

Helsinki

Urban Environment Publications

The City of Helsinki's Roadmap for Circular and Sharing Economy





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Contents

Introduction	4
Actions in the roadmap	6
Construction	6
Circular economy goals in construction	8
Actions for 2020–2025	9
Procurements	12
Circular economy goals in procurements	13
Actions for 2020–2025	14
Green waste	15
Circular economy goals in the processing of green waste	16
Actions for 2020–2025	17
Sharing economy	18
Sharing economy and new business opportunities in circular economy	18
Goals of promoting business related to sharing and circular economy	19
Actions for 2020–2025	20

Introduction

At the moment, our society relies heavily on linear economy: products are manufactured, consumed and thrown away. This has proved unsustainable in terms of the climate, use of resources, economy and people's well-being. Circular economy is the opposite of linear economy. A key idea in circular economy is keeping products and materials in circulation for as long as possible by reusing products and recycling materials at the end of their service life to be used in new products. Circular economy is also closely connected to sharing economy which focuses on using products efficiently instead of owning them, for example through renting and sharing. This reduces the need for new products.

By moving on to circular economy, we can conserve diminishing resources and prevent waste production. Circular economy is also an effective means of combating climate change: when we reduce the use of virgin resources, we are also reducing the emissions from the production of materials.

Helsinki has recognised the significance of circular and sharing economy for solving major sustainability challenges. As stated in the Helsinki City Strategy for 2017–2021, emissions reductions and circular economy projects will be implemented in Helsinki in cooperation with the corporate world and residents. The new operating models for sharing economy, created by residents and companies, will make the City more diverse in a communal as well as economic fashion.

Helsinki City Board approved the Carbon-neutral Helsinki 2035 Action Plan in December 2018. The Plan includes a total of 147 actions through which Helsinki aims for carbon neutrality. One of them is the creation of a roadmap for circular and sharing economy.

For the first time, circular economy is one of the themes in the City's environmental policy, which is currently being updated. One of the long-term goals in the policy draft is that the City will operate in a carbon-neutral circular economy by 2050. In this economy, natural resources will be used sustainably, and the value of products and materials will be maintained in the circulation for as long as possible.

**Carbon-neutral
circular economy
by 2050**

The Urban Environment Division has prepared principles of using excavated earth, rock and demolition materials in earthworks, as well as a related action plan. Many other plans of the City and its divisions also include goals regarding circular economy. This roadmap also supports the progress towards these goals.



Preparing the roadmap for circular and sharing economy

A team consisting of representatives of the City's Environmental Services has coordinated the preparation of the roadmap. In spring 2019, City employees participated in a kick-off event for the roadmap, in which they brainstormed the theme of circular economy and discussed what circular economy means for Helsinki and the day to day of City employees. Finally, the following four focuses arose for the roadmap: construction, procurements, green waste, and sharing economy and new business opportunities in circular economy.

In autumn 2018, the City Board decided that the City should have a plan for reducing the use of plastic, either as a separate plan or as a part of the Carbon-neutral Helsinki 2035 Action Plan. Reducing the consumption of plastic is an essential part of circular economy, which is why it was decided that this topic should be included in the roadmap for circular and sharing economy. The topic of plastic is also dealt with in the Circulating All Plastics process coordinated by the Smart & Clean Foundation and in the Litter Control project of the Environmental Services.

The roadmap's focuses have been discussed in more detail in the workshops held in autumn 2019, in which experts from both inside and outside the City have participated. The team coordinating the roadmap has prepared the actions to be included in the roadmap based on the workshop results.

The timespan and goals of the roadmap are set until 2035, similarly to the Carbon-neutral Helsinki 2035 Action Plan. However, the intention is to achieve the goals gradually. At this point, the reviews cover the council terms of 2020–2021 and 2021–2025. Interim goals and supporting practical actions have been set for each focus and for both of these terms. The intention is to update the interim goals and actions in the roadmap during each council term starting from 2025 and until 2035.

The realisation of the roadmap will require additional resources for things such as putting the actions into practice, monitoring, staff training, the reports needed for the actions, and the planning and implementation of various pilots and new procedures.

Monitoring the actions

The actions in the roadmap will be recorded in the Climate Watch of the City of Helsinki. A contact person will be appointed for each action, and the progress of the actions will be monitored via the monitoring tool created for the Carbon-neutral Helsinki 2035 Action Plan.





Photo | Helsinki Marketing: Jussi Hellsten

Actions in the roadmap

Construction

The built environment globally consumes almost 50 per cent of the materials produced every year. The combined material consumption of the world's cities amounted to 40 billion tonnes in 2010. This volume is estimated to rise to 90 billion tonnes by 2050. Because of this development, carbon dioxide emissions from construction will make up almost 50 per cent of the total emissions of new buildings[1].

As energy efficiency is constantly improved, construction methods and material choices become increasingly significant. Considering all of this, it is clear that we must invest in the energy efficiency of buildings and renewable energy sources, but also in the planning and use of buildings, as well as the materials used in construction. Through circular economy solutions, it is possible to reduce the emissions from construction materials by up to 38 per cent by 2050[1].

Construction is preceded by pre-construction which creates and improves the conditions for construction. Pre-construction involves shaping the terrain through excavation, quarrying, and filling, reinforcing and lightening soft soil, cleaning contaminated soil, dismantling structures, and moving lines and cables. Often, the purpose is to prevent adverse settling of the soil during use. If the pre-construction in the Malmi Airport area is done using conventional methods, the carbon dioxide emissions of the project are estimated to amount to 340,000 tonnes between 2020 and 2050. However, we will use alternative solutions in the pre-construction, which can help reduce the emissions to under a third of the above.

Thanks to the systematic mass coordination implemented in Helsinki since 2014, 47 million euros, 6.9 million litres of fuel and 17,100 tonnes of carbon dioxide emissions have been saved by the end of 2019. It is therefore essential to take the perspectives of circular economy into consideration in entire construction processes, from land use planning to the pre-construction of area construction projects, infrastructure and building construction, maintenance and demolition.

It is essential to take the perspectives of circular economy into consideration in the entire construction process

[1]. Ellen MacArthur Foundation, Material Economics. Completing the picture, How the circular economy tackles climate change



Photo | Helsinki Marketing: Riku Pihlanto

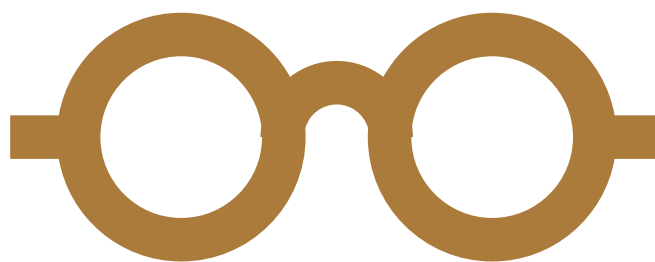
Circular economy goals in construction

2020–2021	2021–2025	2025 →	2035
We will create shared understanding of circular economy in the City's own construction projects and commit to this.	We will prepare and adopt new circular economy requirements and procedures that promote circular economy.	We will take the lifecycle costs of construction sites into account when making decisions about construction.	We will implement carbon-neutral circular economy in land use and construction; this means an economy where natural resources are used sparingly and their lifecycle carbon footprint is small.
We will increase knowledge and competences in the City's own construction projects to define circular economy requirements.	We will continue the pilots of various circular economy requirements.	We will establish circular economy criteria and new procedures for construction in the City's own construction projects, design competitions and plot conveyance conditions.	
We will pilot the first circular economy requirements in the City's own construction projects, design competitions and plot conveyance conditions.		We will apply circular economy requirements on market-determined construction through land use planning and licencing, among other measures.	



Actions for 2020–2025

Education and communication



Action	Party responsible	Schedule
1. Providing the various actors in City construction (from land use planning to the maintenance of infrastructure and buildings) and building users with customised training on the basics of circular economy; collecting practical examples and options of circular economy solutions for construction. We will also extend education and information to political decision-making.	Services and Permits / Environmental Services / Building Control, Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production / Maintenance, Land Use and City Structure, Heka, Divisions	2020–2021

Land use and planning

Action	Party responsible	Schedule
<p>2. Defining the promotion of circular economy as a key premise in land use and urban planning.</p> <ul style="list-style-type: none"> • Influencing preservation of existing building frames and parts through markings in the detailed plans, orders and incentives. Incentives may include the volume of building rights, for example. • Taking circular economy into account when repurposing buildings. • Directing actors to low-carbon construction through detailed planning. • Enabling low-carbon pre-construction and infrastructure construction. • Planning urban structure that supports circular economy. 	Land Use and City Structure, Buildings and Public Areas / Built Assets Management / Construction Contracting, Services and Permits / Environmental Services, Executive Office / Area Construction	2020 →
3. Piloting the use of circular economy criteria in plot conveyance conditions. Adopting functional solutions.	Land Use and City Structure, Executive Office / Area Construction	2020–2025

Infrastructural construction

Action	Party responsible	Schedule
4. Creating an internal operating model for the City concerning the use of surplus materials (excluding land masses), for example via the City's recycling website.	Stara, Land Use and City Structure, Buildings and Public Areas / Maintenance	2020–2021
5. Studying the opportunities for reducing the amount of concrete and using low-emission concrete or substitutes for concrete in the City's infrastructure. Similarly, promoting the use of binding agents made of recycled materials in deep stabilisation, which will reduce the use of high-emission cement and burnt lime as binding agents.	Buildings and Public Areas / Built Assets Management, Land Use and City Structure, HKL	2020–2022
6. Reducing the use of plastic filter cloths. Studying the opportunities for using recycled plastic or other recycled materials in technical structures, such as noise barriers, and piloting them at sites selected separately.	Land Use and City Structure, Buildings and Public Areas / Built Assets Management / Construction Contracting, HKL	2020–2022
7. Implementing lifecycle pilots for four different types of areas: 1) Railway, 2) Street, 3) Park, 4) Pre-construction. <ul style="list-style-type: none"> Defining circular economy goals for each area and scoring them in calls for tenders. Implementing projects, starting from goal-setting and project planning, in extensive collaboration between various actors, from planning to maintenance. Calculating the lifecycle costs and carbon footprints of the options. Implementing light market dialogues. 	Buildings and Public Areas / Built Assets Management / Construction Contracting / Maintenance, Land Use and City Structure, HKL	2020–2022
8. Transferring good and functional practices into processes, instructions and models that will also steer future projects, based on the experiences of Actions 5–7. <ul style="list-style-type: none"> Including aspects such as climate change prevention and mitigation, promoting circular economy, and protecting natural diversity into the maintenance classification of public areas. 	Buildings and Public Areas / Built Assets Management / Maintenance, Land Use and City Structure, Development Services, HKL	2022–2024
9. Promoting the development of national emissions calculations for infrastructural construction in collaboration with the Ministry of the Environment, the Finnish Transport Infrastructure Agency, the Finnish Environment Institute and experts (universities, consultants, etc.).	Buildings and Public Areas / Built Assets Management	2020 →

Building construction

Action	Party responsible	Schedule
10. Studying the opportunities for reducing the amount of concrete and using low-emission concrete or substitutes for concrete in the City's building construction.	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL, Services and Permits / Environmental Services	2020–2021
11. Planning and implementing new construction and renovation projects that follow the principles of circular economy. <ul style="list-style-type: none"> The planning will focus on the following circular economy criteria: smart use of building materials, flexible modifiability, modularity, use of recycled and repurposed materials, maintainability and repairability, ease of demolition and reusability. Calculating the lifecycle costs and carbon footprint of each project. 	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2020–2025
12. Adding circular economy requirements to the planning and implementation of service buildings and housing, based on experiences of Actions 10–11.	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2021 →
13. Compiling comparable data on the lifecycle costs of construction projects, based on Action 11. This data will be used as the basis for decision-making in future construction projects.	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2021 →

Demolition

Action	Party responsible	Schedule
14. Adding circular economy requirements to demolition contracts.	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka	2020–2021
15. Preparing and adopting an operating model for reusing furniture and building parts from demolition and renovation projects.	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, Services and Permits / Building Control	2020–2023



Procurements

The City of Helsinki makes procurements worth more than two billion euros every year. This equals approximately 40 per cent of the City's expenses[2]. The volume of procurements is significant, which means that our procurements are also significant for the environment. When we add criteria that promote circular economy to our procurements, we can reduce the consumption of materials, waste production, transport, and the related emissions. Helsinki has several development projects underway regarding the promotion of low-carbon procurements and the calculation of the procurements' carbon footprint.

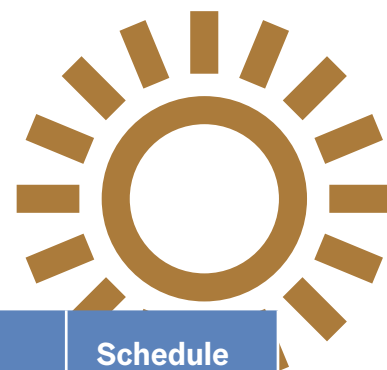
[2]. Carbon-neutral Helsinki Action Plan https://www.hel.fi/static/liitteet/kaupunkiymparisto/julkaisut/julkaisut/HNH-2035/Carbon_neutral_Helsinki_Action_Plan_1503019_EN.pdf

Circular economy goals in procurements

2020–2021	2021–2025	2025 →	2035
We will raise awareness of procurement methods that promote smart use of resources and improved lifecycle impact.	We will move on to service procurements in the product groups where it is considered feasible.	All of the City's procurements will include circular economy criteria.	The key principles in the City's procurements will be using virgin resources sparingly and preventing waste production.
We will add criteria that support circular economy in the City's procurements.	We will add criteria that support circular economy in the City's procurements.	The City will actively monitor the development in the use of recycled plastic and materials that can replace plastic. New solutions will be piloted and adopted.	
	The City will give up the unnecessary use of plastic in its procurements.		



Photo | The City of Helsinki: Vesa Laitinen



Actions for 2020–2025

Action	Party responsible	Schedule
16. Preparing an organisation-wide policy on the catering in meetings and events. The purpose of the policy will be to reduce food waste from catering, reduce the environmental impact of the food served, and reduce the use of disposable plates and cutlery.	Services and Permits / Environmental Services	2020
17. Before procuring new indoor or outdoor furniture, the client will examine the furniture available on the City's recycling website and primarily use this recycled furniture. Next, the client will examine the opportunities of procuring the furniture second-hand, through renting or as a service. This policy will be included in the City's procurement strategy and the division-specific procurement instructions.	Procurements and Tendering, all divisions and City enterprises	2020–2021
18. Preparing instructions on supply procurements that will concern the entire City organisation and that will be specified for each division. The purpose of the instructions will be to optimise order volumes, make the use of supplies more efficient, and thus reduce unnecessary consumption and waste.	Environmental Group for Procurements, all divisions and City enterprises	2020–2021
19. Studying the lifecycle impact of alternative materials used in outdoor furniture. Procurement criteria will be prepared based on this study in order to pilot the use of the materials. Alternative materials will be surveyed in the planning and market survey phase of procurements.	Land Use and City Structure, Buildings and Public Areas / Maintenance, Services and Permits / Environmental Services	2020–2022
20. Adding criteria that promote the sustainability of products (such as furniture, machinery, vehicles, ICT equipment) to the City's procurements. The criteria may be related to the lifecycle, maintainability of the materials, guarantee period, repairability and recyclability. The criteria may be minimum requirements or grounds for comparison.	Procurements and Tendering, all divisions and City enterprises	2020–2025
21. Studying the product groups in which service procurement is a better option compared to product procurement, in terms of lifecycle impact. Service procurements will be used for these product groups.	Services and Permits / Environmental Services, Environmental Group for Procurements, all divisions and City enterprises	2020–2025
22. Preparing procurement criteria through which the use of unnecessary disposable products and single-packed products will be reduced.	Environmental Group for Procurements, all divisions and City enterprises	2020–2025



Photo | Helsinki Marketing: Jussi Hellsten

Green waste

The maintenance of the City's public areas produces various types of green waste, such as leaves, grass, weeds, twigs and branches. At the moment, the methods of processing different types of waste vary. Some of the green waste is composted by the City, and the composted products are used in the City's own construction sites. However, some types of waste are sold to be processed elsewhere or transported to be incinerated among mixed waste. The solutions related to the processing of green waste should be developed and made more efficient so that we can keep the value bound in the waste in circulation, and reduce the emissions from the processing and transport of waste.

Circular economy goals in the processing of green waste

2020–2021	2021–2025	2025 →	2035
We will raise awareness of alternative ways of processing green waste and recycling nutrients.	We will raise awareness of alternative ways of processing green waste and recycling nutrients.	The City's own operations will move towards a closed circulation of green waste and nutrients.	The processing of green waste from City areas will be based on circular economy in which the value of materials remains as high as possible and nutrients are reused efficiently.
	We will pilot new methods of processing green waste.	Collaboration with private operators and the other cities and municipalities in the Metropolitan Area will increase.	
	The City will receive consistent goals and an operating model.		



Photo | Helsinki Marketing: Lauri Rotko

Actions for 2020–2025

Action	Party responsible	Schedule
23. Piloting new technologies for the sustainable utilisation of green waste. <ul style="list-style-type: none"> Continuing the collaboration with HSY to use the pyrolysis process for the City's green waste. In the pilot phase, the invasive species waste from Stara's operations will be offered for testing purposes. Examining the possibility of participating in the 'city refinery' demonstration project of Helen, VTT and Lassila & Tikanoja. 	Buildings and Public Areas / Maintenance, Stara, HSY, Executive Office, Helen, Services and Permits / Environmental Services	2020–2025
24. Participating in projects that study and promote the use of biochar. <ul style="list-style-type: none"> We will actively monitor the preparation of the national guidelines on the use of biochar. We will network with other operators, for example via the biochar map of the Finnish Biochar Association. 	Land Use and City Structure, Buildings and Public Areas / Maintenance	2020 →
25. Developing an operating model for the City for processing green waste and producing culture media.	Land Use and City Structure, Buildings and Public Areas / Maintenance, Stara	2022–2023



Sharing economy

Sharing economy and new business opportunities in circular economy

Sharing economy means the sharing and co-using of supplies, facilities and services, often with the help of digital platforms. In sharing economy based on the principles of circular economy, existing resources can be used efficiently, which will reduce the need for new products and the consumption of resources.

The City of Helsinki has already taken its first steps in sharing economy, for example by offering its residents the City's vacant premises for work or meetings via various digital services. However, there are still ways to go: the City still has underused premises that need to be used more efficiently. The perspectives of sharing economy also need to be considered when planning new areas, so that we can ensure the need for and efficient use of the future premises. All of this will require us to adopt new operating models, but, at its best, it may reduce the need for new construction.

Circular economy is estimated to provide significant growth opportunities for business and employment in Finland. The sustainable growth of circular economy and the related sharing economy will require new innovation and collaboration across divisions and interest groups. The City can act as an important platform and facilitator in these matters. One of the goals is to create conditions for urban and industrial symbioses where operators add value for each other by using each others' material and energy side flows, technology and services. Efficient use of resources increases the value of the resources and reduces the risk of market fluctuations.



Goals of promoting sharing economy and business related to circular economy

2020–2021	2021–2025	2025 →	2035
We will increase understanding of the utilisation rate of the City's premises.	The use of vacant and underused premises controlled by the City will be made more efficient.	The premises owned by the City will be used efficiently.	Space utilisation and sharing economy solutions will be an integral part of urban planning.
We will collect and share information of various sharing economy services.	We will share information of various sharing economy services.	The inclusion of sharing economy in land use and facility planning will be developed further based on experiences gained.	Residents will use the available sharing economy services actively and extensively.
The first model for strengthening the ecosystem of bio-economy and circular economy companies will be created.	The first tools for promoting sharing economy in land use and facility planning will be developed and adopted.		The opportunities provided by bio-economy and circular economy will be routinely taken into consideration in urban planning.
	An operating model that serves bio-economy and circular economy companies will be adopted.		



Actions for 2020–2025

Action	Party responsible	Schedule
26. Preparing the principles for promoting sharing economy in detailed planning. We will require: <ul style="list-style-type: none"> • Neighbourhood-specific plans for shared premises and shared and rentable electric car charging points. • Facility reservations for sharing economy services in land use planning. • At the minimum, cables for smart locking systems in buildings and carparks. 	Land Use and City Structure, Executive Office / Area Construction	2020–2022
27. Preparing a guide on circular and sharing economy services available for residential buildings. The guide will provide support for identifying the building's and residents' needs and purchasing and using the services that meet these needs.	Forum Virium, Heka, Services and Permits / Environmental Services	2020–2021
28. Preparing City-level planning instructions for premises used by residents. The instructions will concern the City's new service buildings and those to be renovated. <ul style="list-style-type: none"> • The instructions will include policies on smart locking solutions, facility compartmentalisation, and connecting building automatics to the reservation systems. 	Buildings and Public Areas / Built Assets Management, Culture and Leisure, Heka	2020–2022
29. Creating a monitoring system for the use of the City's premises, with the aim of using the premises more efficiently. <ul style="list-style-type: none"> • Integrating a monitoring system into the facility reservation systems. • Integrating facility reservation systems into the building automation in new buildings and those to be renovated. 	Buildings and Public Areas / Built Assets Management, and the group under the management model for facility reservations (all divisions)	2020–2022
30. The planning of the City's service buildings will include active seeking for solutions that can make the utilisation of the premises more efficient and avoid unnecessary construction. <ul style="list-style-type: none"> • Building flexibly modifiable multi-purpose spaces. • Testing solutions similar to "school as a service," in which rarely used premises are rented from other operators. 	Education, Culture and Leisure, Social Services and Health Care, Buildings and Public Areas / Built Assets Management	2020 →
31. Preparing the City's model for strengthening the ecosystem of bio-economy and circular economy companies. The goal is to create conditions for industrial and urban symbioses where operators add value for each other by efficiently using each others' side flows, technology, services and energy.	Executive Office / Economic Development / Area Construction, Land Use and City Structure	2020–2021

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Summary:

The City of Helsinki's Roadmap for Circular and Sharing Economy is one of the 147 actions in the Carbon-neutral Helsinki 2035 Action Plan. The roadmap includes the following four focuses: construction, procurements, green waste, and sharing economy and new business opportunities in circular economy. One topic in the roadmap is the reduction of the consumption of plastics and increased utilization of recycled plastics.

The roadmap has been processed in workshops in collaboration with experts from both inside and outside the City. A team consisting of representatives of the City's Environmental Services has coordinated the work.

The goals for each focus are set until 2035. At this point, more detailed reviews cover only the council terms of 2020–2021 and 2021–2025. Interim goals and supporting practical actions have been set for each focus and for both of these terms. The intention is to update the interim goals and actions in the roadmap during each council term starting from 2025 and until 2035.

The actions in the roadmap will be recorded in the Climate Watch of the City of Helsinki.

Keywords Circular economy, sharing economy, roadmap



Helsinki

The Urban Environment Division is responsible for planning, construction and maintenance, building supervision and environmental services in the Helsinki city environment.