



Climate City Contract

2030 Climate Neutrality Investment Plan

2030 Climate Neutrality Investment Plan Helsinki

Helsinki

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Table of contents

Glossary of Terms	3
1 Part A – Current State of Climate Investment	4
1.1 Module IP-A1: Existing Climate Action Funding and Financing	4
3,1 bn euros*	6
1.2 Module IP-A2: Strategic Funding and Financing Evaluation	9
1.3 Module IP-A3: Barriers to Climate Investment	11
2 Part B – Investment Pathways towards Climate Neutrality by 2030	15
2.1 Module IP-B1: Cost Scenarios for Climate Neutrality	15
2.2 Module IP-B2: Capital Planning for Climate Neutrality	48
All actions and costs are outlined in section 2.1. The city is the sole financier of the actions (except for action 1, where Helen is the sole financier)	53
2.3 Module IP-B3: Economic and Financial Indicators for	53
2.4 Monitoring, Evaluation and Learning	53
3 Part C – Enabling Financial Conditions for Climate Neutrality by 2030	66
3.1 Module IP-C1: Climate Policies for Capital Formation and Deployment	66
3.2 Module IP-C2: Identification and Mitigation of Risks	76
3.3 Module IP-C3: Capacity Building and Stakeholder Engagement for Capital and Investment Planning	79

List of tables

<i>Table 1: Historical Municipal Budget and Budget for Climate Actions.....</i>	6
<i>Table 2: Finance Sources By Field of Actions, for Years 2022-2024.....</i>	7
<i>Table 3: List of Income Sources for the City.....</i>	9
<i>Table 4: List of Capital Sources for the City.....</i>	10
<i>Table 5: Barriers to Climate Investment.....</i>	14
<i>Table 6: Sectorial Costing.....</i>	43
<i>Table 7: Capital Intensive Projects.....</i>	47
<i>Table 8: Capital Planning by Stakeholder.....</i>	49
<i>Table 9: Capital Planning.....</i>	51
<i>Table 10: Economic Indicators by Sector.....</i>	56
<i>Table 11: Financial Indicators by Sector.....</i>	57
<i>Table 12: List of Climate Policies to Enable Capital Deployment.....</i>	76
<i>Table 13: Climate Investment Plan Risk Framework.....</i>	77
<i>Table 14: Stakeholder Engagement Mapping.....</i>	84
<i>Table 15: Stakeholder Activity Cost.....</i>	Virhe. Kirjanmerkkiä ei ole määritetty.



Glossary of Terms

Acronym	Description
AP	Action Plan
IP	Investment Plan
KPI	Key Performance Indicator
MEL	Monitoring Evaluation & Learning
MRV	Monitoring Reporting Verification
WP	Work Package



1 Part A – Current State of Climate Investment

1.1 Module IP-A1: Existing Climate Action Funding and Financing

Model IP-A1

Helsinki's carbon neutrality plan is in its second iteration. The first one (2017-2021) set the goal for 2035 but in 2021 the target was moved to 2030 and more emphasis was put into impact and efficiency of the plan. The plan's mandate comes from the City Strategy 2021-25 (Helsinki- A place for Growth), which sets forth the future guidelines for Helsinki. The City Strategy is updated every council term and adapted by the city council. The strategy states: "Our goal is a carbon-neutral Helsinki that is able to not only meet its environmental objectives, but also act as an example, going beyond its part to play in responding to the crisis. We will zero in on the fastest measures for reaching carbon neutrality, and we will actively seek out big picture-oriented solutions that set us on the path to social justice. Environmentally friendly options will be made more readily available to residents. We will move our deadline for achieving carbon neutrality up five years to 2030 and renew our Carbon-neutral Helsinki Action Plan with measures to reduce construction and traffic emissions, in addition to other changes that are seen as necessary and feasible. A goal to attain carbon zero status by 2040 will also be set, and we will map out a series of scenarios for achieving this milestone. Helsinki will also start planning for a carbon-negative future." (Helsinki 2021). The actions listed in this document have been approved by the decision-making process of Helsinki and added to the city budget. The actions are chosen on annual basis to enable faster developments towards the goal.

With the current development in the city and the investments in place by the city owned energy company Helen, it can already be forecasted with a level of certainty that Helsinki will achieve the 2030 goal of 80 % reduction of emissions from the 1990 (and 2008*) levels. Therefore, most of the new actions in the plan concentrate on the reduction of transport emissions as that sector will be the biggest source of emissions in the coming years. There is a lot of on-going work in scenario development, large-scale impact assessment and citizen participation in the transport planning but as they have not yet gone through the political decision -making process in the city we cannot publish everything but have tried to give an overall picture of the work, plans and processes and will update this document when we have more public information.

The second large-scale work right now focuses on how to deal with residual emissions. In the last months the city has in collaboration with researchers and consultants produced three reports on the amount of carbon sinks in the city, the future of natural and technical sinks and the possibilities and challenges of compensation programs. These will also go through the political decision -making process and we can talk about them more after this fall. But the idea is to have enough data and understanding of the different possibilities and cost-analysis of each so that informed decisions can be made between additional emission reduction actions, compensation and/or increasing sinks.

The actions of the climate neutrality plan will be updated annually in order to rapidly react to factors like technological development, political and other types of guidance and other factors that affect emissions. Because of these factors the financing is also thought about on an annual basis and actions are added to the city budget. There are also long-term investments like large infrastructure projects but in general the rule is that actions are decided upon their emission reduction impact and financed accordingly every year. There is no separate climate budget, but actions are added to the annual city budget in normal negotiations with the finance department.



A note to reader about the logic of how this document is written

Helsinki has been active and target oriented about achieving carbon neutrality for over ten years, it's been a journey of learning and iteration, from understanding which actions will deliver biggest emissions reduction to how to involve stakeholders, decision-makers and employees in the most impactful and inclusive ways. This document tries to tell the narrative of that journey in an understandable way but because of the layout of the template the storyline has to be picked up from the different sections a bit differently that we'd normally tell it. Therefore here's a few explanations to ease the reading experience.

The path to decreasing emissions by 2030 in Helsinki is quite clear, the investments done by the energy company Helen and the long-term investment plans by the city on major infrastructure work together with the impact-oriented action plan for carbon neutrality ensures that the target will be achieved with a 80-83 % reduction in emissions by 2030 from the 1990 level. Helsinki uses the year 1990 as it's been set by the city council. The portfolio part of this document lists all the actions and investments that have been decided already, each action is presented with the content description, indicator, impact on emissions, cost effects, parties responsible, stakeholders and co-benefits. They are however not linked to barriers. In our understanding a barrier is something that obstructs or at least delays an action. So when the action is accepted by stakeholders as well as politically and financially it has overcome the barrier that formerly was there.

The impact pathways part of this document describes possible actions on the transport sector and residual emissions where decisions have not been made yet. These are linked to identified barriers as there isn't yet a political, financial or stakeholder consensus on the actions that can be taken. The barriers are linked to stakeholders that need to be part of the decision-making process. Some of the barriers listed look beyond 2030 as a lot of climate planning work in Helsinki is already looking into achieving net zero and even carbon negativity.

It's also important for the reader to understand some specificities of Helsinki as a city. The city has a 6 bn euro budget with a 500.000 euro surplus and its finances are well taken care of with a long-term investment plan in place which the city self-finances. The city has 40.000 employees and is the biggest employer in Finland and takes care of most services to citizens, including education and health care. The local democracy is strong, 72 % of the people voted in the local elections for the city council. The city council consists of 85 representatives and is the highest decision-making power in the city. They also elect the mayors. The city council accepts the four-year city strategy that is the binding and guiding document for all important actions in the city. The carbon neutrality target for 2030 is set by the city strategy and thus its action plan has mandate over all divisions and employees of the city.

The 2030 carbon neutrality target covers scope 1 & 2 but the city has stated in the strategy that it will also target emissions from the construction sector as Helsinki also has quite a lot of power to act in it as it owns 63 % of the land and 20 % of the buildings in the city and has a planning monopoly, making it possible for the city to also steer and regulate the construction sector. The city also owns the energy company and Metropolitan transport ltd which constructs and operates all major transport infrastructure and both have set the same carbon neutrality target 2030.

When it comes to citizen engagement the city has a lot of both legal and voluntary commitments and actions embedded in the city systems and organisations which are explained in the chapter of systems, barriers and opportunities. There are many channels through which citizen engage with the city and vice versa but carbon neutrality specific social innovations and citizen engagement has been described in those chapters.

As a general rule in Helsinki the investments needed for cutting sectoral emissions are as follows: The city takes care and self-invests most transport investments (infrastructure plus regional public transport systems). In the built environment sector, the city is responsible and self-invests most of



the pre-construction infrastructure projects (streets, bridges etc). The city also builds quite a lot itself. Out of the annual 8000 apartments the city builds 1750 and over 5000 are on city owned lands. The city also builds schools, day care centres and other public buildings. There is some co-financing from the state on large, long-term, infrastructure projects, if they cross municipal borders. The energy sector is almost solely a sector where financing and investments are done by the Helsinki Energy Company, Helen, which is owned by the city. The city does not have access to their investment plans but as a company they are committed to the same carbon neutrality target 2030 as the city. There are several waste companies operating in Helsinki, the city co-owns a regional company with the other metropolitan cities. They are also committed to the carbon neutrality targets. Most of the climate plan actions are not expensive, they are more regulatory in nature.

*) Helsinki's emissions in 1990 and 2008 were almost exactly the same: 1990 3514 kt co2e compared to 3521kt co2e in 2007

A-1.1: Textual element

Breakdown of the annual budget

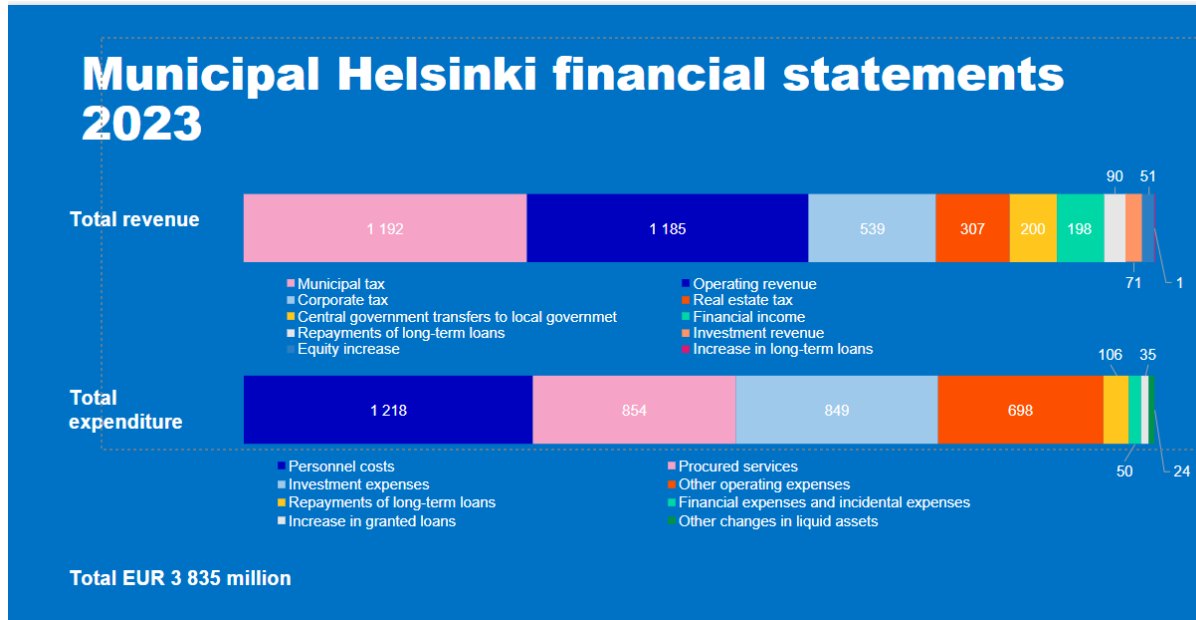


Table 1: Historical Municipal Budget and Budget for Climate Actions

Budget Data	2024	2023	2022	2021	2020
Municipal Budget (€)	3,1 bn euros*	2,8 bn *euros	5,1 bn euros	5 bn euros	4,8 bn euros
Municipal Budget for Climate Actions & Projects (€)	**) 502 MEUR	471 MEUR			
% of Municipal Budget for Climate Actions & Projects (%)	***) 16,7 %	16,8%



*) Finland changed the system for social and health care services and while Helsinki remains as the only city in the country that will be its own health and social services region, the budget has to be separated between health& social budget and the city budget. Thus, the change from 2023 onwards.

***) there is no separate climate budget, all climate actions are included in the city budget.

For the sake of clarity most of the actions mentioned here are not labelled as climate actions. Tram lines, public transport management, bike lanes etc are not climate actions first of all but systems for enabling people to move, Secondly they benefit healthy and active mobility and thirdly can aid, in the future, the carbon neutrality target but while tram lines are built they add to emissions

Most climate actions listed in the annual budget are considered cost positive because while it costs some money to do energy efficiency renovations in buildings the savings from energy bills are so big that they not just pay back the renovations but actually save money for the city. so listing just the actions that are labelled as climate actions would be less than 0 % of the total budget.

An example of this :

ACTION 9: Adjusting the ventilation in City facilities to an appropriate level

Cost effect: -11 million euros/year in comparison to a situation where the ventilation system is running full-time

***) it's quite hard to calculate what are climate actions except for the ones that are defined as carbon neutrality plan additional actions – as an example those actions in 2025 will be 4,5 million euros and thus about 0,15 % of the budget. On years 2023-2024 the calculations would have shown as savings, not costs because most of the climate actions save so much money (as you can see with the example above and can read more in the section where all actions are listed). But here for the sake of this table all the actions that can be seen as adding to carbon neutrality have been added up, these include funding and investments to tramlines, public transport, bike lanes etc.

Table 2: Finance Sources By Field of Actions, for Years 2022 to 2024

Fields of Action	Sector Subsection	Budget Allocation for Climate Actions and Projects		
		2021	2022	2023
Transportation	<i>Climate friendly mobility in total</i>		75 MEUR	80,3 MEUR
	<i>Cycling+ walking infrastructure</i>	19 MEUR	25 MEUR	23,5 MEUR
	<i>Walking /streets</i>	9 MEUR <i>infra repairs</i>	9 MEUR <i>for infra repairs</i>	11 MEUR <i>for infra repairs + 54 for new residential areas</i>
	<i>New tram lines</i>	50 MEUR	40,3 MEUR	10,3 MEUR
	<i>Public transport (paid to the regional HSL)</i>	218 MEUR	235MEUR	243 MEUR <i>usage + 19 MEUR for infra</i>



	<i>Cars /roads</i>			3 MEUR
Built Environment/renovations (energy efficiency about 3-4 % of the renovation sum)	<i>Residential</i>		6,4 MEUR	7,8 MEUR
	<i>Public Buildings Renovations</i>	153MEUR	147MEUR	142 MEUR
	<i>Pre-construction</i>	29 MEUR	46MEUR	63MEUR
Energy Systems	<i>(e.g. Solar Thermal / Solar PV)</i>	<i>The city installs solar panels on city built infrastructure. There's a special budget of 4,5 million for solar panels</i>	<i>Program continues</i>	<i>Program continues</i>
	<i>Heating systems</i>	<i>The city doesn't have all budgetary information for Helen but they have invested over 295 million euros to renewable electricity production and have made decisions for 650 million to sustainable heating energy production in the next years</i>	<i>For 2022 the investments were 562 MEUR invested in renewable energies</i>	<i>For 2023 the investments were 408 MEUR invested in renewable energies</i> <i>Helen says 600 MEUR is invested in renewable energies in 2024</i>
	<i>LED lamps</i> Number of lamps replaced by LEDs per year in relation to the annual target (8,000 pcs/year).			Cost effect: additional cost €2.5 M/year in 2023–2025 and €2 M/year in 2026–2030
Green Infrastructure and Nature Based Solutions	<i>(e.g. Parks, Green Roofs, Community Gardens, Rivers, Protected Areas, Forestry)</i>	<i>Parks budget is 24 million, 0,01 % of the budget</i>	<i>Parks budget is 30 million, 0,01 % of the budget</i>	<i>Parks budget is 37 million,</i>



Waste	waste and environmental cleaning	20 MEUR	22 MEUR	22MEUR
Circular economy			2,9 MEUR	3,5 MEUR
Total in €		821 MEUR	1200,6 MEUR	1302,9 MEUR

1.2 Module IP-A2: Strategic Funding and Financing Evaluation

Model IP-A2
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A-2.1: Textual element

The city has a very clear picture of what the revenue consists of (see below).

The surplus for 2024 is 585 million euros.

Investments are 1042 MEUR, The loan portfolio for 2024 is 500 million euros. The city usually uses loans from EIB, NIB, MuniFin and CEB, mostly for the subsidiaries.

In total Helsinki has about 970 MEUR loans but its subsidiaries owe the city 1900 MEUR

Investments in the city are 88,9 % self -financed.

Category	Value (Eur millions)
Buildings	391
Streets and thoroughfares	98
Major transport projects	95
Real property	59
Project area infrastructure	128
Acquisition of movable property	93
Securities	50
Parks and sports areas	37
Investments of business establishments	74
Urban renewal	16
Other capital economy	1
Funds	2
Total	1042

Table 3: List of Income Sources for the City

Income Category	City income	% of city budget
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<i>Source of City Income</i>
Local taxation revenue	1000 MEUR	27
Deferred funding from state	261 MEUR	7
Community tax (for companies)	475 MEUR	13
Real estate tax	367MEUR	10
Sales	419 MEUR	12
Payments to city	93 MEUR	3
Financial aid and support	31 MEUR	1
Rent income	570 MEUR	16
Other income from activities	105 MEUR	3
Production for own use	117 MEUR	3

Table 4: List of Capital Sources for the City

The city loans money from EIB, NIB, MuniFin and CEB. Also, the subsidiaries of the city take loans from the same funders. The city often first gives short term loans to subsidiaries like Helsingin Toimitilat oy (the city owned real estate company that governs city owned real estate like schools, hospitals, office buildings) and Metropolitan Transport ltd (which builds and operates new tram lines, metros, ferries and light rail system) and then is involved in the larger loan process. Since 2016 Helsinki has not taken loans for itself but mostly on behalf of the subsidiaries. All the loans for the city and the subsidiaries have been considered as green investments by the financiers.

Table 4: List of Capital Sources for the City

Type	Size Range	Level	Description
<i>Source of Capital</i>	<i>Quantum of Capital Accessible to the city through this source</i>	<i>Private or Public</i>	<i>(Description of capital source e.g. cost & provider)</i>
Munifin	465 751 949,00		
European Investment bank	355 000 000,00		
Nordic Investment Bank	30 000 000 ,00		
Council of Europe Development Bank	110 000 000,00		
Deutsche Bank	33 000 000,00		
Evangelische Zusatzversorgungskasse anstalt des öffentlichen rechts	20 000 000,00		
European Investment bank	170 000 000,00		Loan is for Metropolitan Transport ltd (three loans taken in 2012, 2013, 2014)
Nordic Investment Bank	80 000 000,00		Loan is for Metropolitan Transport



			ltd (two loans, 2011, 2016)
Total in €	1263752000,00		

1.3

This section requires evaluation and identification of the range of structural, policy, economic, and financial barriers for capital deployment in support of climate action.

1.4 Module IP-A3: Barriers to Climate Investment

A-3.1: Textual element

Barriers for climate investments

by sector and type of barrier

Heating

1. Financial:

- Helen is moving from burning coal to burning biomass. While biomass at the moment is considered emission-free that categorization can change in the future and thus jeopardize the investments made
- The price of biomass has since the war in Ukraine gone up as imports from Russia are not allowed.
- While right now over 90 % of buildings are connected to the Helen district heating system there have been more and more residential buildings choosing to install heat pumps to lower their heating costs. This can at some point jeopardize the business model of Helen.
- Helen's future investments (beyond 2030) are still under consideration and can be very expensive to realise. They have talked about BECCS and SMR. They are very expensive investments and can therefore risk the business model.
- Possible solution : too early to say with the fast technological development in the field
- Stakeholders: Helen, city as the owner, citizens, EU, National government

2. Acceptance and regulatory barriers

- Burning anything is already a climate risk and many people find it unacceptable for the future. This might get more people to find other solutions, like heat pump installations, to district heating.
- Biomass also uses the same material that makes up the natural carbon sinks and this can become a problem for countries like Finland.
- Future investments in heating infrastructure, especially SMR, can be difficult to get acceptance for whether by regulatory bodies or people in general.
- Possible solution : Large stakeholder engagement and communication of the possibilities.
Risk analysis



- Stakeholders: EU, National government, IPCC; Helen, city, citizens

Transport /mobility

3.Acceptance

- Both political and citizen opinions are very diverse and often contrary. Finding the needed consensus for making decisions can be difficult. This is especially true when it comes to environmental zones in the city, road tolls and other restrictions for cars in the city.
- Helsinki is the capital and the neighbouring cities, and the region make up a huge percentage of journeys inside Helsinki. Any restrictions for entering Helsinki causes worried and even angry protests from the surrounding cities' administration. Only about 50 % of Helsinki residents own a car and 77 % of all journeys in Helsinki are taken by foot (39%), bicycle (9%), public transport (29%) or other (1%) while journeys by car make up about 22 %.
- The chamber of commerce and many inner city companies feel strongly that any restrictions to private car usage will jeopardize the liveability of shops and the service sector in the downtown area and have been very vocal about any restrictions for car usage (for example during the pilot period of closing down one lane in the central Esplanade street, the pilot lasted only 2 years (2023-24) and will not continue due to the huge outcry of businesses and many residents).
- Possible solution : Increased stakeholder engagement before solutions are decided. The citizen panel on transport actions that was held in the spring and summer of 2024 was a good start.
- Stakeholders: citizens, commercial entities, chamber of commerce, political parties, city

4.Socioeconomic /social justice

- While e-vehicles are easily accepted by most people and enable quite a lot of freedom for private car usage in the city the price of e-cars is a barrier to many and create inequality among residents
- There's a similar issue with road tolls or anything that increases the costs of driving, whether for private use or for companies
- Possible solution : Incentives, tax cuts, supporting other modes of transport
- Stakeholders: Citizens, city, car industry, EU, National government

5.Governance

- E-vehicles on both land and sea need a good charging infrastructure. Helsinki has been too slow in putting the infrastructure in place but there are several plans (see actions) for speeding up the process.
- Possible solution : Adding more charging infrastructure by the city but also enabling private sector companies to add more chargers in the city infra
- Stakeholders: City, commercial entities, national government

6.Financial

- The Helsinki archipelago is serviced with a lot of private family-owned water busses /boats that are approximately 70 years old and quite polluting. As they only operate during the summer months the costs for renewing their fleet is very expensive. T



- Possible solution :The city is considering an incentive and financial aid program to speed up the change, piloting of this starts next year
- Stakeholders: Small family-owned companies, city

Residual emissions: Compensation/new natural and technical carbon sinks

7.Regulatory

- It's very difficult at the moment to know for sure which compensation actions will be acceptable according to upcoming regulation. For example double counting will present several restrictions to compensating in other countries /other municipalities. For example, buying forests in either another country or another municipality in Finland will not help as those will be counted as carbon sinks in the area where they are located (and only additional actions can be counted for Helsinki's benefit). Also lowering emissions in another area, waste management for example, will also most likely be counted as emissions reduction in the area where it is located. There are also problems with verifying the real emission reduction /increased carbon sinks in many programs.
- Possible solution : Having a common regulatory framework for all cities, on both national and EU level
- Stakeholders: EU, National government, city, IPCC

8.Acceptance

- Due to aforementioned reasons, it can be hard to convince politicians or citizens for compensative actions. On the other hand, if the other possibility is additional actions in for example mobility sector the choice can difficult. Using a cost-impact analysis for all possible actions on residual emissions is what Helsinki is implementing at the moment.
- Possible solution : Increased stakeholder engagement to find acceptable solutions. Also comparative cost-analysis for all actions so that the city can make financially sound decisions
- Stakeholders: Citizens, political parties, city

9.Financial

- All actions for residual emissions are somewhat costly and some much more than others. For example, the most impactful action, investing in BECCS, DACCS or bio char facilities is extremely expensive but while adding natural sinks is quite impossible in a growing city and compensation is not possible after 2030, technical sinks (CCS/CCU) will be the only possible means for dealing with residual emissions.
- Cost for many of the possible actions for increasing sinks are uncertain. For example, biochar is a good means for capturing co2 but its availability in large amounts and future price are uncertain
- While adding more natural sinks in the city would have many co-benefits: cleaner air, more shelter from climate change, the costs for reducing land for building new residential areas is cost that the growing city probably doesn't want to take .Also in terms of how much more new forest land would be needed Helsinki calculated that in order to offset all current emissions the city would need 4 times the land area it now has and all of that(including the current city) would just need to be forests. On top of that trees are emitters of carbon until they have grown for at least 20 years.
- Possible solution : Too early to say, technological development is fast in the CCS/CCU sector
- Stakeholders: Helen, Industry, city, citizens, political parties



Table 5: Barriers to Climate Investment

Financial Barriers to achieving Climate Neutrality	Typology of Barrier	Description	Sector and stakeholders involved
1	Financial		Heating: Helen, city, consumers of district heating
2	Acceptance & Regulatory		Heating: Helen, city, consumers of district heating, regulators, national administration, lobbyists, EU
3	Acceptance		Mobility: local politicians, residents, commercial interest groups, chamber of commerce lobbyists, national administration and political groups
4	Socioeconomic /social justice		Mobility: residents, local political parties, national admin + politicians, EU
5	Governance		Mobility: city departments (mobility, climate, finance) private e-charging companies, e-vehicle owners
6	Financial		Mobility: small water bus companies, city departments (finance, strategy, climate, mobility
7	Regulatory:		Residual emissions: EU, national governance, city
8	Acceptance		Politicians, citizens, city
9	Financial		Politicians, citizens, city, regulators in EU and national level, compensation programs, industry

As the barriers are explained above in the textual section this template is used to define stakeholders



2 Part B – Investment Pathways towards Climate Neutrality by 2030

2.1 Module IP-B1: Cost Scenarios for Climate Neutrality

Model IP-B1

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B-1.1: Textual element

The following actions have been approved in the city’s budget negotiations in the last three years and up until 2025. The city goes through an annual process where all actions that require financing submit their applications to the finance department in the spring of each year and a normal process of negotiations takes place. The budget then goes through a political process and is approved in late fall each year. Only large-scale investments are approved for a multiyear framework. Those are included in this section after the actions.

Helsinki can not present all investments and cost scenarios until 2030 due to how the city is governed and functions but also because the actions are chosen annually after the annual results of emissions reductions have been reported. The actions chosen for the following year have to guarantee that the carbon neutrality target is achievable. Another reason for why all actions are not defined yet is that technological development and innovations are constantly emerging and it would be unwise to decide now what the best ways moving forward in for example 2028 would be.

Most of the actions are tasks for the Urban Environment Division of the city. Therefore no specific roles or responsibilities are mentioned as while the responsible party might be a the mobility department, city facilities department or city planning department, they all fall under the same leadership and the same overseeing political entity, the Urban development board. The actions that are part of the Carbon neutrality plan of Helsinki are also overseen by the Carbon neutrality program group headed by the mayor. All actions that are part of the Carbon neutrality plan are also included in the city budget and therefore have gone through the normal process of negotiations with the finance and strategy departments of the central administration. The Urban Environment Division bears the main responsibility for the implementation of the measures of the Carbon Neutral Helsinki Action Plan. The division also plays a key role in improving the energy efficiency of the City’s property stock and private housing companies, as it administers a large proportion of the City’s properties in use, while the Energy Renaissance team supports private housing companies in energy renovations and surveys. The division also exerts significant influence over construction emissions through aspects such as carbon footprint steering for apartment buildings implemented in detailed planning and plot conveyance operations, E-value targets, emissions reduction measures in infrastructure construction, and the Green Deal for emission-free worksites.

When the actions are responsibility of either another city division or actors outside of the city these are explained in more detail.

Heating

ACTION 1: Helen’s strategy for carbon neutrality 2030

Helen Ltd is a company owned by the City of Helsinki and its administration is based on the Limited Liability Companies Act, the articles of association and the group policy of the City of Helsinki.

Helen Ltd provides electricity, heating and cooling to its customers, as well as diverse services for energy microgeneration, energy usage and optimised consumption.

Steps towards carbon neutrality

1) 2023: at least 40 per cent on the 1990 level



- The Hanasaari power plant will close and halve the use of coal. Helen will replace production with waste heat, sustainable bioenergy, energy storage, as well as nuclear, wind, and solar power.

2) 2024: at least 60 per cent on the 1990 level

- Helen will close the Salmisaari coal-fired power plant and end the use of coal. The company will make a move towards distributed heat production and a sustainable energy system.

3) 2025: at least 80 per cent on the 1990 level

- The heat production will consist mainly of heat pumps utilising waste and environmental heat, electric boilers, energy storage, and sustainable bioenergy. The electricity will be mainly produced with wind, nuclear, hydro, and solar power.

4) 2030: at least 95 per cent on the 1990 level

- Helen will further increase wind and solar power and the amount of non-combustion heat production especially with heat pump solutions. Helen will offset the remaining emissions.

The city actions for reducing emissions from heating

The energy efficiency of the city's own building stock is improved, and the amount of renewable energy is increased every time the buildings are renovated, but also through separate energy efficiency renovations.

In the city's own business premises, district heating will account for 98 per cent of heating in 2023. A small percentage of the buildings are still heated by oil or electricity, but in these properties, heating modes are constantly being upgraded to lower-emission options. The share of heat pumps is also increasing.

In new construction and renovation projects, the profitability of geothermal and air-to-water heat pumps is always assessed. A heat pump is always chosen as the main heating system if it is technically possible and economically viable. A heat pump system is selected in almost all new construction projects, and in renovations, the share is somewhat lower due to the limitations of existing buildings and their plots.

ACTION 2: Heating method change for all oil and direct electricity heated city owned office and service buildings.

Will be done during 2024-25

- Indicator: Saved energy in the facilities
- Impact on emissions reductions: Depends on the heating method, when its oil it will be significant
- Cost effect: 600.000 euros, cost positive due to saved energy costs
- Party responsible: Urban Environment Division
- Stakeholders: City departments and facility operators
- Co-benefits: cost savings, air quality



ACTION 3: Planning and implementing City facilities and service buildings so that the E value will be -30% of the national threshold value for the use class

ACTION 4: Renovation projects on City facilities and service buildings will be implemented so that the E value will decrease by 34% of the buildings' original E value.

ACTION 5: Requiring energy class A of residential blocks of flats (highrise class 2) in the property conveyance conditions.

ACTION 6: Requiring energy class A of residential blocks of flats (highrise class 2) in detailed planning.

ACTION 7: In detailed planning, buildings other than residential ones will be required to be of a class that is 20% of the national norm set for that type of building.

ACTION 8: The main heating system selected for the City's facilities and service buildings will be a heat pump system if its repayment period is under 15 years and its implementation is technically feasible.

- Indicator: Saved energy and heating emissions in the facilities
- Impact on emissions reductions: saved energy and heating emissions
- Cost effect: regulatory in nature, will be done by official work
- Party responsible: Urban Environment Division
- Stakeholders: City departments and facility operators
- Co-benefits: cost savings

ACTION 9: Adjusting the ventilation in City facilities to an appropriate level

Controlling ventilation according to demand is an essential action to take between renovation projects to improve the energy efficiency of buildings. Appropriate use of the system refers to that the ventilation system will not be used at night when there is no one in the building, and as such, there are no sources of humidity. It also refers to controlling the air flow based on the number of people in the room. Ventilation requires heating energy to increase the air supply temperature to the desired level. When the ventilation machines are not running while there are no activities or people in the building, a significant amount of heating energy can be saved, and good indoor air quality can still be ensured when the buildings are occupied. The potential of adjusting the operating hours of ventilation systems has been studied together with the divisions. Based on the study, the most cost-effective way is to equip facilities that operate outside regular hours with carbon dioxide meters based on which the ventilation is controlled.

- Indicator: Facilities that can be booked outside regular hours will be prioritised, and carbon dioxide meters will have been installed in all such sites by the end of 2025.
- Impact on emissions reductions: -20,000 tCO₂e/year in comparison to a situation where the ventilation system is running full-time. There is no information available on the current usage rate of the ventilation systems.
- Cost effect: -11 million euros/year in comparison to a situation where the ventilation system is running full-time. There is no information available on the current usage rate of the ventilation systems.
- Party responsible: Urban Environment Division
- Stakeholders: City departments and facility operators
- Co-benefits: cost savings, noise reduction



ACTION 10: Lowering temperatures in City-controlled facilities

Helsinki employs guidelines approved in October 2020 and based on the National Supervisory Authority for Welfare and Health's guidelines for applying the Housing Health Act. These guidelines offer instructions on controlling temperature conditions in various facilities and weather conditions. The guidelines also include target temperatures. At the same time, the City will perform energy surveys on dozens of service buildings and implement the necessary energy conservation measures on them. In addition to this, the Urban Environment Division has launched planning on what sort of quick and, if necessary, temporary additional measures can be implemented in the coming autumn and winter to cut down energy consumption and costs so that working conditions will remain at a sufficiently good level. To ensure rapid action, a clear decision will be made on how and in which locations temperatures will be decreased.

- Indicator: Decision to be made by the end of 2022 on how temperatures will be lowered wherever possible.
- Impact on emissions reductions: The consumption of district heating in properties directly owned by Helsinki was 391 GWh in 2021. If the temperature could be decreased by 2°C in half of the properties, the consumption of district heating would drop by 5%, or 20 GWh (with the assumption that a drop of 1°C in indoor temperature corresponds to a drop of 5% in heating energy consumption). With the emissions of 2021, the drop equals an emissions reduction of 3.7 kt CO_{2e}.
- Cost effect: To be carried out as official work. Lowering the temperature will reduce the consumption of heating energy. When calculated using the assumptions above, the savings achieved would be 5% of the district heating costs of properties directly owned by the City. The action is cost-positive.
- Party responsible: Urban Environment Division
- Stakeholders: City departments and facility operators
- Co-benefits: cost savings

Actions for privately owned homes

ACTION 11: Launching Energy Renaissance guidance services.

ACTION 12: Allowing the construction of geothermal heating systems in public areas.

The City of Helsinki's energy experts provide independent advice for housing companies that are interested in surveying how they could improve their energy efficiency and carry out a financially viable energy renovation. The services are provided by the Energy advisory team of Building Control Services

The City's advice service is free and unbiased, intended for housing companies in Helsinki. Advice is provided in all stages of the renovation, from idea to implementation. The City's energy experts can be invited to attend a board of directors meeting or general meeting of the housing company, for example. The experts can also familiarise housing companies with different energy renovation options or present examples of other housing companies' renovation successes Actions include :

- Establishing what energy procedures are available and possible to the housing company
- Evaluating the energy efficiency survey and contract offers received by the housing company
- Building charging stations for electric cars



Housing companies are still responsible for the actual ordering, implementation and payment of energy efficiency surveys and renovations themselves, however. These are done by private companies.

This service has been very successful, with over 640 housing companies and over 19.500 apartments having gone through the renovations, heat pump installations being the most popular action. This has also created a 230 million euro market for private companies in the city.

The second action "Allowing the construction of geothermal heating systems in public areas" means that the city allows residential buildings that either don't own the land their building is on or don't have enough space to install heat pumps to do so on city land. The principle has been approved by Urban Environment Committee 1 February 2022.

- Indicator: number of homes /apartment buildings that have gone through energy efficiency renovations
- Impact on emissions reductions: depends on the actions done. Heat pumps enable very low emission heating, other measures save the amount of energy the house uses
- Cost effect: 1 MEUR/year for the cost of running the system (10 employees)
- Party responsible: Climate Unit
- Stakeholders: Private housing companies, residents, energy efficiency experts, heat pump facilitators, Energy renovation team
- Co-benefits: cost savings for the housing companies, better air quality, market open for innovations

Explanation for how thermal heat compares to district heating

District heating [50 for the years 2024–2073]:

Helen: 0.024 kgCO₂e/kWh

Direct emissions

According to Helen's scenario, estimating that from 2030 onwards the emission factor will remain at the level of 0.016 kgCO₂e/kWh.

Through the rapid drop in emissions, e.g. a site that is completed in 2028, the factor for 50 years would only be 0.017 kgCO₂e/kWh

SYKE (Finnish Environmental Institute) : (CO₂data.fi): 0.064 kgCO₂e/kWh

Lifelong and conservative value

Correspondingly, for a site to be completed in 2028, the factor for 50 years would be 0.056 kgCO₂e/kWh

Geothermal (electricity) [50 for the years 2024–2073]:

SYKE (CO₂data.fi): 0.018 kgCO₂e/kWh.

Calculated with Syke's electricity emission factor 2024-2073, which is 0.0544 kgCO₂e/kWh (lifetime, conservative value)

Correspondingly, this coefficient should be updated to a newer scenario of a drop in electricity emissions

Geothermal efficiency assumed to be 3.0.

Correspondingly, for a site to be completed in 2028, the coefficient for 50 years would be 0.016 kgCO₂e/kWh

Actions for electricity

ACTION 13: Replacing the City's outdoor lights with LEDs by 2030.

The area of Helsinki currently has about 70,000 outdoor light sources that use technology other than LED. Even now, all new lighting fixtures are automatically built to be based on LED



technology. In addition to this, existing outdoor lights will be replaced so that the number of LED lights increases by about 4,000 pieces annually. A LED light source consumes about 80% less electricity than the existing lamps based on discharge technology. The service life of LEDs is remarkably long, which also allows us to save in maintenance costs. The repayment period of adopting LEDs is 5–7 years, depending on the type of fixture. This supports the adoption of LEDs also from a financial standpoint with regard to the average service life. The increasingly strict EU legislation will also make it more difficult to access the discharge lamps that are currently in use. To realise the action, the number of lamps being replaced by LEDs should double.

- Indicator: Number of lamps replaced by LEDs per year in relation to the annual target (8,000 pcs/year).
- Impact on emissions reductions: Direct impact on emissions reductions in relation to the City's total target for emissions reductions: less than 1%. The energy saving estimated for a single lamp is 50–75% compared to a discharge-based light source.
- Cost effect: additional cost €2.5 M/year in 2023–2025 and €2 M/year in 2026–2030. Depending on the type of lighting fixture, the repayment period is 5–7 years. The lifecycle costs will be added.
- Party responsible: Urban Environment Division
- Stakeholders: City facility operators, maintenance crews, suppliers
- Co-benefits: cost savings, better light

ACTION 14: Establishing a tendering process for the energy solutions for city-owned facilities.

During the work on the City's Roadmap for Carbon-neutral Heating, one of the measures identified as being within the City's sphere of influence was that the City would open the implementation of the heating systems in its facility complexes and area construction sites for tendering. At the moment, heating solution providers do not have the opportunity to offer their solutions due to the missing process phase. The current process does not support the business development objectives or ensure the realisation of best heating solutions in the City's own properties. We will establish and implement a process that allows the providers of various energy solutions to offer their solutions to the City's facilities and area construction sites.

- Indicator: Process to be established and implemented by 30 June 2023.
- Impact on emissions reductions: Support for emissions reduction measures; no direct impact on emissions reductions.
- Cost effect: No cost effect; to be carried out as official work.
- Party responsible: Urban Environment Division
- Stakeholders: City procurement dept, private companies offering the services
- Co-benefits: better environment for innovation and competition between companies. cost benefits, air quality

ACTION 15: Energy-efficiency actions on all city owned facilities.

- Impact: 5-30 % reduction of energy usage
- Cost: 2,5 MEUR but it's a cost positive because savings from energy cover all costs
- Party responsible: Urban Environment Division
- Stakeholders: City facility operators
- Co-benefits: cost benefits



ACTION 16: Energy-management system for all city owned facilities

All buildings the city runs will go through an energy efficiency review during 2024–2026. Actions stemming from these reviews will be sped up and the most cost-efficient and emissions reducing actions will be chosen. (the city owns about 20 % of the building stock in Helsinki, although this figure includes residential buildings that are not part of this action)

The energy management system will add data and monitoring to the system.

- Indicator: The energy saving after the measures have been taken
- Impact on emissions reductions: 5-30 % energy saving in total energy usage in buildings. From monitoring about 5 % decrease in energy use
- Cost effect: 1.9 MEUR but the savings from energy usage will make a positive cost impact in 1-5 years. Monitoring costs: 250.000 euros but the saving will cover the costs.
- Party responsible: Urban Environment Division
- Stakeholders: City facility operators
- Co-benefits: cost benefits

Actions for transport /mobility

ACTION 17: Implementing the Bicycle Action Plan

Construction of the inner city target network in 2025-26: 50.0 km (target of 140 km); construction of the Baana cycling network: 18.3 km (target of 150 km); modal share of cycling: 9% (target 20 %)

- Indicator: that the target km are implemented by 2026
- Impact on emissions reductions: Facilitation of emissions reduction measures; no direct reduction of emissions.
- Cost effect: Building the network 20 MEUR in 2025, 30 MEUR in 2026
- Party responsible: Urban Environment Division
- Stakeholders: Construction companies, mobility dept, city planning department. citizens, biking promotion associations
- Co-benefits: health benefits from active mobility, better air quality, less noise

ACTION 18: Reprogramming the implementation plan for the Baana cycling network and target network up to 2030.

Moving the carbon neutrality target forward from 2035 to 2030 also means that the target for cycling as a mode of transport must be achieved five years earlier. The programming on the Baana cycling network and the target network must be accelerated at the same pace.

- Indicator: Reprogramming to be carried out
- Impact on emissions reductions: Facilitation of emissions reduction measures; no direct reduction of emissions.
- Cost effect: No cost effect; to be carried out as official work.
- Party responsible: Urban Environment Division
- Stakeholders: city planners



ACTION 19: Ensuring that the number of charging stations for electric cars will grow in the City area, in line with the predicted increase in electric cars.

A new procurement process for increasing the amount of charging stations in the city area.

- Indicator: 850 new stations by 2030
- Impact on emissions reductions: Facilitation of emissions reduction measures; no direct reduction of emissions.
- Cost effect: No cost effect; to be carried out as official work.
- Party responsible: Urban Environment Division
- Stakeholders: mobility department, charging infra suppliers, citizens
- Co-benefits: better air quality, less noise, health benefits, biodiversity

ACTION 20: Implementation of electric car charging stations on the city's properties so that the delay in the electrification of the vehicle stock can be compensated for. The city has decided that by 2025 all cars that the city uses (756) will be e-cars. Most of these cars are used by social and health services, Helsinki City Construction Services, parking control etc. The program has not moved in accordance to the plan due to the lack of charging stations but will move forward faster once the charging network development moves forward

- Indicator: The amount of new charging stations
- Impact on emissions reductions: Facilitation of emissions reduction measures; no direct reduction of emissions.
- Cost effect: 600.000
- Party responsible: Urban Environment Division
- Stakeholders: City facility operators, mobility dept
- Co-benefits: better air quality, less noise, health benefits,

ACTION 21: The plot conveyance conditions will require that new sites' parking spaces be implemented so that they are electrified and one third of the spaces are equipped with a charging stations.

For the predicted development of vehicles becoming electric, there must be a sufficient number of charging stations for electric cars. In the coming years, the number of charging stations will also determine the emissions reduction realisation of plug-in hybrids: if there are no charging stations, motorists will use the combustion engine, and the predicted emissions benefits will not be achieved. Most passenger cars will be charged at the parking areas and carparks of residential buildings, but this is not possible everywhere in the city. Charging stations are also needed for public and commercial properties, public areas, and parking areas. The city must also prepare for acquiring an electric fleet of its own. The city applies various methods to promoting the construction of charging stations. For example, there is an existing process for the charging stations to be implemented in public areas, but not all types of charging stations have such a plan. The number of different types of charging stations around the city varies, which should be considered when implementing the action.

With city owned buildings the principles of financing and building the charging stations have been agreed on in spring 2024.



A new plan for procurement rules for privately built new charging stations on streets will be decided upon in fall 2024.

- Indicator: Annual number of charging stations in relation to the forecast on electric cars..
- Impact on emissions reductions: Facilitation of emissions reduction measures; no direct reduction of emissions.
- Cost effect: The direct costs incurred by the City come from the implementation of the charging stations in the City's own properties.
- Party responsible: Executive Office/ Urban Environment Division
- Stakeholders: Private housing companies, citizens, charging infra suppliers
- Co-benefits: better air quality, less noise, health benefits, biodiversity

ACTION 22: Promoting the definition of impactful regional emissions reduction measures on mobility.

The regional emissions from transport are also highly influenced by traffic across the city's borders. We will actively promote the definition of impactful regional emissions reduction actions through the shared land use, housing and transport planning (MAL) for the Metropolitan Area. Helsinki will actively promote such measures that are in line with the City's own emissions reduction target for transport.

- Indicator: The most impactful emissions reduction measures for regional transport are to be defined.
- Impact on emissions reductions: Support for emissions reduction measures; no direct impact on emissions reductions.
- Cost effect: No cost effect; to be carried out as official work.
- Party responsible: Urban Environment Division/City Executive Office
- Stakeholders: City decision makers, state, regional cities, citizens
- Co-benefits: better air quality, less noise, health benefits, biodiversity

ACTION 23 : Electrification of water bus line to Pihlajasaari

The city board decided in June 2022 that in order to speed up the electrification of water transport in Helsinki new principles will be decided upon in order to guide the market towards emission-free solutions so that 50 % of the water transport in Helsinki will emission-free in 2030. As the first step the board decided to electrify the Pihlajasaari route and gather feedback and experience in order to move forward with other routes.

The charging of the boats requires 350 kW charging stations in two locations and for that also some harbour infra needs renovations.

The city will use different incentives and subventions to help the private boat operators with the change and also take care of charging infrastructure needed. The city will also develop the procurement models and agreements.

- Indicator: That the water bus route to Pihlajasaari is electrified.
- Impact on emissions reductions: about 50.000 annual passengers emission-free travel
- Cost effect: charging infra 400.000 /charging stations (2 needed) plus planning 40.000, cost for running the route 60.000/boat/year



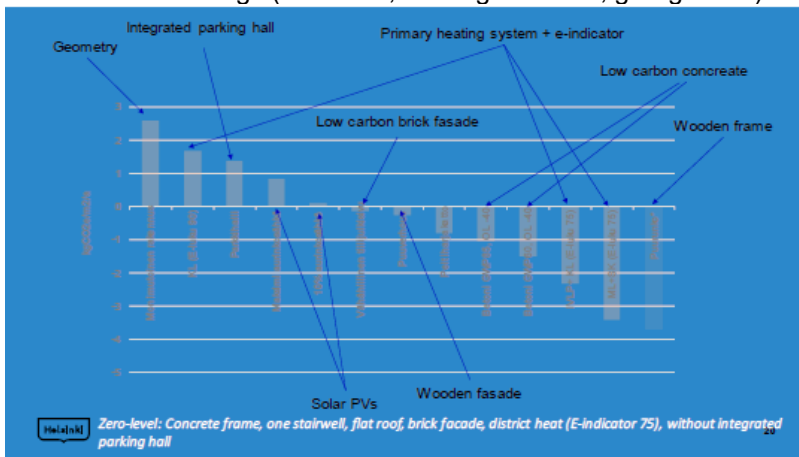
- Party responsible: Executive Office/ Urban Environment Division and Culture and Leisure division
- Stakeholders: charging infra suppliers, private boat operators
- Co-benefits: less pollution on water and air, less noise

Actions for built environment

ACTION 24: A limit value for the lifecycle carbon footprint of new residential blocks of flats since 2023

In the summer of 2023, Helsinki became the first city in Finland to introduce a limit value for the lifecycle carbon footprint of new residential blocks of flats. The limit value for residential blocks of flats is used as a requirement in new local detailed plans. In addition to the plans, the city can set out carbon footprint requirements, for example, in plot competitions and plot transfer terms. The introduction of the limit value was based on the need to control the emissions from residential construction in a material and technology-neutral manner, because the high volume of residential construction makes it a significant source of emissions. In the future, the aim is to set limit values also for other use categories.

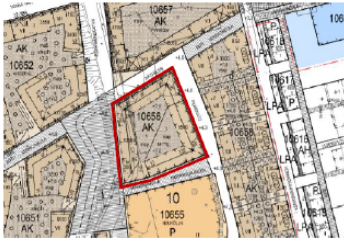
The process was carried out by first researching over 60 buildings for what increases or decreases emissions in buildings (materials, heating methods, garages etc).



The city then held a competition for all construction companies offering a very attractive lot where a low emission residential building would be built. The competition was judged 50 % for architectural merits and 50 % for low carbon footprint. The competition was very popular and the three winning buildings all reached a very low carbon footprint through many various combinations (wood frame/low emission concrete frame, solar panels, heat pumps, green roofs etc).



About the competition



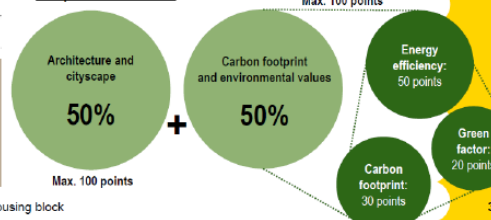
The competition block forms the central block of the northern part of Verkkosaari. The block includes efficient housing and commercial spaces.

The competition was held for developers and their design teams (formed by the developers).

The aim of the competition was

- to create a feasible, architecturally high-standard, low-carbon and highly energy efficient green block, which forms interesting new cityscape,
- to meet the Carbon Neutral Helsinki 2030 target, and
- to select a contractor and a designer to build the apartment building plots in the competition area.

Competition assessment



Helsinki

03/2022

Green and low-carbon housing block

The best three were very different combinations of solutions. each of the three was an awarded a lot in Helsinki and they will all be built.

Through the competition and dialogue with companies it was clear that many different combinations of solutions could reach low lifecycle emissions and as the results and the market dialogue with companies was very successful the limit was set to **16kg co2e /m²/a in 50 year timeframe**

	CARBON FOOTPRINT		
Average building project ~16kg/m ² /a	1. Grün in der mitte (winner proposal) 8,46m ² /a	2. Hiiling 5,83m ² /a	3. Verkkosaaren puuverso 11,88m ² /a
	CALCULATED TOTAL ENERGY CONSUMPTION		
National requirement in Finland /in Helsinki <90 kWh/m ² /a <75 kWh/m ² /a	1. Grün in der mitte (winner proposal) 31 kWh/m ² /a	2. Hiiling 39 kWh/m ² /a	3. Verkkosaaren puuverso 28 kWh/m ² /a

= Lowest in the competition

Helsinki

03/2022

Green and low-carbon housing block

- Indicator: regulation in place
- Impact on emissions reductions: Enables reductions, doesn't directly have an impact.
- Cost: consultants work 45.000 euros
- Party responsible: Climate Unit
- Stakeholders: Construction companies, energy providers, circular economy providers, material providers, planners, designers, citizens
- Co-benefits: market innovations, new companies

ACTION 25: All infrastructure projects commissioned by the City will use low-carbon concrete that meets the class GWP.85 requirements as defined by Betoniyhdistys. The class required of low-emission concrete will be reviewed and updated annually, at the minimum.

Most of the carbon footprint of concrete-intensive infrastructure comes from the use of concrete. For example, 92% of emissions from the construction of the Jokeri Light Rail came from the materials' emissions, and in turn, 50% of these came specifically from the emissions of



concrete. Since the volume of concrete used is often high, especially in infrastructure that requires subgrade reinforcement or concrete tiles, large reductions in Scope 3 emissions can be achieved by reducing the emissions from concrete. Often, there are not many alternatives for concrete in infrastructure construction, which is why using low-emission concrete is the simplest and quickest way of reducing the emissions of infrastructure construction. The Betoniyhdistys concrete industry association has published classifications for low-emission concrete. By using this classification, it is possible to set comparable and consistent criteria for low-emission concrete. The classification also makes it easier to hold tendering processes for concrete. As such, it can also influence the procurement costs. Betoniyhdistys studied the availability of GWP.85-class concrete and discovered that all types of concrete used in infrastructure are available from multiple suppliers, so availability will not become a problem (Betoniyhdistys, to be published in spring 2022). Along with the criteria for low-carbon construction, the supply of low-emissions concrete will also grow. The decisions of the City of Helsinki also have a wider impact on society, since the City's requirements as a major client set incentives and pressure for the construction product industry to develop their products and production processes. The pioneer status of a leading operator has a wider impact on the construction market beyond the operator's own actions.

- Indicator: The requirement of using low-carbon concrete is to be added in the procurement criteria. The requirement will enter into force on 1 January 2023. The level of the requirements will be reviewed annually.
- Impact on emissions reductions: -15% (GWP.85) compared to conventional concrete.
- Cost effect: +10–20% compared to conventional concrete. The estimate is based on the experiences from the Kalasatama–Pasila project. As competition increases, the price difference is expected to diminish. Furthermore, it must be considered that the price of concrete is only a fraction of a project's total costs. In the pilot site, the cost effect of low-emission concrete was only parts per thousand in the overall costs of the project. The price of conventional concrete will increase in the future, which will reduce the price difference even further.
- Party responsible: Urban Environment Division
Stakeholders: material providers, planners, designers, citizens
- Co-benefits: market innovations, new companies

ACTION 26: The emissions of the preconstruction of the former Malmi Airport will be reduced by 50% in 2020–2030, compared to the preliminary preconstruction plan.

The former Malmi Airport is located on clay soil typical of the Metropolitan Area. Before such areas are constructed on, the City of Helsinki will carry out preconstruction following a procedure developed in the 1970s–80s. The emissions estimate for the preconstruction in the former airport area is based on the preliminary preconstruction plan from 2017 (Figure 9). In the preliminary plan, the preconstruction is assessed to be carried out mainly by deep-stabilising the soft clay layer to control dents formed during use. Preconstruction by pillar stabilisation has been widely used in Helsinki since the 1980s, at which time the use of a burnt lime and cement mix ('compo') as a stabilisation binding agent started. When calculated in this fashion, the emissions of preconstruction were estimated to be 340 kt CO₂e. Based on the calculation, the most significant source of emissions is the production and transport of the binding agent for deep stabilisation, the proportion of which is 95% of the emissions. By replacing the binding agent used for the stabilisation with an available recycled agent, emissions can be reduced by 60–70%. When using binding agents in the commissioning phase, the emissions reduction potential is even greater. Recycled binding agents are already being piloted at the first preconstruction sites in Malmi. By developing the stabilisation methods, emissions can further be reduced in the 2020s. In terms of the preconstruction that is underway in the area, it has



been estimated that a cumulative emissions reduction target of 50% could be possible compared to the conventional solution by 2030. As materials, technologies and subgrade reinforcement methods develop, the level of the emissions reduction target can be reassessed.

- Indicator: Emissions reduction in preconstruction (-50%) compared to the conventional solution.
- Impact on emissions reductions: Direct impact on emissions reduction: a minimum of 64,000 tCO₂e by 2030 (-50% from the reference level of 2020–2030).
- Cost effect: Lower-carbon preconstruction will likely incur lower costs than the conventional option. The costs of the preliminary option for a preconstruction plan are increased due to the costs of burnt lime increasing along with the emissions trading in the EU. The objective will not affect the construction schedule.
- Party responsible: Urban Environment Division
 - Stakeholders: Construction companies material providers, planners, designers, citizens
- Co-benefits: market innovations, new companies

ACTION 27: Abolishing the use of lime cement as a ground reinforcement binding agent

- Indicator: lime cement will not be used as a binding material for foundation work on construction sites
- Impact on emissions reductions: 50-60 % less emissions compared to using lime cement
- Cost effect: Positive due to expensiveness of lime cement in emissions trading
- Party responsible: Urban Environment Division
- Stakeholders: Construction companies, , circular economy providers, material providers, planners, designers, citizens
- Co-benefits: health benefits, cost benefits

ACTION 28 : Mainstreaming what is learned in Malmi to all construction sites in the city

- Indicator: the work is done
- Party responsible: Urban Environment Division
 - Stakeholders: Construction companies, material providers, planners, designers, builders

ACTION 29: Reducing emissions for the construction phase of all city owned facilities

Construction phase emissions come from used materials, transport and site activities. Diminishing emissions during the construction phase any actions that go beyond the emission-free construction site Green deal agreement and using materials that produce less emissions will be valid. At the same time actions that are most cost-efficient for most decrease of emissions will be evaluated.

- Indicator: The pilot projects are chosen and included in the city investment plan
- Impact on emissions reductions:
 - Construction site emissions can be brought to zero with these additional measures meaning that there would be a 60 kg CO₂e /m² saving on emissions meaning that a construction of a a 10.000 m² new school building construction site could decrease emissions by 600 tCO₂e



o For materials the decrease depends on the chosen material but for example using low carbon concrete could diminish emissions by 300 tCO₂e for a school of 10.000 m²

- Cost effect: 600.000 e
- Party responsible: Urban Environment Division
 - Stakeholders: Construction companies, circular economy providers, material providers, planners, designers, builders

ACTION 30 Low emissions guidance for demolition work

There's not enough information on emissions from demolition work so in order to guide this work well a report on demolition impacts and best practices is needed

- Indicator: Report ready and follow up actions will decided by 12/2025
- Impact on emissions reductions: no direct emission reduction
- Cost effect: 50–60 000 €
- Party responsible: Urban Environment Division
 - Stakeholders: Construction companies, , circular economy providers, material providers, planners, designers, citizens
- Co-benefits: market innovations, new companies

ACTION 31 Guidance for architectural competitions on low emission criteria

- Indicator: Report ready and follow up actions will decided by 12/2025
- Impact on emissions reductions: no direct emission reduction
- Cost effect: will be done through official work
- Party responsible: Urban Environment Division
 - Stakeholders: Architects, City planning dept, Construction companies, energy providers, circular economy providers, material providers, planners, designers
- Co-benefits: market innovations, new companies
-

ACTION 32 Analysis and report on over- construction

An analysis will be done whether the construction sector uses too much materials compared to what is needed for safety, insulation and other factors.

- Indicator: Report ready and follow up actions will decided by 12/2025
- Impact on emissions reductions: no direct emission reduction
- Cost effect: will be done through official work
- Party responsible: Urban Environment Division
 - Stakeholders: Engineers, architects, city planning dept, Construction companies, energy providers, material providers, planners, designers
- Co-benefits: cost savings, market innovations, new companies

Actions for green infrastructure and nature based solutions

ACTION 33: The green area factor

The partially EU-funded ARVO – Valuation and Strengthening of Urban Green Spaces in Landscape Planning in Cities project (2023–2024) focuses on strengthening the green infrastructure



in detailed planning. The project will develop a regional green area factor as a continuation of the city's lot-specific green area factor, extending the green area factor from lots to larger public areas. The green area factor is a tool used in landscape planning to assure a sufficient amount of green infrastructure. The lot-specific green area factor is included in the new building regulation approved in the summer of 2023 and thus mandatory when applying for a construction permit. Currently, the lot-specific green area factor is updated to further strengthen climate change adaptation and biodiversity aspects

In addition, the city is currently working with assessing a level of preparedness for cloudbursts, which means to make a climate change adaptation statement for which kind of rain events the city will prepare for in the future. A big part of the work is to assess possible rain scenarios and to build a hydrological model for predicting possible outcomes, needed solutions and their costs. When the statement has been made, it will bring forth several largescale green infrastructure projects and nature-based solutions to cover for increasing rain amounts.

- Indicator: Green factor value is set
- Impact on emissions reductions: no direct emission reduction
- Cost effect: will be done through official work
- Party responsible: Urban Environment Division
- Stakeholders: City planning dept, architects, citizens
- Co-benefits: Climate adaptation actions for heat waves and storms

ACTION 34: Tree canopy cover

Another action for strengthening the green infrastructure is assessing of the current tree canopy cover for city districts and neighbourhoods in Helsinki. Once done, a minimum level for the cover (%) on district or even neighbourhood level will be set.

- Indicator: minimum level of tree canopy set
- Impact on emissions reductions: impact is on climate adaptation
- Cost effect: will be done through official work
- Party responsible: Urban Environment Division
 - Stakeholders: City planning dept, architects, citizens
- Co-benefits: Climate adaptation actions for heat waves and storms

Actions in circular economy (35)

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



<p>2. Defining the promotion of circular economy as a key premise in land use and urban planning.</p> <ul style="list-style-type: none"> • Influencing preservation of existing building frames and parts through markings in the detailed plans, orders and incentives. Incentives may include the volume of building rights, for example. • Taking circular economy into account when repurposing buildings. • Directing actors to low-carbon construction through detailed planning. • Enabling low-carbon pre-construction and infrastructure construction. • Planning urban structure that supports circular economy. 	<p>Land Use and City Structure, Buildings and Public Areas / Built Assets Management / Construction Contracting, Services and Permits / Environmental Services, Executive Office / Area Construction</p>	<p>2020 →</p>
<p>3. Piloting the use of circular economy criteria in plot conveyance conditions. Adopting functional solutions.</p>	<p>Land Use and City Structure, Executive Office / Area Construction</p>	<p>2020–2025</p>
<p>4. Creating an internal operating model for the City concerning the use of surplus materials (excluding land masses), for example via the City’s recycling website.</p>	<p>Stara, Land Use and City Structure, Buildings and Public Areas / Maintenance</p>	<p>2020–2021</p>
<p>5. Studying the opportunities for reducing the amount of concrete and using low-emission concrete or substitutes for concrete in the City’s infrastructure. Similarly, promoting the use of binding agents made of recycled materials in deep stabilisation, which will reduce the use of high-emission cement and burnt lime as binding agents.</p>	<p>Buildings and Public Areas / Built Assets Management, Land Use and City Structure, HKL</p>	<p>2020–2022</p>
<p>6. Reducing the use of plastic filter cloths. Studying the opportunities for using recycled plastic or other recycled materials in technical structures, such as noise barriers, and piloting them at sites selected separately.</p>	<p>Land Use and City Structure, Buildings and Public Areas / Built Assets Management / Construction Contracting, HKL</p>	<p>2020–2022</p>



<p>7. Implementing lifecycle pilots for four different types of areas: 1) Railway, 2) Street, 3) Park, 4) Pre-construction.</p> <ul style="list-style-type: none"> Defining circular economy goals for each area and scoring them in calls for tenders. Implementing projects, starting from goal-setting and project planning, in extensive collaboration between various actors, from planning to maintenance. Calculating the lifecycle costs and carbon footprints of the options. Implementing light market dialogues. 	Buildings and Public Areas / Built Assets Management / Construction Contracting / Maintenance, Land Use and City Structure, HKL	2020–2022
<p>8. Transferring good and functional practices into processes, instructions and models that will also steer future projects, based on the experiences of Actions 5–7.</p> <ul style="list-style-type: none"> Including aspects such as climate change prevention and mitigation, promoting circular economy, and protecting natural diversity into the maintenance classification of public areas. 	Buildings and Public Areas / Built Assets Management / Maintenance, Land Use and City Structure, Development Services, HKL	2022–2024
<p>9. Promoting the development of national emissions calculations for infrastructural construction in collaboration with the Ministry of the Environment, the Finnish Transport Infrastructure Agency, the Finnish Environment Institute and experts (universities, consultants, etc.).</p>	Buildings and Public Areas / Built Assets Management	2020 →
<p>10. Studying the opportunities for reducing the amount of concrete and using low-emission concrete or substitutes for concrete in the City’s building construction.</p>	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL, Services and Permits / Environmental Services	2020–2021
<p>11. Planning and implementing new construction and renovation projects that follow the principles of circular economy.</p> <ul style="list-style-type: none"> The planning will focus on the following circular economy criteria: smart use of building materials, flexible modifiability, modularity, use of recycled and repurposed materials, maintainability and repairability, ease of demolition and reusability. Calculating the lifecycle costs and carbon footprint of each project. 	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2020–2025
<p>12. Adding circular economy requirements to the planning and implementation of service buildings and housing, based on experiences of Actions 10–11.</p>	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2021 →
<p>13. Compiling comparable data on the lifecycle costs of construction projects, based on Action 11. This data will be used as the basis for decision-making in future construction projects.</p>	Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, HKL	2021 →



<p>14. Adding circular economy requirements to demolition contracts.</p>	<p>Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka</p>	<p>2020–2021</p>
<p>15. Preparing and adopting an operating model for reusing furniture and building parts from demolition and renovation projects.</p>	<p>Buildings and Public Areas / Built Assets Management / Construction Contracting / Housing Production, Heka, Services and Permits / Building Control</p>	<p>2020–2023</p>
<p>16. Preparing an organisation-wide policy on the catering in meetings and events. The purpose of the policy will be to reduce food waste from catering, reduce the environmental impact of the food served, and reduce the use of disposable plates and cutlery.</p>	<p>Services and Permits / Environmental Services</p>	<p>2020</p>
<p>17. Before procuring new indoor or outdoor furniture, the client will examine the furniture available on the City’s recycling website and primarily use this recycled furniture. Next, the client will examine the opportunities of procuring the furniture second-hand, through renting or as a service. This policy will be included in the City’s procurement strategy and the division-specific procurement instructions.</p>	<p>Procurements and Tendering, all divisions and City enterprises</p>	<p>2020–2021</p>
<p>18. Preparing instructions on supply procurements that will concern the entire City organisation and that will be specified for each division. The purpose of the instructions will be to optimise order volumes, make the use of supplies more efficient, and thus reduce unnecessary consumption and waste.</p>	<p>Environmental Group for Procurements, all divisions and City enterprises</p>	<p>2020–2021</p>



<p>19. Studying the lifecycle impact of alternative materials used in outdoor furniture. Procurement criteria will be prepared based on this study in order to pilot the use of the materials. Alternative materials will be surveyed in the planning and market survey phase of procurements.</p>	<p>Land Use and City Structure, Buildings and Public Areas / Maintenance, Services and Permits / Environmental Services</p>	<p>2020–2022</p>
<p>20. Adding criteria that promote the sustainability of products (such as furniture, machinery, vehicles, ICT equipment) to the City’s procurements. The criteria may be related to the lifecycle, maintainability of the materials, guarantee period, repairability and recyclability. The criteria may be minimum requirements or grounds for comparison.</p>	<p>Procurements and Tendering, all divisions and City enterprises</p>	<p>2020–2025</p>
<p>21. Studying the product groups in which service procurement is a better option compared to product procurement, in terms of lifecycle impact. Service procurements will be used for these product groups.</p>	<p>Services and Permits / Environmental Services, Environmental Group for Procurements, all divisions and City enterprises</p>	<p>2020–2025</p>
<p>22. Preparing procurement criteria through which the use of unnecessary disposable products and single-packed products will be reduced.</p>	<p>Environmental Group for Procurements, all divisions and City enterprises</p>	<p>2020–2025</p>
<p>23. Piloting new technologies for the sustainable utilisation of green waste.</p> <ul style="list-style-type: none"> • Continuing the collaboration with HSY to use the pyrolysis process for the City’s green waste. In the pilot phase, the invasive species waste from Stara’s operations will be offered for testing purposes. • Examining the possibility of participating in the ‘city refinery’ demonstration project of Helen, VTT and Lassila & Tikanoja. 	<p>Buildings and Public Areas / Maintenance, Stara, HSY, Executive Office, Helen, Services and Permits / Environmental Services</p>	<p>2020–2025</p>
<p>24. Participating in projects that study and promote the use of biochar.</p> <ul style="list-style-type: none"> • We will actively monitor the preparation of the national guidelines on the use of biochar. • We will network with other operators, for example via the biochar map of the Finnish Biochar Association. 	<p>Land Use and City Structure, Buildings and Public Areas / Maintenance</p>	<p>2020 →</p>



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

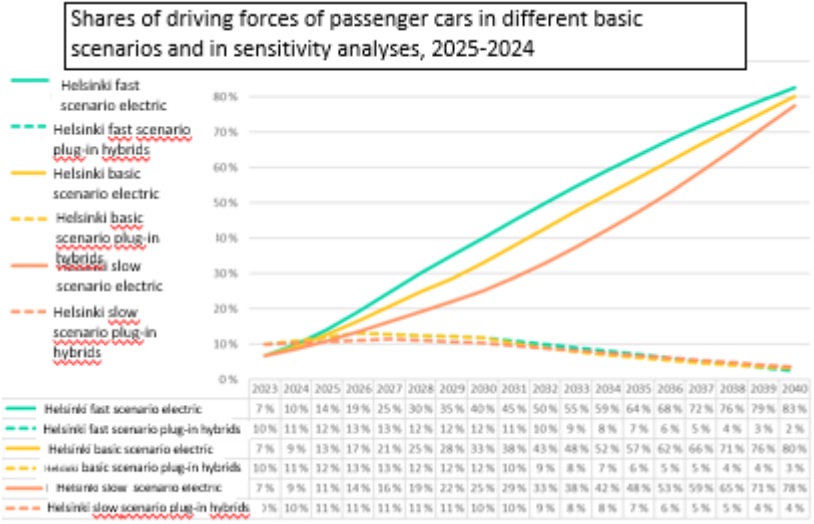


<p>30. The planning of the City’s service buildings will include active seeking for solutions that can make the utilisation of the premises more efficient and avoid unnecessary construction.</p> <ul style="list-style-type: none"> • Building flexibly modifiable multi-purpose spaces. • Testing solutions similar to “school as a service,” in which rarely used premises are rented from other operators. 	<p>Education, Culture and Leisure, Social Services and Health Care, Buildings and Public Areas / Built Assets Management</p>	<p>2020 →</p>
<p>31. Preparing the City’s model for strengthening the ecosystem of bio-economy and circular economy companies. The goal is to create conditions for industrial and urban symbioses where operators add value for each other by efficiently using each others’ side flows, technology, services and energy.</p>	<p>Executive Office / Economic Development / Area Construction, Land Use and City Structure</p>	<p>2020–2021</p>

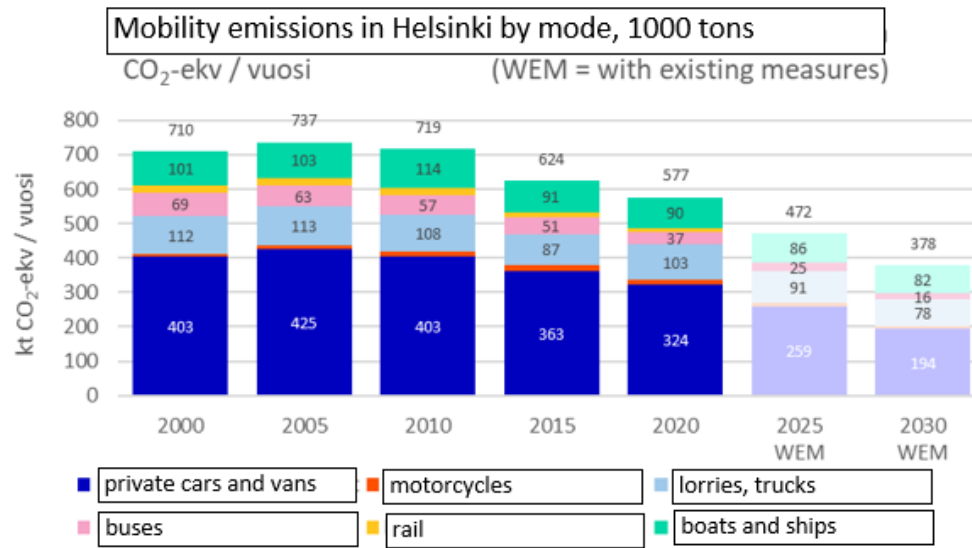
Impact Pathways

Mobility Sector Background:

- WEM scenario updated.** The last update was from 2022 and this was updated in 2024 to include new actions from the state
- Updated models for how the car fleet in Helsinki will change.** Three different databases and models used (1. Aalto university Scenario analysis for electrification of the fleet 2. Peikko-WEM scenarios for national data for fleet changes 3. University of Tampere Local changes in fleet, according to national predictions and electrification models). Scenarios in Helsinki als take into account
 - General development of the economy and employment
 - Prices and availability of vehicles and different modes of fuel
 - Attitudes of citizens and companies
 - Prognosis for increase of inhabitants in Helsinki



The diagram gives different scenarios for rapid electrification (green), rapid increase of hybrid vehicles (green dash line) BAU for electrification (yellow) BAU for hybrids (yellow dash) slow electrification (red) and slow hybrids (red dash)



This diagram explains emissions from mobility according to WEM (private cars – blue, motorcycles- red , busses -pink, lorries, trucks – light blue , boats and ships -green and rail - yellow)

3. Citizen panel (May-September 2024)

5000 invitations were sent by using random sample method to over 18-year-olds in Helsinki. 64 people were chosen from those who accepted by making sure that they represent people in Helsinki by age, occupation, income, modes of transport used and areas of living. On top of those 6 representatives came from the senior council, youth council and disabled council. The panel operates according to deliberative democracy principles.



The panel met in person three times with different questions being discussed, among them the best ways to reduce emissions, how to make equal decisions about mobility, how to make city mobility as efficient and functioning as possible. The panelists were also given lots of information about emissions and city plans. The panel will meet once more in September 2024 and then make a statement that will be presented to the Urban Development board and used as part of the work on choosing the actions for reducing emissions from the mobility sector.

4. Impact assessment for different scenarios

All the possible pathways for cutting mobility emission have gone through impact assessment which looked into the following aspects:

Social impacts

- Impacts on the possibilities of mobility
- Impacts on the competitiveness of sustainable modes of mobility



- Harmful impacts of mobility: noise, air quality, safety
- Health benefits of active mobility
- Liveability of the urban environment
- Impacts on different socioeconomical groups

Economic impacts

- Local economy
- Adaptability of the market and impacts on companies.
- Liveability of the local area
- Cost effects and division of costs
- Resource efficiency

Accessibility

- Functionality of the traffic system
- Logistics and heavy transport
- Capacity of the public transport system
- Area and national impacts
- Security of the supply system

Methods used were

- Mobility prognosis system (Helmet)
- Local economic modelling
- Expert workshops and expert feedback and analysis
- Literary review

The analysis was done by WSP consulting, Aalto University Economic Institute with large stakeholder interviews and workshops from different sectors of the city and outside stakeholders with an external reviewing body consisting of three other research centers.

As the results of the impact assessment are not public yet (have not gone through the process of political decision making) we can not publish them here but can update the plan when the process is done.

The scenarios

Fields of action	Systemic levers	Early changes (1-2 years)	Late outcomes (3-4 years)	Direct impacts (Emission reductions)	Indirect impacts (co-benefits)
Environmental zones phased in- for both private cars and heavy traffic	Governance			-40-80.000	Better air quality, less noise
Co2-free private cars	Governance, technology			-50-60.000	Better air quality
Infrastructure for electrification	Technology, Governance, Finance				Better air quality
Street infrastructure for sustainable mobility	Finance, Governance,			-20-25.000	Health benefits, Liveability in the city, Less noise, Better air quality
Parking policy actions	Governance			-15-20.000	Liveability n the city , Less noise, Better air quality



All mobility actions in Helsinki favor sustainable mobility	Governance, Finance, Technology			stops increase of emissions	Health benefits, Less noise, Liveability, Better air quality
Water transport emissions reductions	Finance, Governance, Technology			-15.000	Better water safety, Less noise, Better air quality

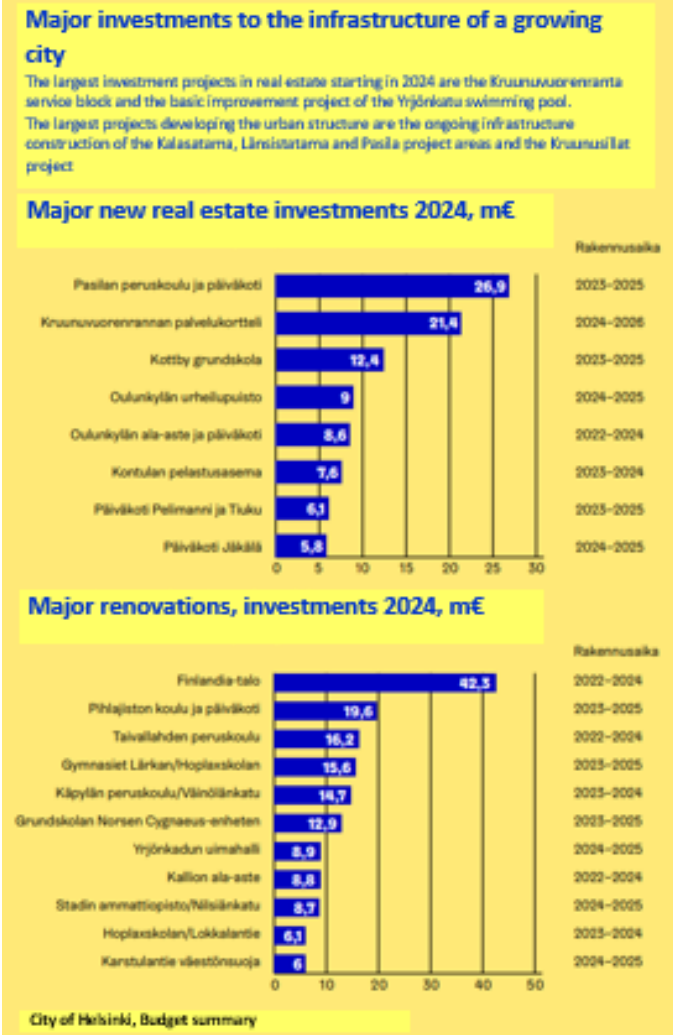
The barriers related to transport emissions are listed in the barriers section as acceptance, socioeconomic/social justice, governance and financial barrier with some possible solutions for each.

Residual emissions

In 2024 Helsinki has in collaboration with researchers and consultants produced three reports on the amount of carbon sinks in the city, the future of natural and technical sinks and the possibilities and challenges of compensation programs. These will also go through the political decision-making process and we can talk about them more after this fall. But the idea is to have enough data and understanding of the different possibilities and cost-analysis of each so that informed decisions can be made between additional emission reduction actions, compensation and/or increasing sinks. The barriers related to residual emissions are listed in the barriers section as regulatory, financial and acceptance barriers with some possible solutions for each

Because this work hasn't undergone the political decision making process in Helsinki we can not be publish more information about the scenarios and their impacts. When the process has been done we will update this sections

Biggest investments 2024



This is a list of the biggest investments in the city, the first category for new buildings and the second for renovations.

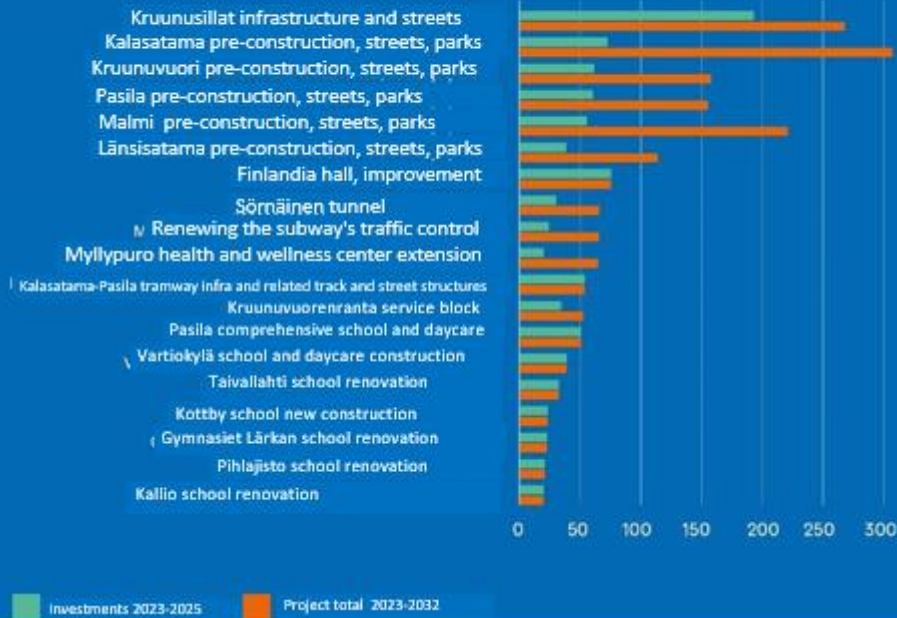
Most of the new buildings are schools. The biggest renovation project is the Finlandia hall, a big event and concert hall, the rest are schools and a swimming pool.

Long-term Infrastructure projects

Below you can see the list of the 20 biggest investments in the period 2023-2032 that will take place in Helsinki. The green line shows the investments (in millions of euros) in the next three years and the red line in the next 10 years. The first one is a big bridges + tram project, the next five are new areas to be built (pre-construction, parks and streets) but there are also investments into extension of the metro lines and new tram lines, the last seven are new schools to be built. Except for the co-financing from the state which is stated in the next chapter, 88,9 % of the investments of 893 million this year is financed through tax revenue.



Biggest investments



Eur million	Investments 2023-2025	Project total 2023-2032
Kruunusillat infrastructure and streets	192,6	267,3
Kalasatama pre-construction, streets, parks	72,3	306,5
Kruunuvuori pre-construction, streets, parks	61,3	157,5
Pasila pre-construction, streets, parks	60,3	155,0
Malmi pre-construction, streets, parks	55,6	220,4
Länsisatama pre-construction, streets, parks	38,4	113,8
Finlandia hall, improvement	75,2	75,2
Sörnäinen tunnel	30,0	66,0
Renewing the subway's traffic control system	24,1	65,6
Myllypuro health and wellness center extension	20,0	64,4
Kalasatama-Pasila tramway infra and related track and street structures	53,6	53,6
Kruunuvuorenranta service block	34,1	52,4
Pasila comprehensive school and daycare	50,5	50,5
Vartiokylä school and daycare construction	38,8	38,8
Taivallahti school renovation	32,4	32,4
Kottby school new construction	23,2	23,2
Gymnasiet Lärkan school renovation	22,8	22,8
Pihlajisto school renovation	21,0	21,0
Kallio school renovation	20,0	20,0

National co-financing on long-term infrastructure projects



The agreements concerning land use, housing and transport are concluded by the State of Finland with the largest urban regions. The purpose of the agreements is to facilitate and support the cooperation between municipalities in urban regions and between municipalities and the State in the guidance related to the urban structure and coordination of land use, housing and transport.

The key aim is to improve the functioning and competitiveness of urban regions and ensure a balanced development of municipalities. The matters specified in the agreements include the objectives for land use development and housing production in the coming years and key development projects concerning the transport network.

The parties to the agreements representing the State are the Ministry of the Environment, Ministry of Transport and Communications, Ministry of Economic Affairs and Employment, Ministry of Finance, Housing Finance and Development Centre of Finland (ARA), Finnish Transport Infrastructure Agency, Finnish Transport and Communications Agency Traficom, and the Centre for Economic Development, Transport and the Environment of the region concerned. The agreements concerning the urban regions of Helsinki, Tampere, Turku and Oulu for 2020–2031 have been signed on 2 June 2020

The agreement for 2020-31 state low carbon and sustainable land use , housing and transport as a priority while also looking at balances development between regions and lowering homelessness.

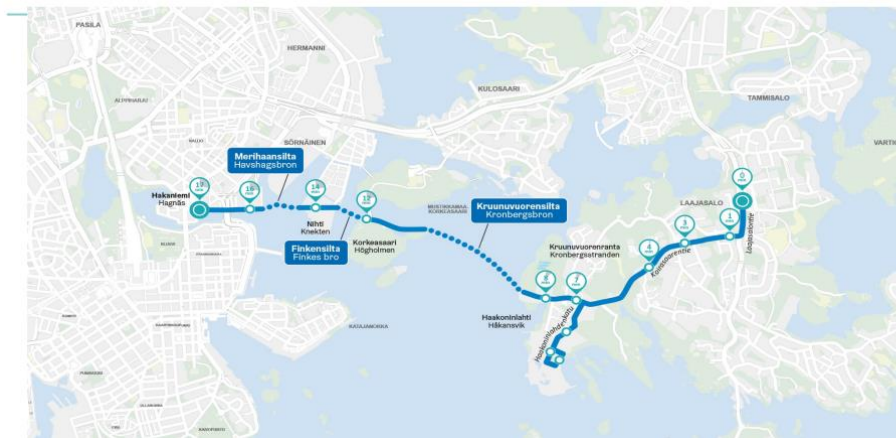
Actions that are co-financed by the state and have an effect on Helsinki's climate plan include :

- Viikki-Malmi fast tram line. The state will pay 30 % of costs no more than than 7,5 million euros
- The Vihdintie fast tram line planning and construction and other sustainable actions connected to it. The state will pay 105 million euros.
- Mobility system improvements in the Helsinki region. State will pay 15 million euros
- Improvements in walking and cycling infrastructures in Helsinki. State will pay 2,5 million to regional improvements and open up new funding for the amount of 4,5 million euro that the regions cities can apply for.
- Helsinki together with Espoo will make improvements to metrolines to increase their capacity.

The biggest investment project Kruususillat (bridges and tramway-460 MEUR) has calculated emissions from construction and use phase:



Kruunusillat-raitiotie



Kruunusillat calculated the climate impacts of the tramway project. The calculation generated significant emission calculation data for infrastructure projects, which was handed over to the Finnish Environment Institute's CO₂ database for use.

The calculation included three new bridges, approximately eight kilometres of new tramway with technical systems, and the emissions estimated to be generated from the use and maintenance of the tramway over 50 years*. The total emissions would be around 129,000 tCO₂e**. During construction, approximately 97,800 tCO₂e (76%) of these are generated, and during operation, maintenance and the end-of-life phase, approximately 31,200 tCO₂e (24%).

The combined emissions correspond to the annual emissions of about 12,900 average Finns, or about two months' emissions of the Hanasaari coal power plant in Helsinki, which was decommissioned a year ago.

The most significant emissions are caused by the production of materials during construction, for example concrete, steel, asphalt and crushed stone, and the energy consumption during operation of the tramway.

Construction emissions have been reduced at the construction site in the following ways: by choosing low-emission concrete, recycled stone products and other construction materials, by making good use of construction site masses within the construction site, and by using renewable diesel in work machines.

It is not possible to unequivocally state an emission figure based on which Kruunusillat would be good or bad in terms of emissions. Without the new bridge connection to Laajasalo, it would not have been possible to plan new apartments for nearly 20,000 residents. Thus, the real carbon footprint comparison option would be related to where and how these 20,000 people would live instead of Laajasalo and how they would move. This would be very difficult to calculate.

In turn, ferry traffic, which is often presented to the public as climate-friendly, would not have met the service goals set for Laajasalo's new public transport.

In addition, the Kruunusillat tram forms part of the city's network-like public transport, and it is not meaningful to look at it alone. It is part of a functioning whole. The Kruunusillat tram, among other things, prevents overloading of the East Metro.

*50 years was chosen as the review period for operation and maintenance because it is a common way to calculate the life cycle emissions of infrastructure projects. It is still good to note that, for example, Kruunuvuorensilta's technical service life is 200 years.

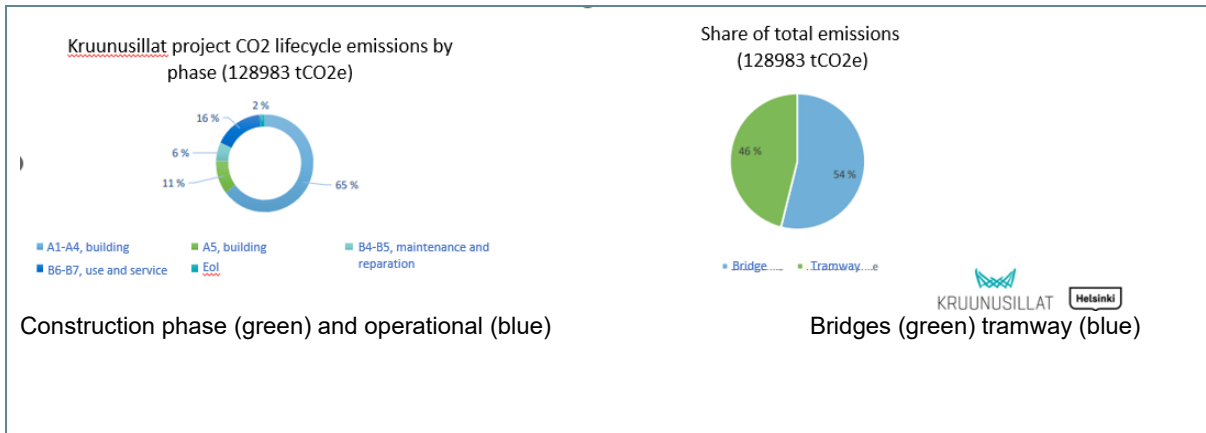


Table 6: Sectorial Costing

Fields of Action	Action / Indicator	Implementation Costs/Capex	Operational Costs	Direct impacts (Emission reductions)*	Cost Effectiveness (EUR/tCO2e)	Indirect impacts (co-benefits)*
Transportation	Kruunusillat bridges and tram project	267,30 Meur		It is not possible to unequivocally state an emission figure based on which Kruunusillat would be good or bad in terms of emissions. Without the new bridge connection to Laajasalo, it would not have been possible to plan new apartments for nearly 20,000 residents. Thus, the real carbon footprint	can not be counted	Supports sustainable modes of mobility, health benefits



				comparison option would be related to where and how these 20,000 people would live instead of Laajasalo and how they would move. This would be very difficult to calculate.	
Kalasantama-Pasila Tramway	Tram 80 M€ Streets 110 M€ Tunnel opening 50 M€ Utilities 30 M€ Total ~270 M€			Emission reductions were made in the construction phase due to actions taken in construction site mobility, low-carbon concrete products, which saved over 17 % of emissions and recycling materials like stones	Supports sustainable modes of mobility, health benefits
Construction of bike lanes	50 Meur			Enabling action, emission saving is dependent on usage	healthy and sustainable mobility
E-fleet charging stations	0,6 Meur			Enabling action	less noise, better air quality, new jobs for the charging infrastructure



						ure constructi on companie s
	Electrification of water busses	0,4 Meur	0.6 Meur /boat	50.000 annual passenger's carbon-free travel		Less pollution on water and air, less noise
Built Environment	Lifecycle limit on emission on new residential buildings	45.000 e		Enables reduction		Market innovations, new companies and jobs
	Replacing lights with LED	€2.5 M/year in 2023–2025 and €2 M/year in 2026–2030.	250.000 euros	The energy saving estimated for a single lamp is 50–75%	5-30 % energy saving in total energy usage in buildings. From monitoring about 5 % decrease in energy use	Cost savings
	Energy-efficiency actions on all city owned facilities+ Energy-management system for all city owned facilities		1,9 Meur		5-30 % energy saving in total energy usage in buildings. From monitoring about 5 % decrease in energy use	Cost savings
Malmi pre-constuction	The emissions of the preconstruction of the former Malmi Airport will be reduced by 50% in 2020–2030, compared to the preliminary preconstruction plan.				a minimum of 64,000 tCO ₂ e by 2030	Market innovations, new companies
Energy Systems	Helen's strategy for carbon neutrality 2030	1,8 billion euros		95 per cent decrease		Cleaner air, new innovation



				on the 1990 level emissions		s, new jobs
Energy renovations service	A service that helps privately owned housing companies (60 % of people in Helsinki) make energy efficiency renovations		1 Meur			The service has created a 230 Meur market for energy efficiency renovation companie s
Green Infrastructur e & Nature Based Solutions	The green area factor	0	0	Enabling action		Climate adaptation actions for heat waves and storms
	Tree canopy cover	0	0	Enabling action		Climate adaptation actions for heat waves and storms
Waste	Sanitation and waste management		22Meur			Heath benefits
Circular Economy	Roadmaps for circular economy		3,5 Meur			Less constructio n waste
Total		2405,845				
Cross Cutting Costs					These can include any supporting activity needed across different sectors, such as citizen engagement, communication with relevant stakeholders, governance and planning exercises, capacity building, the setting-up of SPVs for project management, etc.	

*Referring to the Action Plan

**Indicative indicators

*Referring to the Action Plan

**Indicative indicators

Table 7 Guidelines: Please fill the following table in with the largest and / or most capital-intensive projects that have been established within the Action Plan and Investment Plan (in Table 6). For these projects, provide the below details including the proposed or envisaged funding structure and a description of the project including development timelines and current status.



Table 7: Capital Intensive Projects

Fields of Action	Action / Indicator	Capex (€m)	Opex (€m)	Cost Effectiveness (EUR/tCO ₂ e)	Investment (Split by Stakeholders)
Transportation	Kruunusillat tramline and bridges	267 Meur	97,6 (for new trams)	the construction + use phase emissions are 129 000 tCO ₂ e**. Construction : 97 800 tCO ₂ e (76 %) use phase : 31 200 tCO ₂ e (24 %).	100 % City transport ltd (owned by the city) The city has taken out loans for the city transport (250 Meur from 2011 but the city doesnt want to give out information on exact project loans. They come from European and Nordic Investment banks)
		<p>Project Description The Crown Bridges project will connect Laajasalo, Korkeasaari and Kalasatama to the city centre with a light rail connection of 10 kilometres. The most visible parts of the project are the three new bridges: Kruunuvuorensilta, Finkensilta and Merihaansilta. Kruunuvuorensilta will be the longest bridge in Finland, approximately 1,200 metres long. The project is managed by the Urban Environment Division of the City of Helsinki, while Helsinki City Transport is in charge of constructing the light rail line.</p>			
Transportation	Kalasatama-Pasila Tramline	<p>Emissions: Construction + use phase emissions 112.500 t co2e Costs : 260 Meur Investment : 100 % City transport ltd (owned by the city) The city has taken out loans for the city transport (250 Meur from 2011 but the city doesnt want to give out infomration on exact project loans. they come from European and Nordic Investment banks)</p> <p>Project Description The Kalasatama tramway is a part of the neighbourhood construction entity in Kalasatama. The tramway will cover 4.5 kilometres along the route Nihti–Kalasatama Centre–Vallilanlaakso–Pasila. The tramway will become a part of the tram trunk network in Helsinki</p>			
Transportation	Jokeri Tramline	<p>Costs : 386 + 70 (for depot) The state paid 30 % of the investment as the tramway crosses city border to Espoo</p> <p>Project Description The length of the line is approximately 25 km, of which 16 km will be in Helsinki and the remaining 9 km in Espoo. Jokeri Light Rail will replace trunk bus line 550, which is the busiest bus line in the Helsinki region. There are 91.000 passengers daily.</p>			
Transport	Baana and innercity bikelane system	<p>Costs : 50 Meur Investment : 100 % from the city</p>			



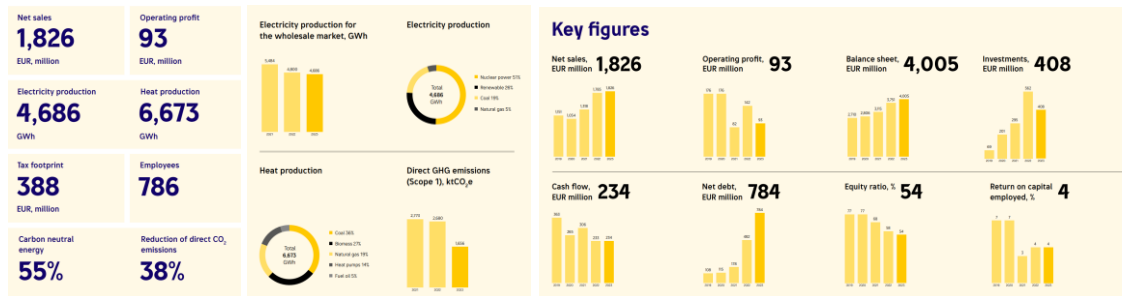
		<p>Project Description :Baana: n the future, the most functional cycling routes in Helsinki will be cycle paths called Baanas. They are high-quality cycle paths that will form an interconnected network once completed.</p> <p>Inner city : focus will be on constructing bikeways in the inner city, as the amount of bicycle traffic is high there. The focus will be on one-way cycle paths and lanes and improving the traffic arrangements at junctions. The continuity of the bikeways will also be a priority.</p>
Built environment	Malmi Preconstruction	<p>Costs : 220 Meur Investment : 100 % city</p> <p>Project Description The emissions of the preconstruction of the former Malmi Airport will be reduced by 50% in 2020–2030, compared to the preliminary preconstruction plan</p>

2.2 Module IP-B2: Capital Planning for Climate Neutrality

Textual element
<p>All actions and their costs are described in section 2.1 and the way the city finances projects has been described in section A.1 and above. In general, the city self-finances all actions and investments. When loans are taken, they are usually for subsidiaries. The state co-finances some large-scale infrastructure projects which are listed 2.1</p> <p>There is no separate budget for climate actions or investments, they go through the normal negotiation process in the city and are added to the annual budget.</p> <p>The city is operating on a surplus budget.</p> <p>In the income statement of Helsinki (including business establishments and funds) of external operating expenses the increase in 2024 is 6.7 percent compared to the 2023 budget. In the 2024 budget, the increase in operating expenses has been targeted especially for basic services where wage settlement and population growth most directly increase costs. In the 2024 budget, the municipal tax percentage is 5.3. Municipal tax revenues are estimated to be one billion euros in 2024, the corporate tax revenues 475 million euros and real estate tax revenues 367 million euros. Property tax revenues have taken into account the proposed changes in the real estate tax law to raising the lowest limit of the land property tax from 0.93 percent to 1.30 percent for 2024. The annual profit margin of Helsinki is weakening. The reason is, among other things the change in the financing model of the social, health and rescue industry causing the weakening of the 2024 tax revenue collection and growth in operating expenses.</p> <p>The city's annual profit is estimated to decrease from the 2022 and 2023 levels in 2024–2026. In 2024, the annual profit will be 585 million euros, while in August of 2023 was forecasted to be around 820 million euros. As a result of the decrease in annual profit, the city's operations and investment cash flow, which is the best indicator of deficit or surplus in an ever-growing city remains approx. EUR 400 million negative in the coming years. It means, that Helsinki has to finance substantially more of its investments than in recent years with loan financing. During the years 2024–2026, the city's loan portfolio will be evaluated growing by a total of 498 million euro. According to the financial plan, the city's loan portfolio will increase to 1,503 million euros (2,164 euros/inhabitant) by the end of 2026. The city's loan portfolio was 951 million euros at the end of 2022 (1,432 euros/inhabitant).</p>



Helen Ltd, which is responsible for most heating related emissions in the city, is a company owned by the City of Helsinki and its administration is based on the Limited Liability Companies Act, the Articles of Association, the ownership strategy and the group policy of the City of Helsinki. Helen has the same carbon neutrality goal as the city and are committed to it. Some key figures



https://www.helen.fi/globalassets/tietoa-meist%C3%A4/raportit-julkaisut/helen_annual_review_2023.pdf

Table 8 Guidelines: For each identified action, please identify the costs to all stakeholders including private citizens and the private sector or municipally owned companies. The actions from Section B1 and the Action Plan should all be referenced here in similar detail.

Table 8: Capital Planning by Stakeholder

Field of Action	Action / Indicator	Citizens (€)	Private Sector (€)	Municipality (€)	State	Utility Providers (€)	Total (€)
Kruunusillat tramline and bridges		0	0	267+ 97,6	0	0	364,6 MEUR
Kalasatama-Pasila Tramway		0	0	260 Meur	0	0	260M eur
Jokeri Tramway				319,2 Meur	136,8 Meur		456M eur
Malmi preconstruction		0	0	220Meur	0	0	220M eur
Energy renovations in privately owned	11	166Meur	-	1Meur	60 Meur		226M eur



<i>apartment buildings</i>							
Heating method change for all oil and direct electricity heated city owned office and service buildings	2	0	0	0,6 Meur	0	0	0,6 Meur
Replacing the City's outdoor lights with LEDs by 2030	13	0	0	17,5 Meur	0	0	17,5 Meur
Energy-efficiency actions on all city owned facilities	15	0	0	1,9 Meur	0	0	1,9 Meur
Energy-management system for all city owned facilities	16	0	0	2,5 Meur+ 250.000 monitoring costs	0	0	2,75 Meur
Implementing the Bicycle Action Plan	17	0	0	50 Meur	0	0	50 Meur
Implementation of electric car charging stations on the city's properties	20			0,6 Meur			0,6 Meur



Electrification of water bus line to Pihlajasaa ri	23	0	0	840.000+ 60.000/annually for operating	0	0	0,9 Meur
Reducing emissions for the construction phase of all city owned facilities	29	0	0	0,6 Meur	0	0	0,6 Meur
Total		166 Meur		1239,65Meur	196,8 Meur	0	1602,45 Meur

As most actions are city funded with some state aid for big infrastructure investments there aren't many that would involve citizen funding as well. But the Energy Renovations program is a very impactful action with lots of private funding. The program is described in Action portfolio (action no 11). The city provides the guidance service, the renovations are done by private companies, the housing companies (where each resident owns shares of the company according to the square meters they own in the building) pays 75 % of the renovations and the state has given 25 % subsidies for the renovations. The renovations have been mostly about installing heat pumps, secondly about installing e-charging stations and thirdly about other energy efficiency measures and fourthly installing solar panels. Heat pumps make up most of the renovations. The state aid criteria has been that the E-class in the house has to go down 32 % for it to get state support. This has been very easy for houses that have used oil for heating but harder for houses that are part of the district heating network. So, while 646 houses have gotten state aid, there are more that have still gone through the renovation process with state support.

The calculation above is based on 646 buildings (19.500 apartments), on average 350.000 euro renovation/house with 25 % state support. Which means that the private citizens have paid about 166 million euros, the state about 60 million.

Table 9 Guidelines: For each identified action from the Action Plan, please identify the costs specifically to the municipality and what percentage of costs is currently covered. For any actions that will be funded in full or in part by other stakeholders (e.g. private sector, loans, grant funding), please identify where these costs will come from if a source has been identified.

Table 9: Capital Planning

Field of Action	Action / Indicator	Cost to Municipality		Cost to Other	% of Costs Covered
Kruunusillat tramline and bridges		267+ 97,6		0	100
Kalasadama-Pasila Tramway		260 Meur		0	100



<i>Jokeri Tramway</i>		<i>319,2 Meur</i>		<i>136,8 Meur</i>	70
<i>Malmi preconstruction</i>		<i>220Meur</i>		<i>0</i>	100
<i>Energy renovations in privately owned apartment buildings</i>	11	<i>1Meur</i>		<i>60 Meur(state) 166 private citizens</i>	0,3 %
Heating method change for all oil and direct electricity heated city owned office and service buildings	2	<i>0,6 Meur</i>		<i>0</i>	100
Replacing the City's outdoor lights with LEDs by 2030	13	<i>17,5 Meur</i>		<i>0</i>	100
Energy-efficiency actions on all city owned facilities	15	<i>1,9 Meur</i>		<i>0</i>	100
Energy-management system for all city owned facilities	16	<i>2,5 Meur+ 250.000 monitoring costs</i>		<i>0</i>	100
Implementing the Bicycle Action Plan	17	<i>50 Meur</i>		<i>0</i>	100
Implementation of electric car charging stations on the city's properties	20	<i>0,6 Meur</i>			100
Electrification of water bus line to Pihlajasaari	23	<i>840.000+ 60.000/annually for operating</i>		<i>0</i>	100
Reducing emissions for the construction phase of all city owned facilities	29	<i>0,6 Meur</i>		<i>0</i>	100



All actions and costs are outlined in section 2.1. The city is the sole financier of the actions (except for action 1, where Helen is the sole financier)

2.3 Module IP-B3: Economic and Financial Indicators for

2.4 Monitoring, Evaluation and Learning

B-3.1: Textual element

There are several ways in which the carbon neutrality actions are evaluated. Each has an indicator that is used for measuring success (those have been described in section 2.1. Most of them have to do with lowering emissions. These are also evaluated and reported by the Environmental report on an annual basis (<https://www.hel.fi/static/kanslia/Julkaisut/2024/ymparistoraportti-2023-en.pdf>)

Also, the total impact of all actions can be seen in the annual check for total emissions in the city. The annual timeline is also used to evaluate whether the actions can lead to carbon neutrality and which additional actions are needed in the following year (which are then added to the city budget)

Secondly large-scale infrastructure projects, like tramlines, have in the past few years had to go through an impact assessment process which also calculates the emissions from the construction and use phase of the project but also show the saved emissions achieved due to the more sustainable structures put in place. These are of course estimates about the future and cannot be validated in the next couple of years as the new areas are being built and people don't live there yet. Examples of this are shown in the previous section. However, it should be noted, that the main rationale for building new tramlines and other modes of sustainable transport is not carbon neutrality but the needs for a growing city and its citizens. Active mobility, air quality, health along with carbon neutrality goals are the co-benefits of the new infrastructures.

Helsinki invests, among other things, in transport infrastructure, enabling housing production and service network. Due to growing investment needs, the development of overall investment programming and evaluation of investment profitability and urban economy will be significantly emphasized in the future. The programming, planning and implementation of the city's investment package are guided by the goals set in the city's strategy and in order to ensure the achievement of this the planning of large project packages is guided and coordinated at city level in the city office (the central administration of the city, led by the mayor).

The scheduled monitoring of investment projects will be further developed during the year 2024, along with the allocation monitoring. The industries and the finance and planning department of the city office are working together to develop the monitoring of investment projects, so that the timing and necessary financing of investments with a total cost of more than one million euros are compiled into a project portfolio that functions as a tool for monitoring investments.

The city divisions must take care of monitoring the implementation of the investment program approved in connection with the action plan and the performance budget or the corresponding investment allocation plan, so that deviations related to the project schedule or funding can be reacted to in a timely and planned manner. The current spatial project handling instructions apply to the city's investment and rental space projects (new construction, expansion, alteration, repair and renovation projects as well as rental spaces). The instructions also apply to other companies in the city such as housing projects and external partnerships, for example leasing, in which the city is involved.

The rules approved by the city council on 21 May 2018 state that instructions for handling traffic corridor, railway and park projects In the planning, implementation and decision-making have to follow those rules

The cost and planning issues of street, traffic lane, railway and park projects are dealt with, if necessary, in the project steering group for transport projects (LiikenneHOR) coordinated by the



City Office, where the urban environment sector, HKL liikelaitos, Kaupunkiliikenne Oy, HSL and Helsingin Port Oy are represented.

Each big investment and infrastructure project also goes through an external assessment process.

1. The new high speed tramline Raide-Jokeri- 25 km tramline that connects Helsinki to Espoo has been assessed by an external evaluator in six main categories and one of them : Finances has six sub categories (costs for an alternative ways of doing the same journeys by for example buses, the impact on ticket prices and revenue, costs on transport infrastructure, costs for other transport providers, impact on logistics providers and impact on public finances. On top of that the effects on climate have been calculated.

“Effects on emissions have been assessed for passenger car traffic and bus traffic based on predicted reductions in vehicle mileage. Estimates are based VTT’s LIPASTO calculation system data on road traffic emission compounds. Reduction of road traffic and replacement of diesel buses with trams reduce traffic emissions. Greenhouse gas and local emissions the annual benefits in euros from the reduction will be in 2030 a total of 0.16 million euros and in 2050 a total of 0.15 million euro. The value of the emission reduction obtained during the review period is 3.45 million euros” (Evaluation report by Flou Consulting, 2019)

2. Another example of evaluation is Kalasatama-Pasila tramway. The report is not yet out but here’s a snippet of how they have looked at the emissions that are caused by the construction and use phase of the tramway

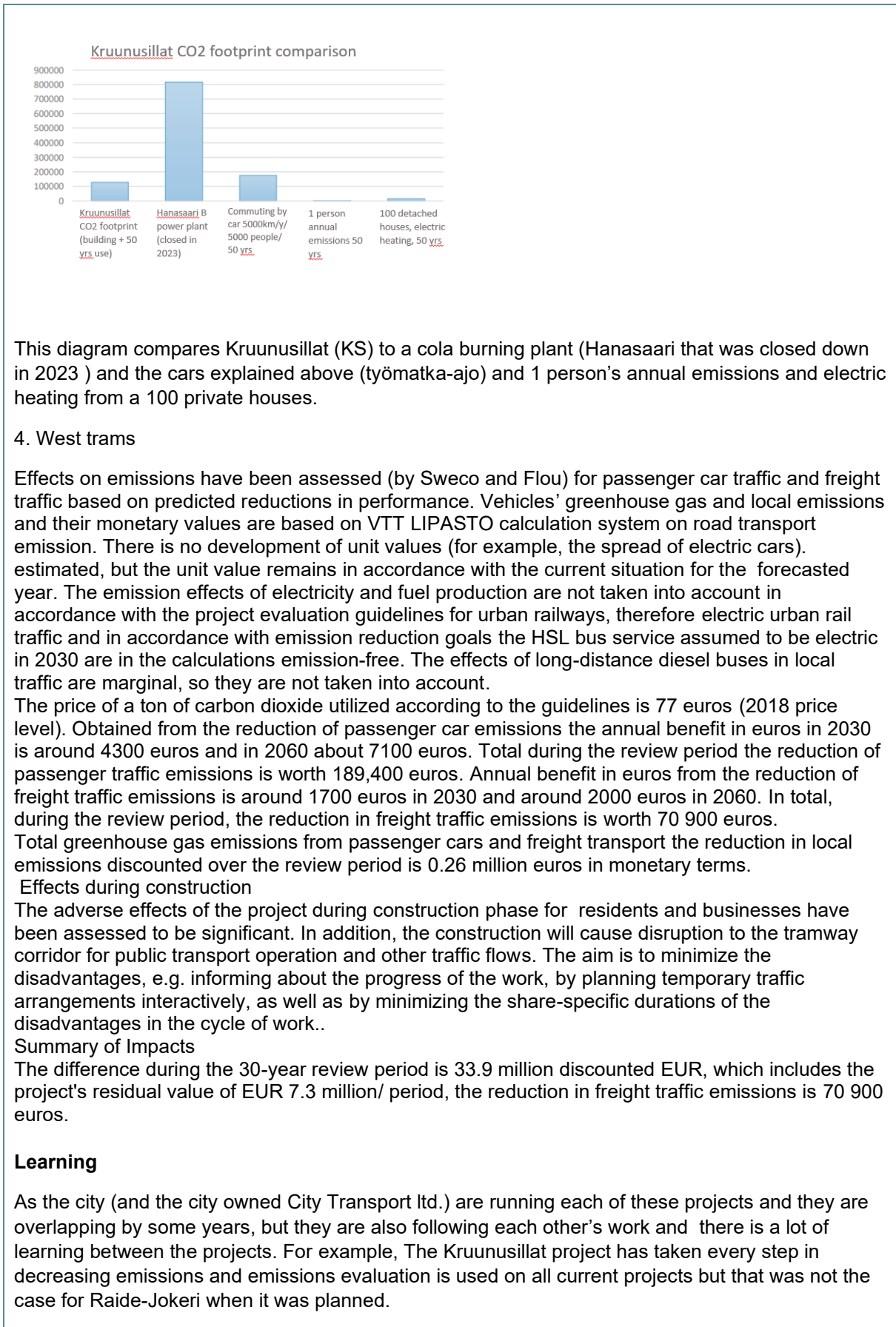


The estimated emissions from the construction + use phase was 112.500 t co2e but the realized emissions are 109.400.

They are comparing the realized emissions to 118.500 flights from Helsinki to New York.

3. Another evaluation was done by WSP for Kruunusillat (still under construction). It doesn’t take into account the costs for emissions but looks at how the emissions compare to other emissions.

Kruunusillat tram, bridges + tram use emissions over 50 years correspond to approximately 12,898 annual carbon emissions of an average Finn. Or if a private car user goes from Kruunuvuorenranta to Hakaniemi once every working day would come about 5,000 km/a per year. Provided there would be 5,000 private car users on the same route daily that would come to the same amount of emissions in 37 years





The Kruunusillat project that will start operating in 2027 described the emission reduction work and learning as follows:

“The most significant emissions are caused by the production of materials during construction, for example concrete, steel, asphalt and crushed stone, and the energy consumption during operation of the tramway. Construction emissions have been reduced at the construction site in the following ways: by choosing low-emission concrete, recycled stone products and other construction materials, by making good use of construction site masses within the construction site, and by using renewable diesel in work machines.

When it was decided to plan the Kruunusillat carbon footprint calculations were not yet carried out in any transport project.

The calculation of the carbon footprint of the infrastructure sector has developed a lot in recent years. The city of Helsinki has played a significant role in this work, together with the Finnish Highway Agency and the Finnish Environment Agency.”

Table 10: Economic Indicators by Sector

Fields of Action	Indicator	Indicator Unit	Indicator Baseline*	Indicator Target 2030*
Transportation	<i>Cycling Infrastructure</i>	<i>Construction of new tramlines, cycling lanes</i>	<i>2024: 65km+25 km ready</i>	<i>Innercity lanes 142 Km Baana lanes 148 km</i>
	<i>New tramlines</i>		<i>11 tram lines in 2024</i>	<i>7 new tramlines</i>
	<i>City Fleet Electrification</i>	<i>City fleet will be electrified</i>	<i>91 (2024)</i>	<i>100 % of city fleet in electric (756 vehicles)</i>
	<i>E-charging infrastrurure</i>	<i>That the city has enough charging stations for the growing amount of e-vehicled</i>	<i>225 (2024)</i>	<i>850 new charging points</i>
Built Environment	<i>Energy saving building retrofit for privately owned buildings</i>	<i>Energy renovation service offered by the city will help privately owned housing companies make energy efficiency renovations</i>	<i>20.000 apartments retrofitted in 2024</i>	<i>n/a</i>
	<i>district heating</i>	<i>Helen will make heating co2 free by 2030</i>	<i>35 % decrease in 2023</i>	<i>co2 free heating</i>
	<i>LED lights</i>	<i>all outdoors lights in the city are changed to LED</i>	<i>n/a</i>	<i>70.000 by 2030</i>
Green Infrastructure and	Green area factor	Green are factor is being analysed	n/a	n/a



Nature Based Solutions		and will have an indicator later		
	Tree canopy cover	Tree canopy cover level will be set later	n/a	n/a

*Indicative indicators

*Table 11 Guidelines: Please develop some project- and sector-level financial indicators as well as some cross-cutting indicators to monitor the implementation of the Investment Plan and identified projects. If you are having trouble conceptualising these indicators, please utilise the **Indicators Guidebook** which can be found on the NetZeroCities portal.*

Table 11: Financial Indicators by Sector

Fields of Action	Indicator	Indicator Unit
Transportation	Cost effectiveness	Euro/ton of co2e compared in different possible actions
		...

Built Environment	Cost effectiveness	Euro/ton of co2e compared in different possible actions of reducing emissions
Energy Systems	Cost effectiveness	Euro/ton of co2e compared in different possible actions of reducing emissions
Energy Systems	Cost effectiveness	Possible future solutions in heating CCU, Beccs, SMR compared against each other
Green Infrastructure and Nature Based Solutions	Cost effectiveness	How much actions in green infrastructure reduce costs of climate hazards, like storm water and heatwaves
Waste and Circular Economy	cost effectiveness of actions	Which circular actions reduce most emissions with least costs
Residual emissions	cost effectiveness of actions (compensation/technical sinks/additional actions)	Euro/ton of co2e compared in different possible actions

Overall indicators for carbon neutrality

Outcomes/ impacts addressed	Action/ project	Indicator No. (unique identified)	Indicator name	Target values		
				2025	2027	2030



Overall impact on co2e in scope 1 & 2 emissions		1	CO2e emissions in the city	1166kt co2e (from 1947 in 2023)	905 kt co2e	600-687 kt co2e
Actions for decreasing emissions from heating	actions 1-12	2	Overall emissions from heating	400 kt co2e (from 1086 in 2023)	220 kt co2e	90 kt co2e
Actions for decreasing emissions from transport	Actions 17-22	3	Overall emissions in transport	510 -kt c2e (from 528 in 2023)		370 kt co2e
		4	-Share of journeys taken by private cars of all journeys		485 kt co2e	
		5	-Increased bike lanes			140+140 km
		6	-Improved e-charging infrastructure			800 new chargers
			-Proportion of electric and gas cars of the passenger car population	currently the number is 14%		



<p>Actions for decreasing emissions from electricity</p>	<p>actions 13-16</p>	<p>8</p>	<p>-Overall emissions from electricity</p>	<p>189 kt co2e (from 262 in 2023)</p>	<p>145 kt co2e</p>	<p>98 kt co2e</p>
<p>Actions for decreasing emissions from built environment</p>	<p>Actions 24-32</p>	<p>9 10 11</p>	<p>-A limit value for the lifecycle carbon footprint of new residential blocks of flats set</p> <p>-The requirement of using low-carbon concrete is to be added in the procurement criteria. The requirement will enter into force on 1 January 2023. The level of the requirements will be reviewed annually.</p> <p>-The emissions of the preconstruction of the former Malmi Airport will be reduced by 50% in 2020–2030, compared to the preliminary preconstruction plan.</p>	<p>16kg co2e /m²/a</p>		<p>Has not been set yet</p>



Actions for green infrastructure and nature based solutions	Actions 33-34	12 13	-The green area factor -Tree canopy cover	has not been set yet		
Actions for circular economy	Action 35	14	Increase of circularity in the city			

The key indicator for monitoring is the development of the City's total emissions. The progress on the target will also be monitored through the following sector-specific indicators:

- specific emission factor for district heating (an indicator in Helen's development programme)
- total heating consumption;
- total emissions of transport
- emissions of electricity consumption (including the volume of electricity consumed and the emission factor for electricity production).

In addition to this, the distribution of the actions' emission categorization and the progress on individual actions will be monitored when this is necessary for seeing the strategic overview, maintaining situational awareness and allocating resources appropriately. The indicators for individual actions are defined when the action is established. An essential indicator to follow is the development of total direct emissions in Helsinki. Emissions are being monitored by using a verifiable calculation model. To ensure the availability of up-to-date information, the aim is to accelerate the assessment cycle. At the moment, the realization of direct emissions (Scopes 1 and 2) is being monitored through the shared GHG emission calculation system of the Metropolitan Area, produced by the Helsinki Region Environmental Services Authority (HSY). The monitoring is based on the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) and built on the framework of the IPCC's calculation methods and parameters for national emission inventories and emission factors for fuel classifications as defined by Statistics Finland (more information on the method: HSY 2022A). The plan's sector-specific estimates for emissions development will be carried out so that they are compatible with HSY's emissions monitoring. The development of the specific emission factor for district heating was assessed by HSY based on the production scenarios delivered by the energy company Helen (HSY 2022B). The development of specific emissions from electricity consumption is based on Fingrid's growth forecast for electricity consumption in Finland and on Finnish Energy's (2020) forecast for the development of specific emissions from electricity consumption. The emissions development for transport is based on an estimate by WSP (WSP Finland Oy 2022).

The city also measures many other things which are linked to air quality, noise level, health, soil and water protection. They are calculated on an annual basis and compared to previous years but no specific target has been set. Therefore they are described here separately from the previous indicators



Indicators for air protection

Indicator	2022	2023	Definition
The annual average nitrogen dioxide concentration at the Mannerheimintie measurement station (limit value of 40 µg/m ³ , as specified in the EU directive)	18.9 µg/m ³	17.0 µg/m ³	The indicator has improved
The annual average nitrogen dioxide concentration at the Mäkeläncatu measurement station (limit value of 40 µg/m ³ , as specified in the EU directive)	22,0 µg/m ³	21,0 µg/m ³	The indicator has improved
Number of days when the limit value level of particulate matter was exceeded at the Mannerheimintie measurement station in Helsinki (EU directive: max. 35 days per year)	11 pcs/a	20 pcs/a	The indicator has deteriorated
Number of days when the limit value level of particulate matter was exceeded at the Mäkeläncatu measurement station in Helsinki (EU directive: max. 35 days per year)	19 pcs/a	27 pcs/a	The indicator has deteriorated
Annual average amount of inhalable particles (PM10) at the Kallio measurement station	9.4 µg/m ³	9.07 µg/m ³	The indicator has improved
Annual average of fine particles (PM2.5) at the Kallio measurement station	5.1 µg/m ³	4.89 µg/m ³	The indicator has improved

Indicators for noise abatement

Indicator	2022	2023	Definition
Number of residents exposed to road traffic noise (over 55 dB LAeq7-22) based on the noise survey made every five years	256,541 (2022)	-	

Indicators for environmental awareness

Indicator	2022	2023	Definition
Number of new eco-supporters who completed basic training (persons/a)	53 persons	62 persons	The indicator has improved
Proportion of environmentally certified Helsinki educational institutions, schools and daycare centres of all	8 %	7 %	The indicator has deteriorated

Indicators for circular economy

Indicator	2022	2023	Definition
Amount of soil masses utilised (t/a)	659,751 t	790,000 t	The indicator has improved
Number of employees who participated in circular economy training (persons/a)	202 persons	175 persons	The indicator has deteriorated

Indicators for environmental management and partnerships

Indicator	2022	2023	Definition
Proportion of divisions, public enterprises and subsidiary communities where environmental management is at least at the level of the lighter environmental management systems (proportion of all).	56 %	53 %	The indicator has deteriorated



Indicators for water protection

Indicator	2022	2023	Definition
Nitrogen emissions to the sea from Viikinmäki Wastewater Treatment Plant (t/a)	605 t/a	707 t/a	The indicator has deteriorated
Phosphorus emissions to the sea from Viikinmäki Wastewater Treatment Plant (t/a)	22 t/a	26 t/a	The indicator has deteriorated
Proportion of Helsinki's coastal waters in good condition	0 %	0 %	No changes in the indicator's development
Proportion of Helsinki's groundwater basins in good condition	80 %	80 %	No changes in the indicator's development

Indicators for nature protection and soil

Indicator	2022	2023	Definition
Share of nature reserves of total land area	4,0 %	4,4 %	The indicator has improved
Change in the number and area of nature reserves (from previous year)	+4 pcs ja +42.1 ha	+5 pcs ja +73.4 ha	The indicator has improved
Total land area of water-permeable areas in Helsinki (available every second year)	64 %	-	The indicator will next be calculated in 2024.
The area of forests and wooded areas or their relative proportion of all land areas (available every second year)	42 %	-	The indicator is calculated every second year, the next time being in 2024.
Change in the number of natural areas (compared to previous year)	The total area of nature areas in 2022 was 8,399 ha (39% of the city's land area).	(not available)	Data on the amount of nature areas in 2022 produced comparably for the first time.
Change in the number of bumblebee specimens	-61 % (from 2021)	+41 % (from 2022)	The indicator has improved. (It must be noted that annual fluctuations in insect populations are normal, and a distinct trend can only be observed in the long term.)
Change in the number of European honeybee specimens	-28 % (from 2021)	-2 % (from 2022)	No substantial change in the development of the indicator.

The City's services promoted environmental awareness among residents of all ages. Helsinki residents participated actively in taking care of the tidiness of the environment. In 2023, residents, residents' associations and schools organised a total of 189 environmental cleaning sessions, in which more than 30,000 volunteers participated. The City's Park Pal activities attracted nearly 500 volunteers to pick up litter across Helsinki. The number of environment-themed books borrowed from libraries' 'eco-shelves' increased to 4,141 from 3,000 in the previous year. A challenge entitled Library Encourages Activism was launched in the spring. The challenge encourages people to engage in environmental activities by means of an activist diploma. The City's libraries also held several events in cooperation with environmental associations. Stoa Cultural Centre invited East Helsinki residents of different ages to delve into themes of a sustainable future through art-based environmental education, gallery activities and community art. Local forests served as outdoor classrooms and venues for nature immersion for babies, wintertime forest adventures for preschoolers, nature art courses for school pupils, environmental empathy workshops for young people, and performative relaxation sessions for adults alike. Libraries carried out the Forest Visiting letter exchange programme at service houses, involving elderly people and children in daycare encountering each other under a forest theme. In 2023, Stoa's environment-themed courses and workshops were attended by 3,500 people, performances by 1,600 people and exhibitions by 11,700 people. Youth Services' environmental and climate education activities were



attended by nearly 36,000 young people. Of the young people taking part in the activities, the largest age group was ages 10–12 (31.7%), followed by ages 13–15 (30.4%). Of all the environmental activities provided, activities produced by young people comprised a total of 21 per cent. Early in the year, the management of Youth Services approved the department's environmental programme for 2023–2025. The objectives of the programme are connected to the Helsinki City Strategy.

Evaluation and learning

Helsinki's City Strategy for 2021–2025, entitled A Place for Growth, states that Helsinki will have a good future when it is based on sustainable growth. Sustainable growth is in harmony with ecological boundary conditions and creates socially, economically, and culturally sustainable wellbeing. One focus of the strategy is ambitious climate responsibility and nature conservation. The objective is to facilitate a carbon-neutral Helsinki that achieves its goals, sets an example and does more than its fair share in preventing climate change. The city is adapting to the consequences of the planet's climate crisis by preparing for extreme weather phenomena and their indirect impacts. Helsinki is continuing its shift towards a circular economy and is actively protecting and cherishing its diverse nature. The City is ensuring that all residents will continue to have local nature sites only a short distance away. Helsinki cherishes the Baltic Sea and its shores and is decreasing emissions into the sea.

The indicators set for the city's environmental protection objectives for 2040 and the carbon neutrality plan 2030 also partially monitor the implementation of the City Strategy. In addition to the Environmental Report and the annual check for the carbon neutrality plan indicators, Helsinki Environmental Statistics also offer multifaceted information about the City's environmental status.

The information in the Environmental Report and statistics is open data. The City of Helsinki's objective is to make continuous improvement of environmental and climate change management a natural part of all management operations. The objectives are set for the City's divisions, as well as enterprises and subsidiaries with significant environmental impacts, to have an audited environmental management system and/ or a responsibility programme that takes the UN Sustainable Development Goals extensively into account. The City also aims to have its other enterprises and subsidiaries include environmental management in their operations by adhering to the principles of lighter environmental management systems and/or creating a responsibility programme for themselves by 2025. The Helsinki Group uses the EcoCompass, Green Office and ISO14001 environmental management systems, as well as the Eco-Schools programme and the OKKA certificate for sustainable development for educational institutions and daycare centres. Helsinki continued its active work towards achieving the Sustainable Development Goals of the 2030 Agenda. The city submitted its third Voluntary Local Review to the UN and took part in the UN's High-Level Political Forum (HLPF) on sustainable development in July 2023. Helsinki's third review painted an overall picture of the City's state and progress in the realisation of the Sustainable Development Goals. Helsinki is very successful in realising many social sustainability objectives, but the city has plenty of challenges with themes of ecological sustainability, such as coordinating material flows and the city's growth with biodiversity. A City-level sustainable development working group took part in creating the review, as did a number of the City's sustainability specialists, who highlighted the City's successes and areas in need of development.

The Voluntary Local Review can be read on the Sustainable Helsinki website (<https://www.hel.fi/static/kanslia/Julkaisut/2023/from-agenda-to-action-2023.pdf>)

The SDG voluntary review also gives recommendations to the city on how to improve. These recommendations are taken into account by the city council and all the divisions in the city.



Recommendations based on the results of the report:

1. Helsinki should set more longer-term sustainability targets that go beyond the council term, as well as progress indicators and target values for its sustainability indicators.
2. The understanding of sustainability issues and knowledge-based management must be developed at all levels, from strategic management to the provision of different services, for example by using the sustainability management tools of the six cities -network.
3. The links between the Sustainable Development Goals should be better identified, and the most relevant strategic actions should be identified for more effective implementation as part of key processes, such as economic, operational, land-use and construction planning.
4. Conflicting goals should be addressed more thoroughly, different impacts identified, and goals transparently reconciled, for example in relation to the growth of the city and the reconciliation of nature values.
5. Effective implementation of sustainability goals and active monitoring of their achievement must be strengthened, and long-term thinking must be increased. Attention must also be paid to the effectiveness of measures and indicators at a more operational level.
6. Helsinki should invest even more in promoting ecological sustainability and combating climate change and also pay attention to global impacts. Ecological impacts and planetary boundary conditions should be better integrated into the assessment and decision-making process.
7. There should be clearer coordination between the many ecological sustainability programmes, for example through updating environmental policy and enhancing environmental management.
8. Sustainable economy should be promoted in the long term by assessing lifecycle costs and investing in circular and sharing economy and preventive services.
9. Local nature and the pleasantness of urban space should be invested in, and their diverse impacts on people's health and wellbeing, the city's attractiveness and biodiversity should be better identified and valued.
10. A clearer integration of the equality and non-discrimination perspective into core functions, such as the different levels of economic and operational planning and the impact assessment of decisions, would be important.
11. Cooperation with and the participation of residents, companies, research operators and the third sector should be further developed and made more effective in order to address sustainability issues.

The City Council has approved the City Strategy for 2021–2025, which is a document that steers the City's operations. The City Board has approved the City's environmental protection objectives for 2040, which complement the current City Strategy with regard to environmental protection. The environmental protection objectives set are medium-term and long-term, and they are pursued through the programmes of various environmental protection sectors, the most significant of which are listed below with the body that decided on the programme in parentheses:

- Carbon-neutral Helsinki Emissions Reduction Plan (City Board)
- Climate change adaptation policies for 2019–2025 (City Board)
- Noise Abatement Action Plan 2018–2022 (Environment and Permits Sub-committee)
- Air Protection Plan 2017–2024 (Environment and Permits Sub-committee)
- Baltic Sea Action Plan 2024–2028 (City Board)
- City of Helsinki Nature Conservation Programme 2015–2024 (Environment Committee)
- City of Helsinki Biodiversity Action Plan 2021–2028 (Urban Environment Committee)
- Action Plan for the Circular and Sharing Economy (City Board)
- Littering Mitigation Action Plan 2022–2025 (City Board)

The carbon neutrality target is measured mainly through the decrease of emissions and checked annually. If the expected annual decrease is not realised additional actions will be added to the following years action plans and the city budget. The monitoring is done by carbon neutrality streeting group that has representation of the mayors, the highest city officials and experts.





3 Part C – Enabling Financial Conditions for Climate Neutrality by 2030

Part C “**Enabling Conditions for Climate Neutrality by 2030**” is the third section of the Investment Plan and is intended to identify other enabling factors the city needs to consider in the implementation of the Investment Plan.

3.1 Module IP-C1: Climate Policies for Capital Formation and Deployment

Model IP-C1

The main strategies and policy papers that guide carbon neutrality work in Helsinki are:

- 1) Helsinki City Strategy 2021-25 which states that ‘We will move our deadline for achieving carbon neutrality up five years to 2030 and renew our Carbon-neutral Helsinki Action Plan with measures to reduce construction and traffic emissions, in addition to other changes that are seen as necessary and feasible.... A goal to attain carbon zero status by 2040 will also be set, and we will map out a series of scenarios for achieving this milestone. Helsinki will also start planning for a carbon-negative future. City decision-makers will consider the impact of all of their decisions from a climate perspective, regardless of the kind of operations in question. When it comes to building projects, energy solutions and transport, climate concerns will be front and centre. Our goal is a carbon-neutral Helsinki that is able to not only meet its environmental objectives, but also act as an example, going beyond its part to play in responding to the crisis. We will zero in on the fastest measures for reaching carbon neutrality, and we will actively seek out big picture-oriented solutions that set us on the path to social justice. Environmentally friendly options will be made more readily available to residents.’ The City Strategy is the highest guiding strategy and policy paper in the city set by the city council which is the highest decisions-making body in the city. (<https://www.hel.fi/static/kanslia/Julkaisut/2021/helsinki-city-strategy-2021-2025.pdf>) The specific actions are listed in part B of this document

The City Strategy is the binding paper for the city and all departments have to follow the targets and policies stated in the strategy. This gives the carbon neutrality work in Helsinki its biggest mandate.

The city strategy is also the document that mandates the carbon neutrality plan actions to be included in the annual budgeting of the city.

- 2) Helen’s strategy 2023 which states: ‘Helen has drawn up a new strategy, the core of which is to improve the flexibility of the energy system... The goal of carbon-neutral energy production by 2030 remains unchanged. In the short term, we will phase out the use of coal and invest in the production of renewable electricity. In the medium term, we will electrify our heat production, use biomass and seize new growth opportunities. In the long term, we will further increase the use of electricity in heat production and phase out combustion-based



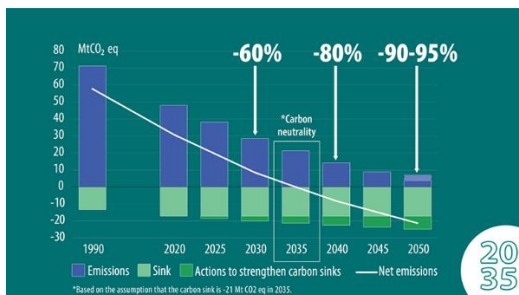
energy production by 2040' <https://www.helen.fi/en/about-us/helen-ltd/about-us/strategy> The specific actions are listed in part B of this document

The importance of Helen's strategy is very big for Helsinki's carbon neutrality target as currently emissions from heating are 62 % of the total scope 1 &2 emissions in Helsinki. Helen's strategy has been evaluated for the city by an outside evaluator and the report states that the investment's made and those in the pipeline are solid and the city can trust that the heating emissions will go down as projected.

The city can use the ownership strategy and the group policy of the City of Helsinki for overseeing how Helen invests in future infrastructure and tech.

3) Finland's Carbon Neutrality Strategy 2035

According to the **government programme**, the Finnish Government is committed to meeting emission reduction targets and moving towards carbon neutrality in 2035 followed by carbon negativity. This is done through sector specific low carbon roadmaps (<https://www.climate2035.fi/>)



The national target is used to align policies and regulations, for example on construction-based emissions and transport emissions.

The state-cities agreements on regional land use, housing and transport agreements state the funding that the city will receive from the state on big infrastructure section 2.1

4) EU targets

The EU is committed to reducing its net greenhouse gas emissions by at least 55 per cent by 2030, compared to 1990. This is also the commitment the EU has declared to the Secretariat of the UN Framework Convention on Climate Change for the purposes of the Paris Agreement. **Finland's**



obligation under EU law is to halve the effort sharing sector's greenhouse gas emissions (non-ETS) by 2030 (from 2005 levels)

The EU level targets and corresponding funding from Horizon help mainly in piloting projects. On the other hand EIB loans have been used in infrastructure projects.

Other policies and programmes

5) Helsinki City Environmental Protection Targets 2040

The environmental protection targets for 2040 are a part of the city's overall sustainable development goals. The document combines the goals for ecological sustainability and sets long-term targets that are fundamental for carrying out environmental protection consistently. Helsinki's environmental protection targets are based on the city's environmental policy, which was adopted by the City Council on 26 September 2012. Updating the environmental policy is timely, as the medium-term target year of 2020 has passed, and many changes have already been made to the targets.

Targets have been set for under following sub-areas:

- Mitigating climate change
- Adapting to climate change
- Air protection
- Noise abatement
- Water protection
- Protecting biodiversity
- Soil protection and remediation of contaminated soil
- Promoting the circular and sharing economy
- Promoting responsible procurement
- Promoting environmental awareness and sustainability
- Environmental management

https://www.hel.fi/static/kanslia/julkaisut/2024/HKI_Ymparistonsuojelun_tavoitteet_ENG_valmis_saav.pdf

The environmental protection targets state the same as the carbon neutrality target but also that Helsinki will develop methodologies for calculating consumption based emissions. And will at some point set a limit for them but there is not timeline set.



- 6) The City of Helsinki’s roadmap to circular and sharing economy which states that the long-term goals in the policy draft is that the City will operate in a carbon-neutral circular economy by 2050. <https://circulareconomy.europa.eu/platform/sites/default/files/the-city-of-helsinki-roadmap-for-circular-and-sharing-economy.pdf>

The circular economy road maps states goals and actions for city procurement, for construction sector circularity and green waste. They are not binding but will help develop circular economy.

The city’s different innovation platforms, including circular economy, built environment and smart mobility – which fund innovation pilots in the city and be seen here

<https://testbed.hel.fi/en/>

- 7) Helsinki- Uusimaa Regional Council Climate Roadmap

<https://uudenmaanliitto.fi/en/development-and-planning/helsinki-uusimaa-regional-climate-roadmap/8>)



The regional policies help set regional transport goals as the public transport is run by a regional company. The same goes for waste management and regional land use planning. Otherwise, regions are not very powerful in the Finnish system when compared to municipalities and the state

- 8) SUMP Helsinki from 2017 <https://dev.hel.fi/paatokset/media/att/4f/4f73f78c1516bef6717a30401146fb12d34e5bf9.pdf> (only in Finnish)

- 9) SECAP Helsinki



Helsinki committed to the 2018 Global Covenant of Mayors for Climate and Energy (GCoM), the world's largest urban climate commitment. The commitment requires a Sustainable Energy and Climate Action Plan (SECAP) in accordance with the eligibility requirements of the GCoM Reporting Guidelines set out in this document. Helsinki's urban strategy 2017–2021 outlines that the city will achieve carbon neutrality by 2035, reducing emissions by at least 60 per cent by 2030 and by at least 80 per cent by 2035. Emission reduction work is guided by the Carbon Neutral Helsinki 2035 Operational Program (HNH Program) and adaptation work by the guidelines for adaptation to climate change, which serve as the starting point for the SECAP action plan. The City Government approved Helsinki's guidelines for adapting to climate change in May 2019. The guidelines are a plan by which Helsinki can adapt to climate change. Helsinki had previously included adaptation measures in various programs and created tools (e.g. stormwater program, green roof guidelines, green factor tool). Helsinki has also implemented the guidelines of the Helsinki Metropolitan Area's joint strategy for adaptation to climate change in its own work. The SECAP plan has been approved and its refinement and implementation is monitored annually by the City Board. The implementation and refinement of the plan will also be reported every two years to the Global Covenant of Mayors European Monitoring System

Helsinki has committed to GCoM SECAP plan but as the targets for Helsinki have since been tightened with the new target year 2030 this document is not so relevant anymore.

Several other reports can be found here [Reports | Climate work in Helsinki | City of Helsinki](#)

Altogether these strategies and plans, and especially the first two, are the basis for Helsinki to reach the target of carbon neutrality. As stated in the above sections these plans will decrease Helsinki's emissions by 80-82 % by 2030 and the rest (around 600kt) will be solved later by either additional actions or compensation.

Helsinki has made a BAU model for 2050.

[BAU Scenario for the City of Helsinki's Emissions up to 2050: Report](#)

and earlier a transport BAU model for 2030 and 2040 [liikenteen-kasvihuonekaasupaastot-raportti.pdf \(hel.fi\)](#)- only in Finnish

The report describes the emission sources and sinks for the following emission sectors:

- heating of buildings,
- electricity consumption,
- transport,
- industry,



- agriculture and forestry,
- waste management,
- other indirect emissions,
- carbon sinks associated with land use.

The report covers direct emissions occurring within the geographical area of the city and indirect emissions caused by activities taking place within the city boundary. Indirect emissions are the result of activities taking place within the city boundary; however, they occur outside the city boundary.

For the legislation in force and the climate actions, the main baseline data for the BAU scenario are:

- The share of the energy content of biofuels from the total energy content of petrol, diesel and biofuels supplied by the distributor must be increased to 30% in 2029 (the distribution obligation).
- The share of biofuel in light fuel oil supplied for consumption will be 10% in 2028 and beyond (the distribution obligation of biofuels).
- The use of coal as a power source for electricity or heat production by power plants and heating plants will be banned in 2029.
- Helen Ltd's development programme and any ongoing and planned projects to replace the use of coal with other fuels.
- Helsinki City Plan (master plan)2016 (City of Helsinki 2018), which promotes a densifying urban structure and infill development. No supplementary construction is expected in planning areas that are not covered by the city plan (Östersundom) or in areas where elements of the plan have been removed. The relevant pending local master plans may change the situation from the estimates of this report.
- Decisions taken on future transport network development projects: Raide-Jokeri, Kruunusillat, Vihdintie light railway, the Pasila–Kalasatama tram line and Sörnäinen tunnel.

The baseline for the scenario does not include objectives or draft resolutions. This means, for example, that the Government resolution on reducing greenhouse gas emissions from air transport (Government 2021), or the draft resolutions on the green public procurement criteria for building work (see Ministry of the Environment 2019) or the emission cap-and trade system for maritime transport (see Honkatukia et al. 2021) have not been used as baseline data for the scenario. The scenarios also take into account three different possible scenarios for how the population of Helsinki will grow, scenarios of the development of jobs in Helsinki.

In addition to the development within the city, the formulation of a long-term outlook for emissions must make baseline assumptions about national and global market trends. For these assumptions, this work is primarily based on the WEM (With Existing Measures) scenario of the National Climate and Energy Strategy and its impact assessment (Koljonen et al. 2021), sector-specific climate roadmaps (Paloneva and Takamäki 2020) and, in the case of indirect emissions, also on the scenarios of measures decided by international organisations (ECAC, IEA, IMO).The models used



in the work are PAS 2070 (BIS 2014a), U.S Community Protocol for Greenhouse Gas Emissions (ICLEI 2019) and GPC Version 1.1 (WRI 2021)

Many calculation models are used around the world to calculate the greenhouse gas emissions of cities. The calculation model used in this study combines the approaches of PAS 2070 (BIS 2014a), the U.S Community Protocol for Greenhouse Gas Emissions (ICLEI 2019) and GPC Version 1.1 (WRI 2021) for assessing city greenhouse gas emissions, which take into account both indirect emissions of a city or urban area as well as the direct regional emissions. With regard to emissions generated within a set geographical area, the principles of the calculation model are similar to those applied in previous analyses of emission scenarios carried out in Finland (Lounasheimo 2015, Huuska et al. 2017, Karhinen and Lounasheimo 2021). The activity data and emission factors are assessed separately to implement the calculation. The method of calculation is a simplified version of current emission inventories. Further sources of data on BAU scenario analyses and inter-city comparisons include the Hilma calculation model of Helsinki Region Environmental Services Authority (HSY 2022) and the Alas model for municipal emissions (Lounasheimo 2020) regarding geographic boundaries, and the Kulma (Liljeström et al. 2021) and AlasKulutus (Karhinen et al. 2023) calculation models for consumption-based emissions.

The starting point for the calculation model is the establishment of geographic boundaries as described above. The calculation of GHG emissions for each cross-section year is based on an assessment of the development of the activity data and the emission factors associated with the

activity measured:
$$GHG\ emissions = Activity\ data \times Emission\ factor$$

The amount of GHG emissions is reported in carbon dioxide equivalents (CO₂e), a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), which describes the relative potency of a greenhouse gas, taking account of how long it remains active in the atmosphere. Activity data are a quantitative measure of a level of activity that results in GHG emissions (e.g., energy used in buildings or kilometres driven). The activity is assessed on the basis of statistical data and other sources, based on the measures of a BAU scenario and the city's general population and employment projections. Demographic development and the related construction, transportation and consumption have the greatest impact on the quantity of activity data. The emission factor converts the activity into carbon dioxide equivalents (CO₂e) expressed in weight (e.g., emissions per vehicle-kilometres travelled). Emission factors may be activity-based or life cycle-based (WRI 2013, WRI 2021): – Activity-based emission factors describe the amount of greenhouse gases (GHG) emitted during a specific activity (e.g., fuel combustion during use). Activity-based emission factors are used to calculate scope 1 and scope 2 emissions.

Life cycle-based emission factors include all the emissions that occur in the life cycle of a material or fuel (production, transport, combustion). Life cycle-based emission factors are used to calculate scope 3 emissions. With regard to carbon dioxide, bio-based fuels have zero emissions in the calculations. Almost the same amount of CO₂ is considered to be captured by plants through photosynthesis while growing as is released during biomass combustion, which can make biomass a carbon-neutral source of energy. The production of biofuels and noncarbon emissions are nonetheless taken into account as a source of emissions.



Emissions by sector

Table 1. Breakdown by sector of the emission sources included in the report. The items shown in brackets are not covered by the calculation model, typically due to the sub-sectors being accounted for elsewhere.

Sector	Sub-sector	Content	Scope
Energy use of fuels	Heating of buildings	Emissions from district heating of buildings	1
		Fuels used for separate heating of buildings	1
	Electricity consumption	Electric heating	2
		Other electricity consumption	2
	Other stationary sources of emissions	Fuel combustion in construction	1
Fuel combustion in manufacturing industries		1	
Indirect emissions from fuels	Emissions from fuel production	3	
Transportation	Road transport	Direct emissions from road traffic within the city	1
		<i>(Electricity consumption by road and railway transport is described under "Electricity consumption")</i>	(2)
	Emissions from road traffic outside the city resulting from cross-border journeys	3	
	Aviation and water transport	Emissions from journeys departing from the airport, with a sub-sector for journeys starting inside the city boundaries	3
Emissions from journeys departing from harbours, with a sub-sector for journeys starting inside the city boundaries <i>(Freight transport by air and water is described under "Other indirect emissions")</i>		(3)	
Manufacturing industries	Industrial processes	Emissions from product use in industrial processes (solvents, propellants, coolants)	1
Agriculture and land use	Agriculture	Agricultural emissions from enteric fermentation, cropland and manure treatment	1
	Carbon sinks	Carbon stock changes and carbon sinks as a result of land use changes <i>Changes in carbon stock resulting from using biomass as a source of energy</i>	(3)
Waste	Waste	Emissions from wastewater treatment	1
		Emissions from landfill waste	2
		Composting of biowaste and sewage sludge	2
Other indirect emissions	Food consumption	Emissions from food consumed in the city	3
	Building materials	Emissions from building materials used in the construction of buildings and infrastructure	3
	Other consumption	Emissions from other services and goods consumed in the city	3

Here is a short summary of the BAU scenarios based on the above criteria plus additional criteria for each sector- you can read the detailed descriptions in the report.

Heating

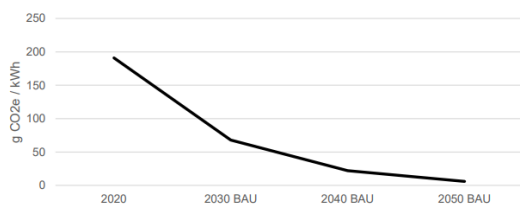


Figure 5. The projected specific CO2 emissions of district heating from the current state to 2050.

The heating energy consumption of the building stock decreases due to the energy efficiency of new construction, renovating the old building stock and climate change.

From 2030 onwards, the projected specific CO2 emissions are not based on a plan of action but on general assumptions about the future trends of district heat production. Of the energy sources in use in 2030, the proportion of natural gas is assumed to decrease to zero according to Finnish



Energy’s low-carbon roadmap (Afry 2020). The energy sources to replace natural gas are assumed to be high-capacity heat pumps, in which case the use of wood-based fuels would not increase from the 2030 level. In the long term scenario of Finnish Energy’s low-carbon roadmap, geothermal energy and other new heat sources are also expected to be put into use

Scenario baseline assumptions for the BAU scenario for electricity consumption is based on changes in the consumption of the residential, industrial and service sectors and the future trends of the national specific CO₂ emission factor of electricity. Residential sector electricity consumption includes forecasts on the use of electricity for heating, transport and other electricity use by households (Figure 7): – The use of electricity for heating is estimated as part of the consumption of heating energy. The scenario takes into account the growth of the building stock floor area, geothermal heat becoming more common as a heat source in buildings and heat pumps in district heat production. – The projected emissions of transport include an estimation of the use of electricity in transport. The scenario factors in changes in traffic volumes, the proliferation of electric cars and the expansion of the rail network. – Other electricity use by households includes cooking, lighting and other electrical devices. Other electricity use is expected to increase in relation to population change. Emissions from electricity generation decrease sharply (Figure 8). The emissions from electricity consumption are calculated using a national source-specific emission factor. The current specific CO₂ emissions of electricity have been determined with Statistics Finland’s average emission factor for electricity generation (Statistics Finland 2021), and long-term development has been estimated according to the base case scenario of Finnish Energy’s low-carbon roadmap (Afry 2020, pp. 12–13). In the emission factors, the emissions from cogeneration have been distributed with a benefit sharing mechanism. The assumption is that electricity generation will change so that the use of coal will end by 2030, and the use of natural gas and peat by 2050. The same source-specific emission factor is applied in the calculation of emissions from electricity use for heating and electricity end-use consumption. Emissions from electricity consumption decrease sharply from the current state due to the reduction in the specific CO₂ emissions of electricity generation (Figure 9). Electricity consumption as a whole will grow by about 1% per year until 2050, mainly due to the electrification of heating and transport, as well as the electricity consumption of services. There is high uncertainty associated with electricity consumption in the services and industrial sectors, in which energy efficiency has not been assumed to improve.

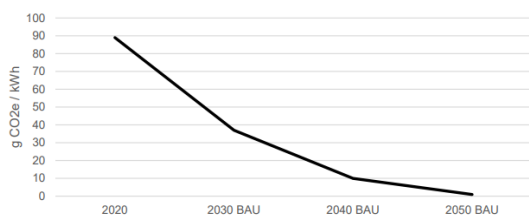


Figure 8. Specific CO₂ emissions of electricity generation from current state to 2050.

Transport emissions.

The BAU scenario for road transport is based on projections of traffic performance measured in kilometres travelled, change in the power source of vehicles, the distribution obligation of biofuels and specific CO₂ emissions of fuels. The baseline assumptions are presented below (Table 5). The kilometres travelled have been estimated by mode of transport on the basis of the data produced using the Helsinki Region Transport forecast model (Supponen and Kyötsönen 2022). The traffic



volume trends take into account new land use as suggested in the city plan and any transport development projects approved for implementation at the time of making the calculations. Emissions from road transport decrease due to a strong reduction in specific CO2 emissions although the number of kilometres travelled increases the reduction in the specific CO2 emissions of road transport is especially due to the electrification of transport and the impact of the distribution obligation of biofuels.

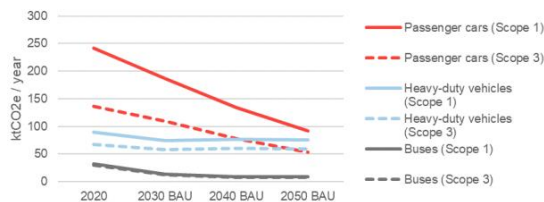


Figure 14. The BAU scenario for emissions from road transport from current state to 2050.

You can see similar projections for air traffic, waste, industry, agriculture, food, construction and goods in the report.

Table 12: List of Climate Policies to Enable Capital Deployment

Climate Policy	Policy Status (Enacted, In Process, Development, etc.)	Description of the policy (sector, targeted audience, etc.)	Intended Outcome for Capital Formation
Helsinki City Strategy 2021-25	Enacted	Highest guiding paper for the city, covers all actions and divisions. The carbon neutrality target is set by the city strategy	Targets set by the strategy can have funding in the annual budget
Helen's strategy 2023	Enacted	Sets the goal for carbon neutral heating by 2030	Helen has invested /will invest in carbon neutral heat production
Finland's Carbon Neutrality Strategy 2035	Enacted	Set the goal and roadmpas for carbon neutral Finland	Enables the state to fund climate actions
The EU is committed to reducing its net greenhouse gas emissions by at least 55 per cent by 2030, compared to 1990	Enacted	Set the target for Eu and enables bith regulatory framework and funding opportunities	Different programs that enable funding for climate actions



Helsinki carbon neutrality action plan	Done every year	Analyses the roadmap towards carbon neutrality each year and adds actions that will secure that the city will hit the target	Lists actions that will have funding from the city budget
Helsinki City Environmental Protection Targets 2040	Enacted	Lists actions that have climate, environmental and biodiversity goals	Can enable funding from city budget
The City of Helsinki's roadmap to circular and sharing economy	Enacted	Lists main actions for increasing the level of circularity in the city especially in built environment	The city has set funding(from the city owned Innovation fund) to fund actions with circular economy companies to test solutions in the city

Table 12: List of Climate Policies to Enable Capital Deployment

Seen above.

3.2 Module IP-C2: Identification and Mitigation of Risks

The risks relevant to the implementation of an Investment Plan should be considered, which may impact the ambition to achieve climate neutrality, mitigation techniques should be identified where necessary and where possible, these should align with the financial policies selected.

Task Goals: *All projects identified in the Climate Action Plan will have potential risks regarding funding and financing – for example, a project overshooting cost estimate. By establishing a risk management framework and developing risk mitigations at both the sector and project level, cities can ensure they are equipped to identify any problems quickly, and sufficiently deal with these problems once they arise.*

Model IP-C2

C-2.1: Textual element
The principles of financial risk management/operating environment, which the city follows, called Balance Sheet Management Principles, are discussed in the city council. It is very conservative even compared to other big Finnish cities. Under the leadership of the CFO, the city regularly holds balance sheet management meetings with an external professor-level expert as a member, and reports extensively on financial activities on a monthly basis to key personnel and the audit. Both loan and investment policies are very conservative. No risky investments are made for the cash assets, and the interest rate risk on the loan side is kept under control under all circumstances. All projects go through impact and risk assessment, every action goes through the city budget negotiations and when loans are involved through the criteria of lenders.



As the city is currently assessing the residual emissions of 2030 all the possible actions are measured for their cost, their impact on emissions, their acceptability by people and politicians and how they fit the current city strategy. The qualification and risk assessment for loans is going through the lenders criteria for green loans.

Table 13 Guidelines: Please identify potential risks, routes to monitoring these risks, and a mitigation plan to prevent risk escalation. This should be completed for the project- and sector-level as well as city-wide risks. Instead of simply listing risks, this is an opportunity for cities to outline a risk management framework (including identifying high, medium and low priority risks), the likelihood of all risks and any residual risks following mitigation actions.

Table 13: Climate Investment Plan Risk Framework

Fields of Action	Sectoral Project	Risks Identified	Description of Risk	Risk Priority	Mitigation of Risk
Transportation	Additional actions on transport emissions	Policy risk Stakeholder engagement risk technical risk regulatory risk	Political decision-making, citizen views tech development, state actions. Eu level regulation	As mobility emissions become the biggest source of emissions by the end of 20's this is a high-level risk	Citizen involvement, data analysis, clear communication Cost analysis
	Charging network for e-vehicles	Commercial risk Policy risk	How quickly the commercial sector can be utilised in building the charging network. The pace for building new charging infra	Quite big	Learning from other cities like Stockholm
	Change of car fleet	Commercial risk Policy risk Equality risk Stakeholder risk		Big as the change of fleet to e-vehicles is necessary for getting the emissions down	The speed of change has so far been faster than expected.
Built Environment	Lifecycle limit of carbon footprint on all new residential buildings	Commercial risk	The stagnation of the industry due to the economic situation	Big	As the capital city the construction sector will pick up. the city still attracts a lot of people from the outside and the current trend predicts the city will grow with 8000 new apartments annually



Energy Generation	Carbon neutrality plans for heating and electricity production	Commercial risk Regulatory risk	Possible changes with how biomass are considered co2e-free. Price of new investments in SMR or BECCS	Biomass definition risk not very high for the coming years. Investment risks somewhat high due to price and regulation	Thoroughly done assessment of risks
Green infrastructure and Nature Based Solutions	Green factor and tree canopy factors	Policy risk	More green areas and more trees can be in conflict with the needs to build a denser city	Not understanding that prioritizing the contribution these actions give to climate adaptation measures	Analysis of benefits, Good communication
Waste and Circular Economy	Increased circularity in the city, including the construction sector	Policy risk Commercial risk	Lack of knowledge about circular possibilities		Capacity building, using the current testbeds in the city
City Wide Risks (Cross Cutting)	General development of the economy and employment	Economic risk	If the economy is not doing great it's harder to push big, costly changes through If employment is at risk people won't make the changes they might otherwise, like changing their car to electric	So far not so big as the city economy is stable and the budget is surplus	Well prepared prognosis and analysis of the coming years
City Wide Risks (Cross Cutting)	Attitudes of citizens and companies	Stakeholder risk Policy risk	If citizens are very much against making carbon neutrality decisions,, especially in the mobility sector it will be harder for politicians to make them	Quite big as	Analysis, communication, cost-analysis of other possible measures
City Wide Risks (Cross Cutting)	Prognosis for increase of inhabitants in Helsinki	Policy risk	If the city grows rapidly it's harder to keep the carbon sinks		As the risks of climate change become more visible during storms and



			and add green areas to the city		heatwaves the adaptation actions become more widely accepted
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3.3 Module IP-C3: Capacity Building and Stakeholder Engagement for Capital and Investment Planning

C-3.1: Textual element

Overall governance for the carbon neutrality plan

The Climate Unit is in charge of the coordination, updates, monitoring and continuous development related to the Carbon Neutral Helsinki Action plan. “Ambitious climate responsibility, and the “Carbon Neutral Helsinki Action Plan” as a part of it, is one of the City’s four cross administrative strategic programs. The work is directed by a program group chaired by the mayor.

To ensure the implementation and impact of the actions agreed on and to prevent delays, a Carbon Neutral Helsinki coordination group is formed of the managers in the city organization who hold decision-making power in the plan’s focus areas. The group is chaired by the City Manager (the highest city servant in the city). The group streamlines the steering of all implementing organizations and monitors the progress of the actions. The steering of the companies owned by the Helsinki City Group is done through Helsinki City Group steering group according to the regulation of the city.

The “Ambitious Climate Responsibility program group” that oversees the carbon neutrality program and the operative “Carbon Neutral Helsinki group” will report on achieved impact to the City Board every autumn, about 6 months before the closing of the city accounts. The reporting will pay special attention to the progress of actions and suggest additional actions when they are needed. The actions in the emissions reduction plan will be updated annually and approved as part of the city’s budget proposal. In connection with this, reports will also be submitted for the realized emissions development by sector and the estimated impact of new actions proposed on future emissions development. In connection with the update, the city ensures that the new additional actions will support the achievement of the emissions reduction target even if the city has fallen behind on target in the previous periods. This approach corresponds, where relevant to the method used by the City of Oslo called the climate budget.

Actions that influence direct emissions and that are carried out as a part of official work have not been included in the Carbon Neutral Helsinki Action Plan. Also, actions related to indirect emissions have mainly been excluded. They will be supported and monitored through the Environment and Climate Network coordinated by the Environmental Management Team and the Climate Unit of the City’s Urban Environment Division. The network includes experts that are responsible for environmental and climate related work in public divisions and enterprises. HSY will be the primary operator to carry out consumption-related influencing and communication directed at residents, based on the City’s strategic steering.

The capacity for making financially sound decisions depends on many factors. The climate unit is planning on adding more capacity for financial /economic knowledge through new hirings. Its becoming more and more important to be able to make cost analysis of possible actions, especially when comparing actions of different sectors and preparing alternative actions for the decision-making process.. On the other hand the city’s financial department is very good and as climate actions are added to city budget through normal negotiations it’s helpful to discuss the actions with



both the finance department and the urban development division. The Climate unit also has funds to use consultants to analyse plans and scenarios so all knowledge doesn't need to be in-house.

Governance and ecosystem management for heating

Helen, the energy company is a big stakeholder in the plan. Helen Ltd is a company owned by the City of Helsinki and its administration is based on the Limited Liability Companies Act, the Articles of Association, the ownership strategy and the group policy of the City of Helsinki. Helen has the same carbon neutrality goal as the city and are committed to it.

The city owned building stock (about 20 %) has its own programs for energy efficiency.

While district heating covers over 90 % of residential buildings in Helsinki there is a slowly growing number of houses that have chosen to install heat pumps. The city has an advisory group for helping housing companies with this change. they also give information about the private renovation companies that can install heat pumps, do other energy efficiency renovations or install e-charging for the lot. Before this year the state also gave subsidies for these renovations.

Governance and ecosystem management for transport

In the transport sector there are a lot more stakeholders than in the heating sector. First of all, politically it's more difficult to find a consensus, secondly there are a lot of very vocal citizens both for and against any actions that might restrict private car usage or make it more expensive due to parking, road tolls or environmental zones. Thirdly there are many lobbies and interest groups representing inner city commercial interests or the freedom associated with being able to drive easily and quickly anywhere. Fourthly the neighbouring cities want to keep access of driving into Helsinki as cheap and easy as possible. Fifthly there are different commercial interests from companies from the parking companies to e-charging companies. Sixthly many of the decisions are closely linked to the state and their transport policies. Seventhly Helsinki is a port city with a large seaside area and the harbour traffic of big ships and the leisure boat companies deal with very different challenges and resources. Eighthly there's heavy transport and logistics, both the traffic from the harbour with trucks and the logistics of the city commerce have different needs and solutions.

All of these aspects fall under the carbon neutrality target. As will be described in section B1.1. there's a scenario work with large scale impact assessment with expert and stakeholder work, including a citizen panel process going on in Helsinki. The political decision-making process will start later this year and will cover most of the aspects mentioned above.

Governance and ecosystem management for electricity

Finland is part of the Nordic wholesale electricity market, which covers the Nordic countries and the Baltic States. Some 70 per cent of the wholesale trade in electricity takes place in the power exchange located in Oslo. The electricity market is becoming European-wide. Market liberalisation and the Nordic market integration have increased productivity and environmental efficiency, as the Nordic hydropower capacity can now be utilised efficiently, and the market also allows for trading in "green" energy.

As the electricity is becoming green through the market there is very little need to do anything about it.

Governance and ecosystem management for built environment

The built environment is mostly scope 3 emissions but since the city of Helsinki has quite a lot of power to act on the sector, a lot of measure to reduce emissions have been taken.

The city owns about 63 % of the land in Helsinki, 20 % of the buildings, 1/6 of the residents live in city owned houses and the city has a planning monopoly. The city is also growing rapidly and about 8000 new apartments are needed every year. This means that there's (usually) a lot of construction going on both in the residential area but also for facilities, like schools, kindergartens, hospitals and infrastructure like new fast tram lines and bike lanes.

There are different ways the city has regulated and guided the construction sector from demanding stricter energy efficiency or use of lower emissions materials to banning the use of lime cement.

The city also uses plot conveyance conditions for implementing more e-charging and other measures that help with transport or other emission reductions. The overall regulatory framework for construction is the life cycle limit for emissions on all new residential buildings. This is way



ahead of the national regulation and it's done in collaboration with the construction companies through dialogue and a competition. The main idea behind the lifecycle limit is that it enables the market to develop innovations and doesn't limit it to certain materials or heating systems or worksite processes, but each entity can combine different solutions as long as they stay under the lifecycle limit. This approach has been welcomed by the industry as its very clear but leaves room for different approaches.

Governance and ecosystem management for circular economy

The action plan for circular economy places a lot of emphasis on creating platforms for different companies to collaborate with the city and each other. Since the City of Helsinki has a strong role as a client, a real estate developer and a constructor, the Circular Economy Cluster Program focuses especially on promoting circularity in the construction sector. Achieving a circular economy requires the whole sector to contribute, but there is still a shortage of know-how. The cluster program offers experimentation with new things, research-based information and the sharing of lessons learned. The Circular Economy Cluster Program supports practical experiments and cooperation between operators and helps find new business opportunities. Activities involve, e.g. designing for the circular economy, extending the life cycle, dismantling intact and reusing materials and building components, there's also innovation competition and student collaboration.

Investment policy

The city's large-scale investments are done by the finance department, they also help the city subsidiaries on their loans. The Risk and Financial management is explained in C.2.1.

Collaboration with citizens and business

The Energy Renaissance model for making energy efficiency actions feasible for households.

A ten people team of energy engineers and service designers give step-by-step guidance on how to make small and large scale energy efficiency renovations to privately owned housing companies (privately owned apartments, usually between 5-100 apartments together form a housing company) Typically the process starts with making an energy efficiency survey which helps establish what are the different improvement options, their prices and their payback periods. Over 850 houses have gone through the energy efficiency renovations after the team started its work in 2021. Approximate renovation costs 350.000 euros (with a 25 % subsidy from the state) so the market for renovations done by private companies in Helsinki has grown to over 230 Million euros.

The energy efficiency of nearly all residential blocks of flats in Helsinki can be improved in way that is financially beneficial for the affected homeowners.

A large proportion of the maintenance expenses of housing companies consists of energy consumption, i.e. the heating of rooms and household water and building electricity. Typically energy and water form 30-40% of maintenance expenses. In best cases, improving energy efficiency and adopting new energy solutions can help housing companies reduce their heating costs by up to 60%.

The adoption of geothermal heat or a heat recovery system, for example, does need to be carried out as part of major renovation works, as these types of measures can be cost-effective on their own and do not require residents to temporarily move out. That said, major renovations also provide excellent opportunities for improving energy efficiency.

An energy renovation project can often be carried out in a housing company charge-neutral manner. What this means is that the housing company charge (yhtiövastike) does not need to



be increased due to the renovations, and the renovations will eventually start providing cost savings.

The service is paid for by the Carbon Neutral Helsinki plan.

<https://energiaremontti.hel.fi/en/>

In the future additional information about climate adaptation renovations to be done simultaneously with energy efficiency renovations (for example about adding nature based solutions to the apartment building grounds /yards to enable storm water management) will be offered.

Collaboration with stakeholders

Built environment cluster program

The City of Helsinki actively promotes smart, energy-efficient, and climate-smart solutions in their renovation and infill construction sites. They are developed and implemented in residential and service construction sites, both in individual buildings as well as at the block level. The Urban Environment Division, the City of Helsinki Housing Production (ATT), and Helsinki City Housing Company (Heka Oy) are central players in these projects. With the help of new, sustainable and smart solutions, a more functional and enjoyable city will be built for Helsinki residents. Companies participating in the test platform activities are able to develop their business as the need-based nature and quality of their products and services improve

Sustainability partners network (formerly called Climate partners)

Helsinki has since 2012 organized a collaboration network of over 100 companies that aims for local businesses to participate in making Helsinki carbon-neutral and more sustainable in every way. The main objectives is to have joint development work, extend the network and create a more unified understanding of various collaboration methods and innovative projects.

- Encourage Helsinki area-based companies to sustainability work and enable more shared activities to reduce emissions
- Create sustainable business opportunities and invite small and medium size enterprises to the network that wish to develop their sustainability agenda
- Support Helsinki area actors to find new and innovative solutions to global challenges according to the strategic city economic policy priority objectives
- Share results, lessons learned and experiences of best practices

List of partners [Sustainability partners | City of Helsinki](#)

Collaboration with the state

Regional land use, housing and transport agreements

The agreements concerning land use, housing and transport are concluded by the State of Finland with the largest urban regions. The purpose of the agreements is to facilitate and support the cooperation between municipalities in urban regions and between municipalities



and the State in the guidance related to the urban structure and coordination of land use, housing and transport.

The key aim is to improve the functioning and competitiveness of urban regions and ensure a balanced development of municipalities. The matters specified in the agreements include the objectives for land use development and housing production in the coming years and key development projects concerning the transport network.

The parties to the agreements representing the State are the Ministry of the Environment, Ministry of Transport and Communications, Ministry of Economic Affairs and Employment, Ministry of Finance, Housing Finance and Development Centre of Finland (ARA), Finnish Transport Infrastructure Agency, Finnish Transport and Communications Agency Traficom, and the Centre for Economic Development, Transport and the Environment of the region concerned. The agreements concerning the urban regions of Helsinki, Tampere, Turku and Oulu for 2020–2031 have been signed on 2 June 2020

The agreement for 2020-31 state low carbon and sustainable land use , housing and transport as a priority while also looking at balances development between regions and lowering homelessness.

Actions that are co-financed by the state and have an effect on Helsinki's climate plan include :

- Viikki-Malmi fast tram line. The state will pay 30 % of costs no more than than 7,5 million euros
- The Vihdintie fast tram line planning and construction and other sustainable actions connected to it. The state will pay 105 million euros.
- Mobility system improvements in the Helsinki region. State will pay 15 million euros
- Improvements in walking and cycling infrastructures in Helsinki. State will pay 2,5 million to regional improvements and open up new funding for the amount of 4,5 million euros that the regions cities can apply for.
- Helsinki together with Espoo will make improvements to metro lines to increase their capacity.

Boosting regional involvement with participatory budgeting, borough liaisons and business liaison

In participatory budgeting, Helsinki residents come up with ideas for improving their neighbourhoods with city funds and then vote on which ideas to bring to fruition, in accordance with an appropriation approved by the city council. The first round of participatory budgeting in the city took place in 2018-2019, when residents submitted over one thousand proposals for how to use an earmarked sum of 4.4 million euros. The ambitious project is named OmaStadi (MyCity) and the proposals and voting took place on the omastadi.hel.fi digital platform.

Every resident of the city can propose ideas, after which the authors join with city experts to develop feasible proposals.

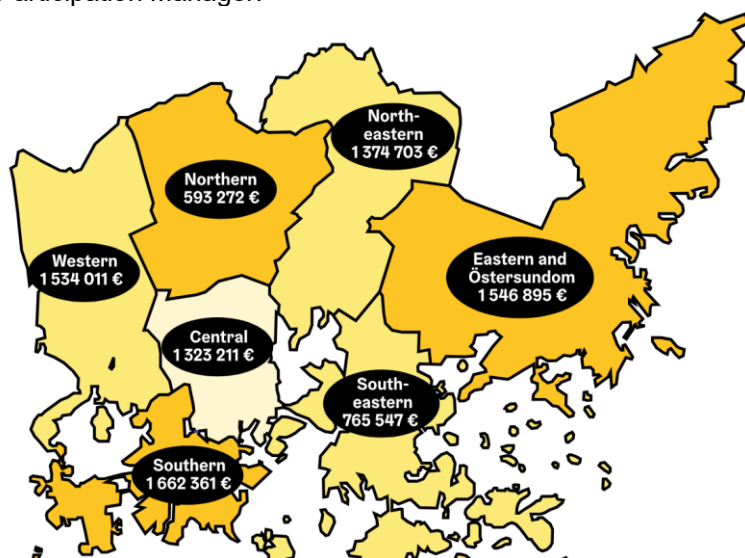
All residents over the age of 12 are eligible to vote, giving young people a concrete opportunity to participate in municipal decision-making each year and in general supporting the new core curriculum for comprehensive schools.

All residents over the age of 12 are eligible to vote, giving young people a concrete opportunity to participate in municipal decision-making each year and in general supporting the new core curriculum for comprehensive schools. The budget for the initiative is divided among the major districts of Helsinki according to their populations. One-fifth of the sum is reserved for proposals that would affect the entire city. Along every stage of the process, the city and its residents jointly arrange events to support the initiative and citizen involvement.



There have been several successful initiatives funded through the participatory budget that help climate goals as well, including planting trees and improving biking infrastructure in various neighbourhoods.

The last round is almost done, ending with a co-creation with the residents for the 45 chosen ideas “In Helsinki, 41 962 people voted, representing 7,1 percent of the city's residents. These results show that the OmaStadi participatory budgeting initiative is a concrete, important opportunity for the people of Helsinki to play a part in the development of our city. I am especially pleased to see that the voting percentage of young people improved. On an international level, Helsinki's participatory budgeting voting percentage is very good,” said **Johanna Sinkkonen**, the City of Helsinki's Participation Manager.



The results of the co-creation are now ready

The citizens and city experts have co-created together 45 voted proposals during the spring. You can now find out what kind of plans were created during joint development, and how the planning and implementation of the projects will continue later.

[Get to know the results →](#)

Table 14: Stakeholder Engagement Mapping

Stakeholders involved	Required Investment (€)	Network	Influence	Interest	Level and Type of Engagement
City carbon neutrality programme group led by the mayor	Depend on actions – the needed actions are part of the city budget	Decision making power for climate actions	The group that decides on climate actions in the city	Getting Helsinki to the set target of 2035	Committed to reaching carbon neutrality
Helen board of directors	The investments needed for the future are estimated to be over a billion euros	The board with the company makes decisions of future investments	Very big influence on emissions as heating is still the biggest source of emissions in the city	Helen has set the same carbon neutrality goal as the city so interest in cutting emissions is big	Committed to reaching carbon neutrality
Climate (Sustainability partners)	Different for different companies	A network the city and over 100 companies-committed to together reach carbon neutrality	A good platform for discussions and shared learning	Decreasing emissions in the city	Meetings, peer learning



Collaboration with universities	-	Helsinki has for over 20 years collaborated with the local universities and have set the shared goal of carbon neutrality	A good platform for discussions and shared learning	Decreasing emissions in the city and the universities	High-level meetings between mayors and rectors. Also many joint programs
National collaboration with Mission cities and ministries	-	The ministries of Transport, environment and economy meet regularly with the 6 Finnish Mission cities	A good platform for discussions and shared learning. Especially useful for integrated policy setting in transport and construction	Carbon neutrality plans of the cities and the state	Meetings, joint planning
Neighborhood associations and other third sector /citizen collaboration	small	Joint meetings. Some funding from the city to the associations. Knowledge sharing	Locally can have big influence on energy efficiency renovations, charging stations, recycling etc	Local carbon neutrality plans and peer learning	Voluntary actions
Helsinki Energy Challenge	1 Meur	For the purpose of finding out the best energy mix and with the objective of not wanting to burn anything (wood pellets, waste etc) the city opened a global challenge called the Helsinki Energy challenge with a winning price of 1 million euros. it used the innovative public procurement framework to run it.	There was a set of criteria including innovativeness, financing, impact on nature, reliability, team structure etc. 252 teams from 35 countries submitted their solutions. The results of the competition showed that the solutions can come from various combinations	New innovative ways of heating the city	Global competition



			<p>ons but also showed trends including electrification and storing of heat energy, optimization, energy efficiency measures, lowering the temperature of the district heating system, two-way district heating systems etc. The winning solutions can be seen at here https://energychallenge.hel.fi/results-helsinkien-energy-challenge</p> <p>The competition results were next taken into a large stakeholder /expert review process that lasted 6 months organised by the city in 2022</p>		
Collaboration with the construction sector	-	A dialogue with construction companies about	Emissions from construction are about as big as from transport,	To have less emissions from construction sector while	Dialogue, competitions



		regulatory changes but also opportunities through competitions	its very important to guide the sector towards less emissions	enabling inovative solutions that can make the construction companies more competitive,	
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