



Helsinki

City of Helsinki Climate Action Plan 2026–2029

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Photo: Timo Niukkanen

Climate work cannot wait – Helsinki is building a sustainable future

Reducing emissions globally is essential to safeguard the viability of our planet and the well-being of people in the future. At the same time, it must be remembered that reducing emissions alone is not enough - the amount of carbon dioxide in the atmosphere must also be actively reduced to keep the planet healthy. Climate work also involves questions of justice; the aim is to enable a good life all over the world, within the limits of the planet's sustainability.

Adaptation is no longer optional, it is necessary. At the same time, global mitigation measures need to be taken urgently, as postponing them significantly increases costs and weakens the ability to adapt to the increasing impacts of climate change.

Cities are significant sources of emissions, as a large part of the population and economic activities are concentrated in them. Urban areas are estimated to account for approximately 70 per cent of global greenhouse gas emissions, particularly due to the energy consumption of buildings and traffic. At the same time, cities have access to many means of influencing emissions development, such as

land use management, transport systems, energy solutions and procurement. Cities are also vulnerable to the effects of climate change: dense construction and impermeable surfaces retain heat and reduce water absorption, making them more sensitive to extreme weather events such as heatwaves and heavy rainfall.

In Helsinki, the effects of climate change can already be felt. Heatwaves, heavy rainfall and increased slipperiness affect the everyday life, health and safety of the city's residents and challenge the sustainability of infrastructure. Adaptation is no longer optional, it is necessary. The city's most vulnerable residents need to be protected from the effects of changing climate. At the same time, global mitigation measures need to be taken urgently, as postponing them significantly increases costs and weakens the ability to adapt to the increasing impacts of climate change.

Emission reduction work has a long history, and in many respects, it has become an established part of the city's normal operations. In the new strategy, the emission reduction target for direct emissions (scope 1 and 2) has been reduced to 85 per cent. The strategy no longer includes a carbon neutrality target. Helsinki's previous carbon neutrality target meant that, in addition to the 80 per cent emission reductions, a maximum of 20 per cent of emissions could have been offset by

buying carbon credits from the voluntary carbon market. If the city had implemented this with high quality, it would have been very expensive for taxpayers, and cheaper offsetting measures would have jeopardised the effectiveness and credibility of the measures. Instead of offsetting, the city has decided to allocate resources to actual emission reductions in the Helsinki area. Helsinki also has a net zero target for 2040. This means that the greenhouse gas emissions generated within the city (scope 1 and 2) and natural carbon sinks and carbon removals are in balance.

The climate and nature are among the cornerstones of the City Strategy, and in the future, climate work will be increasingly based on measures that bring multiple benefits. A climate-resilient Helsinki is created through solutions that make the everyday lives of the city's residents better. When several benefits are considered in planning at the same time, both adaptation and emissions reduction support people's well-being. This helps to make urban

spaces more comfortable, strengthen the vitality of neighbourhoods and promote biodiversity. For example, increasing the share of green structures helps to slow down stormwater and prevent the heat island phenomenon. At the same time, it strengthens biodiversity, promotes health and offers places for recreation. Increasing sustainable modes of transport that replace car traffic reduces traffic emissions and improves air quality, traffic safety and the noise situation. At the same time, it makes people move more, supporting their health and well-being. Energy-efficient improvements in indoor air quality and ventilation of buildings reduce energy consumption and emissions. At the same time, they support client and patient health and staff well-being in the city's service buildings. Switching to plant-based meals reduces the climate impact of food services and supports nutritional recommendations. Developing low-carbon design, construction and maintenance improve cost efficiency and creates jobs in the green transition.

 According to the Environmental Attitudes in the Helsinki Metropolitan Area study carried out in 2022, and the communications survey carried out in 2024 (City of Helsinki 2024), Helsinki residents strongly support the city's climate goals and recognise their own role in adapting to and mitigating climate change.

Vision: Helsinki operates in a changing climate

During the 2025–2029 City Council term, Helsinki will strengthen its overall resilience, i.e. its ability to adapt to the effects of climate change and recover from disruptions. Climate issues are not separate projects, but a cross-cutting principle in all planning, investments and decision-making in the city.

Preparation is proactive, and the city manages risks before they materialise. The impacts and solutions of climate change are most visible locally, in city blocks, traffic environments and public areas, which is why the planned measures are close to people's everyday life. Nature-based solutions and structures that preserve existing nature reduce heat and flood risks. They bind carbon and make the urban environment more pleasant and safer.

The building stock and infrastructure are designed to withstand heat, floods and storms. Attention is paid to the adaptive capacity of vulnerable groups of people. Investments are focused particularly on children, young people, the elderly, people with long-term illnesses and around-the-clock services.

Emission reduction work has moved to a new phase. The city has reduced its emissions significantly, particularly in energy production, and an increasingly large proportion of the remaining direct emissions are related to traffic. Indirect emissions mainly arise from construction and the consumption of goods and services. In addition, they are caused by the city's own operations and services, such as

procurement, food services and the use of products. The everyday choices of residents also have a significant impact on the total emissions. In addition to direct emission reductions, Helsinki is also responsible for climate and nature impacts beyond its borders by reducing indirect emissions. Future decisions regarding land use, urban investments and infrastructure will affect how quickly and cost-effectively emissions can be reduced. They can also prevent carbon lock-ins, i.e. situations where current solutions, investments or operating methods bind society to high emissions for a long time, even if better alternatives are available. Emission reduction work is coordinated with the other objectives of the City Strategy.

The impacts and solutions of climate change are most visible locally, in city blocks, traffic environments and public areas, which is why the planned measures are close to people's everyday life.

Climate work strengthens Helsinki's attractiveness and competitiveness in a sustainable way and supports the city's position as an international example of urban development, where climate sustainability and high-quality urban life go hand in hand.

Climate targets

Climate targets of the City Strategy and Helsinki's environmental protection

According to the Helsinki City Strategy 2025–2029, Helsinki exists for its current and future residents. The aim is to build a city that not only grows but also develops sustainably and responsibly. Amidst all the new and exciting things, the world is full of complex problems: wars, warming climate, biodiversity loss. The consequences of these issues are visible in cities, but cities also have the opportunity to influence and prepare for them and increase their resilience.

Helsinki prepares for the extreme weather events caused by climate change proactively and minimises risks. It prepares for the impacts by taking into account the requirements for adapting to heavy rainfall, floods and heat in the city's infrastructure and site planning. Land use planning and construction are ways to mitigate the formation of heat islands indoors and outdoors in the city. Stormwater, seawater and waterway flood preparedness is at an adequate level in Helsinki. There will be more greenery and green areas in the urban structure, such as along streets, squares and other public outdoor areas, and the city will ensure that there are also parks in newly constructed areas. New daycare centres will be built on children's terms by ensuring sufficiently large and diverse yards with green areas. The share of nature and green areas will also be increased in existing areas. The aim is to increase trees and canopy cover.

Helsinki takes responsibility for climate change mitigation. Helsinki is committed to ambitious climate targets. Emissions will be reduced by 85 per cent from 1990 levels by 2030. Helsinki will achieve

net-zero emissions (emissions and sinks are in balance) by 2040. Traffic emissions are reduced by ensuring the attractiveness of public transport and other more sustainable modes of transport. The aim is for more residents to choose public transport as their mode of transport. The city promotes the electrification of motor vehicle traffic by ensuring the construction of charging infrastructure together with private operators. The city's ports offer shore-based electricity for vessels and the prerequisites for the electrification of ship traffic. Traffic in the nearby waterway area will also be electrified. Non-combustion energy production plays an important role in reducing climate emissions and mitigating environmental impacts. Helsinki is also making provision for possible small-scale nuclear power production, if the changes in regulations allow this.

In reducing indirect emissions, Helsinki focuses on reducing emissions from building and infrastructure construction as well as public procurement. The city is a pioneer, for example, in the use of carbon-binding concrete and in accelerating other low-emission or circular construction solutions. The city will introduce a more stringent carbon footprint requirement for the construction of apartment buildings. The circular economy of construction is one of the growth sectors identified in the City Strategy. As Finland's largest public purchaser, Helsinki also works to reduce indirect emissions and the impact on nature through procurement decisions. Helsinki develops methods for calculating indirect emissions and monitors and supports the reduction of the carbon footprint of its residents.

Climate work takes place in broad-based cooperation

Climate work requires close cooperation between the city's stakeholders, decision-makers and services. Information sharing, common operating models and open interaction ensure that expertise and solutions are widely disseminated and support strategic climate goals. The residents and the organisations that represent them, companies, RDI operators and international networks and projects are also important partners in the implementation of the Climate Action Plan and the development of new solutions. Cooperation with these parties strengthens the ability to test and scale new climate solutions and supports market development.

In addition to the Climate Action Plan, the city implements its climate targets through many other programmes, commitments and agreements (Appendix 1.). Climate work is also widely reflected in the everyday work of civil servants, such as education at schools, land use planning, green area planning, energy efficiency measures in buildings, and social, health and rescue services, which help the elderly and other vulnerable groups with adapting to heat. The climate targets of the City Strategy 2025–2029 apply to the entire city group, and the communities belonging to the group are expected to contribute to promoting them in their operations within the framework of their own community legislation.

City of Helsinki Climate Action Plan 2026–2029

Helsinki

Climate risks



Floods



Heatwaves



Heavy rainfall

Carbon sinks



Distributed energy generation



Indoor cooling



Urban planning



Outdoor shading and cooling



Zero-emission and low-carbon construction



Transport electrification, sustainable modes of transport



Procurement



Floods, water management



Strengthening green infrastructure



Starting Points of the Climate Action Plan

Emissions will be reduced by 85% by 2030

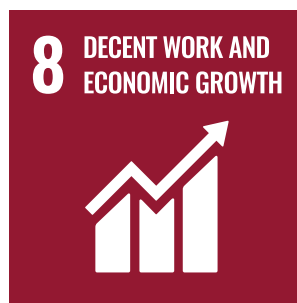
Net-zero emissions by 2040

Protecting vulnerable groups

Preparing for future climate conditions

Local action and strengthening green infrastructure

The Climate Action Plan
contributes towards these UN
Sustainable Development Goals



Structure of the Climate Action Plan and implementation of climate work

The Helsinki Climate Action Plan meets the targets of the [Helsinki City Strategy](#) 2025–2029 and Helsinki's 2040 targets for environmental protection. It covers both preparedness and adaptation to the effects of climate change and climate change mitigation, which includes both reducing emissions and strengthening carbon sinks. The Climate Action Plan describes the measures for climate work, as well as the monitoring and reporting of the programme. The Climate Action Plan replaces the city's previous emission reduction programmes and climate change adaptation policies from 2019–2025.

The Climate Action Plan covers both preparedness and adaptation to the effects of climate change and climate change mitigation, which includes both reducing emissions and strengthening carbon sinks.

The climate is already changing, and the impacts are visible in Helsinki no matter how quickly emissions are reduced globally. Therefore, the programme first deals with preparedness and adaptation, which are immediate and local measures to ensure the well-being and safety of urban residents and infrastructure. This

is followed by a discussion of emission reductions and strengthening carbon sinks, which are crucial for long-term climate resilience and global climate responsibility. Helsinki strengthens its position as a pioneer in climate work by ensuring that its measures produce concrete results. The guiding principles of climate work are focus on risks, responsiveness and measures that bring multiple benefits. The city allocates resources where they are estimated to produce the greatest climate benefit. The assessment of benefits is based on research data, anticipation and an understanding of who the impacts are targeted at, and a review of cost-effectiveness.

The Climate Action Plan does not include detailed annual measures. Instead, measures are part of normal operational planning, prepared in accordance with the annual economic clock. This ensures the availability of the latest information for the preparation, considers the development of regulation and technology and ensures the ability to react to rapidly changing situations. In addition, there are other programmes with climate targets, including measures that are implemented according to the programme-specific schedules.

Preparedness and adaptation

The following chapter describes how Helsinki prepares for the extreme weather events caused by climate change and strengthens its long-term adaptive capacity. This chapter summarises the key priorities, principles and measures of the City Council term. It also describes the city's climate risk assessment method and plans and programmes promoting preparedness and adaptation.

Priorities and principles

Priorities for the City Council term:

→ **Systematic preparation for key climate risks**

- The city defines clear preparedness levels for the management of flood risks and periods of hot weather.
- The responsibilities within the organisation are clear, and there is a common prioritisation model for security measures.

→ **Helsinki develops climate risk information, keeping it up-to-date and usable as an everyday tool**

- More specific and refined risk information will be available for the city's experts.
- The data is used as a basis for decision-making and integrated into urban planning, street planning and new and renovation construction.
- Risk information is communicated internally within the organisation to both residents and property owners.

→ **Developing climate risk management measures**

- Flood risk and wind-driven rain management
 - The assessment of flood risks and the modelling and dimensioning of indoor temperatures in public buildings are based on future climate conditions.
 - The dimensioning criteria for flood management will be updated to reflect changing weather and climate conditions.
 - The city will systematically identify, prioritise and remedy flood risk sites.
 - The weather and climate resistance of the outer shells of public buildings will be strengthened.

• Controlling heat and heat islands

- Helsinki will update the cooling requirements to correspond to future heat periods.
- Passive cooling solutions include urban greenery, canopy cover and other shade areas.
- The cooling solutions of public buildings are governed by a prioritisation plan, which is drawn up based on the size of the property portfolio. It identifies the properties where centralised building-specific cooling systems are necessary and where cooling can be solved by other means.

→ **Strengthening green infrastructure locally**

- The city maintains and increases urban greenery on streets, track areas, squares, yards and plots.
- Private properties and housing companies are involved through guidance and advice.
- Helsinki will set binding targets for canopy cover and water-absorbing surfaces in all areas of the city.

→ **Protecting the most vulnerable groups of people is a priority**

- The priority is to protect children, the elderly and those with long-term illnesses from the effects of climate change.
- Priority is given to the cooling of daycare centres, schools and round-the-clock care properties and the naturalisation of their yards.

The principles guiding the planning of the built environment:

1. “Take care of adaptation first” and identify and enable the multiple benefits of adaptation solutions.

Adaptation does not have to be the most important aspect of planning, but thinking about it right from the start of the planning is a prerequisite for overall success. This is also usually the easiest and most cost-effective way to leverage existing natural processes and avoid costly and technical solutions that can be difficult to implement and maintain, and that usually have a more limited impact on adaptation and the realisation of multiple benefits.

2. Base your planning on the climate of the future, not the past.

The urban structure that we build today will face the conditions prevailing in 2050 and 2100. Planning and construction must involve a sufficient target level of preparedness and adaptation, which is based on future climate scenarios.

3. Preserve existing trees and other green infrastructures, existing soil and existing water flow paths and catchment areas as an adaptation solution and avoid building new impermeable surfaces.

Trees, soil, vegetation and water areas form the city’s most important natural system that helps to control water and cool the environment. The existing and diverse green infrastructure and its soil promote adaptation immediately and tolerate changes better than new planted vegetation. Another goal is to improve the ecological status and biodiversity of the current green infrastructure.

4. Implement the order of priority for stormwater management.

1. Primarily, stormwater is treated and utilised at its source.
2. Stormwater is discharged from its source by means of a slowdown and delay system.
3. Stormwater discharged from its source enters the slowdown and delay areas located in public areas within the stormwater sewer network before it is discharged into the water system (stream).
4. Stormwater is discharged directly into the receiving water system in the stormwater sewer.
5. Stormwater is discharged to the Viikinmäki sewage treatment plant via a mixed sewer.





Photo: Unto Rautio

Successes in adaptation work

For years, Helsinki has been implementing several policies and measures to promote preparedness and adaptation to the changing climate. An example of these is the policy that the design solutions for new service buildings are based on future climate conditions, which are modelled using the Finnish Meteorological Institute's 2050 test weather data. As a result, a centralised cooling system is a requirement in most service buildings. The city has instructions for its staff on how to act during periods of heat, for example, in nursing homes and daycare centres.

The aim of urban planning is to maintain and increase the green infrastructure by means of a plot-specific green factor, for example. The piloting of the regional green factor will continue in large-scale planning projects, while the further development of the method is under preparation.

Stormwater management is an everyday practice, but the aim is to increase nature-based solutions that provide other benefits to residents in addition to water management. The tramway from Kalasatama to Pasila is a great example of a new way of designing traffic environments. The green tramway also promotes

adaptation by managing stormwater, and the diverse habitat increases comfort and creates a beautiful local environment. The city has converted parking spaces into planted areas at a rapid rate, creating visible changes at a local level.

The city is planning local snow management. Snow could be stored at the allocated sites, and the same sites could be used during the non-snowy season for stormwater management and as water reservoirs in case of drought seasons.

Planning for proactive adaptation requires knowledge of future changes and their impacts. Helsinki has been strengthening this knowledge base and, for example, investigating the probabilities of heavy rainfall and urban flood areas and their changes as the climate changes. Helsinki has developed materials for the assessment of canopy cover and mapped out hot areas of the city. The materials are available to the city's planners and experts in the geospatial service. The exchange of information between different sectors and the rescue services is regular and promotes learning and the proactive planning of preparedness and adaptation.

Risk management approach

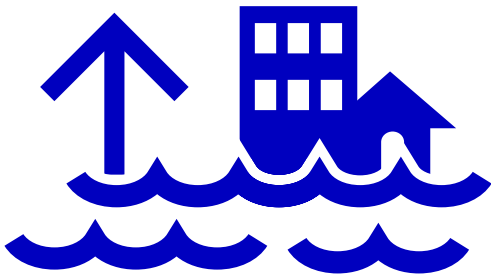


i Definition of preparedness

In the field of security and risk management, preparedness is defined as “activities that ensure the uninterrupted performance of tasks and the necessary exceptional measures in disruption and emergency circumstances” (The Finnish Terminology Centre 2017). In this case, preparedness concerns disruptions and emergency situations, operations during them and how to cope with them. The rescue services are an important operator in climate-related disturbances and crises. In the event of a disruption, the rescue services protect people, property and operations from threats. Preparedness measures include preparedness planning, continuity management, advance preparations, training and exercises. Preparedness planning is a process that identifies threats related to various security situations and their impacts on the organisation’s tasks and operations and secures one’s own operations and performance in the situation as well as the ability to return to normal in a controlled manner (Rescue Services). In this programme, preparedness is defined differently and refers to preparing in advance for extreme weather events and reducing their potential impacts.

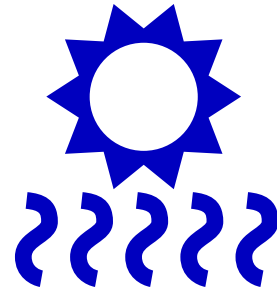
i Heavy rains

Precipitation volumes will increase and heavy rainfall will intensify in the climate of the future. The change will be most evident in heavy rainfall, which is expected to occur with an annual probability of 1–10 per cent. Significant increases in precipitation volumes and intensified rainfall can significantly increase the risk of flooding. Approximately 30 flood areas have been identified in the heart of Helsinki, which could cause considerable damage in the future climate conditions. Practical events also show the city’s vulnerability: for example, the heavy rainfall in August 2023, which caused extensive flooding, corresponded to an annual probability of approximately five per cent in the current climate and caused significant disruptions due to the flooding of metro tunnels and basements, among other things. The annual probability of this kind of precipitation is expected to multiply in the future climate conditions. These observations have led to the city’s policy, which prepares for rainfall with a probability of occurrence of one per cent per year (approx. 51 mm per hour) for the climate in the city centre and extends the modelling tools and planning guidelines to the entire city.



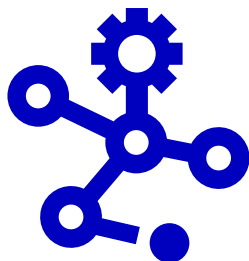
i Sea level rise

Rising sea levels and flooding during storms pose a serious long-term risk. Due to the rise in the sea level of oceans, the sea level in Helsinki may rise by approximately 30–70 centimetres by the end of the century, and sudden rises in water level in connection with storms can cause flood risks, especially for shallow and densely built shore areas. This threatens both buildings and parks, as well as critical utility technology, such as pumping stations and shoreline services. The rise in sea level affects, in particular, the guidelines for safe building elevations, land use planning and the need for protective structures, which is why preparations must be made well in advance before the risks materialise. These effects occur slowly, but they are long-lasting and expensive to repair afterwards



i Heat

Heat is a significant risk factor for Helsinki, as it has already caused concrete effects in the past: the heatwave of 2010 led to approximately 90 excess deaths in Helsinki (Ruuhela et al. 2020). Long periods of heat lasting more than two weeks have previously been rare in Helsinki. However, there have been six long heat periods since the 1990s, and their probability will continue to increase soon. A very severe heatwave, which previously occurred approximately once every hundred years, may occur every six years by the middle of the century (Ruosteenoja and Jylhä 2023). Periods of heat also last longer. Since the 1960s, the number of hot days has increased by two per decade, which means that in the current climate, the hot period is 14 days longer than in the 1960s. The structural characteristics of the urban environment exacerbate the risk: the urban heat island effect increases night-time temperatures, especially in densely built-up areas, increasing heat stress and impairing recovery. The time spent in hot weather will also increase and may be up to 12 hours a day in a large part of the Helsinki area during heat periods (Saranko et al. 2025). The risks are particularly targeted at vulnerable groups, such as the elderly, people with long-term illnesses and children.



i Adaptive capacity

Adaptive capacity is defined as a system's ability to adapt to climate change, mitigate potential damage, exploit different opportunities and cope with consequences (IPCC 2001). In addition to the actual adaptation measures, other characteristics that support the adaptation of society also influence adaptive capacity. These include, for example, good governance and citizens' trust in the authorities, comprehensive health care, high-quality and effective water and waste management, the quality and maintenance of infrastructure, such as roads and networks and residential buildings, as well as the functioning of society in general and in disruption situations. Adaptive capacity is also affected by the security of society and people's feeling of security and trust in other people. Even effective adaptation measures will not meet their goal if society's structures do not support them. For example, preparing for increasing heavy rainfall in the city also requires a functioning water supply network, and a lack of trust in

the authorities can lead to opposition to flood protection measures. Legislative support for the adaptation measures is often crucial. The adaptive capacity of cities may be weaker than that of the rest of society, as the impacts of climate change affect them more strongly than the rest of the country. Cities are densely built and have a lot of hard, heat-retaining and impermeable surfaces that exacerbate the effects of floods and heatwaves. Cities are hubs for populations and activities, with extreme weather events affecting many people and the city's key functions. Cities are heavily dependent on critical infrastructure, such as energy, water and data networks, and disruptions in their operations caused by extreme weather events can also have extensive impacts due to interdependencies between the operations. Cities also have many residents whose ability to adapt is poor, for example, due to physical, social or housing-related reasons. In addition, social networks that support people's self-reliance can be weak in cities due to, for example, the high mobility of the population.

Definition of climate risks

In Helsinki, adaptation to climate change is divided into two timeframe-dependent parts. Climate change preparedness means proactive preparation for extreme weather events and short-term climate impacts. Climate change adaptation, on the other hand, means proactive adaptation to longer-term and average climate changes. Both preparedness and adaptation must be planned and implemented now. The preparedness and adaptation work of the Climate Action Plan only includes preparation for climate change in advance

and work aimed at reducing possible harm and consequences, not the operational management of a possible crisis or its preparedness planning.

The Helsinki City Strategy states that "Helsinki is preparing for extreme weather events caused by climate change in a proactive and risk-minimizing manner". Risks are at the centre of Helsinki's preparation for and adaptation to climate change. The definition of climate risk is based on the definition provided by the

Intergovernmental Panel on Climate Change IPCC (Figure1, KISS2030). Climate risk consists of four factors: hazard, exposure, vulnerability and adaptive capacity. There is no risk if one of the factors is missing. For example, there is no risk of flooding if the site is not located in a flood risk area. Adaptive capacity consists of both the adaptation measures taken and the structures promoting the adaptation of the city, such as good governance and functional infrastructure.

The weather and climate risks in Helsinki were assessed in 2018 (Pilli-Sihvola et al.) and the hazard factor information was updated in 2026 (Syrjälä et al. 2026, Table 1). Based on the risk assessments, the three most urgent risks have been identified for Helsinki: increasing and intensifying heavy rainfall, periods of heat and a sudden rise in sea level during storms (City of Helsinki 2021). The sea level will also rise in Helsinki over a longer period due to the global rise in the sea level. Increased slipperiness and individual snowstorms are also possible. Helsinki's preparedness work has started with the most urgent risks, and the measures related to their management are described below. In the future, the measures will be assessed and reprioritised based on updated climate risk information so that any new urgent risks can also be considered. Climate risks are not speculative but are already materialising and will increase significantly soon.

Exposure

In the Helsinki area, the analysis of **heavy rainfall scenarios** is based on assessing future climate changes and statistical probabilities of rainfall events. The hydrological model prepared for Helsinki and the reviews of heavy rainfall scenarios have enabled a more detailed mapping of the stormwater flood risk in the city centre, and the mapping clearly shows the areas where the flood risk is most critical. The results of the modelling have been supplemented with site-specific

analyses, which have focused particularly on properties and the openings of underground spaces to identify the need for further measures.

For the rest of the city, stormwater flood risk has been assessed in the statutory flood risk survey carried out by municipalities in 2024 (City of Helsinki). The survey examined the location of functions that are essential to society's operations in relation to flood areas, which were based on the general stormwater flood map of the Finnish Environment Institute (2024). The surveys of both the city centre and the surrounding areas utilised hour-long heavy rainfall according to the future climate, with an annual probability of occurrence of one per cent.

The guideline published in 2024 (City of Helsinki) on the determination of safe building elevations on the seashores of Helsinki presents the predicted flood height in 2100, i.e. the seawater level, which may be temporarily exceeded with an annual probability of 0.4% (1/250 years). The flood height in the southern parts of Helsinki is +2.92 metres and rises higher than this in narrow and shallow bays. The safe construction height is determined by the flood height and the effect of the waves. In connection with the implementation of the instructions, properties and underground openings that are below the safe construction height have also been surveyed to identify the need for further measures.

The Finnish Meteorological Institute has modelled **hot areas and heat islands during heat periods** in Helsinki in the current climate and the future (Saranko et al. 2025). Based on the exceptionally hot months of the current climate, they also modelled a so-called supersummer, which was also the basis for the modellings of the future (2040s, 2070s). The supersummer is made up of four hot months in the recent past, which were May 2018, June-July 2021 and August 2022. The analysis describes the average temperatures and maximum temperatures for each

hot month. The future climate is based on a greenhouse gas scenario of average intensity (IPCC SSP2-4.5 greenhouse gas scenario). The analysis tells us which are the hottest areas in the city during heat seasons in the current climate and the future, and what kinds of land use cause the largest heat island. Factors such as the proximity to the sea and differences in land use caused variation between different areas. The hottest areas of the city were inland areas with low and large buildings, such as the Herttoniemi business district. The coolest areas were unbuilt areas. The densely built areas of the city, which also have tall buildings, are located on the coast and therefore did not stand out as the hottest areas of the city in this survey.

Vulnerability

Recognising the most vulnerable groups of people and reducing vulnerabilities is a cross-cutting theme in Helsinki's work to prepare for and adapt to climate change. There is no commonly agreed

definition of vulnerability, but according to the Intergovernmental Panel on Climate Change (IPCC) (2023), it means 'sensitivity or propensity to a phenomenon that may cause harm or danger'. Vulnerability occurs at individual, community and institutional levels and is dependent on time and place. Regarding people, vulnerability is related to, among other things, low financial, informational or social resources, lack of influence or physical or health characteristics (Pilli-Sihvola et al. 2023). In early 2026, Helsinki will survey social vulnerability to floods and heatwaves and develop vulnerability indicators (Savolainen, 2026). Extreme weather events such as hot weather affect people in different ways, and the severity of the effects depends greatly on how vulnerable people are to them. Social vulnerability describes these differences. Vulnerability analysis and mapping provide information on the allocation of climate risks to different groups of people and regions and help to take climate justice into account.

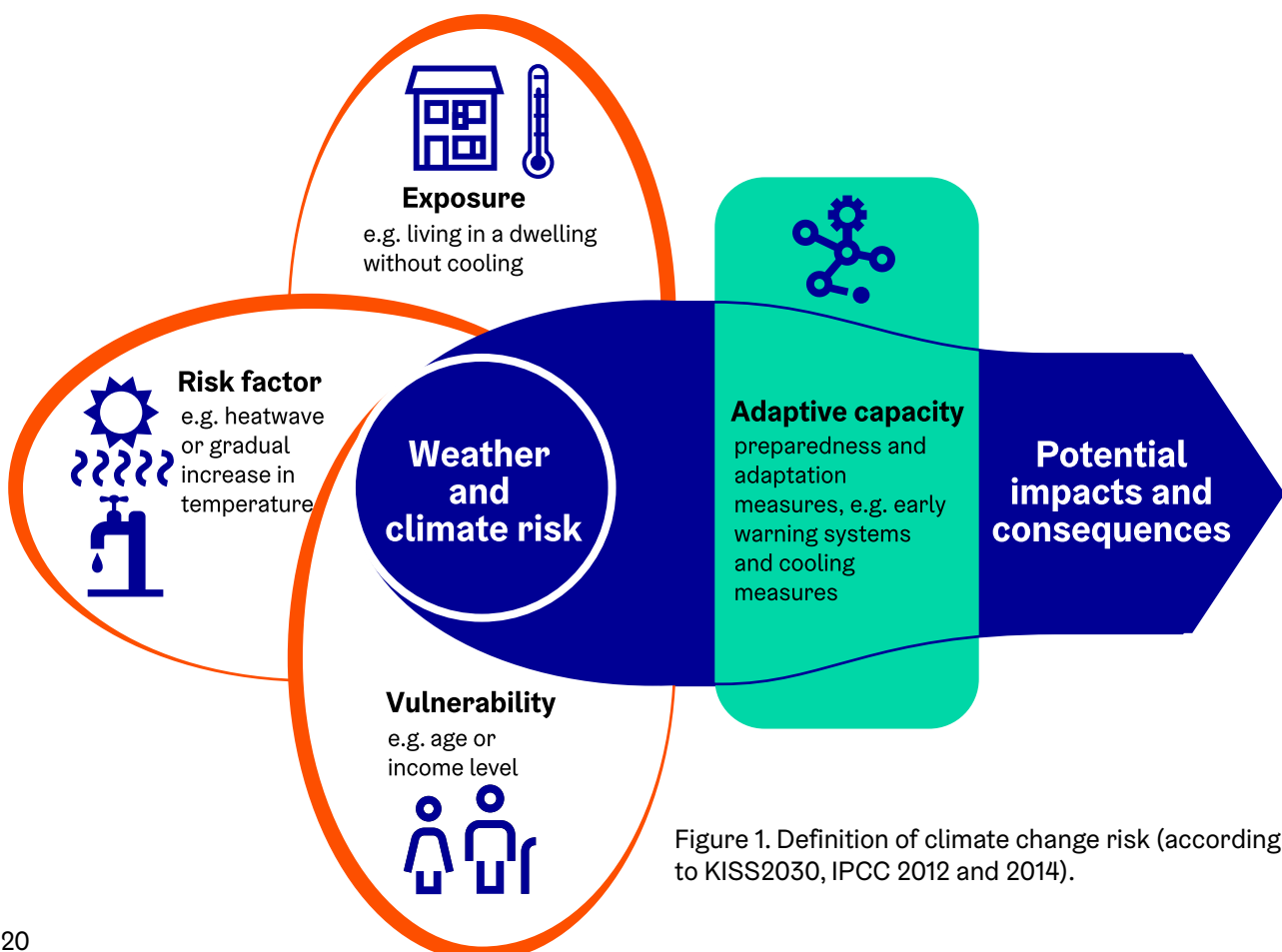


Figure 1. Definition of climate change risk (according to KISS2030, IPCC 2012 and 2014).

Table 1. The risks caused by climate change affecting the City of Helsinki, their intensity, frequency and time span (Syrjälä et al. 2026). The most urgent risks are marked in yellow in the table (City of Helsinki 2021).

Risk factor*	Projected change in magnitude ¹	Projected change in frequency	Timeframe ²
Extreme heat	↑	↑	▶
Extreme cold	↓	↓	▶▶
Icy and slippery conditions	-	↑	▶▶▶
Sea level rise	↑	-	▶▶▶
Drought	↑	↑	▶▶
Heavy Rainfall			
Rainfall	↑	↑	▶
Snowfall	→	-	▶▶▶
Heavy snow accumulation	↓	↓	▶▶▶
Flooding			
Storm water flood	↑	↑	▶
Seawater flood	↑	↑	▶
Storms			
Strong winds	→	→	▶▶▶
Thunderstorms	→	→	▶▶▶
Biological risks			
Plant pests and diseases (urban green areas)	↑	↑	▶
Plant Pests and diseases (forests)	↑	↑	▶
Water-borne diseases	↑	↑	▶
Vector-borne diseases	↑	↑	▶
Tick-borne diseases	↑	↑	▶

*) Examples of **cascading (indirect) impacts** include disruptions in supply chains, volatility in energy prices, the functioning of telecommunications networks, and migration trends (see Syrjälä et al. 2026).

Most urgent risks

1) Direction of change

- ↑ increase
- ↓ decrease
- No significant change

2) Timeframe

- ▶ Short term (< 5 years)
- ▶▶ Medium term (5–15 years)
- ▶▶▶ Long term (> 15 years)

Minimising consequences – Preparing for extreme weather events

We minimise the possible consequences of extreme weather events caused by climate change in different ways. We prioritise measures by utilising the climate risk assessment data described above. The prioritisation and implementation logic is presented in Figure 2 and the measures that increase preparation for extreme weather events are presented in Table 2.

During the City Council term, Helsinki will receive an Extreme Weather Preparedness Plan, which will bring together the work to prepare for extreme weather events. The Extreme Weather Preparedness Plan includes documents that guide the management of the most critical climate risks (Pilli-Sihvola 2018, Syrjälä et al. 2026), such as the City of Helsinki's flood strategy (2008) that is currently being updated and the heat programme that will be prepared during the term of the City Council. For other risks caused by climate change, the Extreme Weather Preparedness Plan can include a situational description of the hazard and an assessment of the change.

An important part of the preparedness is clarifying the organisation's internal responsibilities and group-level cooperation related to extreme weather events. At the same time, it is important to define the preparedness levels, the protection needs for which the city is responsible and the way in which they are prioritised. As the city is not always able to prepare for climate risks fully and in a timely manner, it is important to agree jointly and make an informed decision on the level of preparedness and adaptation to climate risks.

The objective of updating the Helsinki flood strategy (City of Helsinki 2008) is to ensure the city's long-term resilience to various flood risks, including stormwater floods, river floods (Vantaanjoki), seawater floods and small water floods. The updated strategy will start by mapping the current situation,

the laws governing operations and national guidelines, and proposing possible development measures. The aim is to prepare a strategic publication that defines the target level of the city's flood preparedness and the resulting protection needs and responsibilities in the preparedness work. Building communications related to flood preparedness towards residents and property owners is part of the project.

During this City Council term, Helsinki will receive a heat season plan that will help the city prepare for long and intensifying periods of hot weather. To prepare for and adapt to heat, we need to find ways to cool the interiors of buildings and mitigate the heat island phenomenon that is typical of cities, for example, through land use. In addition, the city must react to ongoing periods of heat, which are not addressed in the heat programme or the Climate Action Plan.

Concretisation of the programme and planning work focuses on putting the work into practice. This includes, among other things, preparing instructions. For example, for preparedness to succeed as planned, the operators need clear operating methods for planning projects and the dimensioning used in them. Further detailing, refining and presenting risk information in an up-to-date and suitable format, such as maps, is also important. This makes the information suitable for use in the organisation's core work, such as land use planning, construction, maintenance and the development of existing urban structures and functions.

During the Climate Action Plan period, investments in producing and specifying the climate risk knowledge base and in ensuring that information reaches the experts better will continue. In addition, it is important to communicate directly to the residents so that they can prepare for risks independently.

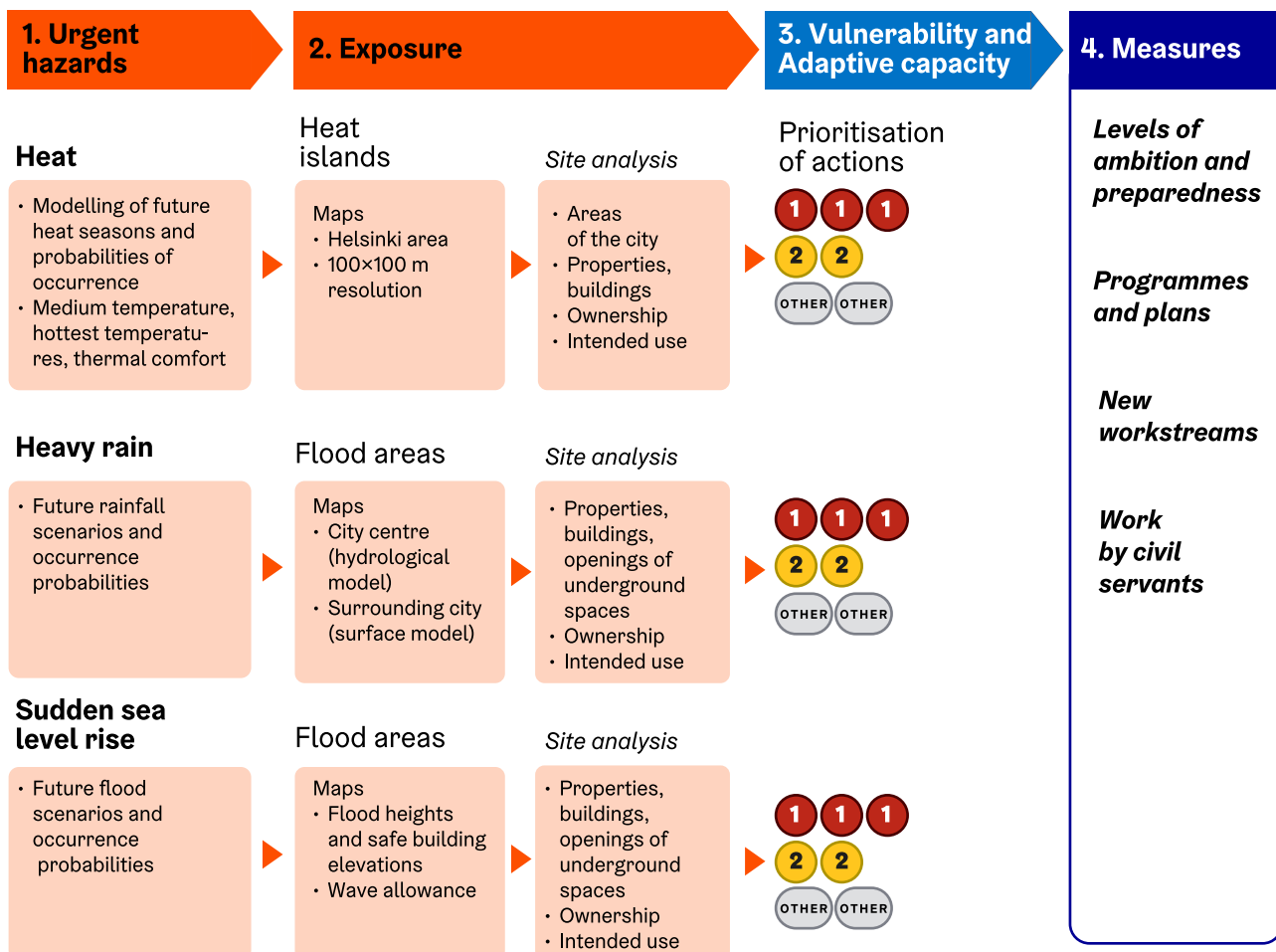


Figure 2. The most urgent risks of Helsinki's preparedness work and the prioritisation and implementation logic of measures. In the future, measures will be assessed and reprioritised based on updated climate risk information so that any new urgent risks can also be considered.



Table 2. Actions that increase preparation for extreme weather events

Risk factor: Preparing for extreme weather events

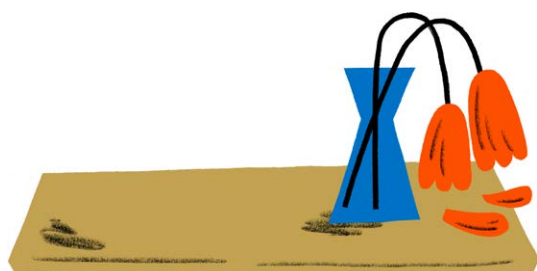


Set of actions	Description of implementation	Indicators
Preparedness plan for extreme weather events	The measures for preparing for extreme weather events caused by climate change are compiled in a separate Extreme Weather Preparedness Plan.	• Plan ready
Updating the climate risk assessment for extreme weather events	Carrying out a change review of the climate risk assessment and specifying the risk data base, including geospatial maps.	• Report, background material and risk table updated
Preparation of a vulnerability assessment and analysis of measures	Determining the social vulnerability related to heat and floods and performing a specific analysis that looks at groups of people, infrastructure and operations.	• Report completed • Geospatial datasets material described and available • Site analyses and prioritisation proposals ready

Risk factor: Preparing for heat



Set of actions	Description of implementation	Indicators
Heat programme	A heat programme will be drawn up, specifying the city's internal responsibilities, group-level cooperation and coordination and measures for preparing for and adapting to heat. Deciding on the levels of preparedness and the prioritisation of protective measures.	• Programme ready
Preparing map-based material for heat islands	Preparing map material and site analyses supporting the interpretation of the city plan and specifying land use planning measures.	• Geospatial datasets • Site analyses and prioritisation proposals ready • Planning measures defined
Enhanced cooling of indoor temperatures in educational facilities	Prioritising, classifying and implementing cooling measures in daycare centres and schools. Closer cooperation between sectors.	• Prioritisation and classification done • Cooling measures implemented (number, %) • Temperature target level reached (pcs, %)
Enhanced cooling of indoor temperatures in care facilities	Prioritising, classifying and implementing cooling measures in care properties for round-the-clock housing and hospitals.	• Prioritisation and classification done • Cooling measures implemented (number, %)



Risk factor: Preparing for heavy rain and seawater flooding



Set of actions	Description of implementation	Indicators
Flood programme	The flood strategy will be updated into a flood programme. The aim is to ensure the city's long-term resilience in relation to various flood risks and to determine the city's internal responsibilities, the level of preparedness and the prioritisation of protection measures. The programme starts by mapping the current situation, the legal framework, national guidelines and proposing possible development measures.	• Programme ready • Preparedness levels are set and the prioritisation model for protective measures is ready
Drawing up a drainage area-based water management operating model and plan	Drawing up a comprehensive stormwater management plan for the Helsinki area, which addresses the need for drainage area-level management and more detailed planning, the targets requiring measures and the identification of stormwater risk and problem areas. The work includes an operating model for comprehensive stormwater management (including stormwater quality management), which also includes the maintenance of management structures and the development of related instructions. Examining the connection of the plan to the comprehensive urban water plan, in accordance with the Urban Wastewater Treatment Directive.	• Comprehensive management plan and operating model ready
Strengthening the management of flood risks in the city centre	Continuing the planning of the remedy of prioritised flood risk sites, updating the flood sizing instructions and developing the planning of stormwater management in street areas.	• Sites whose planning considers a recurring rainfall event in the future climate once per 100 years (number) • Sizing instructions updated • Railway Square flood site management plan ready
Strengthening the flood risk management of the surrounding city	Identifying stormwater flood risk sites and prioritising planning and repair measures.	• Site analyses and prioritisation proposals ready
Improving the climate resilience of the building envelope	In building design and maintenance, preparing for building envelope details that will increasingly withstand water seeping into the structures. After the cost surveys, continuing the work to promote the more extensive implementation of the Healthy House guidelines in construction projects.	• Sites where the Healthy House guidelines have been used (number)

Maximising benefits – Strengthening adaptive capacity

Adaptive capacity must be strengthened at the same time with minimising the consequences of climate change. Green infrastructure is one of the key solutions for adaptation. It delays, absorbs and utilises stormwater and provides additional shading and cooling. A diverse and ecologically sound green infrastructure is more resistant to fluctuations caused by climate change and strengthens resilience to change. Green infrastructures can also be used to create comfortable urban spaces and promote recreation and well-being. The solutions emphasise multiple benefits, i.e. means that achieve many positive consequences. Solutions that strengthen adaptive capacity cannot be centralised, but they must be promoted in every block and on every street. Based

on the risk assessments, priority is given to the locations where solutions need to be implemented most urgently. At the same time, other regional objectives, such as the prevention of segregation, are identified that can be promoted simultaneously with adaptation solutions to maximise the multiple benefits.

Land use planning and the planning of public areas retain existing green infrastructures and increase the share of greenery in the built environment. To identify, maintain and increase the diverse benefits of green infrastructures, the city will test, develop further and utilise new planning tools and methods, such as the regional green factor and the updated plot-specific green factor. In addition,



Helsinki will give recommendations for sufficient canopy cover and water-absorbing surface area in all areas of Helsinki, in accordance with the strategy.

During the City Council term, a greening action programme will be drawn up, focusing on greening the built environment, for example, by looking for ways to increase the number of street trees and transform impermeable surfaces into vegetation areas. As part of the action programme, it is possible to identify parts of public areas where the amount of green infrastructure can be quickly increased and to prioritise the areas where it is most critical for adapting to climate change.

Children, elderly residents and people with chronic illnesses are vulnerable to heat, so strengthening adaptive capacity is a priority

in places where they spend a lot of time. During the City Council term, significant investments will be made in naturalisation of school yards. The impacts of climate change are considered from early on, starting with land use planning and the planning of the service network. Service buildings are easily accessible, and their plot dimensioning considers the area required for operations as well as the needs related to the green factor and naturalisation. The yard planning and maintenance instructions will be updated. Trees and layered vegetation are added to the yards of daycare centres and schools to create shelter, weather protection and a better microclimate as well as nature-based water management. In addition, green environments promote playfulness and exercise, for example, by increasing the diversity of terrain. At the



i Green infrastructure refers to a network of green areas and green connections between them, which also includes water areas known as the blue structure. Areas included in the green infrastructure have varying characteristics and values related to, for example, natural resources, recreational opportunities and biodiversity. The green infrastructure also covers the habitats commonly encountered in the city, i.e. the habitat types of the built environment, such as ground-based yards or the vegetation of streets and squares.

Dense cities are particularly vulnerable to the effects of climate change, as construction increases the number of hard surfaces that are impermeable to water and buildings that store heat. Dense construction also often reduces urban greenery locally. Diverse green infrastructures play a key role in preparing for the impacts of climate change. Vegetation binds and

evaporates water through its leaves and roots, providing shade and cooling during heatwaves. The canopy cover affects the shade area while the species and leaf area affect evaporation. Abundant and sufficient urban greenery also strengthens biodiversity. Diverse nature supports resilience to change in the climate of the future.

Preserving the existing green infrastructure is particularly important, as vegetation only begins to produce the desired benefits, such as adequate water management or shading, once it has grown sufficiently. For example, it takes decades for trees to grow to full size. Extensive green areas and interconnected green networks ensure the ecological benefits of green infrastructures. Similarly, maintaining a functioning and viable soil requires that the soil is not heavily covered or altered. Preserving living soil also protects the natural flow and retention of water.

same time, the needs of sustainable mobility are considered, such as by reserving sufficient parking spaces for bicycles alongside playgrounds. Green spaces will also be added to social and healthcare properties, especially around-the-clock housing, to support comfort and well-being in addition to adaptation. The Energy renaissance team supports the adaptation and climate-sustainable renovation of private housing

companies. The team's tasks also include supporting the improvement of energy efficiency, monitoring the carbon footprint thresholds set for construction and related regulatory work, as well as promoting other goals (noise, biodiversity, urban greenery, charging electric cars, supplementary construction) for housing companies. Table 3 presents the measures to increase adaptive capacity.

Table 3. Actions that increase adaptive capacity

Adaptation solution: Strengthening the green infrastructure



Set of actions	Description of implementation	Indicators
Increasing canopy cover and permeability	Producing district-specific information on canopy cover and permeable surface and identifying the needs for increases.	• Share of water-permeable surfaces in the total land area at district level - indicator ready and implemented • Annual change in canopy cover (%)
Greening action plan	We will draw up an action plan to make the built environment greener in new areas and issue recommendations for sufficient canopy cover and water-absorbing surfaces in every area of Helsinki. The programme identifies and prioritises greening measures for the built environment and accelerates their implementation.	• Action plan completed and approved
Development and implementation of the regional green factor	Continuing to pilot the regional green factor, facilitating usability through automation, identifying further development needs and ensuring resource-efficient use.	• Financing secured for further development project • Planning projects calculated with the regional green factor (number)
Ensuring the required dimensioning of the green infrastructure	Taking into account the dimensioning required by the adaptable green infrastructure in land use planning by appropriate means, considering the overall objectives.	• No identifiable indicator, will be reassessed during the programme period to find a suitable indicator.
Strengthening street greenery	Strengthening the green infrastructure in traffic and street plans by maintaining the current street greenery, increasing street greenery and diversifying vegetation.	• Increase in the area of street greenery in relation to the area of streets (%)
Greening in infrastructure projects	Major infrastructure projects, such as tramway projects (e.g. West Tram), will be implemented with ambition from the perspective of stormwater management and green infrastructure volume and quality.	• Project-specific documentation on taking adaptation into account in the project
Local green infrastructure improvements	Implementing local green infrastructure improvements in the built environment, including small greening measures. Further development of the process for small infrastructure projects to make the implementation more agile. Targeting the implementation especially at streets, traffic areas and squares.	• Greening projects implemented at a rapid schedule (number)

Adaptation solution: Increasing shading and water management of yards and buildings through vegetation



Set of actions	Description of implementation	Indicators
Naturalisation of educational facility yards	Accelerating the naturalisation of school and daycare yards and raising the level of ambition significantly with solutions that support operations. Closer cooperation between sectors.	• Renovated yards (number)
Naturalisation of the outdoor areas of social welfare and healthcare facilities	Promoting the naturalisation of the outdoor areas of social welfare and healthcare service facilities in existing and conversion facilities and intensifying cooperation between sectors.	• Renovated outdoor areas (number)
Developers are offered ways to take adaptation into account	Supporting the adaptation of privately owned properties in the construction phase by developing ways to increase the green infrastructure of yards and also identifying other adaptation methods.	• No identifiable indicator.
Giving housing companies advice on adapting to climate change	Offering housing companies free advice on adapting to climate change and promoting the integration of adaptation solutions into renovation projects.	• Advice sessions (number)
Supporting the greening of plots with the plot green factor	Introducing a plot-specific green factor in new and additional construction, updated to adapt to climate change.	• Updated plot green factor approved for use politically • Green factor effectiveness monitoring developed • Building permits approved with the new tool (number)

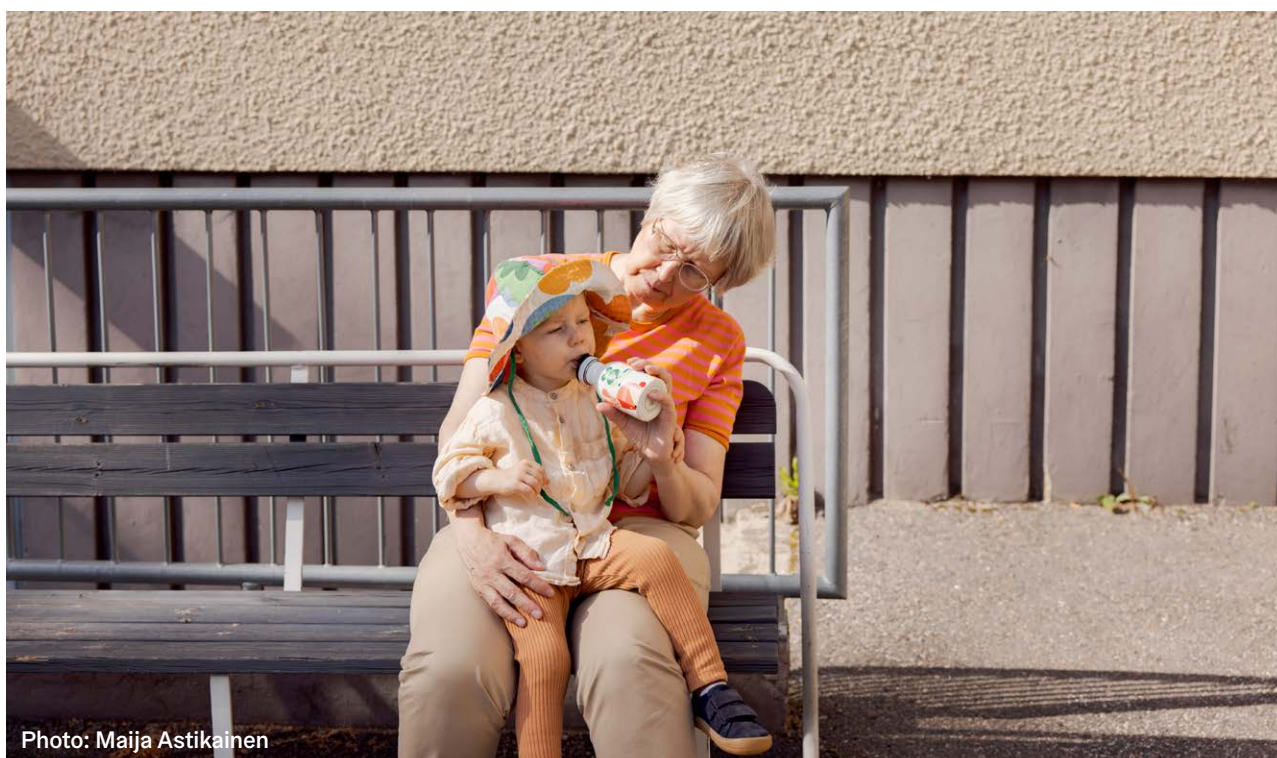


Photo: Maija Astikainen

Emission reduction work

The City of Helsinki's emissions reduction is long-term and extensive, covering the city's own operations, the development of the urban structure and cooperation with residents, companies and partners. The work is based on both research data and practical experiences on how to develop a city to be more low emission in a way that supports smooth everyday life and the vitality of the city. The emissions trading sector already steers the development of the emission factor in many respects on market terms, and it is most cost-effective for the city to focus on minimising output and volume, whether through construction or energy consumption. Emission

reductions result from joint solutions by several industries and operators related to energy and mobility, construction, services and consumption habits.

As the change progresses, overall management becomes more important: structures, control methods and the everyday environment shape the choices that are naturally available to Helsinki residents and how low-emission lifestyles are strengthened as part of the city's growth and development. At the same time, reducing dependence on fossil fuels. A fossil-based energy system exposes the city to price fluctuations, geopolitical disruptions and transition risks caused by tightening climate policy, such as asset depreciation. The transition to sustainable energy solutions reduces these risks, improves cost predictability and strengthens the city's resilience in the long term. Emission reduction work is thus an essential part of Helsinki's goal of building a city of the future that is sustainable, prosperous and attractive to all its residents.

Successes in emission reduction work

Helsinki has determinedly promoted the reduction of emissions in energy production, transport, construction, the city's own operations and waste management. The city's direct greenhouse gas emissions have decreased by a total of 67 per cent from the 1990 level, and emissions have decreased by approximately 50 per cent in the 2020s alone. At the same time, the city has grown, and direct emissions in relation to the number of inhabitants have decreased by 76 per cent since 1990.

A significant milestone has been the discontinuation of the use of hard coal in Helsinki's energy production in 2025 before the national hard coal ban came into force. Through its ambitious ownership policy, Helsinki has promoted non-combustion in energy production, which has directed the energy company Helen's investments towards low-emission forms of production. At the same time, the city has taken long-term energy efficiency measures in its own building stock to reduce energy consumption, such as setting energy efficiency figure targets that

are more ambitious than the national level. For private housing companies, the city offers free and impartial energy advice in energy renovations, and reduced building supervision permit fees are another way to encourage energy efficiency measures.

Emissions from traffic have been reduced through both charging infrastructure and procurement. The city has promoted the charging infrastructure for electric cars in public areas and granted support for the development of the charging infrastructure for electric cars in the properties of Heka. The electrification of public transport is progressing rapidly: in 2024, Helsinki Region Transport had more than 500 electric buses in its fleet, and they covered approximately 42 per cent of the kilometres travelled by buses. The city has implemented new means of traffic control, such as market-based parking in the city centre. The city electrifies its own car fleet by purchasing only fully electric cars, and in other vehicle categories, electrification is promoted through procurement environmental criteria. Helsinki is Finland's largest public purchaser, which is why the city's



Photo: Marjaana Malkamäki / Keksi

ambitious environmental criteria used in the procurement of vehicle and transport services have a significant impact on promoting the green transformation of vehicles. All diesel and fuel oil used by the City of Helsinki is renewable. In addition, the city is committed to the green deal for zero-emission construction sites, which sets targets for low-emission machinery and renewable fuels in infrastructure contracts. In water transport, the Port of Helsinki's investments in shore-based electricity systems have enabled significant emission reductions.

The emissions from construction and the potential for reducing emissions are considerable in Helsinki. The city adopted a limit value for the carbon footprint of buildings even before national regulation and has set a limit value that is stricter than the current national level to accelerate low-carbon construction. As a rule, low-carbon concrete is used in the city's own construction, and new operating methods have been developed to reduce the emissions from pre-construction in the area of the former Malmi Airport, for example, where the aim is to halve the emissions from pre-construction during 2020–2030 compared to the original plan.

The climate work of land use planning and infrastructure construction is supported by various low-carbon assessment tools for analysing the climate measures of land use. The city has also developed mass coordination ambitiously and achieved significant emission reductions and financial savings through the systematic management of soil and rock materials. Thanks to the mass coordination measures, the City of Helsinki saved a total of approximately EUR 82.2 million, 12.2 million litres of fuel and 34,084 tonnes of carbon dioxide emissions in 2014–2025. In addition, districts such as Vallila and Jätkäsaari have received circular city block solutions.

The city's climate work also extends to the everyday life of the city's residents. The work is supported in education and training, for example, with the Kettu model, which strengthens climate education in schools and daycare centres. Emissions have also been reduced in waste management through, for example, landfill gas management and various wastewater treatment plant measures. Together, these measures show that Helsinki's climate work broadly covers the city's various sectors and creates the conditions for long-term emission reductions.



Direct emissions

In accordance with the Helsinki emission reduction target, the city will reduce its direct greenhouse gas emissions (Scope 1 and 2) by 85 per cent by 2030 compared to the 1990 level. In 2040, Helsinki will reach net zero, with direct emissions and carbon sinks in balance. Direct emissions include emissions from traffic, heating, electricity consumption and other emissions in the category. The Other category includes emissions from industry and machinery, waste handling and agriculture.

Helsinki has reduced its direct greenhouse gas emissions by 67 per cent by 2025 since 1990 (Figure 3). The main reasons for the reduction in emissions are the discontinuation of the use of hard coal in energy production, the significant reduction in emissions from national electricity production and the electrification of transport and improved energy efficiency.

The reduction of emissions from the waste sector, the abandonment of oil heating and structural changes in industry have also contributed to the reduction of emissions.

Heating has been the largest source of emissions in Helsinki throughout the measurement history, but as heating emissions turned to a decline due to the abandonment of hard coal and the rapid electrification of heating, transport became the largest source of emissions in 2025. In 2025, heating accounted for 33 per cent and traffic for 45 per cent of the emissions. Electricity accounted for 18 per cent of total emissions in 2025, and other emissions (industrial, agricultural and waste management) accounted for approximately four per cent in total. According to the emission scenarios, the share of traffic would be more than 60 per cent in 2030.

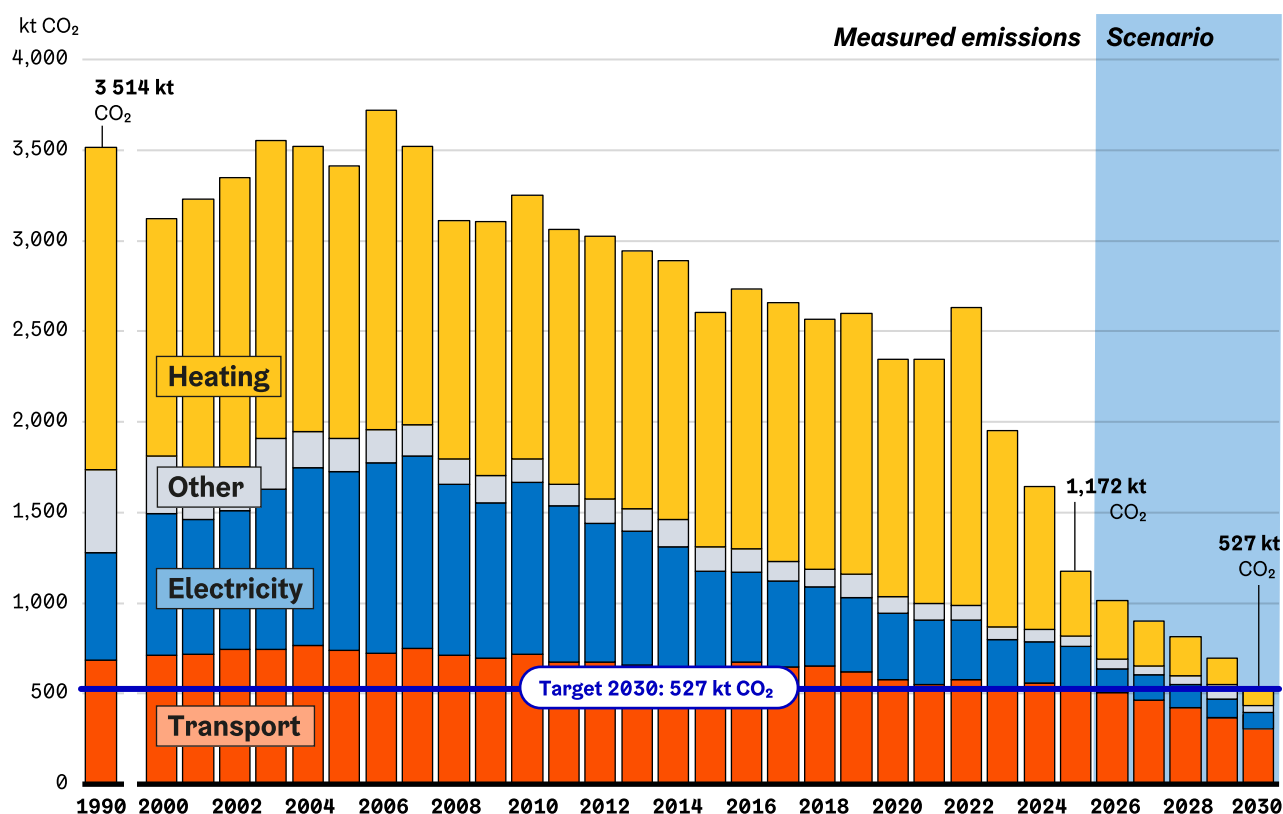


Figure 3. Development of direct emissions in Helsinki 1990–2025, emission reduction scenario in accordance with current measures 2026–2030 and emission reduction target of -85% for 2030 (kt CO₂ e).

Sources: 1990–2025: HSY, 2026–2030: City of Helsinki and Helen Ltd

Achieving the 2030 target requires a 55% reduction from the 2025 emission level. Achieving the 2030 emission reduction target corresponds to an average annual emission reduction of approximately 15 per cent, even if the emission reductions are not linear. However, there is always uncertainty associated with emission scenarios, which is caused by changes

in the operating environment, such as political and geopolitical factors, economic development and changes in consumer and business behaviour. In addition, the specification of emissions calculation methods and the development of available data may affect estimates over time.

Promoting sustainable modes of transport and electrification of transport

Transport is currently the largest source of direct greenhouse gas emissions in Helsinki (Figure 4). The transport sector's emissions are estimated to decrease by 216 kt CO₂e from the 2025 emission level by 2030 through the Climate Action Plan. In 2024, Helsinki commissioned a survey of the most effective means of reducing emissions from

traffic in extensive cooperation with research institutes and other experts.

Helsinki wants to reduce transport emissions and move towards zero-emission mobility. Currently, most of the emission reductions are generated by the rapid electrification of passenger car traffic. The city is expanding its

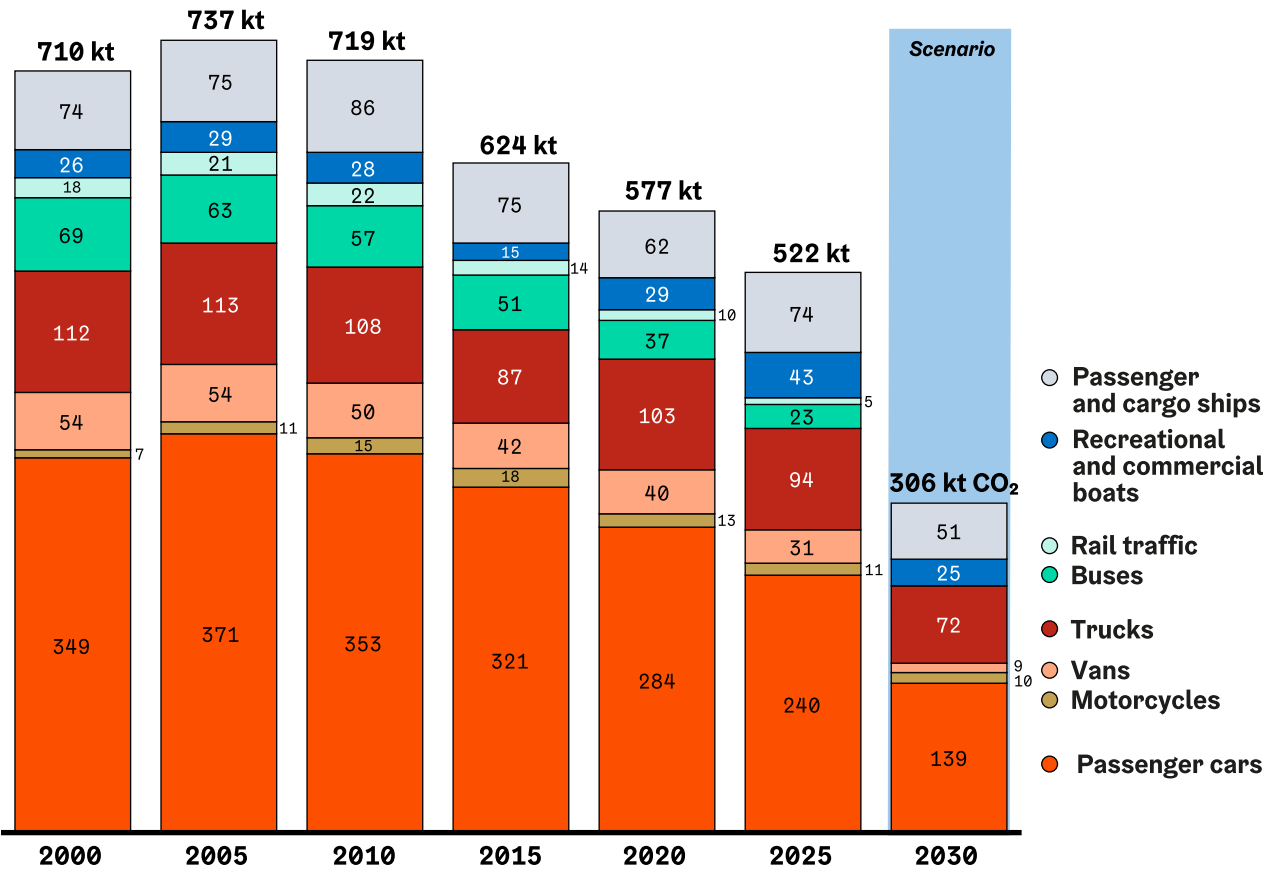


Figure 4. Emissions from traffic in Helsinki by mode of transport in 1990–2025 and emission scenario 2030. Sources: 2000–2025: HSY, 2030: City of Helsinki

charging network and striving to promote the electrification of other categories of vehicles. The increase in electric cars is also influenced by market-based factors, particularly the trends in fuel prices. As the price of fuel increases, the operating costs of internal combustion engine vehicles increase, which makes electric vehicles economically more attractive and can significantly accelerate the transition without separate additional measures. As a result of geopolitical tensions, increased fluctuations in fuel prices have already increased the attractiveness of electric cars and affected their demand in Finland as well. According to estimates, a 20% increase in the price of fuel could reduce traffic emissions by approximately 9 kt CO₂e in Helsinki in 2030 compared to the baseline. The control measures under the jurisdiction of the state, such as incentives for electric cars, are also estimated to have an impact on the reduction of transport emissions in Helsinki by 2030.

Helsinki improves the conditions for walking, cycling and public transport and guides mobility choices with incentives and parking policy. The aim is for more people in Helsinki to choose walking, cycling or public transport as their means of transport. The city wants to curb the rise in public transport prices and develop the ticketing system for the benefit of the residents. The densification of the urban structure also reduces the need for movement, and the multi-centre structure based on rail traffic helps to mitigate traffic growth as the population increases.

When sustainable mobility increases, the consequences are also visible in the quality of the living environment: air quality improves, noise decreases and traffic safety improves. This is especially important for children, the elderly and those with respiratory and heart diseases. Another aim is to stay below the new limit values for street dust (PM₁₀), which are currently at risk of being exceeded in Helsinki. The city takes special groups into

account in emission reduction measures so that the solutions do not increase inequality.

Of the trips made by Helsinki residents (Figure 5), walking, cycling and public transport account for 82 per cent and passenger cars for approximately 18 per cent. Reducing transport emissions requires increasing the share of sustainable modes of transport, which is why the city aims to steer the growth of mobility towards sustainable, low-carbon modes of transport and to further strengthen the role of walking, cycling and public transport. As part of the emissions reduction measures for transport, an environmental zone for delivery traffic will be introduced in Helsinki in 2030. The measure steers the renewal of rolling stock in the direction of zero emissions and is estimated to reduce traffic emissions by approximately 15 kt CO₂e per year. Table 4 summarises the measures that increase the share of sustainable modes of transport and Table 5 presents the measures promoting the electrification of transport, as well as the indicators used to monitor their progress and the affected emissions.

Figure 5. Modes of transport in Helsinki in 2025.
Source: Helsinki residents' travel habits 2025 survey

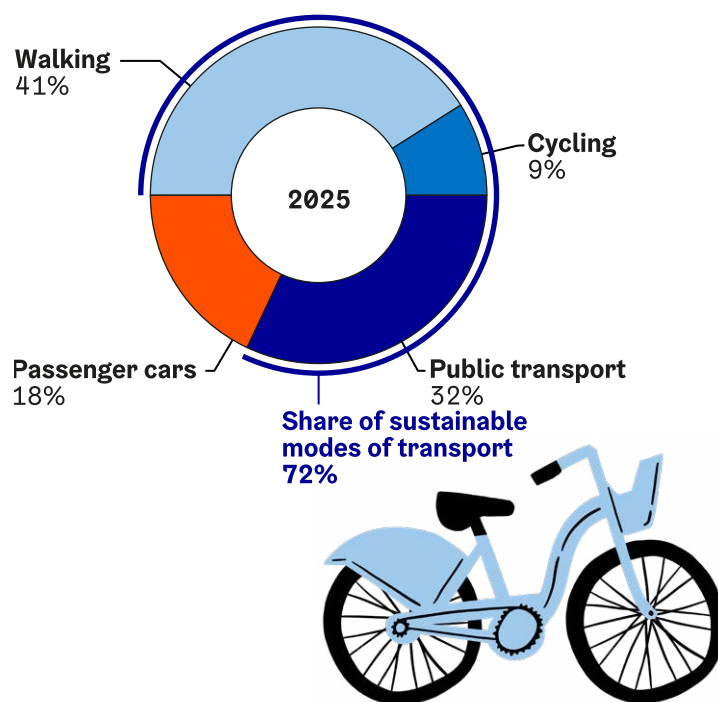


Table 4 summarises the measures that increase the share of sustainable modes of transport and Table 5 presents the measures promoting the electrification of

transport, as well as the indicators used to monitor their progress and the affected emissions.

Table 4. Actions that increase the share of sustainable modes of transport

Set of actions	Description of implementation	Indicators
Developing the urban structure in accordance with the network city approach 	Developing the urban structure in the city plan supports efficient and smooth public transport, where the regional centres are connected to each other through strong rail connections, which enables sustainable mobility and smooth everyday life throughout the urban region. In land use planning, giving priority to projects that are located on the high-level public transport network.	• Location of the residential floor area under the local detailed plan in the city centre, heavy rail station areas and the express tramway zone (%) • Placement in the high service level zone of public transport (%)
Transport system planning that supports sustainable mobility: promoting walking, cycling and public transport 	In land use and traffic planning, promoting a transport system that is in line with the principles of the city plan and supports low-emission and sustainable mobility and the improvement of conditions for public transport, cycling and walking. The increase in traffic volumes is allocated to pedestrian, bicycle and public transport so that the output of motor vehicle traffic does not increase. The city's personnel, residents and customers are encouraged to choose sustainable modes of transport. The City will advocate for national measures that strongly steer the vehicle fleet towards zero-emission and electric vehicles through effective and equitable economic incentives that deliver genuine emissions reductions.	• Percentage of walking, cycling and public transport (%) • Average daily weekday traffic volume (motor vehicle traffic) for the autumn as a total for the peninsula border, city centre border, city border (2008) and transverse calculation line (number/day)
Promoting responsible business travel 	Reducing the climate impact of the business travel by the city's civil servants, for example, by increasing ground travel.	• Emissions from business flights in the city (t CO₂ e, scope 3)
Environmental education in transport 	Carrying out traffic education promoting sustainable mobility for children, for example, in schools and traffic parks. Discussing the impacts of different forms of mobility and everyday mobility choices in the activities. Placing emphasis on training cycling and walking skills and basic mobility skills in traffic parks (2027-).	• Number of children participating in traffic-related environmental education activities (number) • Traffic Park visitor numbers (children/adults, number)

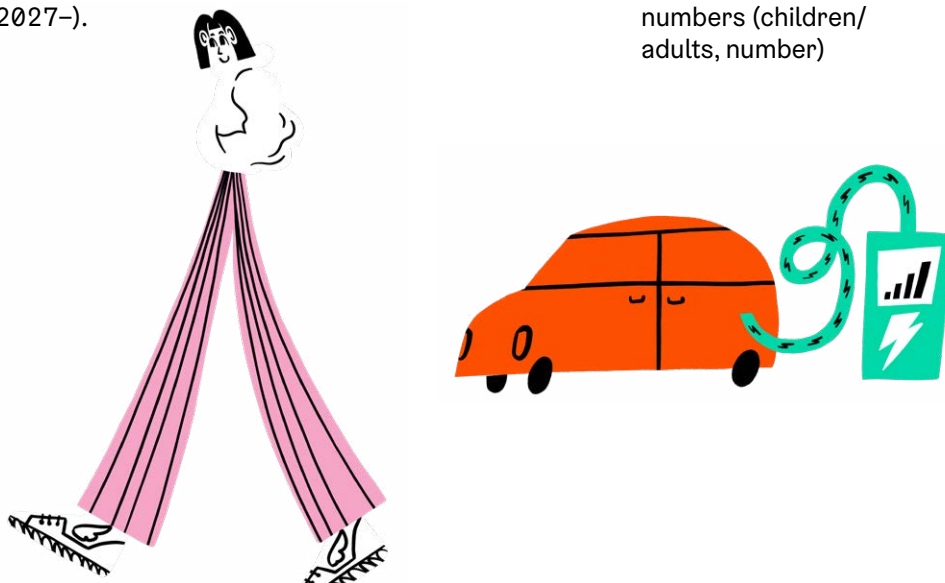


Table 5. Sets of measures promoting the electrification of transport and increasing the share of alternative propulsion power

Set of actions	Description of implementation	Indicators
Expanding the charging network for electric vehicles 	Expanding the charging infrastructure for electric cars in the public areas of Helsinki and supporting and advising properties in the construction of a charging network. Identifying ways to increase and improve private and commercial charging infrastructure and to increase the attractiveness of parking garages and facilities, for example, by promoting the development of charging infrastructure in them.	• Charging points in public areas (number) • Charging points built in properties for which the city has granted grants (number) • Share of fully electric cars and vans of cars registered in Helsinki (%)
Promoting the electrification of distribution traffic and heavy traffic 	Introducing an environmental zone for distribution traffic. Promoting charging options for heavy-duty and distribution traffic at identified traffic nodes and examining the possibility of different benefits for zero-emission distribution traffic. The selection of methods will be supplemented based on the results of ongoing and future projects. Accelerating the electrification of HSL's bus fleet.	• Emissions from heavy traffic by vehicle category (t CO₂ e) • Public electric charging stations for heavy-duty and distribution transport (number)
Promoting alternative propulsion power in water transport 	Electrifying local waterway traffic ordered by the city and providing shore electricity to vessels in ports. To enable these, strengthening the capacity of the electricity network in ports and quay areas, planning sufficient structures for high-current charging cables and considering electrification in quay solutions.	• Share of electric fleet in on-demand traffic (%) • Share of vessels using shore electricity (%) • Shore electricity consumption (MWh)
Electrification of the city's vehicles and transport services ordered by the city 	Electrifying the city's passenger and van fleet and accelerating the electrification of the truck fleet towards fully electric fleet by 2030. The environmental criteria for Helsinki's vehicles and transport services are reviewed regularly. Electric rolling stock is primarily required, but other low-emission propulsion powers are also considered according to the vehicle category, depending on availability. The needs of security of supply are considered in the replacement of the rolling stock and in the work on environmental criteria.	• Share of electric fleet (cars, vans, trucks and buses) (%) • Share of electric/low-emission rolling stock used in transport services (%)

Zero-emission energy production and energy efficiency

The energy system of the future in Helsinki will be based on zero-emission and reliable energy production and significant efficiency improvements in energy use. Helsinki is preparing for the possible location of small-scale nuclear power production in Helsinki in accordance with

the non-combustion target, if the changes in regulations allow this. Heating emissions are estimated to decrease by 261 kt CO₂e and electricity emissions by 159 kt from the 2025 emissions level by 2030 as a result of the Climate Action Plan.

Helsinki's role is to act as a pioneer and enabler of a sustainable energy system. The city promotes this objective through active ownership steering and by accelerating the improvement of the energy efficiency of the building stock in both its own business premises and private building stock. The city supports the development of the energy system through land use planning, own construction projects, energy advice, piloting, partnerships and the regulation available to the city, so that new technologies and operating models can be scaled into everyday life. In addition, the city promotes the deployment of zero-emission, energy-efficient and flexible solutions in the built environment by using its own property portfolio and procurements as an example. Regional energy solutions can also be promoted on a case-by-case basis, for example, when they offer functional solutions to the growing cooling need or are justified from a preparedness perspective.

Emissions from energy production have decreased significantly thanks to the phasing out of coal and extensive emission reduction investments (Figure 6). The last coal plant was closed in spring 2025. Emissions from purchased electricity calculated using the national emission factor have decreased as the national electricity system has shifted from fossil fuels to wind, solar and nuclear power. Emissions from oil heating have also been reduced for a long time due to changes in the building stock and energy renovations.

The Helsinki City Group is a significant energy consumer, and its energy consumption accounts for more than 11 per cent of the total consumption in the city area. The city organisation has promoted and continues to promote emissions reduction work by improving the energy efficiency of its own building stock, assessing the heating system of the city's business

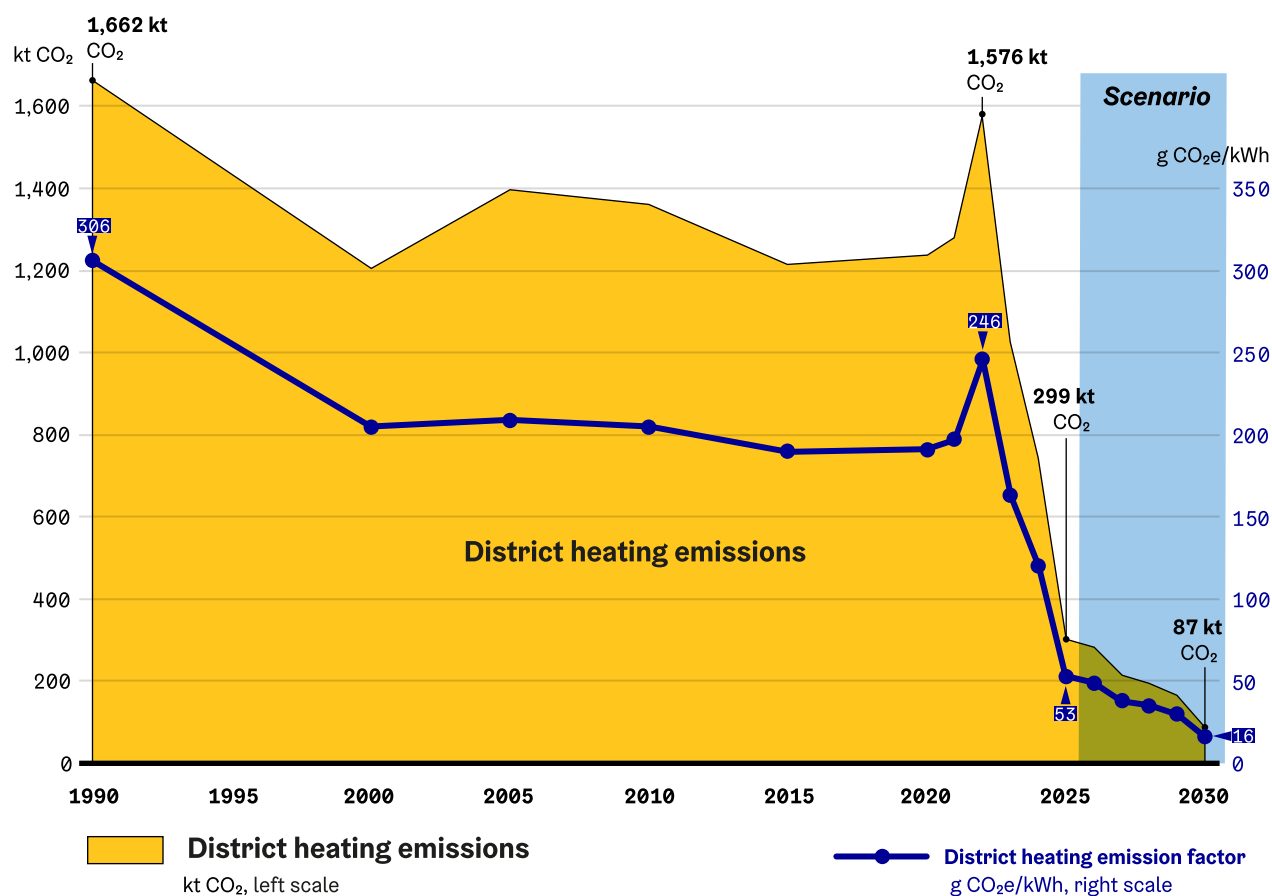


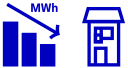
Figure 6. District heating emissions and estimated future development. The estimate of future emissions from district heating is based on a typical year. In a typical year, the temperature during the heating season is typical, the price of electricity during the heating season is average, and there are no significant events related to the security of supply in the energy system. Sources: 1990–2025: HSY, 2026–2030: Helen Ltd

premises and service buildings when selecting all cost-effective heating method options, making changes to heating methods and engaging in closer cooperation with energy operators. The city offers energy advice to private housing companies and supports their energy efficiency improvements and energy renovations. In the future, the city will promote energy efficiency through even more ambitious energy efficiency agreements both in the parent organisation and in subsidiaries with significant energy consumption.

The more intense periods of hot weather also require strengthening of the knowledge base related to cooling. The city will investigate the cooling needs of its own building stock and identify cost-effective and low-emission cooling solutions that support adaptation to climate change and consider vulnerable groups of people.

Table 6 lists the measures that increase zero-emission energy production, energy efficiency and cooling, the indicators used to monitor their progress and the emissions they affect.

Table 6. Actions that increase zero-emission energy production and energy efficiency

Set of actions	Description of implementation	Indicators
Zero-emission energy production 	Ensuring a -95% reduction in district heating emissions through ownership steering (cf. 1990 emission level). In addition, promoting the prerequisites for implementing the non-combustion strategy through the cooperation between the city and Helen. Investigating the prerequisites for the implementation of small-scale nuclear power and promoting its planning.	Emissions from heat and electricity production (t CO₂ e)
Improving the energy efficiency of private building stock 	Free energy advice will be provided to housing companies to improve the energy efficiency of the private housing stock, increase demand flexibility, and promote smart heating control.	Energy advice sessions (number)
Improving the energy efficiency of the city's building stock and public areas 	Applying targets for the city's own construction that go beyond legislative requirements in both new construction and renovation projects and continuing the transition to low-carbon heating systems. Improving energy efficiency in the City Group through energy efficiency investments and optimising the energy use of the existing building stock. Promoting the transition to LED lighting in public areas to improve energy efficiency.	Calculated cumulative electricity and heating energy savings in city premises and public areas (MWh/year)
Group energy efficiency 	Promoting the energy efficiency targets of subsidiaries with significant energy consumption.	Calculated cumulative electricity and heating energy savings in subsidiaries covered by the Public Sector Energy Efficiency Agreement (JETS) (MWh/year)
Cooling 	Investigating the need for cooling in the city-owned building stock in the future climate and assessing energy-efficient, cost-effective and low-emission implementation options, taking vulnerable groups of people into account.	To be specified later

Industry and machinery

Industry is not a significant source of emissions in Helsinki, as the city does not have heavy industry or large-scale energy-intensive production. Helsinki's industrial structure consists mainly of small and medium-sized, service- and technology-oriented companies with relatively low emissions compared to large industrial cities. In addition, many emissions are generated by industries located outside the Helsinki Metropolitan Area.

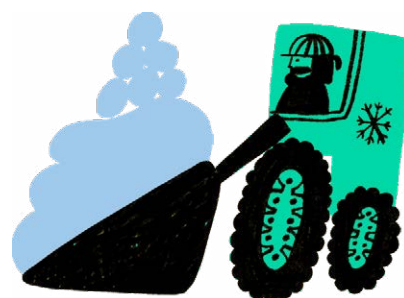
In 2025, the emissions of work machines in Helsinki were approximately 14 kt CO₂ e, or approximately one per cent of the city's total emissions. Although the share is small, measures are being taken to reduce emissions as the city grows and work machines often operate in dense environments where people move. In addition to emission reductions, electrification of work machines has significant benefits in terms of air quality and noise levels.

The emissions of work machines are reduced through the national green deal for zero-emission construction sites, to which Helsinki is committed. Helsinki's goal is that by 2029, all construction sites in the city will be fossil-free: they will not use fossil fuels, and at least 50% of work machinery and construction site transport will be powered by electricity, biogas or hydrogen. The port and its operations play a major role in reducing the emissions of heavy traffic passing through it. Emissions from heavy traffic account for approximately 20% of transport emissions.

Table 7 describes the set of measures promoting zero-emission construction sites, the indicators used to monitor its progress and the emissions affected by it.

Table 7. Set of actions promoting zero-emission construction sites

Set of actions	Description of implementation	Indicators
Zero-emission construction sites 	Fossil-free fuels will be used on construction sites and in maintenance machinery and transport, and electricity, biogas and hydrogen will be used as the main power source for at least 50% of machinery and transport equipment from 2031 onwards. Reducing the emissions of heavy traffic and work machines in the port area by switching to zero-emission work machines.	• Share of electrical, gas or hydrogen-powered rolling stock used on construction sites and in maintenance (%) • Share of renewable diesel (HVO) and share of renewable fuel oil of fuel oil used (%)





Waste treatment

HSY is responsible for the treatment of waste and wastewater in the Helsinki Metropolitan Area. In 2025, the emissions from waste treatment in Helsinki totalled 38 kt CO₂ e, or approximately three per cent of the city’s total emissions. Emissions from waste treatment are steadily reduced thanks to process improvements, such as reducing methane emissions, developing landfill gas management and utilising landfill gases as energy, as well as improving the biowaste recycling process and the energy efficiency of operations. With regard to the wastewater treatment process, the city is currently investigating

opportunities to reduce emissions through chemical treatments.

Emissions from waste processing and other smaller sectors (e.g. work machinery) are estimated to decrease by 9 kt CO₂e from the 2025 emission level by 2030 through the Climate Action Plan.

Table 8 describes the measures promoting the emission reductions of the wastewater treatment process, the indicator used to monitor its progress and the emissions affected by it.

Table 8. Set of actions promoting emission reductions in the wastewater treatment process

Set of actions	Description of implementation	Indicators
Wastewater treatment process emission reductions	Implementing the chemical treatments identified on the basis of the nitrous oxide study in the wastewater treatment process.	• Waste treatment emissions (t CO ₂ e)



Indirect emissions

Indirect emissions are emissions that occur outside the borders of Helsinki but are directly linked to the city's operations, procurement and consumption. Such emissions arise, for example, from the manufacture of building materials for the city's construction projects, telecommunications and food purchased for the city's food services. The share of indirect emissions is nowadays significantly higher

than direct emissions. As the city's demand and decisions also cause emissions outside Helsinki, the City Strategy stipulates that climate measures are also targeted at reducing these indirect emissions. A particular focus is on construction and public procurement, where the city has the best opportunities to manage and reduce its climate and nature impacts.

Construction

Helsinki wants construction in the city to be low-carbon and resource-smart in the future. The aim is to reduce the emissions from construction significantly in relation to the volume of construction. In addition, the aim is to reuse existing buildings, structures and land areas more than before whenever it makes sense and supports the development of the area. The city steers this change through land use planning, its own construction projects and low-carbon construction control measures, such as limit values and material requirements, which steer new construction towards low-carbon solutions.

The principles of the circular economy are at the heart of the change. According to the principles, existing buildings and infrastructure will be utilised first if it

supports economic sustainability, a good urban environment and the development of the area. The decision-making is based on increasingly better information about how different materials and facade solutions can withstand, how they need to be maintained and how often they need to be repaired. This allows the city to choose solutions that are both low-carbon and cost-effective in the long term.

The City of Helsinki owns approximately 65 per cent of the city's land, controls where and how to build through land use planning and is one of the largest developers in Finland. Therefore, the city has good opportunities to steer construction in a climate-friendly direction. The work covers both building construction and infrastructure construction. The circular



Photo: Veikko Somerpuro

economy is strongly linked to this: projects always assess the options for renovation, partial demolition and new construction. The aim is always to choose a solution that causes as little climate and material impact as possible while at the same time producing a high-quality urban environment. To reach these solutions, decision-making uses evolving digital tools for land use planning, structural planning and carbon footprint assessment.

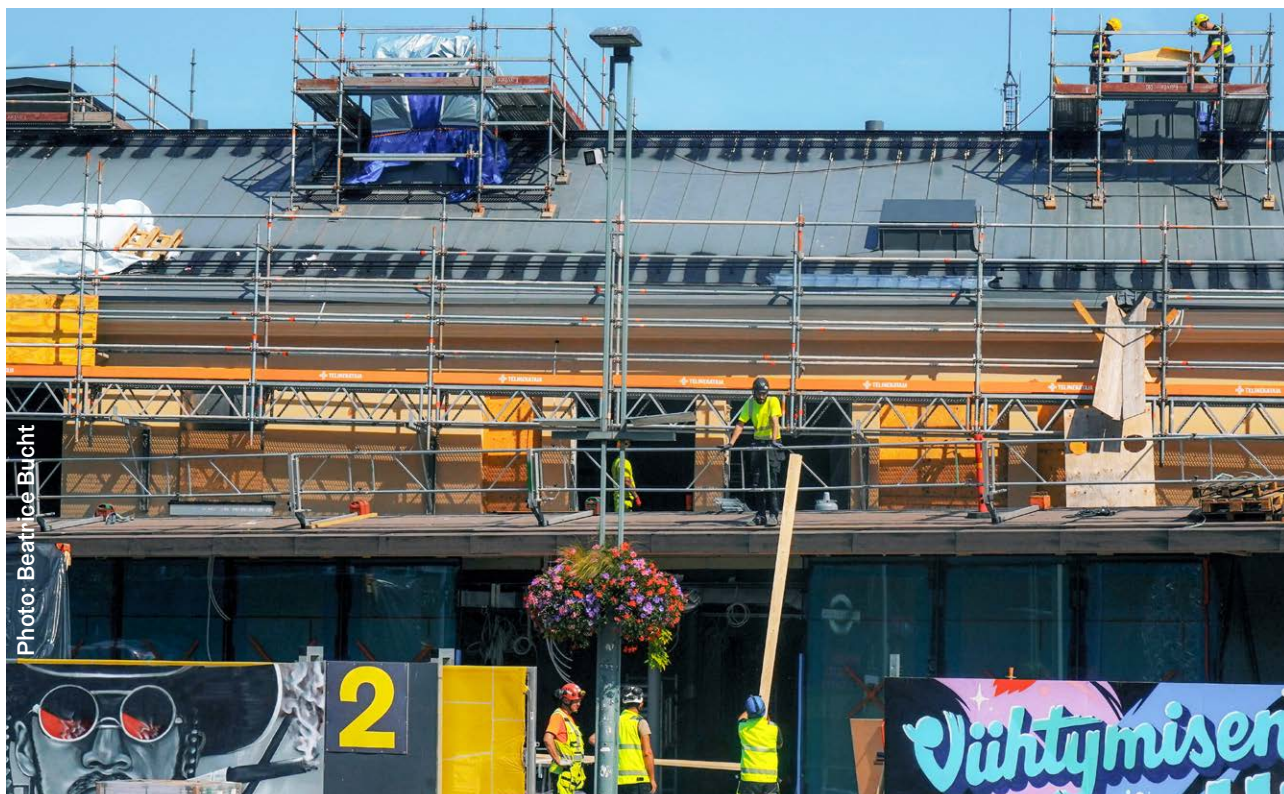
If it is not reasonable to preserve buildings or structures based on assessments, Helsinki promotes responsible demolition practices and the reuse of demolition materials whenever technically and economically possible. In this way, the

circular economy supports low-carbon and resource-smart urban development and helps reduce the carbon footprint of construction.

The carbon footprint of construction is significant in Helsinki. Emissions from new construction, building construction and infrastructure are approximately 300–400 kilotons of CO₂e per year. The figure does not include renovation emissions. Table 9 summarises the measures and indicators used to reduce and monitor construction emissions.

Table 9. Actions that enable emissions reductions in the construction sector

Set of actions	Description of implementation	Indicators
Taking the climate perspective into account in land use planning 	Strengthening the perspective of climate change mitigation in land use planning and related decision-making. Actively seeking and implementing urban planning solutions to reduce climate emissions during the life cycle of urban growth, considering the existing building stock and the circular economy. Used as a guiding factor for the climate perspective in land use planning.	Climate emissions (kg CO₂ e/m²/a, t CO₂ e) per planning project and as the average and sum of the plans per year (low-carbon assessment method for local detailed plans)
Carbon footprint management 	Construction projects are guided towards low-emission solutions already at the planning stage through the carbon footprint limit value set for apartment buildings. The limit value will be tightened, and the possibility of extending it to other building types will also be assessed.	Average carbon footprint per building type of buildings that have applied for a building permit and completed buildings (kgCO₂ e/m²/a)
Transitioning to low-carbon and resource-smarter material choices in building construction 	Accelerating low-carbon construction by developing incentives, such as land handover competitions, that promote the use of carbon-negative and reusable materials. The use of carbon-binding concrete, low-carbon materials (such as low-carbon concrete and steel), reusable building components and structures will be increased in the city's own projects and cost-effective low-carbon solutions are developed in cooperation with the market. A numerical target for reducing emissions from construction will be prepared, considering the significant year-to-year variation in construction volumes.	- In the city's building construction projects, comparison of materials with the reference level of the national emission database (benefit % and difference kgCO₂ e/m²/a) - Use of particularly low-carbon materials in the city's construction projects (% of defined categories) - Average carbon footprint by building type (kg CO₂e/m²/a)



Set of actions	Description of implementation	Indicators
Increasing the use of low-carbon materials in infrastructure construction in the city's construction 	Reducing emissions from infrastructure construction by considering the opportunities offered using low-carbon materials in planning and by implementing projects considering the circular economy and cost effects. The use of low-carbon concrete will be continued, and the use of low-carbon steel will be increased in the city's preliminary and infrastructure construction. Reducing pre-construction emissions and replacing the use of lime cement as a binder in foundation reinforcements with alternative recycled-based binders. Halving the emissions from the pre-construction of Malminkenttä and utilising the lessons learned from it at the city level. Choosing a carbon-binding method, such as wood piling, as the foundation reinforcement method in soft ground.	• Percentage of low-emission concrete used (%) (indicator to be developed) • Percentage of projects located on soft ground where the suitability and use of wooden piles have been investigated (%) • Emissions from Malminkenttä pre-construction (t CO₂ e)
Reducing the climate impact of construction with circular economy solutions 	Increasing the reuse and recycling of building components, structures, soil and other building materials in the city's construction projects. Promoting the use of circular economy solutions in the city's and other actors' projects by developing soil coordination, material logistics and procurement procedures, for example. Reserving areas for material handling and intermediate storage in the urban environment.	• Utilisation of excavated land (%) • Share of the city's construction projects that have examined the reuse of materials and carried out a reuse report (%) (indicator to be developed)
Increasing the carbon sequestration of materials in the built environment 	Determining the minimum level of carbon sequestration of materials in the city's own construction by determining the current level, identifying key improvement measures and setting targets for them. Increasing the use of carbon sequestration solutions, such as biochar, in construction.	• Actual carbon sequestration level of sites in building construction (CO₂ kg/m²/a)

Procurement

By 2029, Helsinki will consistently use public procurement to steer the market towards low-emission solutions that have less impact on the environment. As Finland's largest public purchaser, Helsinki leverages the scale of its purchases to increase the demand for sustainable products and services. The city will implement sustainability criteria in all significant procurement groups and strengthen the procurement units' ability to identify and implement effective, responsible procurements.

Responsibility also extends to the entire life cycle of the purchased products. The city aims to use the products longer, maintain them better and recycle them efficiently to reduce the environmental impact.

The city's procurements cause a lot of indirect emissions, which are not visible in the city's annual emissions monitoring, as it only covers direct emissions. In addition to construction, the procurement of services, transport services and ICT and food procurement in the social, health and rescue sectors have significant impacts on the climate and nature.

In accordance with the City Strategy, Helsinki will be increasingly ambitious in reducing the climate and nature impacts of its procurement. Table 10 summarises the measures and indicators that enable monitoring the emission reductions of procurements.

Table 10. Actions that enable emissions reductions in procurement

Set of actions	Description of implementation	Indicators
Taking climate impact into account in public procurement 	Reducing the emissions and adaptation-related risks of procurement categories with significant climate impacts by strengthening the planning phase of procurements, defining the need for procurement and the implementation method so that they support the climate goals. Developing criteria and requirements, monitoring the development of innovations and technologies and strengthening contract monitoring and verification. Promoting the lifecycle management of climate-smart procurements so that procurement management practices support the achievement of climate targets throughout the contract period.	• Share of procurements exceeding the threshold value (€ and number) with climate criteria (%) • Share of procurement processes that take into account the climate impacts of procurement (%) (indicator to be developed)
Reducing the climate impact of food services 	Developing food services to meet the long-term goals of Finnish nutrition recommendations and customer group-specific meal recommendations as well as the goals of the planetary diet. Halving the amount of food waste in the city's catering services from the 2021 level by 2030 so that the reduction of food waste does not come at the expense of the adequacy or taste of food. Ensuring through monitoring and operational practices that food services both manage food waste and promote good food uptake and a positive dining experience among children and young people. The reduction of the climate impacts of food services will be implemented in line with the City Council resolution adopted on 25 February 2026.	• Consumption of meat and dairy products in food services (g/customer/week and g/customer/day) • Food waste in the city organisation's food services (g/eater/year)
Strengthening market knowledge 	Engaging in close dialogue with market operators to communicate the city's goals, promote market development and ensure the market's readiness to offer lower-carbon and more sustainable products and solutions.	• Procurements with market dialogue (%)

Carbon sinks

Helsinki aims for net zero emissions by 2040. Achieving net zero means that the greenhouse gas emissions produced by the city and their removals are in balance. In practice, emissions may only be generated to the extent that natural carbon sinks, such as forests, and other removals, such as technical decarbonisation solutions, can absorb them. The smaller the carbon sinks are in the future, the more emissions need to be reduced.

Natural carbon sinks remove carbon dioxide from the atmosphere, thereby reducing the amount of greenhouse gases that accelerate climate change. They support both climate change mitigation and adaptation. For example, increasing the carbon stocks of forests strengthens the resilience of ecosystems to extreme weather events and at the same time reduces the carbon dioxide concentration in the atmosphere. The use of biochar is a good example of such a solution: biochar binds carbon in the soil in the long term while improving the soil's water retention capacity and availability of nutrients, which increases the sustainability of vegetation in changing climate conditions.

In addition to carbon sinks in the soil, marine areas also bind carbon. Carbon sequestration in the sea can be strengthened, for example, by restoring underwater habitats. However, the current measurement methods do not yet enable reliable

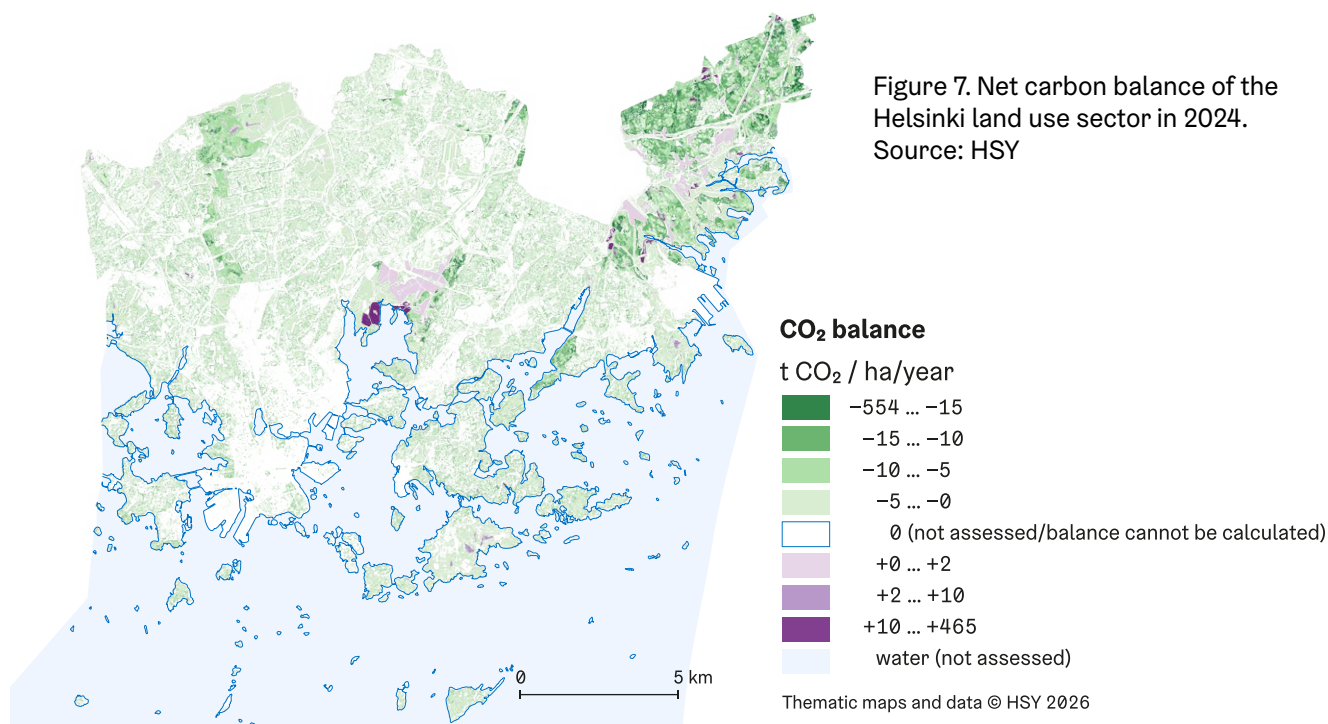
monitoring of marine carbon sinks, which is why they are not included in the Helsinki net zero target for the time being. The work to strengthen the sea's carbon sinks will continue within the framework of the Baltic Sea Challenge Action Plan.

In addition to natural carbon sinks, Helsinki's net zero target requires technical decarbonisation solutions. The city's greenhouse gas balance can take the removals generated in the Helsinki area into account in full, while the removals generated outside the city can only be utilised to a limited extent. Helsinki continuously monitors the development of technical carbon sinks and cooperates closely with research institutes and international operators to implement the most cost-efficient and effective solutions. Although there are still 14 years to go before the net zero target, the city must prepare for piloting technologies and scaling the best practices in good time to ensure impact.

The rapid growth of Helsinki and the expansion of construction reduce the opportunities to increase carbon sinks in the land use sector. The carbon sink of forests is expected to decrease in the future as natural development progresses and the growth of old forests slows down. This is why the city also needs technical solutions, such as carbon capture and storage, alongside natural sinks. The



Photo: Raisa Ranta



development and implementation of these solutions will play an increasingly important role in achieving the net zero target for 2040.

Helsinki's carbon sinks amounted to approximately 42 kt CO₂ in 2024. Helsinki strengthens these sinks by preserving forests and restoring and managing forests and soil in a way that safeguards biodiversity. The aim is to promote the regeneration of forests, and the growth and a more diverse age structure of trees.

Strengthening the sinks also supports the city's adaptation to the effects of climate change. Key planning projects, such as city plans and intermediate-level plans, aim to ensure that the areas with the most significant carbon sequestration capacity are preserved alongside other ecological values.

Table 11 describes the set of actions promoting the increase and strengthening of natural and technical carbon sinks and the indicators used to monitor its progress.

Table 11. Actions promoting the increase and strengthening of natural and technical carbon sinks

Set of actions	Description of implementation	Indicators
Preservation of carbon sinks in the land use sector 	Preserving forests and wooded areas in the urban area, in accordance with the principles of the Helsinki Biodiversity Programme. Forest carbon sinks and carbon storage will be maintained in accordance with the Principles of nature management.	• Amount of natural carbon sinks (t CO ₂ e)
Carbon capture and storage 	Exploring opportunities for carbon capture and storage to map the city's role and identify the most cost-effective alternatives. Specifying the computational limits for carbon removals calculated for the net zero target.	• To be specified later
Promoting the use of biochar 	Drawing up a biochar vision and measures to implement it.	• Amount of biochar used by the city (t) (indicator to be developed)

Climate work requires anticipation of the future

Helsinki is already 2.3 degrees warmer than it would be without climate change (Finnish Meteorological Institute, 2026). In Finland, the rate of warming is four times the global average (Finnish Meteorological Institute). We do not yet know which climate scenario, or forecast, will be realised by 2050 or 2100. We are now rapidly moving towards a more extreme and dangerous climate whose impacts are more difficult to control. Heavy rainfall can fill an underpass in minutes. A prolonged heatwave puts a strain on emergency care and fills hospitals as heat exacerbates chronic illnesses. Supply chains, energy infrastructure and migration will be affected by surprising secondary impacts.

Preparing for climate change, adapting to it and reducing emissions require anticipation based on climate data from the city. It is important to understand what kind of changes are coming and what they mean in practical work - not only from the point of view of managing individual risks, but also from the point of view of long-term emissions development and structural choices. Key decisions in both adaptation and emission reduction work are often made long before their effects are visible.

Anticipation means the ability to recognise signs of change, utilise climate data and break away from old habits. It can be used

to design solutions that at the same time strengthen the city's crisis resilience and steer operations in the direction of lower emissions. Anticipation that identifies risks ensures that current decisions do not lock us into solutions that will be harmful or costly to dismantle in future climate conditions.

Everyone can anticipate the future in their own work by looking at new phenomena, assessing the impacts of decisions and considering both adaptation and emission impacts in relation to the city's other goals. Highlighting development needs helps to ensure that climate perspectives are considered in planning, procurement, investments and service development in good time.

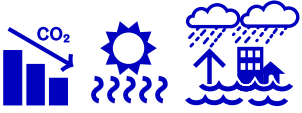
During this City Council term, the city will strengthen the capacity of its divisions to use climate data consistently in adaptation, preparedness and emission reduction work. Services and units receive help to make knowledge-based interpretations that are relevant to their own work and find solutions that affect, for example, urban structure, mobility, construction and care, education and cultural services. This also applies to the organisation of work, scheduling, and supporting of social networks - both in everyday life and in crisis situations.

The city strengthens climate communications and competence development to make them support the ability of employees and organisations to act and use new information in practice. By better identifying the multiple benefits and impact of solutions, climate risk management and

emission reduction can be linked even more directly to the city's other strategic goals.

Table 12 describes the actions that strengthen future forecasting based on climate data.

Table 12. Actions that strengthen future forecasting based on climate data

Set of actions	Description of implementation	Indicators
Communication of the knowledge base and sharing information 	Producing information on the risks caused by climate change and the development of emissions and making it more visible to support internal work by civil servants.	• No identifiable indicator.
Future climate forecasting 	Starting forecasting work based on the knowledge base to concretise climate scenarios from the perspective of the core tasks of the divisions, utilising Helsinki's own climate forecasts and risk information. Identifying possible future paths to support the planning of operations.	• Predictive work model ready
Strengthening of competences 	Providing training and clinic-based support, with an emphasis on key stakeholders, enabling units to apply risk and prediction knowledge to planning and find easily applicable implementation solutions. Introducing new methods for communicating climate information to target groups (e.g. adaptation walks). Strengthening the competence of personnel in considering the economic impacts of climate action as well as topics related to low-carbon construction and carbon sequestration. Training the personnel involved in procurement to take climate and nature impacts into account more comprehensively.	• Training or support meetings organised by the Climate Unit (number)
Strengthening the environmental competence of the City Group's employees 	A network of eco-support persons will be trained from among the city's employees to implement ecological sustainability practices in their own work communities. Strengthening climate competence through further training in climate change mitigation and adaptation.	• Trained eco-support persons (number)
Strengthening the environmental and sustainability management of the city organisation 	Promoting the implementation of climate goals through environmental and sustainability management and programmes of industries and businesses by integrating the climate perspective into operating methods and processes and increasing awareness and commitment to the goals.	• Share of industries and businesses that are environmentally certified/comply with the principles of the environmental management system/implement the sustainability programme (%)

Strengthening the climate responsibility of residents and visitors



Photo: Vesa Laitinen

The city organisation's role in climate work is crucial, as its decisions and practices have a direct impact on the everyday life of the city's residents and the environment. However, the success of climate action also requires the active participation of other actors, residents, in particular. HSY's Climate Info offers free advice and practical tips for residents of the Helsinki Metropolitan Area to support climate-friendly living and energy use in everyday life. The city supports the opportunities for its residents and employees to make

climate-positive choices by providing information through eco-support activities, education and training, projects, events and communications, and by enabling sustainable choices through means such as traffic planning. Table 13 describes the actions that strengthen climate responsibility and the indicators used to monitor their progress.

Table 13. Actions that strengthen climate responsibility

Set of actions	Description of implementation	Indicators
Environmental and climate education at all levels of education and training 	Supporting the environmental and climate education in early childhood education, playgrounds, schools, educational institutions and liberal education work through measures such as Kettu activities, themed study courses and food education by strengthening the sustainability education competence of teachers and educators.	• Educators and teachers participating in environmental responsibility and environmental education training (number)
Strengthening residents' environmental literacy and reducing their carbon footprint 	Strengthening sustainable choices and environmental awareness of residents through communications, environmental education for children, young people and adults and OmaStadi activities. Supporting environmental and nature awareness through the nature school and course activities of Harakka Nature Centre, nature schools of youth services and open youth work. Promoting sustainable everyday life and environmental literacy in libraries by offering shared facilities, materials, workshop activities and lending of objects, and by organising environmental reading tips for all five-year-olds, environmental story lessons for children and environmental events for adults. Increasing the visibility of circular economy services through events. Supporting the sustainability of everyday life and the influence of residents through work aimed at new Helsinki residents.	• Participants in Harakka Nature and Environment School and nature excursions led by guides (number) • Activities implemented in youth services (number) • Actual tips and events (number) • Circular economy companies on the service map (number) • Carbon footprint of Helsinki residents (t CO₂e)
Reducing the climate impact of tourism 	Developing sustainable practices for tourism to Helsinki and reducing emissions related to tourism.	• Emissions from tourism (t CO₂e)

Monitoring, reporting and impact assessment

The city must use its limited resources effectively and correctly to target its efforts on climate change mitigation and adaptation. Monitoring the programme's measures and assessing their impacts are important tools in this regard.

Preparation of the Climate Action Plan took place in a city-level preparation group during 2025–2026. The City Executive Team and Civil Servant Executives guided the preparation of the programme. The preparation considers previous work and interfaces to other programme entities. The city's experts and management have participated extensively in the preparations. The preparatory team will continue its work during the strategy period and will take care of the promotion of implementation and reporting to the management (the City Executive Team and Civil Servant Executives). The city supports the implementation of the Climate Action Plan by considering the communication priorities of divisions.

Helsinki will implement the Climate Action Plan as one, unified city. The City Council, the city's divisions and businesses all participate in the implementation of the programme. Subsidiaries participate in the implementation to the extent that the programme is related to their operations and ownership strategy. The work takes

place in close cooperation with key stakeholders. In accordance with the Strategy implementation decision, the implementation of the Climate Action Plan is guided by the City Executive Team and Civil Servant Executives.

The City's sectors are responsible for taking the Climate Action Plan into account and allocating resources to it as part of their annual operational and financial planning processes. The objectives of the programme must be coordinated with the other objectives of the strategy, identifying the financial framework conditions and striving for the most cost-efficient implementation possible. A significant part of the goals can be promoted by directing operations within the framework of the existing resources, developing operating methods and strengthening the city's internal cooperation.

For example, the estimated faster development of technologies and markets or changes in consumer and business behaviour may also enable the achievement of the 2030 emission target in transport, for example, faster than estimated. For this reason, it is important to adapt the city's actions to changes. The city's other goals are to secure the city's growth and business conditions to enable tax revenue and public services. For this reason,

measures such as carbon sinks, which have a long-term impact on the city structure, must be balanced in more detailed planning and implementation with the city's other objectives, particularly in the planning of investments.

The impacts of the Climate Action Plan are assessed from an economic, social and ecological perspective at a general level. In addition, the financial and other impacts of individual measures can be assessed in more detail in the annual financial and operational planning.

The city assesses the financial impacts of the programme by examining the costs, benefits and long-term impacts of the measures on the city's economy. The economic impacts of emission reduction measures can be assessed through, for example, investments, energy savings and other factors affecting the operating economy. The benefits of adaptation measures are often reflected in avoided costs, such as reduced damage, health impacts and infrastructure repair needs, which makes their monetary evaluation more challenging. Nevertheless, preventive measures, such as stormwater management, strengthening the green infrastructure and preparing for heatwaves, are usually cost-effective compared to repairing the damage afterwards.

In some cases, climate work aimed at reducing emissions increases investment and procurement costs, especially in the transition phase; however, at the same time, it reduces exposure to fluctuations in energy and material prices, tightening regulation and asset depreciation. In addition, many measures generate direct savings, such as improving the energy efficiency of city buildings. When looking at the impacts from the point of view of life cycle costs and avoided risks, the costs are often focused on the initial phase, but in the medium and long term, climate measures mitigate cost increases and strengthen the sustainability of the city's economy.

The city will develop the monitoring, indicators and impact assessment of adaptation and emission reduction during the programme period to achieve the climate targets cost-effectively. This supports the prioritisation of climate actions based on their effectiveness, cost-efficiency and strategic significance and ensures the appropriate use of the city's resources. The achievement of the objectives of the Climate Action Plan and the need to update the programme will be assessed at the end of the new City Council term.

Reporting on the Climate Action Plan is part of the annual monitoring of the implementation of the strategy and the mid-term and final evaluations of the strategy. The progress of the unifying programme packages is discussed once a year by the City Executive Team.

The monitoring examines whether the measures set out in the Climate Action Plan implement the climate targets set in the City Strategy and whether their implementation is sufficient to respond to potentially increasing climate risks. The annual follow-up also identifies the measures to be implemented in the following years and the possible need for changes to the measures or their implementation. If progress according to the objectives is not achieved, the measures are supplemented or their implementation is accelerated.

The emission scenario is updated regularly. Gap analysis is used in the preparation of the measures, which shows the effectiveness of the emission reduction measures in relation to the set targets. The analysis also reveals the emission reduction gap that arises if the planned measures are not implemented or their impact is less than estimated. The gap analysis also assesses the impact of national measures on Helsinki's emissions trajectory and the uncertainties related to achieving the target. Emissions trends, the emissions reduction gap, and any potential need for

additional measures are evaluated as part of the regular monitoring of the Climate Action Plan. That ensures that the emission reduction work can be managed systematically and based on impacts and that everything progresses consistently towards the set climate targets.

The monitoring of the measures is carried out as part of normal financial and operational monitoring. The implementation of the Climate Action Plan is monitored using the following main indicators:

- tree canopy cover (%)
- share of water-permeable surface in total land area (%)
- total greenhouse gas emissions in the Helsinki area (scope 1 and 2) (t CO₂ e/y)
- greenhouse gas emissions per capita in the Helsinki area (scope 1 and 2) (t CO₂ e/y)
- amount of carbon sinks (t CO₂/year)

The measures and their progress are monitored on the city's website. The implementation of climate work is reported to the City Executive Team and as part of the city's environmental report.

The main indicators for climate change mitigation are commonly used and quantitative, such as the change in the city's total greenhouse gas emissions or the number of carbon sinks. On the other hand, the identification of suitable indicators is a challenge in monitoring adaptation. Adaptation does not have one (numerical) goal, but there can be several goals and they are mainly qualitative. Developed adaptation indicators do not directly measure the status of adaptation, but something that promotes adaptation, such as the amount of green infrastructures. Both emission reduction and adaptation measures often provide several benefits at the same time. For example, reducing emissions from traffic reduces not only climate emissions but also air pollutants that are harmful to health and can increase health benefits as everyday exercise increases through walking and cycling. Similarly, adaptation measures, such as adding greenery to street space, promote stormwater management and cool down the nearby environment, but can also improve comfort, promote health and increase safety.

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Appendix 1. Programmes, commitments and agreements that contribute to the city's climate goals

Other strategic programmes of the city that contribute to the achievement of climate goals:

- The sites of the City of Helsinki Nature Conservation Programme 2025–2038 will become part of the city's green and recreational area network, which strengthens the city's ability to adapt to climate change.
- The LUMO Programme 2021–2029 strengthens the ability of green areas to adapt to climate change through diversity and nature-based solutions.
- The Baltic Sea Challenge Action Plan 2024–2029 improves the ability to adapt to increasing rainfall and flood risks by improving stormwater management and strengthening ecosystems.
- The Action Plan for the Circular Economy reduces emissions through material-efficient construction, low-carbon procurement and sustainable everyday choices.
- The Cycling Development Programme 2026–2029 increases low-emission mobility, which will reduce traffic emissions.
- Walking Helsinki Vision increases low-emission mobility, which reduces traffic emissions.
- The city's parking policy promotes sustainable mobility, which reduces traffic emissions.
- The Helsinki Tourism and Events Programme 2026–2029 promotes low-carbon tourism and event solutions as well as sustainable mobility and services.
- The Maritime Helsinki Action Plan 2026–2029 promotes sustainable and low-carbon maritime transport.
- Procurement policies steer procurement towards low-carbon and circular economy solutions.
- The Air Quality and Noise Abatement Plan 2024–2029 reduces emissions by promoting the electrification of public transport, machinery and heavy traffic.
- The Development Programme for the Utilisation of Excavated Land, Aggregates and Demolition Materials reduces construction emissions by promoting the recycling of raw materials and short transport distances.

- Extreme Weather Preparedness Plan, a new plan arising from the City Strategy, which includes the Flood Programme and the Heat Programme, which are being updated, and other guidelines for preparing for extreme weather events.

Other programmes of the city and divisions that contribute to the achievement of climate goals:

- Action Plan for Greening the Built Environment, a new programme emerging from the City Strategy.
- The City of Helsinki's Action Plan for Sustainable Tourism and Events addresses climate-related issues concerning tourism and events in more detail. Helsinki has signed the Glasgow Declaration on Climate Action in Tourism, which aims to halve tourism-related emissions by 2030. This objective is being advanced in close cooperation with the business sector.
- Urban Environment Division: Sustainable Urban Environment - The Starting Points and PRIORITIES of the City of Helsinki Urban Environment Division's Sustainability Work
- Education Division: division-level EcoCompass is being planned, and some schools and daycare centres have a Green Flag or the OKKA Foundation's sustainable development certificate. All locations of Stadin AO, the Helsinki Vocational College, have the OKKA Foundation's sustainable development certificate.
- Culture and Leisure Division: Services covered by EcoCompass (library, sports, youth and cultural services), division-wide services are building the EcoCompass.
- Social Services, Health Care and Rescue Services Division: Sustainable Development Programme 2024–2026 of the Helsinki Social Services, Health Care and Rescue Services Division, EcoCompass.
- Palvelukeskus Helsinki: Sustainable Development Programme 2025–2027, EcoCompass
- Stara Public Enterprise: EcoCompass.
- City Executive Office: EcoCompass.

Key commitments and agreements related to climate change in which Helsinki is involved:

- Global Covenant of Mayors for Climate & Energy: an international network of cities committed to reducing emissions, increasing climate change adaptation and promoting sustainable energy use.
- Net Zero Cities: a European initiative that supports cities in achieving carbon neutrality by 2030.
- Glasgow Declaration on Climate Action in Tourism: an international tourism industry commitment to reduce emissions to promote sustainable tourism.
- Circular Cities Declaration: the declaration of European cities that guides towards a circular economy to promote resource efficiency, emission reductions and sustainable urban development.
- Zero-Emission Construction Sites - Green Deal Commitment for Sustainable Procurement: commitment made with the Ministry of the Environment, including Senate Properties, the cities of Espoo, Helsinki, Turku, Vantaa and Tampere, Helsinki Region Environmental Services (HSY), Finnish Transport Infrastructure Agency, Metropolitan Area Transport and Helen. The goal

of the green deal is that the construction sites of participating cities, municipalities, agencies or other public sector procurement organisations will be fossil-free by the end of 2025, meaning that no fossil fuels will be used in them. In addition, by 2030, at least 50% of the machinery and transport used on construction sites will be powered by electricity, biogas or hydrogen.

- The Circular Economy Green Deal Commitment: a commitment made with the Ministry of the Environment to promote the transition to a circular economy and the reduction of the use of natural resources by the entire society.
- Energy Efficiency Agreement for the Public Sector: an agreement between the Ministry of Economic Affairs and Employment, the Finnish Energy Agency, the Finnish Municipal Association and the Real Estate and Facilities Management Competence Center for Wellbeing Services Counties on the more efficient use of energy in the public sector in 2026–2035. The agreement applies to municipalities, cities, joint municipal authorities, wellbeing services counties and state operators.

Appendix 2. SDG analysis of the Climate Action Plan

Analysis of city-level steering documents

Programme name: Helsinki Climate Programme 2026–2029

Effect on the UN Sustainable Development Goals		Direct positive	Indirect positive	No effect
	1. No poverty		•	
	2. Zero hunger			•
	3. Good health and well-being	•		
	4. Quality education	•		
	5. Gender equality			•
	6. Clean water and sanitation		•	
	7. Affordable and clean energy	•		
	8. Decent work and economic growth	•		
	9. Industry, innovation and infrastructure	•		
	10. Reduced inequalities	•		
	11. Sustainable cities and communities	•		
	12. Responsible consumption and production	•		
	13. Climate action	•		
	14. Life below water	•		
	15. Life on land	•		
	16. Peace, justice, and strong institutions			•
	17. Partnerships for the goals	•		

The sustainability goals of the City Strategy that the programme promotes in particular:

In particular, the programme implements SDGs 13 (Climate Action), 3 (Good Health and Well-being), 7 (Affordable and Clean Energy) and 11 (Sustainable Cities and Communities). In addition, several sets of actions promote SDGs 4 (Quality Education), 8 (Decent Work and Economic Growth), 9 (Industry, Innovation and Infrastructure), 10 (Reduced Inequalities), 12 (Responsible Consumption and Production), 14 (Life Below Water), 15 (Life on Land) and 17 (Partnerships for the Goals).

Assessment of the effectiveness of the objectives of the programme/plan in relation to the SDGs and strategic objectives:

The programme is central to the achievement of the City Strategy's climate and, in part, nature goals. The Climate Programme takes into account Helsinki's commitments to the equality of residents, increasing and securing the biodiversity of Helsinki within the city's borders and cross-generational justice through financial investments in preventing and limiting the increasing impacts of climate change. By committing to preserving the existing sinks, the Climate Programme puts pressure on a more dense urban structure, which makes it more difficult to increase urban greenery in a dense urban structure. Helsinki bears its global climate responsibility by including indirect emissions from construction and public procurement in the programme, even though they are not included in the emission reduction target.

Helsinki