

4 The circular economy as a driver for climate neutrality

Chapter 4 first argues that moving towards a circular economy can effectively contribute to achieving climate neutrality in the business sector and shows the role of the business sector in the transition. The chapter then analyses current and planned circular economy initiatives led by the Department of Environment, Climate, Energy and Agriculture of the City of Hamburg (BUKEA). It provides an international literature review on the role of the business sector in promoting the circular economy, highlighting the main barriers to implementation. The chapter concludes by illustrating how the City of Hamburg and the Hamburg Chamber of Commerce can promote the circular economy through new business models.

The transition towards a circular economy as a means to achieve climate neutrality

A circular economy (Box 4.1) can help reduce greenhouse gas emissions (GHG) and contribute to climate neutrality. Material management represents up to two thirds of global greenhouse gas emissions (GHG). It is estimated that in the absence of new policies, GHG emissions related to materials management would rise by 66.6% between 2017 and 2060, from 30 Gt CO₂-equivalents to about 50 Gt CO₂-eq. The transition towards a circular economy could reduce global GHG emissions by 39% by 2032 compared to 2019 levels (OECD, 2019^[1]). In cities, the adoption of a circular economy framework in five key areas - namely steel, plastics, aluminium, cement, and food – could achieve a reduction of a total of 9.3 Gt CO₂-eq of GHG by 2050 (Ellen MacArthur Foundation, 2021^[2]). It could also do so by substantially lowering energy inputs, a key concern for the transition to climate neutrality. In addition, products designed and manufactured according to circular principles tend to have a smaller environmental footprint than their conventional counterparts.

Box 4.1. Defining the circular economy

More than 100 definitions exist worldwide to characterise a circular economy (Blomsma and Brennan, 2017^[3]; CIRAIG, 2015^[4]; Homrich et al., 2018^[5]). The OECD Expert Group on a new generation of information for resource-efficient and circular economy (RECE-XG) and the UNECE Task Force on measuring the circular economy (UNECE-TF) define a circular economy as one where: i) the value of materials in the economy is maximised and maintained for as long as possible; ii) the input of materials and their consumption is minimised; and iii) the generation of waste is prevented and negative environmental impacts reduced throughout the life-cycle of materials (OECD, 2022^[6]). Therefore, moving towards a circular economy goes beyond waste management and recycling; it implies changes in production and consumption models, eco-design and integrated planning. While recycling has an important role to play in the transition, recycling is not as effective as other “Rs” of the circular economy (i.e. Reduce, Reuse, Regenerate, Refurbish, Remanufacture, and Recover).

According to the European Commission, a circular economy is where the value of products, materials and resources is retained in the economy for as long as possible, including by returning them to the product cycle at the end of their use, thus minimising the generation of waste (European Commission, 2015^[7]).

The Ellen MacArthur Foundation describes a circular economy as an alternative to a traditional linear economy (make, use, dispose), being restorative and regenerative by design (EMF, 2013^[8]).

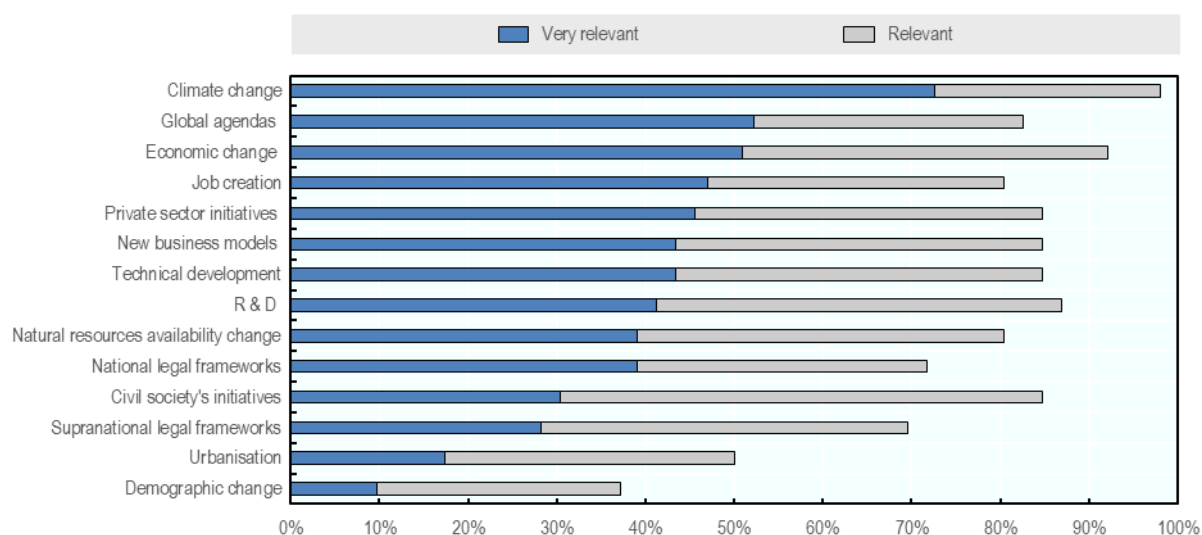
The International Organisation for Standardisation (ISO) defines the circular economy as an economic system that uses a systemic approach to maintain a circular flow of resources by regenerating, retaining or adding to their value, while contributing to sustainable development (ISO, 2021^[9]).

Source: OECD (forthcoming), 21IT01 - Advanced policy instruments to accelerate the circular economy in Italy.

Findings from the OECD (2020^[10]) show that climate change is a very relevant driver for the transition to a circular economy for 73% of the 51 cities and regions surveyed¹ (Figure 4.1). Several circular economy strategies at national and subnational level recognise the importance of the circular economy to achieve climate neutrality. For instance, the Spanish Circular Economy Strategy (*España Circular 2030*) sets the goal of achieving climate neutrality by 2050 (Government of Spain, 2020^[11]). In Scotland (United Kingdom, UK), *Making Things Last: A Circular Economy Strategy for Scotland* aims to tackle climate change and curb emissions arising from the consumption of goods, as it is estimated that a more circular economy

could reduce carbon emissions by 11 million tonnes per year by 2050 (Scottish Government, 2016^[12]). London (UK) is pursuing circularity to make a substantial contribution to the mayor's aspiration to achieve a zero-carbon city by 2050 (OECD, 2020^[10]). The city of Joensuu (Finland) is planning circular economy actions within its ongoing climate programme that aims for a carbon neutral city by 2025. For the city of Umeå (Sweden), the transition towards a circular economy represents a paradigm to stimulate businesses while achieving the environmental goal of carbon neutrality by 2040, while Glasgow (UK) aims to become the first circular city in Scotland through innovative solutions to achieve carbon neutrality by 2030 (OECD, 2020^[13]) (OECD, 2021^[14]).

Figure 4.1. Drivers of the circular economy in surveyed cities and regions



Note: Results based on a sample of 51 responding city representatives.

Source: OECD (2020^[10]), *The Circular Economy in Cities and Regions: Synthesis Report*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/10ac6ae4-en>.

The circular economy is gaining momentum across several cities, focusing on specific sectors. For example, Rotterdam (Netherlands) focuses on reducing textile waste and increasing recycling by promoting the exchange of used clothing and opening a chemical recycling facility for the treatment of discarded textiles. Seattle (United States) is focusing on the deconstruction of buildings while conserving building materials. Stockholm (Sweden) is developing a digital system to make recycling more accessible to the public. Many German cities are advancing in the transition by incorporating circular economy principles into their waste management plans (e.g. Munich); linking emission reduction targets to the transition to a circular economy (e.g. Berlin, Freiburg, Munich); or implementing circular business models (Aachen, Frankfurt) (Box 4.2).

Box 4.2. German cities' actions to move towards a circular economy

Several German cities are taking steps towards a circular economy:

- In 2021, the city of **Aachen** committed to integrating circular economy principles into administrative processes, development strategies and urban planning, with the participation of citizens.

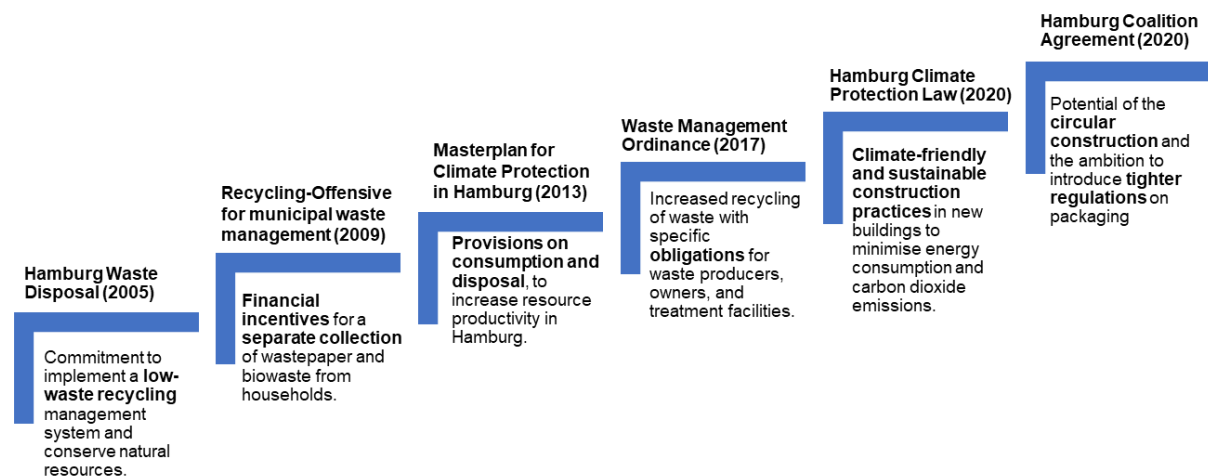
- In 2016, the city of **Freiburg** joined the EU-Interreg Alpine Space Project Greencycle to reduce CO₂ emissions and develop a holistic circular economy system. As part of the project, Freiburg has identified 12 key principles for the transition to a circular economy, including the integration of circular 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**'s 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.
- In 2021, the city of **Berlin** adopted the Waste Management Plan (2020-2030), which serves as a planning tool focused on strengthening a circular economy that prioritises waste prevention, reuse and recycling. Between 2020 and 2022, the implementation of the strategy contributed to cutting over 900 000 tonnes of CO₂ emissions and saving approximately 2.2 million tonnes of primary raw materials per year.

Source: OECD (2020^[10]), *The Circular Economy in Cities and Regions: Synthesis Report*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/10ac6ae4-en>; Circular Cities Declaration (2023^[15]), Circular Cities Declaration: Current Signatories, Senate Department for Mobility, Transport, Climate Protection and Environment, (2023^[16]), Zero Waste Strategy of the State of Berlin.

Overview of the main ongoing and planned initiatives on the circular economy in Hamburg

In December 2021, the Hamburg Chamber of Commerce (HCC) adopted a resolution committing to building a climate neutral business community in the city by 2040, while the city aims to become carbon-neutral by 2045 as outlined in the 2020 Hamburg Climate Protection Act (*HmbKliSchG*) (City of Hamburg, 2020^[17]). The Ecology and Economy Unit within the Ministry of Environment, Climate, Energy and Agriculture (BUKEA) of the city of Hamburg is in charge of exploring opportunities for transitioning from a linear to a circular economy in collaboration with the Waste Policy Unit, based on a legal framework that promotes sustainable waste management and climate policies (Figure 4.2).

Figure 4.2. Timeline of the legal framework for sustainable waste management and climate policies in Hamburg, Germany



Source: City of Hamburg (2005^[18]), Hamburg Waste Disposal Act ; City of Hamburg (2009^[19]) Recycling-Offensive für den Klimaschutz; Federal Ministry of Justice (2012^[20]), Federal Waste Avoidance, Recovery, and Disposal Act; City of Hamburg (2011^[21]), Hamburg Recycling Ordinance; City of Hamburg (2013^[22]), Masterplan for Climate Protection in Hamburg; City of Hamburg (2017^[23]), Waste Management Ordinance ; City of Hamburg (2020^[24]) Hamburg Climate Protection Law; and City of Hamburg (2020^[25]), Hamburg Coalition Agreement .

In addition to the regulation listed in Figure 4.2, sectoral waste legislation in Germany and in Hamburg addresses collection, use and treatment of a range of waste streams, often to prevent specific environmental impacts from poor disposal. This legal framework includes the following: End-of-Life Vehicles Ordinance (BMUV, 2023^[26]); Waste Oil Ordinance (BMUV, 2002^[27]); Commercial Waste Ordinance (Hamburg City, 2017^[28]); Batteries Ordinance (BMUV, 2021^[29]); Waste Electrical Equipment Ordinance (BMUV, 2022^[30]); Waste Wood Ordinance (BMUV, 2023^[31]); Sewage Sludge Ordinance (BMUV, 2017^[32]); and the Substitute Building Materials Ordinance (BMUV, 2023^[33]).

National regulations, which comply with European Union legislation, are also encouraging the adoption of more sustainable materials use to reduce GHG emissions, as well as other environmental impacts, notably from plastics. For instance, the German Federal Government has adopted the Closed Substance Cycle Management Act (KrWG) and the Packaging Act (VerpackG) to implement the 2019 EU Directive on single-use plastics², which aims to avoid short-lived plastic packaging, and ban harmful and detachable plastic items. The Single-Use Plastics Prohibition Ordinance (*EWKVerbotsV*) and the Single-Use Plastics Labelling Ordinance (*EWKKennzV*) entered into force in 2021. The former bans the import of plastic products such as disposable cutlery, drinking straws, plates, stirrers, food containers and beverage cups made of expanded polystyrene (e.g. boxes with or without lids). The latter requires the labelling of certain environmentally harmful products, such as disposable plastic cups, cigarette filters, etc. From January 2023, an additional provision of the EU Directive was incorporated into national law, requiring final distributors of single-use packaging to also offer reusable alternatives (City of Hamburg, 2022^[34]).

In 2022, the BUKEA commissioned a study on the potential of the circular economy in Hamburg to the Wuppertal Institute and the Institute for Innovation, Climate Protection and Circular Economy (HiCCE). Preliminary findings of the study suggest the potential role that BUKEA could play, namely acting as a co-ordinating and contact point, a funding authority and a driver for awareness raising. The study also highlights: (i) a need for better co-ordination of all ongoing initiatives; (ii) insufficient dissemination of knowledge on the circular economy; (iii) limited awareness of key stakeholders; (iv) the need to support companies in specific areas, such as supply chain legislation, sustainability reporting and digital material passports³ (Box 4.3).

Box 4.3. Digital material passports: Tracking materials for better use

Digital material passports provide a comprehensive record of the materials used in the design and manufacture of a product. They aim to enhance transparency and traceability by providing clear information on the origin, composition, and environmental impact of materials via open-source digital platforms. For example, digital passports identify the materials used in buildings during construction and renovation. Among other benefits, they help avoid the costs associated with hazardous materials testing prior to demolition and reuse. They also help make informed decisions about resource management, reuse, recycling, and waste reduction. Some international examples of digital material passports include the following:

- The city of Mikkel (Finland) is applying circular material management methods to carry out the demolition of a healthcare centre and a hospital. Following a selective demolition process, the municipality will digitally track the recovered materials, which will eventually be put to new use on a building materials market.
- The city of Amsterdam (Netherlands) introduced material passports as one of the main action points of its circular economy agenda in 2016. One of the proposed actions was to encourage construction companies to use material passports by offering discounts on land acquisition.

Source: OECD (2023^[35]), *The Circular Economy in Tallinn, Estonia*, <https://www.oecd.org/publications/the-circular-economy-in-tallinn-estonia-06abc3de-en.htm>; OECD (2020^[36]), *The Circular Economy in Groningen, the Netherlands*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/e53348d4-en>; OECD (2020^[13]), *The Circular Economy in Umeå, Sweden*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/4ec5dbcd-en>.

This chapter highlights five main typologies of activities undertaken in Hamburg to move towards a circular economy:

1. **Business engagement:** in 2003, BUKEA set up the **Hamburg Eco-Partnership** (*Umweltpartnerschaft*), a network of 1 600 companies committed to taking voluntary environmental action. The partnership offers free advice to companies on environmental measures. It brings together partners such as the Hamburg Senate, the HCC, the Chamber of Crafts and Trades (*Handwerkskammer Hamburg*), the Hamburg Industrial Association (*Industrieverband Hamburg*) and the Hamburg Port Association (*Unternehmensverband Hafen Hamburg*). The 2023–2028 work programme prioritises the circular economy and is developing a working group on circular textiles (City of Hamburg, 2023^[35]). The **Circular Hub North**, supported by the German Federal Foundation for the Environment (*Deutsche Bundesstiftung Umwelt*, DBU), is one of the four circular hubs in Germany to foster knowledge sharing and collaboration across small and medium-sized enterprises (SMEs) at regional level. In 2023, the BUKEA organised a meeting in Hamburg with 60 stakeholders to kick off the project (City of Hamburg, 2023^[36]). Finally, the **Caught-up Initiative** (*aufgefangen*) was initiated by the Ministry of Justice and Consumer Protection of Hamburg in 2021 and promotes solutions against food waste, involving supermarkets, grocery shops and restaurants.
2. **Awareness raising and knowledge building** on the opportunities of a circular economy: in 2022, the city hosted the “1st Hamburg Dialogue against Food Waste”. The Ministry for Justice and Protection and the Hamburg University gathered experts to discuss practical solutions and share knowledge on best practices to reduce food waste (City of Hamburg, 2022^[37]). In the fashion industry, the city organises “Green Fashion Tours”, where participants have the opportunity to hear and learn from local designers and store managers about how they incorporate sustainable and circular economy principles into their businesses, as well as the selection of materials, suppliers

and products and the design of second-hand products (Hamburg Tourism Office, 2023^[38]). In June 2023, the city of Hamburg published its first **Sustainability Report**. According to the report and in relation to SDG 12 on sustainable production and consumption, the city applies a five-stage waste hierarchy, as an obligation of the KrWG, with waste prevention as the highest priority, followed by reuse, recycling, energy recovery and disposal. Between 2015 and 2020, the amount of waste per inhabitant decreased from 0.45 to 0.44 tonne, reflecting some progress in complying with this waste hierarchy (City of Hamburg, 2023^[39]). BUKEA plans to develop a Circular Economy Strategy for Hamburg with a focus on business development and concrete measures to build knowledge around the circular economy in Hamburg. Launched in 2023, the **Hamburg Port Development Plan 2040** also includes measures to further strengthen and expand the circular economy in the port and to increase resource efficiency, mainly in the built environment and infrastructure. Some of the actions included in the plan are: site remediation and activation of contaminated soil; increasing space efficiency in buildings through multi-storey designs; cooperation with the city of Hamburg in researching suitable areas for soil storage; regular use of old asphalt in the construction of new roads; and use of waste from port operations to supply heat (Hamburg City, 2023^[40]).

3. **Networks:** In 2019, Hamburg became the first **German Fab City**, along with 41 cities around the world. The international Fab City Foundation has set the goal of completely transforming the urban economy of Fab Cities into a circular economy by 2054, where no physical goods or raw materials are imported or exported and where all products consumed are produced locally. Funded by the Ministry for Economy and Innovation, the Fab City Hamburg project aims to promote science and research, environmental protection, public education and vocational training, as well as art and culture. As part of the Fab City Hamburg project, the BUKEA organises awareness-raising workshops (Fab City Hamburg, 2022^[41]). Hamburg participates in the the project **Circular City – Opportunities for local and regional resilience & value creation** (“*Kreislaufstadt – Chancen für Resilienz und Wertschöpfung*”) led by Difu (German Institute of Urban Affairs). The Difu aims to support municipalities in developing their own city-wide circular economy strategy based on the political and legal framework and on the knowledge of already active circular economy cities and initiatives. The project will take place from July 2023 to February 2025 (Difu, 2023^[42]).
4. **Guidelines:** Hamburg’s website provides clear **guidelines** on how residents can donate used clothes to the Hamburg City Cleaning Service (SRH), the city’s largest waste collection and treatment service provider. The SRH facilities include two second-hand department stores and 12 recycling centres where citizens can directly dispose of recyclable used textiles in small quantities of up to 1 m³ free of charge. Rags and leftovers from pre-sorting are accepted as residual waste for a fee. Hamburg provides information on prices and fees for commercial customers and a list of collection points for used textiles in the city. In addition, the Hamburg Consumer Advice Centre offers information and consultation services to consumers to enhance market transparency. On its website, it features a list of sites where residents can donate discarded clothing (Hamburg Consumer Advice Centre, 2022^[43]). The city website provides information on rules and legal frameworks applying to warehouses (*Fairteilers*), where both households and businesses can donate edible food. The donated food is stored in refrigerators and on shelves, and is made available to the local community free of charge (City of Hamburg, 2023^[44]). Moreover, the Hamburg Tourism Office (*Hamburg Tourismus*) promotes sustainable tourism practices by advertising green transport and accommodation, as well as sustainable activities, to visitors. Since 2018, the tourism office has received the Green Globe certification, recognising its efforts to reduce resource consumption, minimise waste, use seasonal ingredients, increase recycling, share resources, and offset GHG emissions (Hamburg Tourismus, 2023^[45]). The Hamburg Tourism Office offers guidelines and advice for tourists to spend a sustainable holiday in the city and provides a list of sustainable hotels, which are sorted by different criteria such as avoiding using plastic (Hamburg Tourism Office, 2023^[46]). The Tourism office highlights the importance of adopting a sustainable tourism policy in the city, as recognised in the city website with recommendations aiming to use

fewer resources and energy, produce less waste and increasing the recycling (Hamburg Tourism Office, 2023^[47]).

5. **Funding:** in co-operation with the Hamburg Investment and Development Bank (*Hamburgische Investitions- und Förderbank*, IFB Hamburg), the city of Hamburg has implemented two funding schemes to support the transition towards a circular economy: (i) UfR - companies for resource protection (*Unternehmen für Ressourcenschutz*), and (ii) the Programm für Innovation (Programme for Innovation, PROFi) Umwelt and PROFi Umwelt Transfer schemes. The former, in place since 2001, aims to encourage investment in increasing energy and resource efficiency in the operational processes of companies. The programme proposes loans and grants from EUR 1 000 up to EUR 100 000 for individual projects, depending on the amount per tonne of CO₂ avoided annually or per tonne of material, waste or cubic metre of water saved. The PROFi Umwelt and PROFi Umwelt Transfer schemes, within the framework of the PROFi Programme, promote individual and collaborative projects that foster the development of innovative products, processes and services that help save resources and emissions. The schemes provide up to EUR 500 000 for individual projects and EUR 1 million for collaborative projects from companies of all sizes, sectors and technologies, as well as universities and research institutions co-operating with them (IFB Hamburg, 2023^[48]; 2023^[49]). Companies and research institutions also receive subsidies for industrial research, experimental development, and feasibility studies. In addition, Hamburg has joined three major EU funded programmes aiming to support the transition to a circular economy. First, in 2016 the city joined the **European research project “FORCE”**, which aimed at demonstrating the potential of circular practices in relation to the waste prevention and treatment for four key materials (plastics, electric waste, wood waste, and biowaste). As a result of this project, Hamburg launched a tool to inform citizens about reselling, repairing, recycling and donation possibilities of Waste from Electrical and Electronic Equipment (WEEE) (Hamburg City, 2016^[50]; EC, 2022^[51]). Second, the city of Hamburg, together with the cities of Helsinki (Finland), Copenhagen (Denmark) and London (UK), joined the **Circular Construction in Regenerative Cities (CIRCulT) project**, which is funded by the EU's Horizon 2020 programme between 2019 and 2023. The main objective was to close the gap between theory and implementation in the adoption of circular economy principles in the built environment sector. CIRCulT established a knowledge exchange structure to enable the up-scaling and replication of circular economy solutions (CIRCulT, 2023^[52]; Hamburg City, 2019^[53]). Third, the City of Hamburg and HafenCity University participated in the European Union Horizon 2020-funded **REPAiR project** in 2016, which aimed to provide local and regional authorities with an innovative transdisciplinary open source Geodesign Decision Support Environment (GDSE). The overall objective of the project was to develop spatial sustainable development strategies, while demonstrating the feasibility and validity of the GDSE as a tool to improve waste and resource management (Hamburg City, 2016^[54]; REPAiR, 2023^[55]).

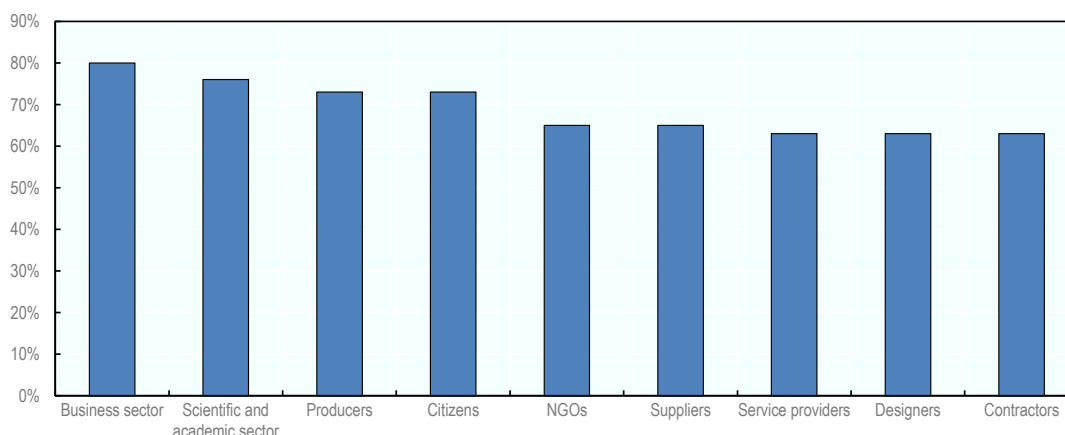
The role of the business sector

Introduction

The circular economy is a shared responsibility across levels of government and key stakeholders including the business sector. A total of 80% of cities and regions responding to an OECD survey (2020^[10]) have identified the business sector as a key player in contributing to the development and implementation of circular economy initiatives (Figure 4.3). Businesses and other economic actors are generally involved in the development of circular economy strategies, as the private sector is leading the shift towards new business models. For example, the Dutch, Finnish and Slovenian roadmaps recognise the key role of SMEs in the transition to a circular economy. In Greece, the inclusion of the circular economy into the

national growth strategy involves initiatives aimed at building knowledge, as well as linking entrepreneurship and social economy with technological innovation (OECD, 2020_[10]).

Figure 4.3. Type of stakeholders involved in the development of circular economy initiatives in surveyed cities and regions



Note: Results based on the 51 surveyed cities and regions that responded “Yes” to the question: “Have the following categories of stakeholders been involved (or planned to be) in the design and implementation of the circular economy initiative of your city/region?”.

Source: OECD (2020_[10]), *The Circular Economy in Cities and Regions: Synthesis Report*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/10ac6ae4-en>.

New business opportunities and the development of new markets represent an important driver for cities and regions to transition to a circular economy. A total of 85% of respondents to the OECD survey consider the emergence of new business models as a very relevant or relevant driver (Figure 4.1). While there is no consensus on the exact definition of a circular business model, it is usually presented as an “alternative value proposition” through which companies can reduce their environmental footprint by creating and capturing the value of a given material input (Ekins, P. et al., 2019_[56]). Lahti et al. (2018_[57]) argue that “a circular business model is designed to create and capture value while helping achieve an ideal state of resource use (e.g. finding a model that most closely resembles nature and comes close to achieve complete material cycles)”. Implementing circular business models also has a positive socio-economic impact. In 2019, circular activities (e.g. repair, reuse or recycling) generated around EUR 145 billion in value-added in the EU-28, 30% more than in 2012 (Eurostat, 2022_[58]; Eurostat, 2022_[59]). According to the European Commission, the share of employment in the circular economy increased by 13% between 2012 and 2019.

All sectors are concerned, but some show higher potential in terms of economic, social and environmental benefits, including the reduction of GHG emissions. Making a sector “circular” implies rethinking value chains, production and consumption processes. “Circularity” entails that any output can be an input for something else within and across sectors. It aims to: make products and goods last longer through better design; produce goods using secondary and reusable materials, and renewable energy, while reducing atmospheric emissions; produce and distribute products locally and consume them in a conscious and sustainable manner; and transform waste into a resource (OECD, 2020_[10]).

A number of examples of circular business models described below concern the retail and the hospitality sectors⁴ in Hamburg. These sectors hold potential in developing circular practices towards a more efficient use of resources. The retail industry covers all activities of reselling new and second-hand goods (excluding motor vehicles and motorcycles), mainly to the general public for personal or household consumption or use. The retail industry plays a pivotal role in OECD countries, as it links upstream

industries and consumers, contributes almost 5% of GDP and employs around 1 in 12 workers (OECD, 2020^[60]). In addition, before the COVID-19 pandemic, in 2019 (or latest available year pre-COVID-19) the tourism and hospitality sector contributed 4.4% of GDP in OECD countries, generates 21% of service exports and accounts for about 6.9% of total employment (OECD, 2022^[61]). In Germany, between 2013 and 2021, the retail sector reduced its CO₂ emissions by 33% (National Climate Initiative, 2023^[62]).

Circular business models can be classified according to a value chain approach, which divides business models into circular design, optimal use, and value recovery; or they can be based on the material flow they address. The OECD (2019^[56]) identifies five types of circular business models, which are described below, namely: Circular supply models; Resource recovery models; Product life extension models; Sharing models; and Product service system models (PSS). In practice, firms tend to combine several business models rather than following a specific one. For instance, adopting a circular supply model, where strategic sourcing and design decisions are made early in a product's life, can improve the business case for component and material recovery further downstream (OECD, 2019^[63]).

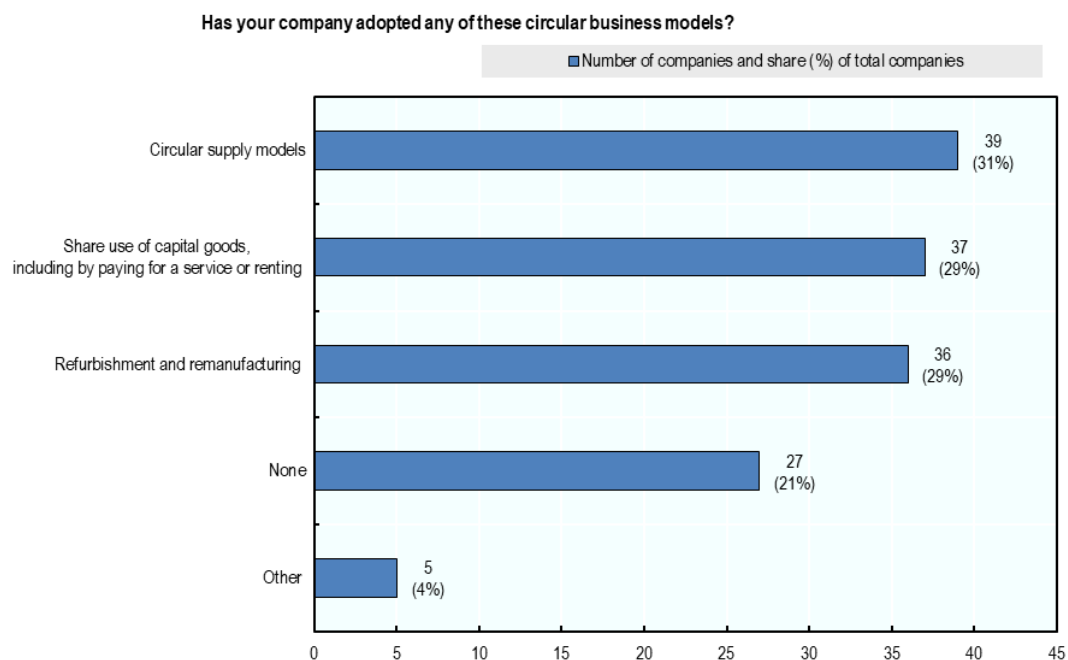
Circular supply models replace conventional material inputs obtained from virgin resources with bio-based, renewable, or recovered materials, which reduces the need to extract virgin resources. This is the main type of circular business model implemented among respondents to a business survey on climate neutrality targets and actions among HCC members followed by the share of capital goods (29%) and refurbishment and remanufacturing (29%) (Figure 4.4). Responses may not be representative as only a fraction of businesses responded and businesses may be more likely to respond if they have stronger interest in environmentally-friendly business practices. Circular supply models allow firms to market their products as “green” and target environmentally conscious consumers. They can also help manage supply chain risks, as the raw materials used to produce key inputs are often located in a limited number of countries. Circular supply models also require increased co-ordination within and across the value chain (OECD, 2019^[63]) (Box 4.4).

Box 4.4. International examples of cities implementing circular supply models

- In 2018, Amsterdam (The Netherlands) established the Circular Hotels Leaders Group (*Kloplopergroep*), comprising 12 hotels actively incorporating circular principles into their business models. This collaboration included knowledge sharing, joint purchasing and consolidation of waste streams, reuse of furniture and carpet tiles, bed repair and reuse, introduction of *a la carte* breakfast options, and collaborative circular procurement practices with other hotels, including sustainable linen and laundry rental services.
- The Network for Sustainable Construction and Real Estate Management in Cold Climates (*Nätverket för hållbart byggande och förvaltande*) launched by the city of Umeå (Sweden) in 2008 brings together 55 members from all segments of the construction supply chain. Sustainability and the circular economy are at the core of the network's annual member meeting and monthly breakfast meetings. The network has enabled the creation of a public-private partnership (PPP) to develop, by 2024, the new Tomtebo Strand city district, which incorporates circular economy principles in its structural plan.
- The Sustainable Restaurants Network (*Hållbara Restauranger*) involves 14 restaurants in Umeå (Sweden) for sustainable practices in the food industry and food waste management. On a wider scale, the North Sweden Cleantech is a regional innovation platform focusing on exporting green technology, clean energy and sustainable solutions through business support and networking. A hundred companies are currently part of the platform. Since 2016, the platform has been organising circular economy capacity building events.
- In Ireland, the National Platform for Circular Manufacturing Initiative 2020-22 (CIRCULEIRE) is the first cross-sectoral industry-led innovation network dedicated to accelerating a zero-carbon circular economy. It is a PPP de-risking and delivering circular business model innovation. The platform is led by Irish Manufacturing Research (IMR), in collaboration with its strategic partners, the Department of Communications, Climate Action and Environment (DCCA), the Irish Environmental Protection Agency (EPA), EIT Climate-KIC and 25 industry members. Companies involved come from the building, furniture, packaging and material reprocessing sectors, among others. The platform has a dedicated innovation fund designed to foster cross-sectoral systems integration projects.
- Paris's (France) 1st Circular Economy Roadmap has set the objective of promoting sustainable, organic and responsible product supplies in public entity canteens (e.g. in schools). This objective is linked to the implementation of a more socially and environmentally responsible public procurement scheme and the goal of expanding urban agriculture practices in the city.
- Rotterdam (The Netherlands) is using a digital market place for building materials, bringing supply and demand of used building components together and promoting sustainable supply in the construction sector.
- By including the circular economy in the textile supply chain and the reuse and recycling of clothing, London (UK) aims at: reducing the number of textiles sent for disposal; becoming a hub for textile collection, reuse and recycling; and being recognised as a well-known circular economy textile design centre. In 2017, 330 000 tonnes of textiles were diverted from landfill in the UK.

Source: Network for Sustainable Construction and Real Estate Management in Cold Climates (2013^[66]), Umeå. More Sustainable Buildings; Municipality of Umeå (2019^[67]), Tomtebo Beach - A New Neighborhood with People and Sustainability in Focus; North Sweden Cleantech (2019^[68]), North Sweden Cleantech; Irish Manufacturing Research (2020^[69]), CIRCULÉIRE – The National Platform for Circular Manufacturing, and Traid (2018^[70]), The Impacts of Clothing .

Figure 4.4. Circular business models in Hamburg, Germany



Note: The survey was sent to a sample that is broadly representative of the population of Hamburg businesses in the sectors covered by the HCC, although businesses with fewer than 10 employees are underrepresented. The questionnaire was sent to a random sample of 2300 businesses with more than 10 employees and to a random sample of 500 businesses of all size classes. 128 businesses responded, a response rate of about 4%.

Source: Survey carried out by HCC (2023).

In Hamburg, numerous companies have adopted practices that endorse circular models. In the textile industry, these practices primarily focus on the reuse and repurposing of materials, extending the lifespan of used garments through upcycling while diverting them from landfill disposal. The hospitality sector has also taken steps to reduce food waste through an effective management and measurement system. In addition, in the retail sector, companies of the supply chain achieved the resource recovery of plastic packaging waste.

A Hamburg-based fashion start-up called Bridge&Tunnel produces new clothes, accessories, and home items from a variety of used textiles. The materials are sourced through collaborations with clothing chambers, private individuals, or surplus production from fashion companies. In addition to the environmental benefits of avoiding materials in the production of new products, the company also provides employment opportunities for socially disadvantaged individuals and refugees (Bridge&Tunnel, 2023^[69]). Another example in the fashion industry is the start-up NONOI, which recycles old clothes made of high-quality materials such as cashmere, linen, or wool to create new pieces through upcycling (NONOI, 2023^[70]).

In 2016, the Hamburg-based cruise line TUI Cruises, together with Futouris and supported by the United Against Waste Association (UaW), launched a project to reduce food waste on cruise ships based on a user-oriented service system. TUI Cruises and UaW measured food waste stemming from overproduction (return from buffet) and quantified plate leftovers. The project also measured waste from food storage and production waste on the entire ship. Analysis results showed that 50% of TUI Cruises' food waste was generated in the overproduction segment, followed by the segment of plate leftovers (18%). Following this initiative, TUI Cruises cut food waste by 17% between 2016 and 2017 (TUI Cruises, 2019^[71]).

In 2020, the city administration and the Hamburg University of Technology (TUHH), along with other stakeholders from the private sector, launched the *Hamburg's Recyclables Initiative* to demonstrate how incentivising recycling at the local level can contribute to closing loops. As part of this initiative, the "Hamburg's Bottle" project aims to create a bottle entirely from recycled plastic waste by allocating each partner a specific role: the Hamburg City Cleaning Service (*Stadtreinigung Hamburg - SRH*) collects plastic waste, while key partners from the private sector are responsible for extracting high-density polyethylene and transforming it into recyclable material, as well as filling bottles with an established detergent. The local drugstore retailer Iwan Budnikowsky GmbH & Co. KG ensures the distribution of these products to consumers in Hamburg. In addition to increasing recycling and reducing the consumption of new materials, the project aims to raise awareness among customers, by concretely demonstrating recycling principles and highlighting their own influence to support regional circular cycles through their purchasing decisions (Interreg Europe, 2021^[72]).

Resource recovery models transform waste into secondary raw materials, diverting waste from disposal and displacing the extraction and processing of virgin natural resources. This business model comprises three variants: downcycling, upcycling and industrial symbiosis. *Downcycling* involves transforming waste into secondary materials. *Upcycling* refers to converting waste into secondary materials that are subsequently used in valuable applications. *Industrial symbiosis* refers to a situation where one firm uses the by-products of another company's production as inputs (OECD, 2019^[63]). Among the cities hosting industrial symbiosis processes and clusters, the city of Kalundborg (Denmark) fosters eco-innovation amongst eight public and private companies to reuse water and energy and recycle materials. The industrial symbiosis in Drummond (Canada) is a network of local companies exchanging resources, such as waste materials, by-products, equipment, space or even energy. Some companies participating in industrial symbiosis sell their production waste rather than paying to dispose of it, thus making a double economic profit. The Eco Parks in Kitakyushu (Japan) allow for recycling waste while producing energy, saving water and creating new business opportunities. The Metropolitan Project of Industrial Symbiosis in the Barcelona Metropolitan Area (Spain) co-ordinates industrial symbiosis projects with circular economy initiatives (OECD, 2020^[10]). In Sweden, the roadmap for industrial symbiosis connects with urban symbiosis. While industrial symbiosis allows resource exchanges across companies, urban symbiosis looks at mutual and beneficial exchanges of resources within urban areas and across industries.

Some companies located in Hamburg have adopted resource recovery models such as Cirplus, a Hamburg-based B2B marketplace for recycled plastics. The platform aims to digitise and shorten the transaction process for plastics processors and recycling companies. Its main objective is to consolidate all aspects of the transaction process including finding, negotiating, contracting, shipping, insuring, and paying for recycled and plastic waste, in order to reduce the cost of recycled plastics compared to virgin plastics (Cirplus, 2023^[73]). A company called Recyclehero uses electric cargo bikes across the city of Hamburg to collect used glass, paper, clothing, and deposit bottles from companies and private households destined for recycling. The company is responsible for collecting bottles and boxes and disposing of them in the correct container, while offering customers a subscription option for the regular collection of recyclable materials. In addition, Recyclehero's recruitment process gives priority to people in vulnerable situations, such as the long-term unemployed (Recyclehero, 2023^[74]).

Product life extension models prolong the useful life of products, slow down the flow of constituent materials through the economy, and reduce the pace of resource extraction and waste generation. The life of products can be further extended through maintenance; reuse and repair; or refurbishment and remanufacturing processes to take advantage of the cost savings of using pre-existing materials and products as inputs. For example, the city of Tokyo (Japan) has rented equipment for the celebration of the 2020 Olympic Games and leased it after the games. The circular economy will also play a role in the upcoming Paris 2024 Olympic Games through leasing of materials (OECD, 2021^[75]). The city of Paris (France) emphasises the need to facilitate the extension of product life cycles and has implemented measures to recover information technology (IT) and telephone equipment and furniture. It has also

promoted the adoption of a charter in cultural venues for the design of eco-responsible events (OECD, 2020^[10]). At national level, Italy's circular economy strategic framework focuses on product eco-design whereby material resources are rationalised by replacing non-renewable materials with renewable, recycled, permanent, biodegradable, non-hazardous and compostable materials; and recreating production processes to make more products that can be easily disassembled, recycled, modular (replacement of parts, recovery and reuse of systems and sub-systems) and repairable. Similar emphasis is placed on efficient and circular product design in Portugal's circular economy action plan, with a particular focus on boosting manufacturer innovation and responsibility in order to manufacture products that are "designed to last" by encouraging strategies to extend product working life and support the development of a network of repair facilities by establishing partnerships with municipalities to train and disseminate repair and reuse networks.

In Hamburg, a number of supermarket chains, restaurants, businesses and start-ups offer reusable cups and packaging for beverages and food through deposit systems, and the city administration has played a leading role in their implementation. Since 2016, the city's Environment Agency restaurant has only served takeaway coffee in its own reusable porcelain cups. Similarly, a number of cafeterias in local public institutions have also adopted this practice. In 2017, the city of Hamburg launched the "Return.Again" (*Kehr.Wieder*) campaign in collaboration with local coffee shops. As part of the campaign, more than 260 establishments offered discounts of between EUR 0.10 to EUR 0.30 to customers who brought their own reusable cups. An interactive map on Hamburg's official website showed the location of coffee shops, bakeries, and bistros where customers could benefit from a discount. From 2017 to 2018, the campaign helped avoid the use of approximately 120 000 disposable cups (City of Hamburg, 2018^[76]). In 2018, the City joined another deposit and return scheme implemented by the start-up RECUP. In this system, customers buy takeaway coffee in a returnable cup, pay a 1 EUR deposit on the cup, and receive an additional price advantage over coffee sold in disposable cups. These cups can be returned to any of RECUP's partner institutions in Hamburg and Germany. In 2018, the City health authority and the Hamburg police academy also introduced the RECUP system in their canteens (City of Hamburg, 2018^[76]).

Some companies in Hamburg have experienced high return rates for reusable cups, reaching up to 99.5% in some cases (Hamburg City, 2022^[77]) (German Retail Association, 2022^[78]). At the national level, the German Retail Association is also active in the development of reusable solutions by supporting small and medium-sized retailers in engaging in this transition (Box 4.5).

Box 4.5. The German Retail Association for a plastic-free retail industry

The German Retail Association (HDE) aims to strengthen climate protection in the retail sector and to offer practical support towards climate-neutrality at the national and federal level. To achieve this goal, the HDE developed the Climate Protection Initiative (*Klimaschutzoffensive* - KSO) in 2017 to support small and medium-sized retailers in developing energy-saving solutions and other measures for climate protection. The Climate Protection Initiative is part of the National Climate Initiative and has been partially funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK) since 2017. The German Retail Association estimates that this initiative could reduce emissions by 30 000 tonnes of CO₂ within the industry.

Additionally, in 2023, the KSO published a guide entitled “*Reusable instead of more waste*” (*Mehrweg statt mehr Müll*) on the use of reusable packaging in the food retail sector. This document presents a comprehensive overview of the current legal framework conditions and hygiene requirements. It also provides information on why reusable solutions are more sustainable than plastic packaging, how individual reusable pool systems work, and how retail employees can properly communicate the benefits of reusable containers to customers at the point of sale.

In 2017, the German Packaging Act (*Verpackungsgesetz* - VerpackG) made it compulsory for restaurants and retailers to offer reusable alternatives for the delivery of food and beverages. In order to comply with this regulation, the Climate Protection Initiative has designed posters for retailers to display at the point of sale to encourage customers to use reusable products.

Source: New guide to reusable food retailing, <https://www.hde-klimaschutzoffensive.de/de/energie-sparen/neuer-leitfaden-zu-mehrweg-im-lebensmitteleinzelhandel> [accessed on 2 October 2023].

Within the product-life extension model, maintenance, repair, and refurbishment services are also provided at Repair Cafés in Hamburg. The purpose of these shops is to restore damaged products (e.g. smartphones, flat tires, bicycles, televisions), either for a fee or on a voluntary basis, and to spread knowledge about how to repair items while protecting the environment and promoting a sustainable lifestyle. The official website of the city provides information on the location, schedule and contact details of 13 Repair Cafés based in Hamburg. For instance, the Repair Café Altona has set up a workshop on the repair of electronic equipment. Experts on electronics meet every month to screw, tinker and solder deteriorated electrical appliances, and also act as a network to seek synergies (Hamburg City, 2023^[79]).

Sharing models (also named sharing economy or sharing platform) facilitate the sharing of under-utilised products while reducing the need for new products and the raw materials they contain. This model is particularly suited to densely populated urban areas to reduce the transaction costs associated with a temporary change in product ownership (OECD, 2019^[63]). Several cities (e.g. Antwerp, Belgium; Lappeenranta, Finland; Lisbon, Portugal; Malmö, Sweden; Milan, Italy; and Paris, France) offer examples of local government support for circular initiatives, notably by investing in circular transport measures with shared municipal car and bicycle fleets, developing areas for the management of logistics activities, enhancing public transport usage, expanding sustainable transportation choices, and establishing additional cycling lanes (OECD, 2020^[80]). In Espoo and Helsinki (Finland), as part of the Cycling Promotion Programme 2013-2024, the Urban Environment Sector and the Helsinki Metropolitan Area Transport Ltd. offer a joint bike service that can be used in the city all year long and allows to move between cities during the city bike season from April to October (City of Espoo, 2013^[81]).

Product service system models (PSS) involve marketing services instead of products to enhance incentives for green product design and the efficient use of products. These models facilitate an efficient use of natural resources and can be divided into three main variants: product-oriented, user-oriented, and

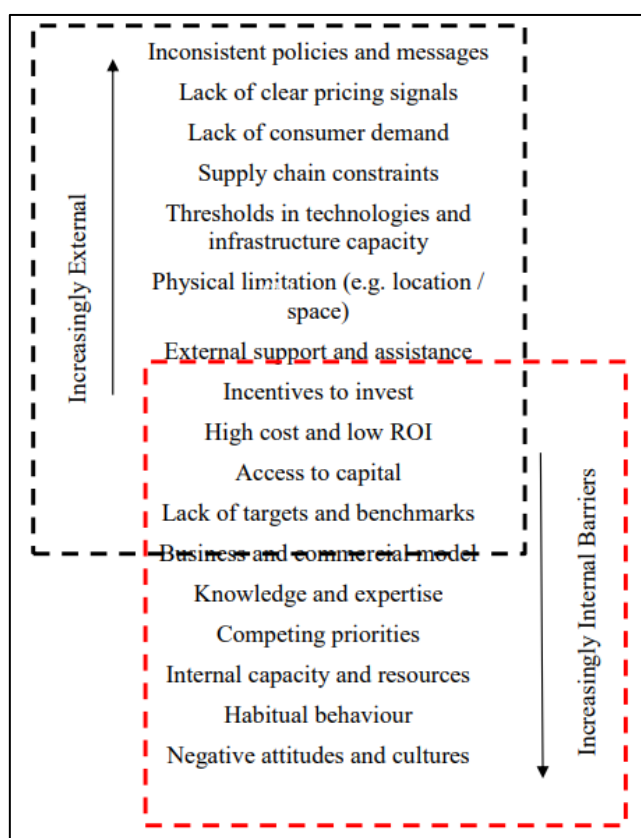
result-oriented PSS models. *Product-oriented models* focus on the product. In this case, manufacture firms continue to produce and sell products in a conventional way but add after-sales services. *User-oriented models* give access to the services associated with a specific good without ownership of the good itself. *Result oriented-models* enable firms to market a service or outcome instead of a product (OECD, 2019^[63]). Several cities have put these models into practice. For example, the municipality of Bollnäs (Sweden) has applied “functional public procurement” (*funktionsupphandlingen*) to rent light as a service in municipal pre-schools and schools. The service is provided by a start-up that received support from Umeå’s BIC Factory business incubator. The Amsterdam Airport Schiphol (The Netherlands) also rents light as a service, instead of the traditional model of buying light bulbs: Schiphol pays for the light it uses, while Philips, the provider, is the owner of all installations and is responsible for performance and durability, improving its incentives to use cost-effective, long-lasting products.

Main obstacles to the implementation of circular business models

The literature review conducted for this chapter shows a distinction between internal and external barriers from the business perspective. Internal barriers pertain to decisions and strategies made within a company or by individuals, which are, to some extent, under their control. External barriers are shaped by the operating context of the company or individual and beyond the latter’s direct control, making it necessary for policy intervention to address them (Figure 4.5). For example, external factors include challenges such as “inconsistent policies and messages” and “lack of clear pricing signals”. In addition, barriers pertaining to “supply chain constraints and thresholds in technologies and infrastructure capacity” may involve interactions with other companies.

Internal barriers can be addressed and improved by the company itself. The barriers encompass elements such as the “business and commercial model,” “knowledge and expertise”, “competing priorities”, “internal capacity and resources”, “habitual behaviour”, and “negative attitudes and cultures”. In some cases, external barriers can potentially hinder internal dynamic forces of improvement. For instance, a lack of consumer demand for recycled or remanufactured products, or the absence of adequate policies, can significantly restrain the motivation of a company to remove internal barriers. Similarly, financial barriers including “high upfront costs”, “low returns on investment”, and constrained “access to capital” reflect internal company conditions but are strongly influenced by external circumstances (Ekins, P. et al., 2019^[56]).

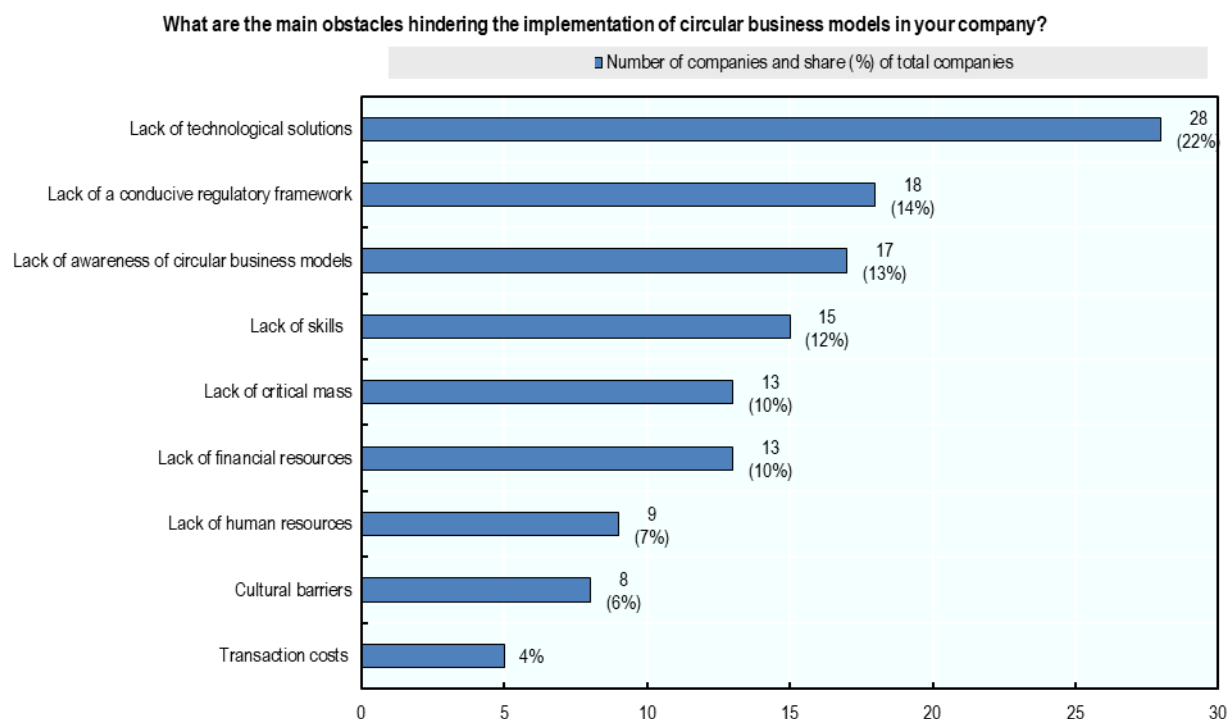
Figure 4.5. Barriers to business becoming more resource-efficient



Source: (Ekins, P. et al., 2019^[56]) *The Circular Economy: What, Why, How and Where*, <https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf>

When implementing circular business models at the subnational level, a number of barriers arise, in particular: lack of awareness, insufficient financial incentives, small scale of circular business models and inadequate regulatory frameworks. Results from the HCC business survey with 126 responding businesses suggest that the main obstacles in the city for the implementation of circular business models relate to: the lack of technological solutions (22% of respondents); lack of conducive regulatory frameworks (14%); lack of awareness of circular business models (13%); lack of skills (12%); lack of critical mass (10%); lack of financial resources (10%); lack of human resources (7%); cultural barriers (6%); and transaction costs (4%) (Figure 4.6).

Figure 4.6. Main obstacles hindering the implementation of circular business models in companies in Hamburg



Note: The survey was sent to a sample that is broadly representative of the population of Hamburg businesses in the sectors covered by the HCC, although businesses with fewer than 10 employees are underrepresented. The questionnaire was sent to a random sample of 2300 businesses with more than 10 employees and to a random sample of 500 businesses of all size classes. 128 businesses responded, a response rate of about 4%.

Source: Survey carried out by HCC (2023).

Regulation is not yet conducive to circular-related innovations. At the local level, various regulations are promoting efficient waste management and addressing climate change, but there is no strategic document dedicated to the circular economy.

Although at national level a Circular Economy Act has been adopted and the building blocks of the future national circular economy strategy (planned for 2024) have been identified, at local level there is not yet clear vision of the city's rationale for moving towards a circular economy. In Germany, the Circular Economy Act (2012^[82]) promotes the principles of the circular economy and the environmentally friendly management of waste, including the conservation of natural resources, the protection of human health and the preservation of the environment throughout waste generation and management. The law also creates legal requirements to ban specific waste and set a regulation on waste collection, treatment, transportation, storage and recovery. It also advocates aligning state and local government procurement with the circular economy vision, thereby strengthening markets for innovative products and services. In addition, the National Circular Economy Strategy, expected for 2024, will aim to reduce primary raw material consumption to improve market conditions for secondary materials and increase their durability, reparability and circularity. The foundations on which the future strategy will be built recognise SMEs as key actors in circularity and drivers of innovation. A first step to support industry and SMEs will require removing unnecessary regulatory barriers and establishing complementary frameworks. This includes R&D funding for innovation, advisory programmes on resource-efficient production and further development of norms and standards. To foster sustainable consumption, the strategy is expected to develop measures to provide a suitable legal framework, and create the right incentives for companies and

consumers through measures on green product design, providing information (for example labelling) or empowering consumers regarding product reparability (right to repair) (Federal Environment Ministry, 2023^[83]).

International examples also show that public procurement generally does not incentivise the use of circular business models. The authorities awarding the contracts tend to only consider upfront costs rather than lifecycle costs (e.g. operation, maintenance and end-of-life), and the price is often the dominating criterion for awarding procurement contracts. Meanwhile, when environmental criteria are added to the selection process, in practice, the price still remains the prevailing selection method. Moreover, when introducing environmental criteria, there is a risk for tenders to go empty or that participating companies would complain about the possible threat of anti-rivalry clauses, claiming that only big companies can meet some of the specific requirements. For instance, in Ljubljana (Slovenia), legal constraints on public procurement pose challenges to the emergence and adoption of innovative projects (OECD, 2020^[84]). Other regulatory barriers can inhibit the development and implementation of circular economy strategies. In Umeå (Sweden), regulatory barriers are related to the definition of waste (each material is considered waste once it has been collected), which hinders the reuse of some materials because they could generate environmental and health issues (OECD, 2020^[13]).

Businesses are often not sufficiently aware of what a circular economy is and how to take advantage of the opportunities it offers. There is an overall lack of understanding of the potential benefits of the circular economy and little interest from companies. The initiatives described in this chapter show that most of the companies involved in the circular economy transition in Hamburg are committed to waste reduction, but few are taking a fully circular approach. Overall, key private sector stakeholders in Hamburg are not informed about the potential economic benefits of circular business models. In some cases, this leads to a perception among businesses that the adoption of circular economy principles entails significant costs and limited prospects for returns on investment. International experience also illustrates this lack of awareness in the private sector. For instance, in Valladolid (Spain), more than 70% of 70 companies surveyed in 2018 declared that they did not know what the circular economy meant. They associated the term with minimising waste production, recycling and reuse, and assumed that they already implemented these processes on a regular basis (OECD, 2020^[84]). Similarly, in Ireland, only 51% of businesses understood the meaning of the circular economy (OECD, 2022^[85]). Moreover, in some cases, there is a form of scepticism across stakeholders who implement environmental and sustainable practices but do not see the value added of the circular economy approach (OECD, 2022^[85]). The lack of cost-benefit analysis of various activities and sectors slows down the transition towards the circular economy. Limited awareness of circular economy practices and their effects amongst key players can hinder opportunities for their implementation and scaling up (OECD, 2020^[10]).

There are also insufficient financial incentives to promote the adoption of circular business models. Shifting from a linear to a circular economy presents financial risks for economic actors. Risks can be associated with the critical mass of activities taking place in cities of different sizes, or dimensions related to market size, population, material flows, etc. 10% of businesses responding to the HCC survey have identified the lack of critical mass as well as the lack of financial resources as key obstacles hindering the implementation of circular business models (Figure 4.6). Still, virgin materials are usually less expensive than secondary products, despite the environmental impacts of the former, and uncertainties about the economic benefits can derail an effective implementation of the circular economy (OECD, 2020^[10]). For example, in Groningen (The Netherlands), the lack of financial resources for innovators results in small-scale, low-risk projects with limited impact in terms of job creation and positive environmental effects. Local entrepreneurs face high investment risks and maintenance costs (e.g. the cost of secondary materials compared to virgin materials), and when funding is available from innovation programmes for a circular economy, they often lack the knowledge, skills, resources and time to apply for calls (OECD, 2022^[85]).

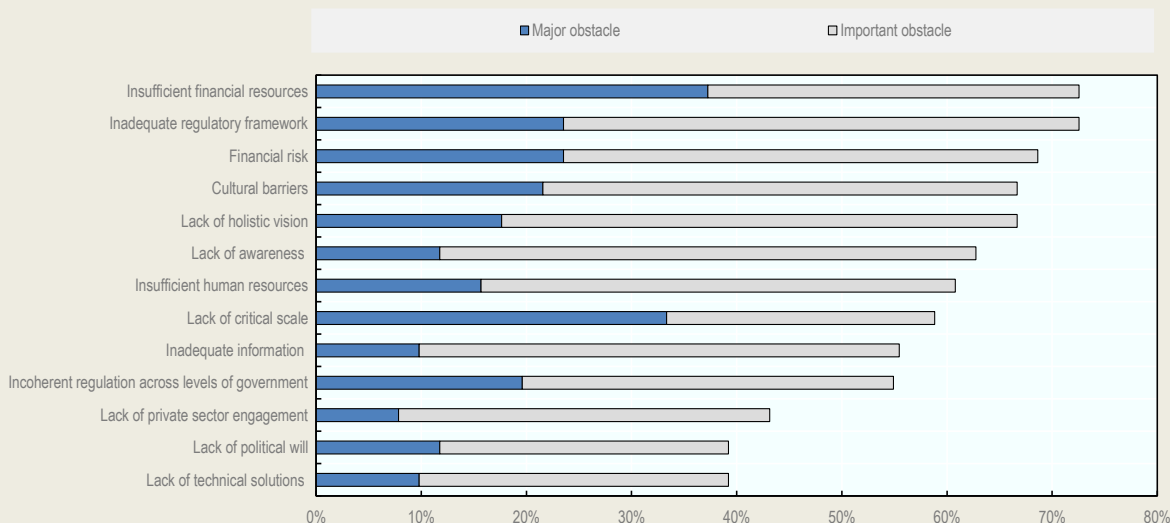
Circular business models only occupy a peripheral position in most markets. Recycled pulp and paper, metals, and plastics represent small proportions of global material output, while remanufactured industrial and consumer products represent an even smaller share of global manufacturing (OECD, 2020^[86]). Hence, companies are often reluctant in changing procedures and forms of financing related to the loss of efficient market reach, compared to the competition that continues to work in a linear logic. Consequently, there are difficulties in scaling up pilot projects and experimentation. In addition, the collaboration between stakeholders along the value chain, both upstream and downstream, is challenging due to prevailing competitive dynamics or limited market interactions among these actors (Ekins, P. et al., 2019^[56]).

However, the governance gaps identified in Hamburg are similar to those faced by other subnational governments. Box 4.6 shows the main barriers identified by more than 50 cities and regions in OECD countries and their corresponding five broad categories: funding, regulation, policy, awareness and capacity.

Box 4.6. Governance gaps for the transition towards a circular economy in cities and regions

Results from the OECD synthesis report on (2020^[10]) “The Circular Economy in Cities and Regions” show that major obstacles for cities and regions transitioning towards circular economies are not technical but of an economic and governance nature (Figure 4.7). More than a third of the interviewed stakeholders in the OECD survey have identified insufficient financial resources, inadequate regulatory frameworks, financial risks, cultural barriers and the lack of a holistic vision as major obstacles.

Figure 4.7. Main obstacles to the circular economy in surveyed cities and regions



Note: Results based on a sample of 51 respondents who indicated obstacles as being “Major” and “Important”
 Source: OECD (2020^[10]), *The Circular Economy in Cities and Regions: Synthesis Report*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/10ac6ae4-en>.

Key actions to promote circular business models in Hamburg

The following section proposes three types of actions that the HCC can carry out to transition from a linear to a circular economy: (i) immediate actions; (ii) medium-term action that the city of Hamburg can take in co-ordination with the HCC and key stakeholders by 2030; and (iii) targets towards 2040 for the city of Hamburg in collaboration with the HCC.

Immediate actions

As the HCC is a legal advocacy body of the business sector and an intermediary between the local government and the business community in Hamburg, it has an important role to play in fostering a circular economy. In particular and based on international good practices, the HCC could consider implementing the following recommendations as immediate action:

- **Raise awareness of the circular economy and related opportunities to encourage sustainable production and consumption and the adoption of circular principles.** For example, since 2015, the Chamber of Commerce of Glasgow (Scotland, UK), in collaboration with Glasgow City Council and Zero Waste Scotland, has put in place a number of events on the circular economy to raise awareness and facilitate collaborations, workshops and circular economy platforms to crowdsource ideas (e.g. Circle Lab Challenge) (OECD, 2021^[14]). London (United Kingdom) has recruited “*circular economy ambassadors*” in different companies and local authorities to share the benefits of the circular economy, with specific information for each economic sector and to raise awareness at the workplace (LWARB, 2017^[87]). Collecting data on the progress and the impact of circular economy practices in Hamburg (e.g. food and packaging waste avoided, share of the second-hand textile market) could also help associated companies to better understand the opportunities of the circular economy in practice.
- **Build capacities among the business community.** Through its training subsidiary, the HCC could consider offering training programmes targeting business actors, providing them with deeper knowledge and tools to succeed in their circular projects and discover new business opportunities. Particularly in an intermediary role and in the area of education, the HCC can influence the content of training and lifelong learning programmes, which could be used more intensively toward individual and collective behavioural transformations. For example, in 2018, the Valladolid Chamber of Commerce (Spain) launched a master course in “*Digital transformation and the circular economy*”. The curriculum included product life cycle analysis, eco-design, circular value chains and data mining (Valladolid Chamber of Commerce, 2019^[88]). The aim of the master course, beyond building specific skills on the circular economy, was also to increase awareness among professionals. The Chamber of Commerce of Valladolid, together with research partners, is creating consulting models for companies willing to adopt circular economy processes (OECD, 2020^[84]). In the UK, the Glasgow City Council, Zero Waste Scotland and the Glasgow Chamber of Commerce have collaborated to create the *Circular Glasgow* initiative, which aims to build best practice and capacity with regards to the circular economy, mainly within the private sector in Glasgow. This initiative aims at connecting companies across the city to share ideas and developing circular strategies that can contribute to climate change objectives (Glasgow Chamber of Commerce, 2017^[89]). In Sweden, the Umeå branch of the NGO Cradlenet Norr, founded in 2015, organises bi-monthly meetings to discuss challenges with different stakeholders (e.g. SMEs, municipal authorities, business coaches, university researchers and students), organise specialised field visits and participate in international events and platforms on the circular economy. It also provided training courses on circular business models (OECD, 2020^[13]).
- **Support the local government of Hamburg through market innovation.** The HCC could collaborate with the city to support market innovation with the creation of incubators, hubs and spaces for experimentation, and it could stimulate demand by being a launch customer. For

example, in Groningen (The Netherlands), a Circular Economy Hub is planned as an incubator space for small businesses and start-ups, and as an information centre, repair hub and second-hand shop (OECD, 2020^[90]). The Tallinn Creative Incubator (Estonia) offers on its website seven educational videos on how companies and start-ups can move towards a circular economy (Tallinn Business Incubators, 2022^[91]). In Spain, the Business Confederation of Granada created the "OnGranada technological cluster" in 2014, encompassing a diverse membership of private and public sector entities including municipal, provincial, and regional governments, alongside the University of Granada, and the Granada Chamber of Commerce. The cluster is actively integrating circular economy principles into waste reuse and resource efficiency initiatives, such as optimising water usage in plant cultivation and irrigation through injections, as well as exploring opportunities to convert waste from olive production into biofuels (IUC, 2020^[92]). The HCC could also build on ongoing initiatives to foster innovation towards a circular economy. For example, the HCC and the City of Hamburg fund the Innovation Contact Service Hamburg (*Innovations Kontakt Stelle Hamburg*), which supports communication between companies and scientific institutions in Hamburg and facilitates mutual access by identifying potential R&D opportunities and networking suitable project partners (IKS Hamburg, 2023^[93]). In addition, the HCC's Innovation and Patent Centre supports member companies in the protection of intellectual property rights, patent and innovation management and provides patent-related advice. Services provided by the HCC include awareness-raising events, patent filing assistance, patent potential analysis and market analysis (HCC, 2023^[94]).

Actions by 2030

In order to create the enabling conditions for a transition from a linear to a circular economy, the local and national governments, in consultation with the HCC and key stakeholders, could **promote the uptake of circular economy systems through changes in legislation and specific regulatory tools**. These tools can include circular procurement, product norms, industry targets, standards for secondary materials, tax reductions, differentiated fee structures for waste management and investment support (EIB, 2021^[95]). For example, since 2020, the city of Turku (Finland) has implemented circular procurement to reduce food waste and GHG emissions from food and related services, in accordance with the Finnish Procurement Act, by doubling the share of vegetarian meals and reducing heating and electricity consumption (City of Turku, 2020^[96]). In 2009, Paris (France) developed a Sustainable Food Plan to encourage the procurement of seasonal and local food to boost the local economy and reduce environmental impact. The plan covers 1 200 municipal refectories, including in schools, retirement homes and staff lunchrooms, serving over 30 million meals a year (City of Paris, 2015^[97]).

Moreover, it is important to ensure adequate incentives to stimulate large scale and high impact projects, by broadening the range of financial instruments supporting businesses towards the circular economy (from grants to venture capital) and by creating spaces for experimentation. Since 2010 in Paris, France, the Urban Lab has accompanied more than 200 experiments and consolidated a methodology to support effective experimentation in 4 main stages: i) the definition of the experimental project and its evaluation; ii) a search of the experimental site; iii) the deployment of experimentation; and iv) valuation and transformation. In order to facilitate access to these experimental sites, the Urban Lab has been working, for 10 years, in the development of a legal framework that start-ups can refer to for the development of their projects (e.g. a model agreement for using publicly owned spaces for a fixed period of time). Concerning the funding, between 2017 and 2018, the city of Valladolid (Spain) operated a grant programme for circular projects to support the development of local circular initiatives to create jobs and economic prosperity. Through this programme, the local government financed 61 projects for a total budget of EUR 960 000, benefitting in particular private companies, business associations, non-profit entities and research centres based in the city. However, projects struggled to scale up after the experimentation phase (OECD, 2020^[84]). In 2022, the city of Montreal (Canada) launched the Open Innovation Grant (*subvention*

à *l'innovation ouverte*), which encourages emerging companies to collaborate with established organisations in the city to test innovative solutions in a business context, especially in relation to the circular economy (OECD, 2022^[98]). In 2016, the city of Amsterdam (The Netherlands) created a revolving sustainability fund for businesses to pay back within 15 years with a very low interest rate (OECD, 2020^[13]).

Lastly, the HCC could act as a **one-stop-shop** for member companies seeking information on circular business models and on regulation and legislation. To this end, the Chamber could create a thematic committee on the circular economy, which could offer information and administrative support regarding circular economy projects for businesses, help reduce transaction costs for entrepreneurs and SMEs, and identify the main regulatory barriers. For instance, the initiative Start-up Slovenia, established in 2014, mobilises a network of mentors from various backgrounds to provide entrepreneurs and young firms with tailored advice. Nowadays, some start-ups also work within the circular economy field (OECD, 2020^[10]).

Based on the OECD Checklist for Action for the transition to a circular economy (2020^[10]), the City of Hamburg in collaboration with the HCC could meet the targets of the 12 key governance dimensions that would enable a circular economy system to thrive by 2040 (Box.4.7).

Box.4.7. The OECD Checklist for Action for cities and regions and the OECD Scoreboard on the Governance of the Circular Economy

The OECD Checklist for Action for cities and regions aims to support decision-makers in promoting, facilitating and enabling the transition to the circular economy (Figure 4.8). The Checklist is based on 12 key governance dimensions, which are grouped into three clusters corresponding to the complementary roles of cities and regions as promoters, facilitators and enablers of the circular economy.

The OECD Checklist for Action is accompanied by the OECD Scoreboard on the Governance of the Circular Economy (Figure 4.9), which helps governments identify their level of progress towards the implementation of each of the 12 governance dimensions, namely Newcomer (Planned; In development), In progress (In place, not implemented; In place, partly implemented) and Advanced (In place, functioning; In place, objectives achieved).

Figure 4.8. The governance of the circular economy in cities and regions: A Checklist for Action

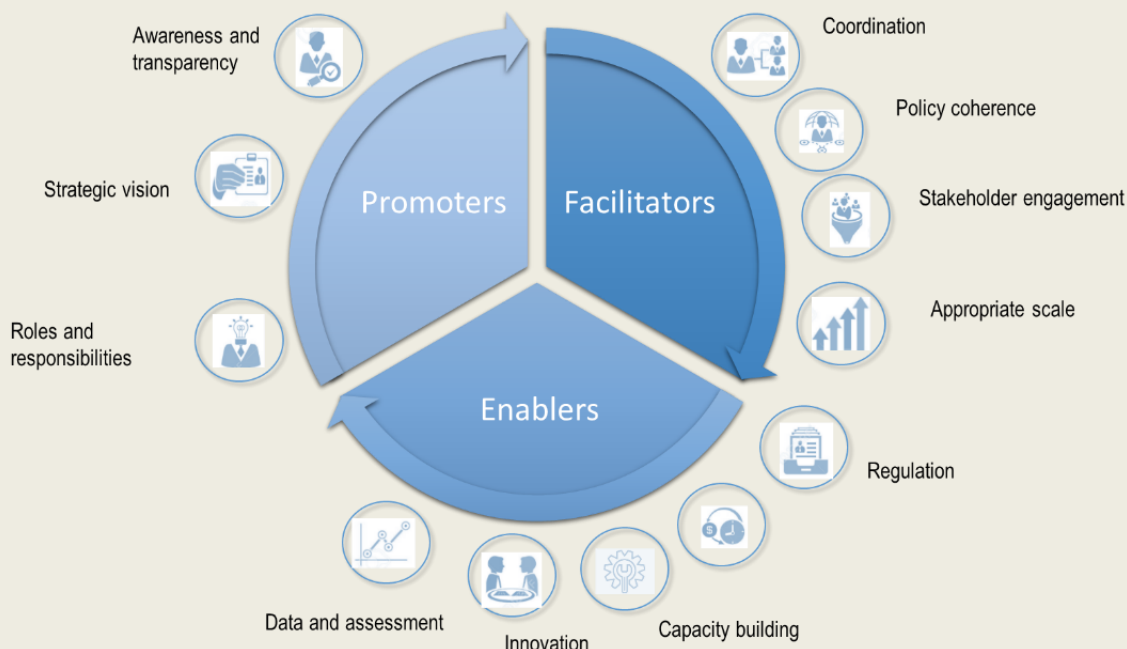
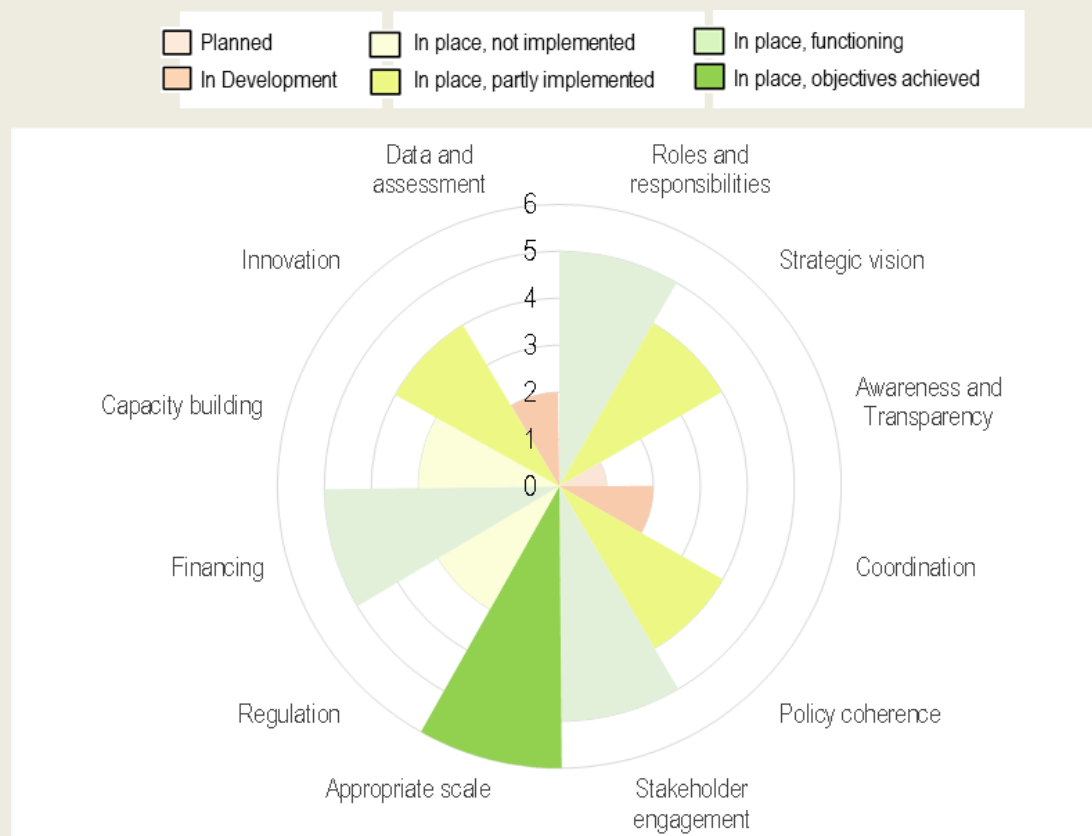


Figure 4.9. Visualisation of the results from the Scoreboard on the Governance of the Circular Economy



Based on the most “advanced” levels of implementation of the 12 governance dimensions, the city of Hamburg in collaboration with the Hamburg Chamber of Commerce could meet the following targets:

1. **Roles and responsibilities:** The government adopts circular economy principles in all policies and activities. It is a role model for citizens and businesses and leads by example. Roles and responsibilities are clearly allocated across the departments of the city of Hamburg.
2. **Strategic vision:** A circular economy strategy is in place with specific goals consistently achieved and periodically monitored and revised.
3. **Awareness and transparency:** Stakeholders are informed, clear communication is in place. Producers and consumers are aware of the opportunities and the means made available by the government to boost the transition towards a circular economy.
4. **Co-ordination:** Circular economy co-ordination mechanisms across levels of governments are functioning and leading to actions, which are monitored and revised.
5. **Policy coherence:** Departments favour co-ordination and link circular principles to key strategies as business as usual. Grey areas, overlaps, and conflicting objectives are avoided. Results are monitored and checked for further improvement.
6. **Stakeholder engagement:** Stakeholders are actively engaged in the transition towards a circular economy, as its implementation is a shared responsibility. The government facilitates contacts and collaboration.

7. **Appropriate scale:** Circular economy initiatives are embedded in a territorial approach, considering functional rather than administrative boundaries. Results are monitored and follow-up initiatives are considered.
8. **Regulation:** Regulation is fit to foster the circular economy transition (e.g. Masterplan for Climate Protection in Hamburg, Hamburg Climate Protection Law, Waste Management Ordinance). A dialogue across levels of government is established when responsibilities are shared. Results are monitored and initiatives scaled up.
9. **Financing:** Financial instruments are well functioning and impacts are monitored (e.g. promoting systematic recognition of good practices through project audits).
10. **Capacity building:** Specific capacity-building programmes are implemented. They contribute to creating new skills, technical competencies and new jobs opportunities.
11. **Innovation:** The enabling environment for supporting circular business is in place (e.g. regulation, funds) and functioning. The local or regional government provides additional tools, such as co-creation spaces, networks, one-stop-shop for businesses and capacity-building programme.
12. **Data and assessment:** Data is systematically used and updated to inform the public policy design and implementation and to promote circular business models.

Source: OECD (2020^[10]), *The Circular Economy in Cities and Regions: Synthesis Report*, OECD Urban Studies, OECD Publishing, Paris, <https://doi.org/10.1787/10ac6ae4-en>.

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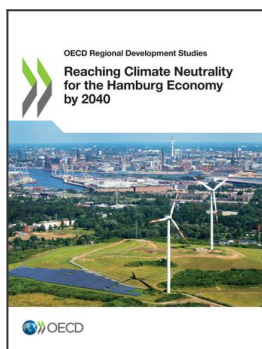
Notes

¹ The OECD Survey on the Circular Economy in Cities and Regions was launched in April 2019, and submitted to more than 100 cities from OECD and non-OECD countries. By July 2020, a total of 51 responses were provided by 47 cities, 1 regional county municipality and 3 regions, located in Europe (38), North and South America (10), Oceania (2) and Asia (1).

² <https://eur-lex.europa.eu/eli/dir/2019/904/oj>

³ The city of Hamburg and the European Union jointly fund the Interfacier project which amongst others, aims to provide Digital Product Passports (DPP) to track and trace material flows (Interfacier, 2023^[99]).

⁴ The section below provides an overview of the main initiatives already in place in the city of Hamburg, based on the information obtained during three interviews (29 August, 22 September, 17 October 2023) with stakeholders associated with the retail and hospitality industry, as well as desk research.



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