models (i.e. circular supply, resource recovery, product life extension, sharing, product service system); iii) data for the circular economy; and iv) analytical tools (e.g. Life Cycle Assessment, Material Flow Analysis, Urban Metabolism).

	Innovation: In place, partly implemented	• Support the creation of circular innovation ecosystems. The city of Berlin could prioritise areas (e.g. construction, food, and manufacturing) for

	As part of Berlin's offer to innovative businesses, SenWEB sponsors the Impact Hub Berlin, an impact community, co-workspace, and start-up incubator aimed at empowering entrepreneurs and their partners to create businesses, products and services. It addresses the circular economy in areas such as circular construction and design (i.e. building materials and interior fitting), and sustainable operations (i.e. facility management focused on waste minimisation and efficient energy use). Berlin Partner, Berlin's office for Business and Technology (*Berlin Partner für Wirtschaft und Technologie*) fosters economic growth, supports businesses, technology, and innovation, and promotes the capital's advantages to companies, investors, and talent. It assists established entities in the region with expansion plans, facilitates networking, provides information on funding opportunities, and offers advice on locating suitable sites and recruiting highly skilled personnel. Success is gauged by indicators such as job creation, job security, investment volume, and external funding raised. In 2023, the SenWEB commissioned the study "Requirements and potential analysis of the circular economy in Berlin's industrial sector". The research, aligning with legal frameworks like the European Green Deal and the German Circular Economy and Waste Act, outlined legal requirements for sectors to comply with, including recycling quotas, bans on hazardous substances, energy efficiency standards, and use of secondary materials. It also anticipated future mandates like mandatory use of recycled materials and digital product passports. A SWOT analysis highlighted strengths such as innovation and expertise, weaknesses such as low SMEs awareness, opportunities including economic potential and digital progress, and threats such as regulatory uncertainty. Recommendations include enhancing visibility, capacity building, cooperation, and providing incentives for businesses (SenWEB, 2023[36]). Although innovation ecosystems are active and well-established, there are not many calls for projects on the circular economy in Berlin. Efforts to support market formation by matching the production of circular goods and services and potential buyers or users are not in place, except for the construction sector where recycled concrete innovation has been supported and used in urban redevelopment projects.	innovation to focus and make efficient use of its limited human and economic resources. A partnership between SenWEB, SenMVKU, Impact Hub and Berlin Partner could contribute to a more efficient use of resources by providing: i) open access to city data (e.g. material flows, recycled waste fractions and available secondary resources in Berlin) to allow entrepreneurs to create solutions tailored to city needs; ii) physical infrastructure; iii) venture capital support; iv) and a network of willing parties and frontrunners. • Initiate a dialogue with companies, innovation hubs that support the adoption of circular business models (e.g. Berlin Partner, Impact Hub) and business associations (e.g. Federation of German Industries, BDI) to identify which resource flows should be prioritised for intervention and how to facilitate the achievement of the end-of-waste status.
	Data and assessment: Planned In accordance with the Waste management concept of Berlin, SenMVKU is required to submit waste impact balances on a bi-annual basis. These provide transparency on the mass flows of more than 35 waste streams. However, these reports focus on the environmental impact of waste and waste treatment, neglecting to provide insight into the resource inputs into the city, which hinders the adoption of more systemic circular approaches to resource conservation and waste prevention. Given the generalised lack of circular economy standards and indicators and the difficulties to gather data for the circular economy, SenMVKU published a feasibility study on	• Create a one-stop shop for data on the circular economy. The city of Berlin could centralise all relevant circular economy data in an integrated online repository. This repository would help improve data sharing within the city government, identify areas for intervention, and support budget acquisition in the long term. Relevant data would include:

	resource conservation in the city of Berlin in 2022. The study aimed to identify areas for coordinated strategy development by analysing key sectors that drive resource demand and existing initiatives. At the federal level, the German Resource Efficiency Programme (ProgRess) is designed to enhance the sustainability of natural resources and the competitiveness of the German economy. The findings of ProgRess were integrated into a feasibility study, which presented recommendations for the creation of a holistic strategy for resource conservation. This included the built environment, urban development, services and trade, and the public sector. Furthermore, the report projected Direct Material Input (DMI) and Domestic Material Consumption (DMC) for the city of Berlin from 2017 to 2030. Despite efforts to collect data, Berlin struggles to make the best use of available data for policy making, which is generally available but scattered across datasets produced by different Senate departments and individual companies. Due to the difficulties in retrieving data, Berlin relies on proxy data to analyse information on urban metabolism and material flows. Other challenges relate to limited data availability on commercial waste as companies are responsible for managing their waste independently through a waste management company. Additionally, there are no indicators on the social impacts of the circular economy (e.g. job creation related to circular economy activities).	○ Resource management: material consumption and productivity (i.e. Domestic Material Consumption, Raw Material Consumption), circular material use rate, intermediate consumption of secondary materials in production processes, renewable content of material inputs into production processes. ○ Governance: Circular Public Procurement (proportion in total public procurement), investments in infrastructure supporting circular business models (e.g. repair centres). ○ Environmental impact: Carbon footprint of priority materials or products in selected sectors. ○ Economic and social trends: value added and job creation in sectors related to the circular economy (e.g. repair, reuse, renting). • To design the one-stop shop, Berlin could: ○ Map the available data and identify the institution responsible for data collection and dissemination. ○ Communicate the benefits of sharing the data. ○ Consider collaboration with data providers.

4 Accelerating the circular economy transition in Berlin

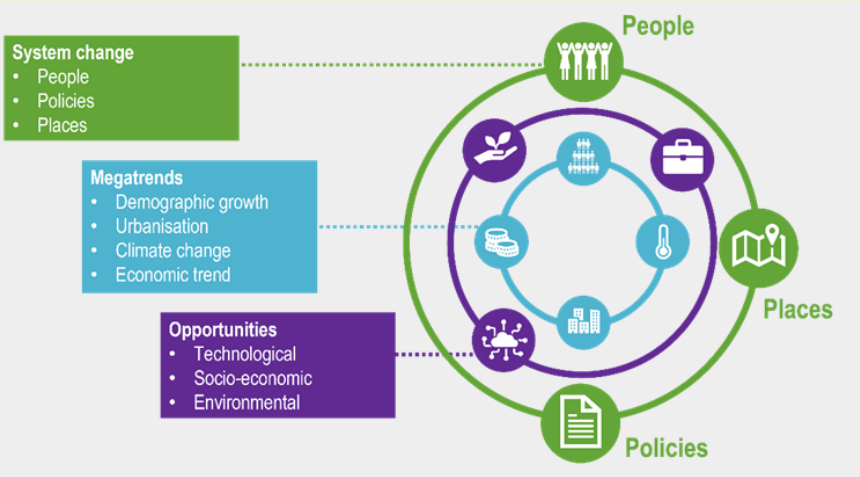
Based on the 3Ps analytical framework, People and firms, Policies, and Places key governance recommendations are highlighted for Berlin.

- *People and firms:* Being the city a national and international centre for innovation, driven by its 2020 digitalisation strategy (*Gemeinsam Digital*) and given its young, educated population, Berlin is well positioned to **boost circular innovation by leveraging on talents**. Berlin could set up innovative business models (e.g. product as a service, sharing models, reuse and repurpose, etc.) for example by: fostering collaborations with startup incubators (e.g. Impact Hub, Berlin Partner); mainstreaming the circular economy into the implementation of innovation programmes, such as the Startup Agenda 2022-2026; making the Senate Department for Urban Mobility, Transport, Climate Action, and the Environment (SenMVKU) and the Senate Department for Economic Affairs, Energy and Public Enterprises (SenWEB) collaborate to mobilise talents for circular economy related initiatives in sustainable production, consumption and services. The city could support SMEs by establishing policy tools to stimulate circular economy innovation (e.g. economic incentives such as subsidies, tax breaks, grants, simplified regulations, standards, and guidelines) and set clear circular procurement criteria (e.g. eco-design, minimum recycled content in products, adoption of circular business models and dedicated procurement programmes for SMEs). While the city of Berlin is already using digital tools for the circular economy, such as the digital marketplace that is part of the Urban Mining Hub under the city's Re-Use initiative, they could be applied to other sectors beyond construction, such as textiles, food, transport, consumer goods and services.
- *Policies:* The circular economy could contribute to **achieving Berlin's priority policy objectives** and agendas, such as the Berlin Energy and Climate Programme 2030, aiming to reach carbon neutrality by 2045. This could be done by: identifying strategic value chains (e.g. concrete, wood, steel, bio-resources, food) that have environmental impacts, from extraction to end of life; mapping game changer actors and working with facilitators (e.g. transition brokers) to help align interests and goals on resource use across supply chains, from producers, to retailers and consumers. The city could establish a circular economy roundtable to facilitate a formal and regular discussion between public and private sector stakeholders on matters related to the circular economy, including sector-specific challenges as well as data access and availability to monitor resource use and waste reduction targets (e.g. tonnes of waste avoided through re-use and repair), but also eco-design in products and services (e.g. design for disassembly, modularity, repairability). Finally, the city could appoint circular ambassadors providing positive and concrete examples of successful circular initiatives (i.e. "walk the talk").
- *Places:* Berlin's robust service-based economy is in an advantageous position to ensure accessibility and proximity to citizens. Circular services, including repair centres, sharing transport, renting, can promote resource sustainability by extending product lifecycles, reducing waste, and

enabling resource reuse and regeneration. **A city of circular services**, which presents a significant opportunity for the dematerialisation of the economy, could be boosted by creating experimentation areas (e.g. circular districts) that would allow for the implementation and enforcement of local regulations, including for land use and the ban of single use plastics and food packaging, while leveraging on different existing initiatives (e.g. reuse centres, repair bonus, pop-up or temporary stores, library through which sharing or lending items, packaging initiatives in restaurants and sport facilities). The city could also explore ways to make the circular economy attractive to investors and ensure its long-term economic sustainability, leveraging Berlin Partner in their role as business development supporter. The city should then regularly communicate about the impacts of such initiatives, for example in terms of energy savings, climate impacts, or cost savings due to circular initiatives.

Box 4.1. The OECD 3Ps framework: People and firms, Policies and Places

Figure 4.1. The OECD 3Ps framework: People and firms, Policies and Places



People are at the centre of a cultural shift towards new business and governance models within a circular economy. The circular economy is a shared responsibility across levels of government and stakeholders. The business sector can determine the shift towards new business models (e.g. using secondary material, recycling, sharing, etc.). Knowledge institutions contribute to boosting innovation and research. Not-for- profit organisations are at the core of bottom-up initiatives in a wide range of sectors, such as food and the built environment, to raise awareness and build capacities. The role of these stakeholder groups is described below.

The circular economy requires a holistic and systemic approach that cuts across sectoral policies. As somebody's waste can be someone else's resource, the circular economy provides the opportunity to foster complementarities across policies, such as environmental, regional development, agricultural and industrial ones.

Adopting a functional approach going beyond the administrative boundaries of cities and regions is important for resource management and economic development. Cities and regions are not isolated ecosystems but spaces for inflows and outflows of materials, resources and products, in connection with surrounding areas and beyond. Therefore, linkages across urban and rural areas (e.g. related to agriculture and forestry) are key to promote local production and recycling of organic residuals to be used in proximity of where they are produced and avoid negative externalities due to transport. At the

regional level, loops related to a series of economic activities (e.g. to the bioeconomy) can be closed and slowed.

It is important to note that actions proposed and based on the 3Ps approach are neither compulsory nor binding. They represent suggestions, for which adequacy and feasibility should be carefully evaluated by Berlin, involving stakeholders as appropriate. In turn, the combination of more than one action can be explored, if necessary. Moreover, 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, according to the needs and the capacity. When prioritising and assessing the adequacy and feasibility of the suggested actions, the resources needed to put them into practice should be carefully evaluated, as well as the role of stakeholders that can contribute to the implementation phase. Finally, the proposed actions should be updated in the future as new potential steps and objectives may emerge as actions start to be implemented. The implementation will not be possible without the involvement of several stakeholders and levels of government.

Source: OECD (2020[2]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-e

People and firms

Leverage on talents to boost circular innovation

Being the city a national and international centre for innovation, driven by its 2020 digitalisation strategy (*Gemeinsam Digital*) and given its young, educated population, Berlin is well positioned to boost circular innovation by leveraging on talents. Berlin has the potential to drive support innovation through skills development and behavioural change by: collaborating with Berlin Partner, Impact Hub, KEK and universities; using on line and off line channels to increase awareness; and enhancing the use of tools such as digital marketplace, digital twins, and artificial intelligence:

- **Support innovation** on the circular economy by: working with Berlin Partner, Impact Hub and KEK; integrating the circular economy into the implementation of innovation programmes, such as the Startup Agenda 2022-2026 launched in 2022; facilitating collaborative work between SenMVKU and SenWEB; having the SenWEB to inform SMEs about upcoming circular economy regulatory frameworks from the EU, federal and state level. The city could also support SMEs by establishing policy tools to stimulate circular economy innovation (e.g. economic incentives such as subsidies tax breaks, grants, simplified regulations, standards, and guidelines) and promoting Public-Private Partnerships to bring private parties onboard, by sharing resources (e.g. economic resources, infrastructure, equipment) and risks. The city could support market development by setting clear circular procurement criteria (e.g. eco-design, minimum recycled content in products, adoption of circular business models and dedicated procurement programmes for SMEs) and promoting common standards for circular products and services tailored for SMEs to ensure the quality of circular product and service and facilitate their market acceptance (e.g. certification programmes, support for legal compliance).
- **Collaborate with universities to build skills** for the circular economy. By working with universities, Berlin can ensure a steady supply of qualified professionals and attract young talent to career paths in the circular economy. Berlin could foresee two types of training opportunities: one focused on the private sector (e.g. SMEs, start-ups) and another one on public administration (e.g. district authorities and state government). Training for the private sector could include principles of eco-design and circular economy strategies (e.g. refurbish, repair, re-use, re-think and reduce), material passports and traceability, environmental impact assessment, data management and reporting practices (OECD, 2019[44]). Capacity building for the public sector could be based on policy and regulatory frameworks for the circular economy, system thinking, eco-design principles, whole life cycle costing and assessment, circular public procurement, and the evaluation of life cycle cost analysis. This training could be supported by the city in collaboration with universities, such as *Technische Universität Berlin*, *Humboldt-Universität zu Berlin* and *Freie Universität Berlin*, which have already integrated circular economy in their curricula and structures.
- **Engage the community.** Community engagement can enhance the awareness in relation to the circular economy and help the city of Berlin identify, co-create and implement circular economy initiatives that are tailored to the needs and specific characteristics of its citizens. Berlin could enable the community to share ideas and make proposals for implementing circular economy practices. These suggestions could inform local start-ups and SMEs about potential services and products. Berlin could also set up an online platform for the community to centralise information, share insights and priority actions to shape circular economy policy. These digital tools could also provide the city of Berlin with a low-cost and permanent way to collect relevant

(place-based) data for the circular economy through online surveys.

- ➔ Support the development and use of **digital tools for the circular economy.** The city of Berlin is already using digital tools for the circular economy, such as the digital marketplace that is part of the Urban Mining Hub under the city's Re-Use initiative, Remap (a website that enables users to identify environmentally-friendly methods for passing or disposing of items no longer required) and Repami (a platform for quality repair services – craft businesses and repair cafés– in Berlin funded by SenMVKU and managed by Berlin Waste Management and the Berlin Chamber of Crafts). Building on existing efforts, Berlin could enhance, centralise and further disseminate the use of these tools by integrating blockchain-based material passports to improve the traceability of building materials and components, and by requiring digital twins in new buildings to estimate the availability of secondary resources in the future. While the introduction of digital tools is not exclusive to the construction sector and could be applied to other sectors such as textiles, food, transport, consumer goods and services, the city of Berlin could draw on existing circular economy projects in the built environment to explore the potential benefits and challenges of integrating digital tools as an enabler of circular systemic solutions.

International practices

- In 2021, the Basque Government and Bilbao City Council, Spain, set up the Basque Circular Hub as a result of a public-private partnership. This circular economy services centre, managed by the Public Society of Environmental Management of the Basque Country (IHOBE), aims to **support innovation** in 500 companies and train 1 200 professionals by 2024. Since 2021, the hub supports the city of Bilbao in the development of a circular economy roadmap and in the search for innovative circular solutions (Basque Government, 2024[45]).
- Since 2021, the Netherlands offers subsidies for circular economy breakthrough projects that provide a total budget of EUR 400 000 for orchestrated efforts of 3-5 years. This subsidy requires an existing consortium of chain partners, a signed ambition document and an action plan to achieve a circular value chain. The subsidy is meant to implement the consortium's action plan. The subsidy is aligned to the priority value chain included in the 2016 Dutch strategy *A Circular Economy in the Netherlands by 2050* (i.e. plastics, consumption goods, construction, and manufacturing). Since 2021 the subsidy has been granted for projects in the construction, manufacturing, and textile industries (Ministry of Infrastructure and Water Management, 2021[46]).
- In the city of Liège, Belgium, the launch in 2017 of the Réinventons Liège **community engagement** process supported by the CitizenLab platform provided local policy makers with valuable insights from citizens to identify 77 priority actions in the city and shape the waste management policy (City of Liege, 2017[47]). In Nesodden, Norway, nearly 300 families responded in 2016 to a survey on product needs, which served as the basis for the creation of the Tingenes Bibliotek in 2018, the first Nordic Smart Library of Things to provide shared tools to the community (Circular Regions, 2020[48]).
- The Advanced Metropolitan Solutions (AMS) Institute, a collaboration between the city of Amsterdam and Delft University of Technology and Wageningen University and Research, has provided open online courses (MOOCs) to **develop skills** related to the circular economy and other urban challenges in Amsterdam. These MOOCs can be followed online for free. In 2023, AMS launched the MOOC 'Sustainable building with wood', which is based on the principles of circular construction and supports the city's goal of a circular built environment (AMS Institute, 2023[49]).
- The New South Wales government (Australia) has been developing its Spatial **Digital Twin** since 2018 aimed at providing opportunities to better support decision making in relation to natural resource and environmental management, amongst other infrastructure, community, and project related objectives. Spatial Digital Twin gathers and shares 4D data (3D plus time) of the New South Wales's built environment through an open platform for academia, industry, business, and governmental actors (NSW Spatial Digital Twin, 2024[50]).

Policies

Unpack the circular economy as a means to an end

The circular economy could contribute to achieving Berlin's priority policy objectives and agendas, such as the Berlin Energy and Climate Programme 2030, aiming to reach carbon neutrality by 2045. This could be done by: identifying strategic value chains (e.g. concrete, wood, steel, bio-resources, food, and events) for a system change and mapping game changer actors; working with frontrunners, monitoring progress and replicating successful practices; creating roundtables on the circular economy and circular ambassadors providing positive examples (i.e. "walk the talk").

- **Identify strategic value chains (e.g. concrete, wood, steel, bio-resources, food, and events) for a system change.** Berlin could first map and select a number of actors in value chains with the potential to yield successful results and facilitate city-wide exchange of resources. This could start through a conversation with circular economy pioneers already working with the city of Berlin (e.g. Concular) and further identification of companies through snowballing. The city could then conduct market consultation to uncover market opportunities and available goods and services, understand demand and needs, identify and mitigate risks, and promote cooperation both within and between sectors. The city of Berlin could promote living labs to agree on innovative projects for which local companies can provide solutions and work with transition brokers, as facilitators selected to help align interests and goals and reach agreements across supply chains.
- **Work with frontrunners and monitor progress.** Berlin could focus on the most promising and far-reaching innovators. As such, the city could identify circular frontrunners in industry to test and develop monitoring for the circular economy, including circular business models adoption (e.g. rate of new businesses adopting circular business models), resource use and waste reduction targets (e.g. tonnes of waste avoided through re-use and repair), eco-design principles in products and services (e.g. design for disassembly, modularity, repairability), and circular public procurement (e.g. rate of public bids and purchases that include circular principles or business models). Successful cases can be inspirational for new actors in the field and across value chains.
- **Establish a circular economy roundtable in Berlin.** This roundtable would facilitate a formal and regular discussion between public and private sector stakeholders on matters related to the circular economy, including coordination, implementation, sector-specific challenges, and data access and availability. Berlin could start by inviting representatives from active industries and local actors who are already convinced of the benefits of the circular economy. The roundtable could also contribute to produce a common agenda, illustrate the political commitment of the city of Berlin towards the circular economy transition, attract new actors and set a multi-stakeholder process to address the challenges and opportunities of the circular transition.
- **Appoint circular economy ambassadors** to showcase positive practices and behaviours across economic sectors, public authorities, civil society organisations and academic institutions. Berlin could designate circular economy ambassadors in different companies to share the benefits of the circular economy with specific information for each economic sector and to raise awareness in the workplace. Appointing ambassadors would require setting an introductory programme in areas of circular economy principles and strategies, circular business models, public funding opportunities and experiences from different value chains. Ambassadors promote circular economy communication and messaging as well as events across their networks and have the opportunity to show the feasibility of the implementation of circular economy actions in

practice. Ambassadors can also help to channel concerns, emerging barriers, and challenges to the city government, thereby improving Berlin's readiness for the transition (Circular Flanders, 2024[51]).

International practices

- Since 2020, the Province of Zuid-Holland in the Netherlands has recognised that **market research** goes beyond proving the viability of a new product in the circular economy; it has proven essential for fostering innovative clusters. The province has found that pioneers need seed capital to cover the costs of developing proof of concepts, support in establishing local production and value chains, access to test and pilot production facilities, experimental spaces to add value to residual flows, and personnel with the necessary knowledge and skills for a rapid start and ongoing development (Zuid-Holland Province, 2021[52]).
- Six Dutch regions (Utrecht, Gelderland, Nijmegen, Friesland, Brabant, and the Amsterdam Metropolitan Area) appointed **transition brokers** for the circular economy between 2015 and 2018. The role of these transition brokers as intermediaries between market, public, academic, and social actors was structured through 4 phases, namely: i) drafting and negotiating about a circular economy programme, ii) preparing and helping to build circular initiatives, iii) repeating and upscaling successful circular initiatives, and iv) mainstreaming circular economy (Cramer, 2020[53]).
- Circular Flanders, a public-private initiative led by the Flemish government in Belgium, has been **working with frontrunners** in the circular economy since 2018. This has enabled city actors to break inertia, build on ongoing initiatives in the region, and test and develop circular practices. In addition, the decision to work with local frontrunners has enabled the sharing of lessons learned, broader knowledge sharing from 'early adopters' and the creation of targeted communication and awareness campaigns for SMEs and start-ups (Circular Flanders, 2023[54]).
- In the autumn of 2020, the City of Gothenburg in Sweden conducted the feasibility study "Cooperation for a Circular Gothenburg 2030" in collaboration with businesses, civil society, authorities, and academia. The study aimed to assess the needs, interests and conditions for a collaborative development and **sustained dialogue with local actors** towards a circular Gothenburg by 2030 (City of Gothenburg, 2024[55]).
- Since 2022, Circular Flanders (Belgium) has provided the **Circular Ambassador Programme**, a comprehensive 7-day training in three inspiring locations, providing participants with expert coaching in the circular economy. Participants work in multidisciplinary teams of young professionals, enhancing their skills and expanding their professional networks in the circular sector. Participants are also included in the Flanders CircularAid expert database. The programme allows participants to work on current cases in various fields, including bioeconomy, circular construction, chemicals and plastics, manufacturing industry, food chain and water cycles (Circular Flanders, 2024[51]).

Places

Create the city of circular services

Berlin's robust service-based economy is in an advantageous position to ensure accessibility and proximity to citizens. Circular services, including repair centres, sharing transport, renting, can promote resource sustainability by extending product lifecycles, reducing waste, and enabling resource reuse and regeneration. A city of circular services, which presents a significant opportunity for the dematerialisation of the economy, could be boosted by: creating experimentation areas (e.g. circular districts) that are attractive from an infrastructural and architectural point of view; scaling up experimental areas by establishing circular districts in which reuse, repair, sharing services are provided; ensuring long term investment to provide continuity and communicate on the positive economic, social and environmental impacts; establishing an ecosystem of district communities to ensure accessibility and proximity of services to all citizens; finding capital investors to sustain and scale up these circular services; and bringing information back to the consumers on the benefits of their actions.

- **Develop an experimentation area for the circular economy** (e.g. circular district). The area should be a modern and sustainable space designed by architects and designers through an open challenge fostering innovation, creativity and the incorporation of cutting-edge sustainability features. This area could allow for the implementation and enforcement of local regulations such as the ban of single use plastics and food packaging, while leveraging on different existing initiatives (e.g. reuse centres, repair bonus, pop-up stores, library broader function, packaging initiatives in restaurants and sport facilities). The circular district could be the place to implement accessible circular business models, such as product life extension, sharing, and product service systems, which are circular business models that require active consumer engagement. Berlin could create a recognisable brand for goods and services provided in the area that would ultimately create a sense of community for those companies and consumers actively involved in the experimentation.
- **Establish an ecosystem of district communities.** Following the development of the experimental area, the city of Berlin could consider replicating the city of circular service model in other districts to ensure accessibility and proximity to all citizens. The city of Berlin could appoint a small team to build a community of practice, with the aim of facilitating mutual learning and assessing potential city-level initiatives for scaling up. To achieve this, the team should select promising initiatives and identify potential business partners who may be interested in sponsoring and/or participating in the initiative (e.g. to start a business). In the medium-term (3-5 years), funding from business partners should be secured or cost-effectiveness achieved.
- **Find and select investors to continue and scaling up.** The city of Berlin could explore ways to make the circular economy attractive to investors and ensure its long-term economic sustainability. Business involvement is crucial to guarantee the viability of experiments beyond the scope of the budget of Berlin Senate. As such, the city of Berlin could identify potential investors and consult them on their willingness to finance specific circular economy projects. The city of Berlin could then support the formation of a consortium in which the selected investors discuss the necessary conditions to develop a viable business case and agree on an action plan, including timelines, roles, responsibilities, and an investment scheme, which could be facilitated by Berlin Partner in their role as business development supporter (Cramer, 2020[56]).
- **Inform citizens and business about the impacts and benefits of the experimentation areas.** Communication could be focused on the economic savings that can be achieved by selecting products that are more durable,

require less maintenance, can be repaired, or have a lower long-term cost despite possible higher prices of these products while they are introduced to the market. In addition, Berlin could inform on energy savings, climate impact or cost savings circular initiatives.

International practices

- Since 2022, France and Austria have implemented **repair incentives** for electrical, electronic, clothing and shoes. These repair incentives cover up to EUR 200. In Austria, the incentive is funded by the Austrian Recovery and Resilience Plan, with a duration of 4 years starting in 2022, while in France funding is provided by the fees collected through their Extended Producer Responsibility scheme and does not have an incentive end date (Right to Repair, 2024[57]).
- Sege Park, in the east of Malmö, Sweden, is a **modern and attractive experimental hub** for future climate-smart housing solutions. Since 2015, the City of Malmö has partnered up with developers to build around 1 000 homes with a focus on long-term sustainability, the sharing economy and urban agriculture. This development is expected to integrate homes, businesses, and public services in an attractive old park, promoting easy waste separation for reuse and recycling. Shared resources such as space, tools and toys will reduce individual ownership while increasing access. Energy efficient buildings with solar panels, renewable and recycled energy and rainwater harvesting systems aim enhance sustainability (Malmö, 2023[58]).
- Rcube, a non-for-profit federation supported by the city of Paris (France), launched the RECQ label in 2016 aimed to inform buyers about quality and safety of used goods, promote the reuse of products, professionalise and help **branding the reuse sector** by defining quality standards (Rcube, 2024[59]).
- Since 2020, Circular Communities Scotland, a non-for-profit funded by Zero Waste Scotland in the UK, supports a **community-based ecosystem** of over 250 repair, reuse and recycling charities and social enterprises in Scotland to facilitate their growth, visibility, coordination, create local jobs and economic opportunities in Scottish communities (Circular Communities Scotland, 2024[60]).

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Notes

[1] The Berlin economy saw a slight decline in new business creation compared to pre-pandemic figures, with 37 125 new businesses established in 2022, down from 38 210 in 2019 (-3%). This included 9 596 start-ups (State of Berlin, 2023[10]).

[2]Measured as the proportion of people with an equivalised income of less than 60 percent of the federal median of the equivalised income of the population in private households.

[3] Domestic material consumption (DMC) denotes the quantity of materials used within an economy, encompassing materials extracted or harvested domestically, in addition to materials and products imported, and deducting those exported.

[4] Berlin Waste Management is the public company in charge of cleaning, waste collection, and reporting waste balances annually in the city of Berlin.

[5] Municipal waste in Berlin includes household waste, commercial waste, organic waste, bulky waste, wastewater sludge from treatment plants, commercial waste similar to household waste and street cleaning waste (State of Berlin, 2021[32]).

[6] Household waste in Berlin refers to waste collected from households and street level retail.

[7] The Waste Management Concept is planning document that the city of Berlin shall draft as required in the Berlin Recycling Waste Management Law. It serves as a comprehensive tool for waste management in Berlin for a 10-years period, detailing: 1) current and projected waste generation, including type, quantity, origin, and disposal methods over the next decade; 2) Berlin's objectives for waste reduction and use; 3) strategies for waste prevention, recovery, and capacity development; 4) approaches to ensuring high-quality waste recovery tailored to waste type and characteristics. The Waste Management Concept can be supplemented with sub-plans when changes or new provisions are required in the current Waste Management Concept. These sub-plans are based on annual waste balances prepared by Berlin Waste Management.

[8] Waste hierarchy included in the Directive 2008/98/EC is depicted as an inversed pyramid that goes from top to bottom from prevention to preparing for re-use, recycling, recovery, and disposal. Preventing waste is the preferred option; landfilling should be a last resort.

[9] Waste Zero means a primary goal of waste avoidance, re-using and high-quality waste recycling, in line with the EU waste hierarchy (State of Berlin, 2021[32]).

[10] Funded partnership established in 2022 between the Senate Departments for Mobility, Transport, Climate Protection, and the Environment (SenMVKU) and for Economy, Energy, and Public Enterprises (SenWEB).

[11] It is part of the House of Statistics model project, initiated by Koop5 in 2018, comprising five partners: the Senate Department for Urban Development, Building and Housing (SenStadt), the Mitte Berlin District Office (BA Mitte), the Housing Association Berlin Mitte (*Wohnungsbaugesellschaft Berlin Mitte mbH*), the Berlin Real Estate Company (*Berliner Immobiliengesellschaft GmbH*) and the Cooperative for Urban Development Berlin (*ZUsammenKUNFT Genossenschaft für Stadtentwicklung Berlin eG*). Funding from the German Federal Environmental Foundation supports the involvement of the Cooperative for Urban Development Berlin, Material Mafia, Technical University of Berlin, and Circular City (*Zirkuläre Stadt eV*) in the project.

Annex A. List of stakeholders consulted during the policy dialogue

Table A A.1. List of stakeholders consulted during the policy dialogue

Institution	Name
Arup	Martin Pauli
Association of German Cities	Tim Bagner
Association of German Engineers - Centre for resource efficiency	Hirschnitz Garbers
BDI Circular Economy Initiative	Claas Oelmann
BDI Circular Economy Initiative	Annika Stuckenhoff
Berlin Chamber of Architects	Margit Sichrovsky
Berlin Partner	Hannes Lebert
Berlin Partner	Diana Woelki
Berlin Partner Smart City	Beate Albert
Berlin Water Works	Dirk Thonke
BIM Berlin Real Estate Management GmbH	Helge Nast
Circular Berlin	Dina Padalkina
Concular	Dominik Campanella
Coordinating body for energy efficiency and climate protection in Enterprises	Robin Bruck
Dialogue Platform for recyclable commodities	Dr.Paul Mählitz
District office Charlottenburg-Wilmersdorf	Wilhelm-Friedrich Graf zu Lynar
District office Neukölnn, environment and nature conservation department	Anna Dreischarf
District office Spandau	Philipp Freisleben
Friends of the Earth Germany	Tobias Quast-Malur
German Advisor Council on the Environment	Baron Mechthild
German Society for waste management	Dr. Alexander Gosten
Howoge	Ann-Ulrike Henning
Howoge	Viviane Bode
Impact Hub	Leon Reiner
Messe Berlin	Esra Aoukal
Oeko-Institut e.V. Insitute for applied ecology	Sarah Otto
Ramboll Consulting	Marco Baldauf
SCC EVENTS	Michael Fuchs
SCC EVENTS	Jürgen Lock
Senate Department for Economic Affairs, Energy and Public Enterprises	Gesine Wittrich
Senate Department for Economic Affairs, Energy and Public Enterprises	Nina Lakeberg
Senate Department for Education, Youth and Family	Beate Conrad

Senate Department for Justice and Consumer Protection	Martin Kröger
Senate Department for the Environment	Sophie Drünert
Senate Department for Urban Development, Building and Housing	Maria-Theresia Erat
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Britta Behrendt
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Dr. Benjamin Bongardt
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Schultz Hüskes
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Ulf Berger
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Tina Jürgens
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Axel Strohbusch
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Benjamin Bongardt
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Laura Geßner
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Lisa Herrmann
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Judith Scheer
Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Amrei Münster
Technical University Berlin	Prof. Dr. Susanne Rotter
Technical University Berlin	Roswag Klinge
Vattenfall	Kai Nelder
Visit Berlin	Luisa Mentz
World Wide Fund for Nature (WWF) - Circular Economy Initiative Deutschland (CEID)	Silke Küstner
Zero-Waste-Agency	Meike Al-Habash

OECD Programme on the Circular Economy in Cities and Regions

The OECD Programme on the Circular Economy in Cities and Regions supports local and regional governments in designing and implementing policies allowing the transition from a linear to a circular economy in a shared responsibility with national governments, with a strong focus on the governance framework conditions required for the transition. The OECD Roundtable on the Circular Economy in Cities and Regions, a multi-stakeholder network gathering 100+ cities, regions and institutions facilitates knowledge exchange.

European Commission's Circular Cities and Regions Initiative (CCRI)

Launched and funded by the EU as part of the Circular Economy Action Plan, the Circular Cities and Regions Initiative (CCRI) focuses on implementing the circular economy across Europe's cities and regions. The CCRI aims to increase synergies among projects and initiatives, disseminate relevant knowledge, and give greater visibility to best practices. Combining this knowledge sharing with technical and financial support, it offers comprehensive support to stakeholders across Europe's cities and regions.

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